

Radio equipment used in mobile services —

Part 1: General requirements and conditions of measurement

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Electronic Equipment Standards Committee (EEL/-) to Technical Committee EEL/25 upon which the following bodies were represented:

- British Broadcasting Corporation
- British Radio & Electronic Equipment Manufacturers' Association
- British Telecommunications plc
- Department of Trade and Industry — Radiocommunications Division
- Institution of Electronic and Radio Engineers
- Radio Electrical and Television Retailers Association

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

- British Approvals Board for Telecommunications
- ERA Technology Ltd
- Electronic Engineering Association
- GAMBICA (BEAMA Ltd.)
- OFTEL (Office of Telecommunications)
- Radio Society of Great Britain
- Telecommunication Engineering and Manufacturing Association
- User Standards Forum for Information Technology
(Institute of Data Processing Management)

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National foreword

This Part of BS 6160 has been prepared under the direction of the Electronic Equipment Standards Committee. It is identical with IEC 489-1:1983 “*Methods of measurement for radio equipment used in the mobile services — Part 1: General definitions and standard conditions of measurement*” published by the International Electrotechnical Commission (IEC).

This Part of BS 6160 is a revision of BS 6160-1:1981, which is withdrawn.

This revision comprises the text of the first edition with an amended clause 30 dealing with other environmental conditions.

BS 6160 describes recommended methods of measurement used to determine the characteristics and performance of radio equipment used in the mobile services. The other Parts of BS 6160 are as follows:

- *Part 2: Methods of measurement for transmitters employing A3 or F3 emissions;*
- *Part 3: Methods of measurement for receivers for A3 or F3 emissions;*
- *Part 4: Methods of measurement for transmitters employing single-sideband emissions (A3A, A3H or A3J);*
- *Part 5: Methods of measurement for receivers employing single-sideband techniques (R3E, H3E or J3E);*
- *Part 6: Methods of measurement for selective calling and data equipment¹⁾.*

Further Parts of BS 6160 are under consideration.

Cross-references

International Standard	Corresponding British Standard
IEC 51:1973 ^a	BS 89:1977 <i>Specification for direct acting indicating electrical measuring instruments and their accessories</i> (Identical)
	BS 2011 <i>Basic environmental testing procedures</i>
IEC 68-1:1982	Part 1.1:1983 <i>General and guidance</i> (Identical)
IEC 68-2-1:1974	Part 2.1A:1977 <i>Tests A. Cold</i> (Identical)
IEC 68-2-2:1974	Part 2.1B:1977 <i>Tests B. Dry heat</i> (Identical)
IEC 68-2-3:1969	Part 2.1Ca:1977 <i>Test Ca. Damp heat, steady state</i> (Identical)
IEC 68-2-6:1982	Part 2.1Fc:1983 <i>Test Fc. Vibration (sinusoidal)</i> (Identical)
IEC 68-2-27:1987	Part 2.1Ea:1977 (1984) <i>Test Ea. Shock</i> (Identical)
IEC 68-2-32:1975	Part 2.1Ed:1977 <i>Test Ed. Free fall</i> (Identical)
IEC 215:1987	BS 3192:1979 <i>Specification for safety requirements for radio (including television) transmitting equipment</i> (Identical)

^a IEC 51:1973 has been superseded by IEC 51, Parts 1 to 9 and it is intended that BS 89 will be revised in due course.

The Technical Committee has reviewed the provisions of IEC 68-2-4, to which reference is made in the text, and has decided that they are acceptable for use in conjunction with this standard. The reference to IEC 244-1 is for information only and therefore the validity of the standard is not affected.

¹⁾ In preparation.

The British Standard related to the International Electrotechnical Vocabulary (IEV) is BS 4727 “*Glossary of electrotechnical, power, telecommunication, electronics, lighting and colour terms*”. The reference to the International Telecommunications Union (ITU) Radio Regulations is for information only.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 20, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This standard applies to radio transmitting and receiving equipment and systems used in the mobile services.

This standard is restricted to land and mobile stations in the mobile services and to portable and personal equipment which may operate in one or more radio-frequency channels in the frequency range below 1 000 MHz and is intended for the transmission and the reception, either in a simplex or a duplex mode, of emissions modulated by a single information channel.

In this standard, the equipment includes the aerial (antenna) change-over device or the duplexer, if used, but does not include:

- the aerial (antenna) or aerial (antenna) system except in the case of equipment using integral aerials (antennas);
- the input transducer of the transmitter;
- the output transducer of the receiver except in the case of equipment using integral transducers (see note).

NOTE The performance of the equipment depends upon that of the input and the output transducers used. Assessing the performance of these transducers may be the subject of separate measurements which are outside the scope of this standard.

This standard also provides for testing certain special sub-systems (see Clause 10).

2 Object

This standard belongs to a series of publications which, when completed, will describe recommended methods of measurement to be used to ascertain the characteristics and performance of equipment used in the mobile services and to make possible the comparison of the results of measurements made by different observers.

This standard applies to detailed methods of making measurements selected and recommended for assessing the essential properties of the equipment. It is not mandatory that measurements of all the defined characteristics be made. Either fewer or additional measurements may be appropriate. When additional measurements are desired or necessary, they preferably should be carried out in accordance with the standards laid down by other IEC Technical Committees or Sub-Committees or by other international bodies.

Limiting values of the various quantities for acceptable performance generally will not be specified, as these normally will be given in the relevant equipment specifications, or in requirements laid down by the responsible regulating bodies.

The methods of measurement mentioned in this standard are intended for type tests and acceptance tests, if these tests are agreed between manufacturer and user, but may also be used for factory tests.

Section 1. Terminology

3 General terms and definitions

In the terms and definitions below, certain of them are quoted from Article 1 of the ITU Radio Regulations, edition of 1982. They are identified by the number of the Radio Regulations definition. The International Electrotechnical Vocabulary (IEV) reference number is added if the definitions conform to those given in the IEV.

3.1

type

a type comprises products having similar design features, manufactured by the same techniques and falling within the manufacturer's usual range of ratings (see Notes 2 and 3) for these products

NOTE 1 Mounting accessories are ignored, provided they have no significant effect on the test results.

NOTE 2 "Ratings" cover the combinations of:

- a) electrical ratings;
- b) sizes;
- c) behaviour under environmental stresses.

NOTE 3 The limits of the range of ratings should be agreed between manufacturer and purchaser.

3.2

type tests

the complete series of tests to be carried out on a number of specimens representative of the type, with the object of determining whether a particular manufacturer can be considered capable of producing products meeting the specifications

3.3

acceptance tests

tests carried out to determine the acceptability of a consignment on the basis of an agreement between user and manufacturer

the agreement should cover:

- a) the sample size;
- b) the selection of tests;
- c) the extent to which the test specimens should conform to the requirements for the selected tests of the specification.

NOTE In cases of divergent test results, the IEC standard test methods should be used for acceptance tests.

3.4

factory tests

tests carried out by the manufacturer to verify that his products meet the specification

3.5 Mobile service

A service of radiocommunication between mobile and land stations, or between mobile stations (RR1-3.7):

3.5.1

aeronautical mobile service

a mobile service between aeronautical stations and aircraft stations, or between aircraft stations, in which survival craft stations may also participate (RR1-3.15)

3.5.2

land mobile service

a mobile service between base stations and land mobile stations, or between land mobile stations (RR1-3.9)

3.5.3

maritime mobile service

a mobile service between coast stations and ship stations, or between ship stations, in which survival craft stations may also participate (RR1-3.11)

3.5.4

port operations service

a maritime mobile service in or near a port, between coast stations and ship stations, or between ship stations, in which messages are restricted to those relating to the operational handling, the movement and the safety of ships and, in emergency, to the safety of persons. Messages which are of a public correspondence nature shall be excluded (RR1-3.13)

3.6 Station

One or more transmitters or receivers, or a combination of transmitters and receivers, including the accessory equipment, necessary at one location for carrying on a radiocommunication service. Each station should be classified by the service in which it operates permanently or temporarily (RR1-4.1):

3.6.1

land station

a station in the mobile service not intended to be used while in motion (RR1-4.10)

3.6.2

aeronautical station

a land station in the aeronautical mobile service. In certain instances an aeronautical station may be placed on board a ship or an earth satellite (RR1-4.19)

3.6.3

aeronautical fixed station

a station in the aeronautical fixed service (RR1-4.7)

3.6.4**base station**

a land station in the land mobile service carrying on a service with land mobile stations (RR1-4.11)

3.6.5**coast station**

a land station in the maritime mobile service (RR1-4.13)

3.6.6**fixed base station**

base station which is permanently located at a known and precisely described geographical point

3.6.7**mobile station**

a station in the mobile service intended to be used while in motion or during halts at unspecified points (RR1-4.8)

3.6.8**aircraft station**

a mobile station in the aeronautical mobile service on board an aircraft or an air-space vehicle (RR1-4.21)

3.6.9**land mobile station**

a mobile station in the land mobile service capable of surface movement within the geographical limits of a country or continent (RR1-4.12)

3.6.10**ship station**

a mobile station in the maritime mobile service located on board a vessel, other than a survival craft, which is not permanently moored (RR1-4.15)

3.6.11**survival craft station**

a mobile station in the maritime or aeronautical mobile service intended solely for survival purposes and located on any lifeboat, life-raft or other survival equipment (RR1-4.5)

3.6.12**port station**

a coast station in the port operations service (RR1-4.18)

3.7**simplex operation**

operating method in which transmission is made possible alternately in each direction, for example by means of manual control (IEV 60-00-095)

NOTE Simplex operation may use either one or two frequencies in radiocommunication.

3.8**duplex operation**

operating method in which transmission is possible simultaneously in both directions (IEV 60-00-100)

NOTE In general, duplex operation requires two frequencies in radiocommunication.

3.9**terms and definitions related to modulation**

these terms and definitions are given in the relevant standards of this series

4 Terms and definitions related to the equipment**4.1****transmitter**

a device used in the mobile services for converting audio-frequency signals intended for the transmission of speech or data, combined or not with selective calling signals or control signals, into required frequency, phase, amplitude or pulse-modulated radio-frequency signals

NOTE For the general definition of a radio transmitter, reference should be made to Sub-clause 3.1 of IEC Publication 244-1: Methods of Measurement for Radio Transmitters, Part 1: General Conditions of Measurement, Frequency, Output Power and Power Consumption.