

High fidelity audio equipment and systems; minimum performance requirements —

Part 8: Specification for combination equipment

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- Association of Sound and Communications Engineers Limited
- Audio Engineering Society
- British Educational Equipment Association
- British Kinematograph, Sound and Television Society
- British Radio & Electronic Equipment Manufacturers' Association
- British Telecommunications plc
- Cable Television Association of Great Britain
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National foreword

This Part of BS 5942 has been prepared under the direction of the Electronic Equipment Standards Committee and is identical with Publication 581-8:1986 “*High fidelity audio equipment and systems; Minimum performance requirements — Part 8: Combination equipment*”, published by the International Electrotechnical Commission (IEC).

Terminology and conventions. The text of the International Standard has been approved for publication as a British Standard without deviation. Some terminology and certain conventions are not identical with those used in British Standards.

References to page numbers in the text relate to the IEC page numbers given in brackets at the bottom of each page.

Cross-references

International Standards	Corresponding British Standards
IEC 94-3:1979	BS 6288 <i>Magnetic tape sound recording and reproducing systems</i> Part 3:1982 <i>Methods of measuring the characteristics of recording and reproducing equipment for sound on magnetic tape</i> (Identical)
IEC 98A:1972	BS 4852 <i>Methods of defining and measuring the characteristics of disk record playing equipment</i> Part 1:1972 <i>Disk record players</i> (Technically equivalent)
IEC 268-1:1985 (See Note)	BS 6840 <i>Sound system equipment</i> Part 1:1987 <i>Methods for specifying and measuring general characteristics used for equipment performance</i> (Identical)
IEC 268 (See Note)	BS 5428 <i>Methods for specifying and measuring the characteristics of sound system equipment</i>
IEC 268-3:1969	Part 2:1979 <i>Amplifiers</i> (Technically equivalent)
IEC 268-5:1972	Part 11:1977 <i>Loudspeakers</i> (Identical)
IEC 268-15:1978	Part 10:1979 <i>Preferred matching values for the interconnection of sound system components</i> (Identical)
IEC 315	BS 4054 <i>Methods of measuring and expressing the performance of radio receivers for sound broadcasting</i>
IEC 315-1:1970	Part 1:1980 <i>General conditions</i> (Identical)
IEC 315-4:1982	^b Part 4:198 Radio-frequency measurements on receivers for frequency modulated sound-broadcast emissions
IEC 581	BS 5942 <i>High fidelity audio equipment and systems; minimum performance requirements</i>
IEC 581-2:1986	^a Part 2:1987 <i>FM radio tuners</i> (Identical)
IEC 581-3:1978	Part 3:1980 <i>Specification for record playing equipment and cartridges</i> (Identical)

^a In preparation.

^b In preparation including Amendment No. 1.

International Standards	Corresponding British Standards
IEC 581-4:1979	Part 4:1981 <i>Specification for magnetic recording and reproducing equipment</i> (Identical)
IEC 581-6:1979	Part 6:1980 <i>Specification for amplifiers</i> (Identical)
IEC 581-7:1986	^a Part 7:198 <i>Specification for loudspeakers</i> (Identical)
IEC 651:1979	BS 5969:1981 <i>Specification for sound level meters</i> (Identical)

^a In preparation.

NOTE BS 5428 will be superseded by BS 6840. All new parts of IEC Publication 268 will be implemented under BS 6840 and all existing parts will be brought under BS 6840 when they are revised, amended or otherwise reviewed.

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 gives the minimum requirements applicable to combination equipment, for high quality reproducing systems primarily intended for home use.

It should be noted that the requirements given are not always mere additions to the relevant values of the individual units which are dealt with in the various other parts of this standard, but are based on the needs dictated by the merits of each case.

2 Explanation of terms

Combination equipment can be distinguished as follows:

- a) *A combination of separate units* comprising two or more separate units marketed together by the manufacturer and not intended to be used separately or to be freely interchangeable with other units of the same general type.
- b) *An integral combination* being an equipment in which two or more basic equipment functions are included in the same enclosure, or otherwise mechanically linked, so that it is not practicable to separate any one function from the others.

3 General requirements for combination equipment

Combination equipment shall meet the minimum requirements as stated in this part. For combinations of separate units the interconnection between units need not meet the requirements concerning the type of connector and preferred values for interconnection. Connections for other units not marketed with the combination shall, however, comply with these requirements. Values of characteristics measured at interconnections between units need not comply with the requirements for those characteristics at that measuring point, provided the overall characteristics of the combination comply with the requirements of this part. Values of characteristics measured at interconnections between units of the combinations and other units not marketed with the combination shall, however, comply with these requirements.

For *integral combinations* the performance requirements given in the various other parts of this standard shall apply to individual functions of an integral combination only insofar as that function can be used by itself in conjunction with other equipment not forming part of the combination, the interconnections to this other equipment complying with the requirements for connectors and preferred electrical values for interconnection.

4 Amplifier part of combination equipment

4.1 Measuring conditions

According to the measuring conditions stated in IEC Publication 581-6: High Fidelity Audio Equipment and Systems; Minimum Performance Requirements. Part 6: Amplifiers.

4.2 Minimum requirements of the various characteristics and their relevant methods of measurement

The amplifier part of combination equipment shall meet the minimum requirements as stated in IEC Publication 581-6 for the following characteristics:

- Clause 7: "Rated output power".
- Clause 10: "Crosstalk attenuation (between inputs)".
- Clause 13: "Balance control".
- Clause 14: "Loudness control".
- Clause 15: "Thermal stability".
- Clause 16: "Electrical stability".
- Clause 17: "Short circuit protection".
- Clause 18: "Marking of controls".

5 Combination record playing equipment and amplifiers

5.1 Measuring conditions

According to the measuring conditions stated in IEC Publication 581-3: High Fidelity Audio Equipment and Systems: Minimum Performance Requirements, Part 3: Record Playing Equipment and Cartridges, and 581-6 respectively.

All characteristics, given in Sub-clause **5.3.1** up to and including Sub-clause **5.3.6** of this standard as well as the unweighted and weighted signal-to-rumble ratio (Sub-clause **5.2**) are measured at the output terminals of the amplifier part, making use of the relevant test records.

However the total harmonic distortion of the amplifier part shall be measured on the amplifier itself in accordance with IEC Publication 268-3: Sound System Equipment, Part 3: Sound System Amplifiers. Unless otherwise stated, the measurements are made at a volume control setting corresponding to an output equal to the reference output (10 dB below the rated output) and the controls, modifying the audio frequency response curve set to such a position that the requirements of IEC Publication 581-6 are met ("flat" position).

5.2 Minimum requirements of the mechanical characteristics and their relevant methods of measurement

The mechanical characteristics of the record playing equipment, when measured according to the appropriate method of measurement given in the relevant clause, shall meet the minimum requirements stated in IEC Publication 581-3.

This applies to the following characteristics:

- Clause 4: "Mean deviation from rated speed".
- Clause 5: "Weighted wow and flutter".
- Clause 6: "Unweighted reference signal-to-rumble ratio".
- Clause 7: "Weighted reference signal-to-rumble ratio".
- Clause 13: "Tracking ability".
- Clause 15: "Vertical tracking angle".
- Clause 16: "Static vertical stylus force".
- Clause 17: "Stylus tip radius".

5.3 Minimum requirements of the electrical characteristics and their relevant methods of measurement

In addition to the minimum requirements for the characteristics of the amplifier part given in Sub-clause 4.2, the combination shall meet the minimum requirements given for the following characteristics:

Clause	Characteristic	Method of measurement	Minimum requirement
5.3.1	Effective frequency range	According to the clause of IEC Publication 98A ^a "Signal characteristics"	From 40 Hz to 12 500 Hz within the tolerances defined by the graph: $f_1 = 40 \text{ Hz}$ $f_2 = 63 \text{ Hz}$ $f_3 = 8\,000 \text{ Hz}$ $f_4 = 12\,500 \text{ Hz}$ If the claimed effective frequency range is wider than the minimum requirement of 40 Hz and 12 500 Hz the tolerances of 6 dB and 5 dB respectively still apply
5.3.2	Channel unbalance	According to the clause of IEC Publication 98A ^a "Channel unbalance"	$\leq 5 \text{ dB}$ at 1 000 Hz This applies to settings of the volume control down to 46 dB below the maximum setting
5.3.3	Channel separation	According to the clause of IEC Publication 98A ^a "Separation"	$\geq 20 \text{ dB}$ at 1 000 Hz $\geq 15 \text{ dB}$ between 315 Hz and 6 300 Hz These figures apply to settings of the volume control down to 40 dB below the maximum setting
5.3.4	Total harmonic distortion	<i>Amplifier part</i> According to IEC Publication 268-3, measured via the input for the pick-up system, applying the circuit of Figure 1 Figure 1 $G =$ a.f. generator $T =$ transducer (relevant p.u. system) $R_1 =$ to match generator G $R_2 \ll$ transducer impedance <i>Combination</i> Under consideration	<i>Amplifier part</i> According to IEC Publication 581-6 for pre-amplifiers and integrated amplifiers <i>Combination</i> Under consideration

^a Publication 98A: First Supplement to Publication 98:1964: Processed Disk Records and Reproducing Equipment — Methods of Measuring the Characteristics of Disk Record Playing Units.