

Methods of measurement for radio transmitters —

Part 11: Transposers for FM sound broadcasting

The European Standard EN 60244-11:1993 has the status of a
British Standard

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National foreword

This British Standard has been prepared under the direction of the Electronic Equipment Standards Policy Committee and is the English language version of EN 60244-11:1993 *Methods of measurement for radio transmitters*.

Part 11: Transposers for FM sound broadcasting, published by the European Committee for Electrotechnical Standardization (CENELEC). It is identical to IEC 244-11:1989, published by the International Electrotechnical Commission (IEC) and is part of a multi-part series describing recommended methods of measurement for assessing the performance of radio transmitters.

This Part of BS EN 60244 incorporates in a single publication all recommended measurements for FM sound broadcasting transposers.

This standard is intended to be used in conjunction with EN 60244-1¹⁾.

It is anticipated that the other Parts of IEC Publication 244 will be published as identical British Standards, subject to their harmonization by CENELEC.

For ease of reproduction French captions have been retained on the figures.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 18, 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⁾ In preparation. It is envisaged that an identical British Standard, designated BS EN 60244-1 will be published in due course.

English version

Methods of measurement for radio transmitters Part 11: Transposers for FM sound broadcasting

(IEC 244-11:1989)

Méthodes de mesure applicables aux
émetteurs radioélectriques
Onzième partie: Réémetteurs pour la
radiodiffusion sonore à modulation de
fréquence
(CEI 244-11:1989)

Meßverfahren für Funksender
Teil 11: Umsetzer für FM-Tonrundfunk
(IEC 244-11:1989)

This European Standard was approved by CENELEC on 1993-03-09. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

At the request of 72nd Technical Board, HD 236.11 S1:1990 (IEC 244-11:1989) was submitted to the CENELEC voting procedure for conversion into a European Standard.

The text of the International Standard was approved by CENELEC as EN 60244-11 on 9 March 1993.

The following dates were fixed:

- latest date of publication of an identical national standard (dop) 1994-06-01
- latest date of withdrawal of conflicting national standards (dow) —

Annexes designated “normative” are part of the body of the standard. In this standard, Annex ZA is normative.

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Introduction

This standard is one of a series of parts of IEC Publication 244, describing recommended methods of measurement for assessing the performance of radio transmitters.

A number of the existing parts of IEC Publication 244 are currently under review and several of the older parts will be revised or withdrawn. When this process is complete, the overall publication will comprise one part dealing with general characteristics, with cross-references to relevant CCIR publications and the Radio Regulations, and a number of specialist parts, each dealing with a particular type of transmitter.

This new part, therefore, incorporates all recommended measurements for FM sound broadcasting transposers in a single publication and supersedes all clauses dealing with FM broadcasting transposers in the following publications:

- Publication 244-2, first edition, 1969
- Publication 244-2A, first edition, 1969
- Publication 244-2B, first edition, 1969
- Publication 244-3, first edition, 1972
- Publication 244-3A, first edition, 1971
- Publication 244-3B, first edition, 1972
- Publication 244-4, first edition, 1973

1 Scope

This standard applies to transposers, as defined in Clause 3, operating in accordance with current CCIR Recommendation 450 for FM sound broadcasting at VHF, including stereophony. It also covers requirements for other multiplexed subcarrier services.

2 Object

This standard lays down detailed methods of measurements, selected and recommended for assessing the essential performance and general characteristics of FM sound broadcasting transposers. It is not mandatory to measure all the defined characteristics. Fewer or additional measurements may be appropriate. Any additional measurements should preferably be in accordance with relevant standards published by the IEC or by other international bodies.

Limiting values for acceptable performance are not specified, as these are normally given in the equipment specification, or in requirements laid down by the responsible regulating bodies.

This standard shall be used in conjunction with IEC Publications 244-1 and 244-1A (now being revised) or, in due course, with the future edition replacing these publications.

For guidance on the information to be given in descriptive leaflets particular to the type of equipment considered in this standard, refer to the relevant sections of IEC Publication 244-12.

The methods of measurement described in this standard are intended for type tests but they may also be used for acceptance tests and factory tests. (See IEC Publication 244-1 for the meaning of these terms.)

Section 1. General conditions of operation and measurement

3 Definition

The term “FM sound broadcasting transposer” is used in this standard to refer to that equipment in an FM sound broadcasting relay station which is connected between the feeder terminations of the receiving antenna and the transmitting antenna, and in which a frequency transposition is performed without demodulation. The majority of the measurements apply also to a receiver/transmitter combination.

Any device for the suppression of unwanted signals, irrespective of whether or not it is located inside the transposer, shall be considered to be part of the transposer for the purpose of this standard.

4 Input and output signal arrangement

For the purpose of measurement, the transposer can be considered in terms of input and output characteristics, and of transmission performance.

Depending on the particular measurements, one of the three measuring arrangements described below may be employed. Details of the arrangements are given in Figure 1, Figure 2 and Figure 3.

The modulating signals for the test transmitters in Figure 1 to Figure 3 shall be provided by:

- or more baseband (audio) signal generators,
- a high quality stereo coder of specified characteristics,
- auxiliary devices for the supplementary multiplexed subcarrier services, if required.

All measurements concerning transmission performance are carried out with baseband signals at the output of the test demodulator or, for some stereo tests, at the output of a high quality stereo decoder.

Because the results of these measurements are critically dependent on the performance of the test equipment, it is necessary first to check the overall performance of the test equipment in the absence of the transposer.

5 General conditions regarding input signal source and test load

5.1 Input signal source

The rated load impedance of the test transmitter shall be equal to the nominal input impedance of the transposer over the whole FM broadcasting band.

5.2 Test load

The transposer shall be terminated with a test load, the impedance of which, expressed in terms of return loss relative to the nominal load impedance of the transposer, shall not be less than:

- 26 dB at frequencies within the FM broadcasting band at the output of the transposer.
- 16 dB at frequencies of any measured unwanted frequency outside this band.

5.3 Connection of measuring equipment to the transposer

The preferred arrangement for the test load for low power transposers is an attenuator, the output of which is used to feed the radio-frequency test equipment.

Alternatively, especially for high power transposers, the test equipment may be connected to the transposer output through a calibrated directional coupler or suitable matching network inserted in the line between the transposer and the test load.

Any measuring instruments used at the input of the transposer are connected to the input through a calibrated directional coupler or suitable matching network inserted in the line between the input signal source and the transposer.

The terms “connected to the input” and “connected to the output” will hereafter be used for test equipment connected as described above.

6 Terms and definitions for input and output signals

6.1 Test signals

a) *Monophonic signal*

The monophonic test input signal is a signal at the appropriate carrier frequency, modulated by the standard reference audio-frequency ($\leq 1\,000$ Hz), with a specified frequency deviation. If required, other audio modulation frequencies may be chosen.

b) *Stereophonic signal*

The stereophonic input test signal is a signal at the appropriate carrier frequency modulated by a coded stereo (multiplex) signal in accordance with the standard concerned.

The standard reference audio-frequency, $\leq 1\,000$ Hz, shall be applied to both left-hand channel A and right-hand channel B, or to one of them only, as required for each particular test. The frequency deviation for each component of the multiplex stereo signal shall be specified and shall comply with the standard concerned. When required, other audio modulating frequencies may be chosen.