

IEEE Standard Test Procedure for Measuring Longitudinal Balance of Telephone Equipment Operating in the Voice Band

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An American National Standard

**IEEE Standard Test Procedure for
Measuring Longitudinal Balance of
Telephone Equipment Operating in the
Voice Band**

Sponsor

**Wire Communication Committee of the
IEEE Communications Society**

Approved August 8, 1977

American National Standards Institute

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Approved September 4, 1975

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Foreword

(This foreword is not a part of ANSI/IEEE Std 455-1976, Test Procedure for Measuring Longitudinal Balance of Telephone Equipment Operating in the Voice Band.)

In inductive interference coordination between power and communication systems, the well-known trio — Influence, Coupling and Susceptiveness — is the key to controlling interference; improvement in any one or more reduces the interference level. This standard is intended to establish a uniform method of measuring the basic susceptiveness of telephone apparatus; that is, the longitudinal-to-metallic circuit attenuation, defined as the “longitudinal balance.”

The balance number one would measure for a given device can be varied tremendously by the characteristics of the test circuit used, particularly the magnitude of its longitudinal and metallic impedances. This was dramatically brought to the attention of the communication industry by a paper: JOHN C. MAU, GTE Automatic Electric Company (currently with General Telephone Company of Florida). Comparison of Techniques for Measuring Longitudinal Balance, Automatic Electric Technical Journal, vol 9, Jan 1964, published by GTE Automatic Electric Laboratories, P. O. Box 17, Northlake, IL 60164.

The subject was then taken up by the IEEE Communication Society’s Wire Communication Committee, which sponsored a panel discussion, Techniques for Measuring Longitudinal Balance on Telephone Equipment, at Session No. 5, October 19, 1964, of the National Electronics Conference in Chicago. It was moderated by D. T. Osgood of American Telephone and Telegraph Company, and the panelists were J. C. Mau (the above author), P. G. Lambidakis of the Rural Electrification Administration, REA, G. L. Menninga and L. Nichols of Michigan Bell, J. V. Buscemi of Anaconda Wire and Cable, C. L. Roach of Bell Canada, and C. S. Thaeler of Bell Laboratories.

In March, 1965, the Wire Communication Committee established a Task Force on Longitudinal Balance Standardization, chaired by Joseph N. Petrie of GTE Automatic Electric Company. The IEEE Standards Board approved their proposal on December 14, 1966, to prepare a measurement standard and designated it Project P455. The Task Force prepared a draft document and disbanded on March 22, 1967.

The Wire Communication Committee created, on March 21, 1972, a permanent Subcommittee on the Susceptance of Wire Communication Facilities. Wirecom has delegated authority to sponsor Standards to its Subcommittees, as recorded in the Minutes of its December 3, 1974, meeting. The Subcommittee revised the Task Force draft document, and it was approved on September 4, 1975, by the IEEE Standards Board.

The Subcommittee acknowledges with thanks the assistance of F. P. Sullivan for editorial work, and G. A. DeBalko for technical evaluation work which helped derive the test circuit parameters. Both gentlemen are with Bell Laboratories.

A paper presenting this method of measurement for open discussion was given by D. W. McLellan and S. W. Guzik at the 1974 National Telecommunications Conference (NTC-74) in San Diego. See pages 756-760 of the NTC-74 Conference Record.

Devices measured with test circuits built to this standard will demonstrate reproducible and comparable results. This has been verified and documented using a set of selected devices which were tested by four test circuits built independently by four different groups of people at four different locations.

The members of the Subcommittee on the Susceptance of Wire Communication Facilities were:

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