

AS/NZS 1102.110:1997
IEC 617-10:1996

AS/NZS 1102.110

Australian/New Zealand Standard[®]

Graphical symbols for electrotechnical documentation

Part 110: Telecommunications— Transmission

[IEC title: Graphical symbols for diagrams,
Part 10: Telecommunications—Transmission]



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AS/NZS 1102.110:1997

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee TE/13, Symbols, Units and Quantities for Electrotechnology. It was approved on behalf of the Council of Standards Australia on 19 September 1997 and on behalf of the Council of Standards New Zealand on 19 September 1997. It was published on 5 December 1997.

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 The Association of Consulting Engineers, Australia
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AS/NZS 1102.110:1997

Australian/New Zealand Standard[®]

**Graphical symbols for
electrotechnical documentation**

**Part 110: Telecommunications—
Transmission**

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee TE/13, Symbols, Units and Quantities for Electrotechnology. It is issued as a Joint Standard to supersede AS 1102.110—1989. This Standard is technically equivalent to and reproduced from IEC 617-10, *Graphical symbols for diagrams*, Part 10: *Telecommunications: Transmission*.

The objective of this Standard is to provide users of electrotechnical documents with graphical symbols for telecommunications transmission for the purposes of uniformity and clarity in presenting electrotechnical diagrams.

The Part numbers in this series of Standards correspond to equivalent Parts in the IEC 617 series but with '100' added to the IEC 617 Part number. For example, for the Standard IEC 617-2 refer to AS/NZS 1102.102. The symbol numbers within this Standard are the same as the IEC 617 numbers. In AS 1102.101, *Graphical symbols for electrotechnical documentation*, Part 101: *General information and general index*, the first part of the symbol number refers to the Part number, e.g. in the index, for symbol 102-01-01, refer to Part 102, symbol 02-01-01.

In this Standard, Australian and New Zealand variations have been listed in Appendix ZA and accordingly, the source text should be amended, supplemented or replaced as required. The changes to the source text are indicated with a marginal bar against each clause, table, figure or part thereof affected.

The term 'normative' has been used in this Standard to define the application of the appendix to which it applies. A 'normative' appendix is an integral part of a Standard.

As this Standard is reproduced from an international Standard, the following applies:

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- (c) A full point substitutes for a comma when referring to a decimal marker.

References to international Standards should be replaced by equivalent Australian or Australian/New Zealand Standards as follows:

<i>Reference to International Standard</i>		<i>Australian or Australian/New Zealand Standard</i>	
IEC		AS	
617	Graphical symbols for diagrams	1102	Graphical symbols for electrotechnical documentation
617-1	Part 1: General information, general index. Cross-reference tables	1102.101	Part 101: General information and general index

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INTRODUCTION

Symbols have been designed in accordance with requirements given in the future ISO 11714-1. The module size $M = 2,5$ mm has been used. For better readability smaller symbols in this standard have been enlarged to double size and are marked "200 %" in the symbol column. To save space larger symbols have been reduced to half size and are marked "50 %" in the symbol column. In accordance with the future ISO 11714-1, clause 7, symbol dimensions (for instance height) may be modified in order to make space for a greater number of terminals or for other layout requirements. In all cases, whether the size is enlarged or reduced, or dimensions modified, the thickness of the original line should be maintained without scaling.

The symbols in this standard are laid out in such a way that the distance between connecting lines is a multiple of a certain module. The module 2M has been chosen to provide enough space for a required terminal designation. The symbols have been drawn to a size convenient for comprehension, using the same grid consistently in the representation of all symbols.

All symbols are designed within a grid in a computer-aided draughting system. The grid which was used has been reproduced in the background of the symbols.

The older symbols which were included in appendix A of the first edition of IEC 617-10 for a transitional period, are no longer part of this second edition, as they will definitely be withdrawn from use.

The indexes in Annex A, B and C include an alphabetic list of symbol names and their corresponding number. The symbol names are based on the description of the symbols of this part. A general index including an alphabetic list of symbols of all parts is given in IEC 617-1.

AUSTRALIAN/NEW ZEALAND STANDARD

Graphical symbols for electrotechnical documentation

Part 110:
Telecommunications—Transmission

CHAPTER 1: TELECOMMUNICATION CIRCUITS

SECTION 1 – LIGNES ET AFFECTATION DE CIRCUITS

SECTION 1 – LINES AND CIRCUIT USAGE

- 1.1 Le symbole 03-01-01 est utilisé pour représenter une ligne ou un autre circuit de télécommunication. L'affectation d'un circuit peut être précisée en utilisant des lettres, symboles 10-01-01 à 10-01-04.
- 1.1 Symbol 03-01-01 is used to represent a line or other telecommunication circuit. The usage of circuits may be indicated by letters, symbols 10-01-01 to 10-01-04.

No.	Symbole	Symbol	Légende	Description
10-01-01			Téléphonie	Telephony
10-01-02			Télégraphie et transmission de données	Telegraphy and transmission of data
10-01-03			Canal vidéo (télévision)	Video channel (television)
10-01-04			Canal son (télévision ou radiodiffusion)	Sound channel (television or radio broadcasting)
10-01-05			EXEMPLES: Ligne ou circuit téléphonique Un trait tiré peut être dessiné pour distinguer une liaison radioélectrique d'une liaison de télécommunication.	EXAMPLES: Telephone line or circuit A dashed line may be used to identify a radio link or any radio section of a circuit.
10-01-06			Le symbole d'antenne (10-04-01) peut être dessiné à chaque extrémité du symbole de la liaison radioélectrique. Liaison radioélectrique utilisée pour la télévision (vidéo et son) et pour la téléphonie	The antenna symbol (10-04-01) may be placed at the radio terminal points. Radio link carrying television (video and sound) and telephony
10-01-07			Ligne pupinisée	Coil-loaded line Inductively loaded line

SECTION 2 – AMPLIFIED CIRCUITS

SECTION 2 – CIRCUITS AMPLIFIÉS

No.	Symbole	Symbol	Légende	Description
10-02-01			Circuit à deux fils avec amplification dans un seul sens	Two-wire line with unidirectional amplification
10-02-02			Circuit à deux fils avec amplification dans les deux sens	Two-wire line with both-way amplification
10-02-03			Circuit à quatre fils avec amplification dans les deux sens	Four-wire circuit with both-way amplification
10-02-04				
10-02-05			Circuit assimilé à un circuit à quatre fils à partage de fréquences	Four-wire type circuit with frequency separation
10-02-06			Circuit à quatre fils avec amplification terminale dans les deux sens et suppression d'écho	Four-wire circuit with both-way terminals amplification with echo suppression
10-02-07				

**CHAPITRE II: ANTENNES ET STATIONS OU POSTES
RADIOÉLECTRIQUES**

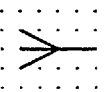
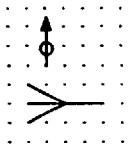
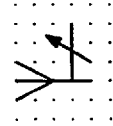
SECTION 3 – SYMBOLES DISTINCTIFS

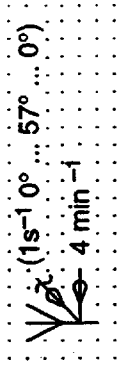
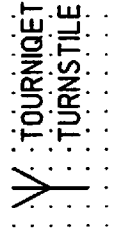
CHAPTER II: ANTENNAS AND RADIO STATIONS

SECTION 3 – QUALIFYING SYMBOLS

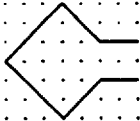
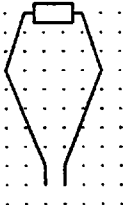
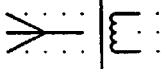
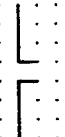
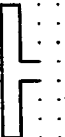
No.	Symbole	Symbol	Légende	Description
10-03-01			Polarisation dans un plan Pour indiquer la polarisation horizontale (verticale) une flèche doit être tracée perpendiculairement (parallèlement) à la ligne centrale du symbole d'antenne.	Plane polarization Horizontal (vertical) polarization shall be indicated by an arrow shown perpendicular (parallel) to the stem of the antenna symbol.
10-03-02			Polarisation circulaire	Circular polarization
10-03-03			Direction de rayonnement fixe en azimut	Direction of radiation fixed in azimuth
10-03-04			Direction de rayonnement orientable en azimut	Direction of radiation variable in azimuth
10-03-05			Direction de rayonnement fixe en site	Direction of radiation fixed in elevation
10-03-06			Direction de rayonnement orientable en site	Direction of radiation variable in elevation
10-03-07			Direction de rayonnement fixe en azimut et en site	Direction of radiation fixed in azimuth and elevation
10-03-08			Radiogoniomètre ou radiophare	Direction finder or radio beacon

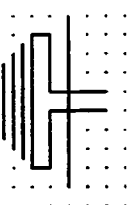
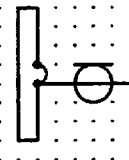
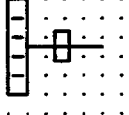
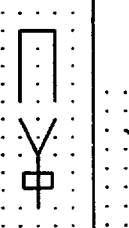
SECTION 4 – SYMBOLE GÉNÉRAL ET EXEMPLES D'EMPLOI SECTION 4 – GENERAL SYMBOL AND EXAMPLES OF USE

No.	Symbole Symbol	Légende Legend	Description
10-04-01		Antenne, symbole général Ce symbole peut être utilisé pour représenter une antenne directive ou non. La ligne centrale du symbole peut représenter un type quelconque d'alimentation, symétrique ou asymétrique, y compris un conducteur unique. On peut indiquer sur un diagramme distinct, voisin du symbole de l'antenne, le lobe principal du diagramme de directivité de l'antenne. On peut ajouter des indications supplémentaires (lettres et chiffres) tirées du Règlement des radiocommunications en vigueur, publié par l'Union internationale des Télécommunications (UIT), Genève. On peut ajouter un nom ou une référence au symbole général de l'antenne.	Antenna, general symbol This symbol may be used to represent any type of antenna or aerial array. The stem of the symbol may represent any type of balanced or unbalanced feeder, including a single conductor. A drawing of the general shapes of the main lobes of the polar diagrams of the antenna may be given adjacent to the antenna symbol. Supplementary references in figures or letter symbols may be taken from the current Radio Regulations published by the International Telecommunication Union (ITU), Geneva. Alternatively a name or a reference may be written adjacent to the general antenna symbol.
10-04-02		Antenne avec polarisation circulaire	Antenna with circular polarization
10-04-03		Antenne à direction de rayonnement orientable en azimut	Antenna with direction of radiation variable in azimuth
10-04-04		Antenne à direction de rayonnement fixe en azimut, à polarisation horizontale	Directional antenna fixed in azimuth, horizontal polarization
10-04-05		Antenne à direction de rayonnement orientable en site	Antenna with direction of radiation variable in elevation

No.	Symbole Symbol	Légende	Description
10-04-06		Antenne radiogoniométrique ou de radiophare	Direction finding antenna (radio goniometric or radio beacon)
10-04-07		Antenne à direction de rayonnement fixe en azimut, à polarisation verticale avec son diagramme de rayonnement dans le plan horizontal	Directional antenna fixed in azimuth, vertically polarized, with horizontal polar diagram
10-04-08		Antenne radar tournant dans un sens en azimut à la vitesse de quatre tours par minute et oscillante en site entre 0° ... 57° ... 0° en 1 s	Radar antenna rotating four times per minute in azimuth and reciprocating in elevation between 0° ... 57° ... 0° in 1 s
10-04-09		Antenne tourniquet	Turnstile antenna

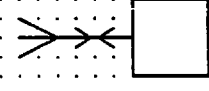
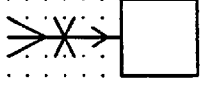
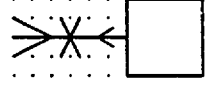
SECTION 5 – SPECIFIC TYPES OF ANTENNAS
AND PARTS OF ANTENNASSECTION 5 – ANTENNES PARTICULIÈRES
ET ÉLÉMENTS D'ANTENNES

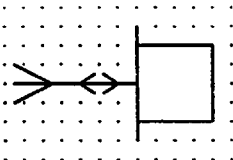
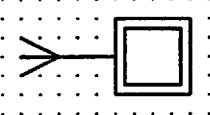
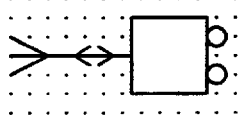
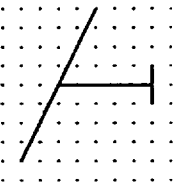
No.	Symbole Symbol	Légende	Description
10-05-01		Cadre	Loop (or frame) antenna
10-05-02		Antenne en losange, figurée terminée par une résistance	Rhombic antenna, shown terminated by a resistor
10-05-03		Contrepoids	Counterpoise
10-05-04		Antenne à noyau magnétique, par exemple de ferrite S'il n'y a pas de risque de confusion, on peut supprimer le symbole général d'antenne.	Magnetic rod antenna, for example ferrite If there is no risk of confusion, the general antenna symbol may be omitted.
10-05-05		Doublet	Dipole
10-05-06		Doublet replié	Folded dipole

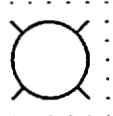
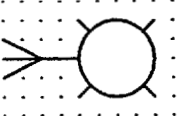
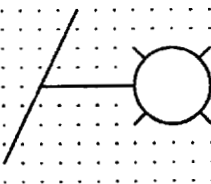
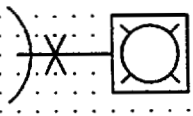
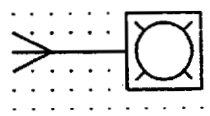
No.	Symbole Symbol	Légende	Description
10-05-07		Doublet replié, figuré avec trois éléments directeurs et un élément réflecteur	Folded dipole, shown with three directors and one reflector
10-05-08		Symétriseur	Balun (Balancing unit)
10-05-09		Doublet replié, figuré avec un symétriseur et une paire coaxiale	Folded dipole, shown with balun and coaxial feeder
10-05-10		Antenne à fentes, figurée avec alimentation par un guide d'ondes de section rectangulaire	Slot antenna, shown with rectangular waveguide feeder
10-05-11		Cornet	Horn antenna Horn feed
10-05-12		Réflecteur en D alimenté par un cornet, figuré avec un guide d'ondes de section rectangulaire	Cheese (box) reflector with horn feed, shown with rectangular waveguide feeder
10-05-13		Antenne parabolique, figurée alimentée par un guide d'ondes de section rectangulaire	Parabolic antenna, shown with rectangular waveguide feeder
10-05-14		Cornet réflecteur, figuré alimenté par un guide d'ondes de section circulaire	Horn-reflector antenna, shown with circular waveguide feeder

SECTION 6 – RADIO STATIONS

SECTION 6 – STATIONS OU POSTES RADIOÉLECTRIQUES

No.	Symbole Symbol	Légende	Description
10-06-01		Station ou poste radioélectrique, symbole général Le symbole 02-05-04 ou 02-05-05 est utilisé pour indiquer une station émettrice ou réceptrice. Pour des exemples d'application, voir les symboles 10-06-02 à 10-06-05.	Radio station, general symbol Symbol 02-05-04 or 02-05-05 is used to indicate a transmitting or receiving radio station. For examples of use, see symbols 10-06-02 to 10-06-05.
10-06-02		Poste émetteur et récepteur (émission et réception simultanées sur la même antenne)	Transmitting and receiving radio station (simultaneous transmission and reception on the same antenna)
10-06-03		Poste radiogoniométrique récepteur	Direction finding radio receiving station
10-06-04		Poste radiogoniométrique émetteur	Radio beacon transmitting station

No.	Symbole Symbol	Légende	Description
10-06-05		Poste radioélectrique portatif (émission et réception alternées sur la même antenne)	Portable radio station (alternate transmission and reception on the same antenna)
10-06-06		Station radioélectrique de base Station radioélectrique maîtresse	Controlling radio station
10-06-07		Station radioélectrique mobile (émission et réception alternées sur la même antenne)	Mobile radio station (alternate transmission and reception on the same antenna)
10-06-08		Station-relais passive, symbole général	Passive relay station, general symbol

No.	Symbole Symbol	Légende Station spatiale, symbole général	Description Space station, general symbol
10-06-09		Station spatiale active	Active space station
10-06-10		Station spatiale passive	Passive space station
10-06-11		Station terrienne seulement pour le radiorepérage d'une station spatiale, exemple figuré avec une antenne parabolique	Earth station only for space station tracking, example shown with a parabolic antenna
10-06-12		Station terrienne d'un service de télécommunication par station spatiale	Earth station for communication with a space station
10-06-13			

CHAPITRE III: TECHNIQUES DES HYPERFRÉQUENCES

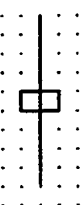
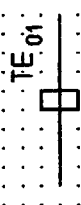
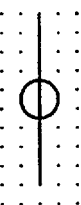
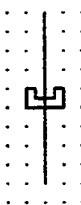
SECTION 7.- LIGNES DE PROPAGATION

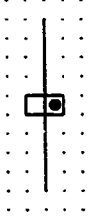
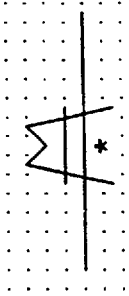
CHAPTER III: MICROWAVE TECHNOLOGY

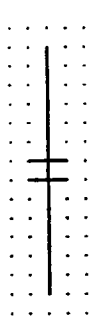
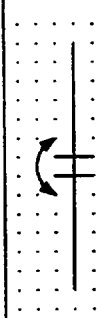
SECTION 7 – TRANSMISSION PATHS

7.1 Le symbole 03-01-01 est utilisé pour représenter une ligne de propagation. Des symboles distinctifs peuvent être dessinés au début et à la fin de chaque ligne de propagation et en des points intermédiaires. Le mode de propagation peut être indiqué à côté du symbole du guide d'ondes. Des indications précisant les structures mécaniques (par exemple angle de coude), les types, les impédances ainsi que des données particulières peuvent être ajoutées à proximité ou à l'intérieur d'un symbole ou dans une note.

7.1 Symbol 03-01-01 is used to represent a transmission path. Qualifying symbols may be added at both ends of the transmission path and at intermediate points. The mode of propagation may be shown at the side of the waveguide symbol. Details of structure (for example elbows), type, impedance, ratings, etc., may be added adjacent to or within any symbol or in a note.

No.	Symbole	Symbol	Légende	Description
10-07-01			Guide d'ondes de section rectangulaire	Rectangular waveguide
10-07-02			EXEMPLE: Guide d'ondes de section rectangulaire avec propagation du mode TE ₀₁	EXAMPLE: Rectangular waveguide with propagation in the TE ₀₁ mode
10-07-03			Guide d'ondes de section circulaire	Circular waveguide
10-07-04			Guide d'ondes à moulure	Ridged waveguide
10-07-05			Guide d'ondes coaxial	Coaxial waveguide

No.	Symbole Symbol	Légende	Description
10-07-06		Ligne à rubans à deux conducteurs	Stripline with two conductors
10-07-07		Ligne à rubans à trois conducteurs	Stripline with three conductors
10-07-08		Ligne Goubau (ligne de propagation à un seul conducteur sous diélectrique solide)	Goubau line (single wire transmission line within solid dielectric)
10-07-09		Guide d'ondes de section rectangulaire contenant un gaz	Gas-filled rectangular waveguide
10-07-10		Guide d'ondes flexible	Flexible waveguide
10-07-11		Guide d'ondes en torsade	Twisted waveguide
10-07-12		Suppression d'un mode de propagation L'astérisque doit être remplacé par l'indication du mode de propagation qui est supprimé.	Mode suppression The asterisk shall be replaced by the indication of the propagation mode suppression.

No.	Symbole Symbol	Légende	Description
10-07-13		Paire de connecteurs symétriques pour guide d'ondes	Pair of symmetrical waveguide connectors
10-07-14		Paire de connecteurs asymétriques pour guide d'ondes Le trait n'est pas interrompu à travers la jonction, quel que soit le type d'accouplement.	Pair of asymmetric waveguide connectors The line is not interrupted at the junction regardless of the type of connector.
10-07-15		Joint tournant avec connecteurs symétriques	Rotatable joint, with symmetrical connectors
10-07-16		Résonateur, symbole distinctif	Resonator, qualifying symbol
10-07-17		Réflecteur à réflexion totale, symbole distinctif	Reflector, reflecting totally, qualifying symbol
10-07-18		Réflecteur à réflexion partielle, symbole distinctif	Reflector, reflecting partially, qualifying symbol

SECTION 8 – ONE- AND TWO-PORT DEVICES

SECTION 8 – DISPOSITIFS À UN ET DEUX ACCÈS

No.	Symbole Symbol	Légende	Description
10-08-01		Discontinuité à deux accès (introduisant une réflexion d'ondes voulue), symbole général	Discontinuity, two-port (introducing intentional wave reflection), general symbol
10-08-02		Discontinuité variable ou dispositif d'adaptation	Variable discontinuity or matching device Adjustable discontinuity or matching device
10-08-03		Dispositif d'accord à vis mobile	Slide screw tuner
10-08-04		Dispositif d'accord E-H	E-H tuner
10-08-05		Dispositif d'accord à bras multiple, figuré avec trois bras	Multi-stub tuner, shown with three stubs