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Part 5 : Preparation of interconnection diagrams and tables

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

DIAGRAMS, CHARTS, TABLES

Part 5: Preparation of interconnection diagrams and tables

FOREWORD

1) The formal decisions or agreements of the IEC on technical matters, prepared by Technical Committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.

2) They have the form of recommendations for international use and they are accepted by the National Committees in that sense.

3) In order to promote international unification, the IEC expresses the wish that all National Committees should adopt the text of the IEC recommendation for their national rules in so far as national conditions will permit. Any divergence between the IEC recommendation and the corresponding national rules should, as far as possible, be clearly indicated in the latter.

PREFACE

This publication has been prepared by Sub-Committee 3B, Preparation of Diagrams, Charts and Tables. Item Designation, of IEC Technical Committee No. 3, Graphical Symbols.

A first draft was discussed at the meeting held in Istanbul in 1973. A revised draft, Document 3B(Central Office)12, was submitted to the National Committees for approval under the Six Months' Rule in April 1974.

The following countries voted explicitly in favour of publication of this Part 5:

Australia
Austria
Belgium
Denmark
Egypt
Finland
France
Germany
Israel
Italy
Japan
Netherlands
Portugal
Romania
South Africa (Republic of)
Spain
Sweden
Switzerland
Turkey
United Kingdom
United States of America

DIAGRAMS, CHARTS, TABLES

Part 5: Preparation of interconnection diagrams and tables

1. Scope

This standard applies to interconnection diagrams and tables used in electrotechnology.

2. Related publications

The other parts of IEC Publication 113 (see inside back cover) are concerned with matters of drawing practice and provide additional guidance.

Graphical symbols for diagrams are given in the relevant parts of IEC Publication 117, Recommended Graphical Symbols (see inside back cover).

Different methods for the designation and marking of conductors and cables are given in IEC Publication 391, Marking of Insulated Conductors.

3. Purpose of an interconnection diagram

Interconnection diagrams and tables provide information on the external electrical connections between units of equipment. They are used as an aid in the realization of the wiring harnesses and for maintenance purposes.

Information on the internal connections in units is not normally included, but references to the appropriate circuit or wiring diagrams may be provided.

The diagrams may employ single-line or multi-line representation and may be combined with or replaced by tables, providing clarity is maintained. The latter are recommended when the number of interconnections is large.

4. General notes

Some of the methods for the marking of conductors given in IEC Publication 391 are used in the figures of this standard. These figures, however, are examples only and are not intended as recommendations for the choice of designation and marking method.

In these examples, item designations for plugs, sockets, cables and conductors are shown in accordance with IEC Publication 113-2, Part 2 (with the letters X and W according to Table I). However, in accordance with that publication, other designations may be used. Especially in diagrams showing only cables, a numerical designation for each cable is generally sufficient (this is in fact the minimum designation laid down by IEC Publication 113-2).

5. Interconnection diagrams

5.1 *Layout*

Interconnection diagrams employ straight lines and simple outlines—squares, circles or rectangles—to depict equipment units. The connections between the units are symbolized by lines which may represent individual wires or complete cables. The diagrams should be arranged so that the lines can be drawn in a simple and logical manner between the various points of termination.

Views should be shown as though all connections were in one plane. Where practicable, the sequence and arrangement of the equipment symbols on the diagram should depict the physical arrangement of the installation. A location diagram should complete interconnection information if the relative location of such items as terminals or connectors is not clear.

Figure 1 is an example of a simple interconnection diagram.

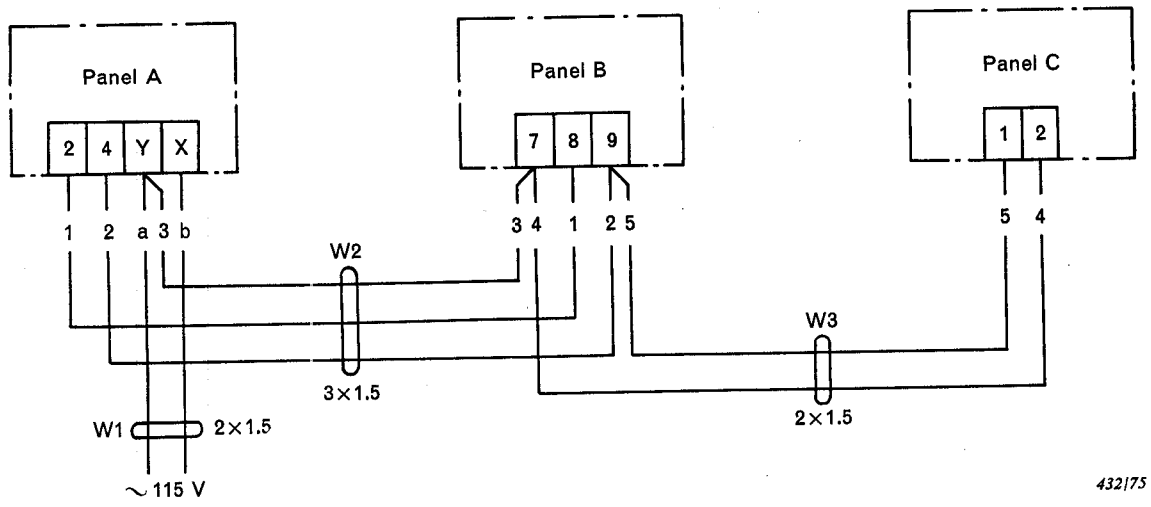

FIGURE 1

5.2 *Identification*

5.2.1 *Units of equipment*

The outline representing each item should be suitably identified, e.g. by a functional title or item designation.

5.2.2 *Connectors*

The symbol for each connector should also be identified, e.g. by item designation. Such identification is not required if the connector forms part of a cable assembly separately designated in the interconnection information, or if it is of a type covered by an explanatory note.

Cable assembly information may be shown on the diagram together with identification of connecting assemblies, adaptors, cable clamps, etc., and any special assembly instructions which are required.

5.2.3 *Connector contacts*

Contact symbols should be identified by:

a) either markings on the actual connector;

b) or designations in associated documentation;

c) or arbitrary designations explained in the interconnection information.

5.2.4 *Terminals*

Terminals may be depicted by symbols or the interconnecting lines may be terminated at the item outline. In either case, each point of termination should be identified by:

a) either a marking appearing on the actual equipment;

b) or a designation appearing in associated documentation;

c) or an arbitrary designation explained in the interconnection information.

5.2.5 *Conductors*

The line representing each conductor (either individual or in a cable) should be identified:

a) either by a marking or colour coding on the actual conductor;

b) or by a code assigned on an overall system basis, explained on the diagram or in supporting documentation;

c) or in another suitable manner.

Such identification may not be needed in some cases.

Supplementary information such as conductor function, size, length, screening, voltage rating, etc., may be included.

5.2.6 *Cables*

The line representing each cable may be identified by the marking on the actual cable, type designation, item designation or otherwise.

Supplementary information may be included as in Sub-clause 5.2.5.

5.3 *Types of diagram*

5.3.1 *Individual conductor representation*

Each individual conductor between equipment items should be represented by a separate line. See Figure 2.

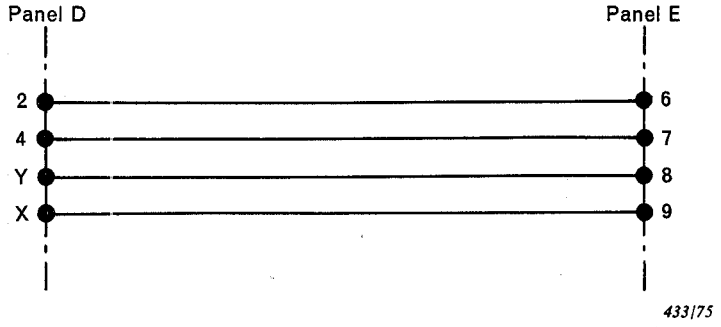

FIGURE 2

Apart from small gaps necessary to accommodate identification or supplementary information, the lines may be drawn in full between the appropriate terminations. See Figure 3.

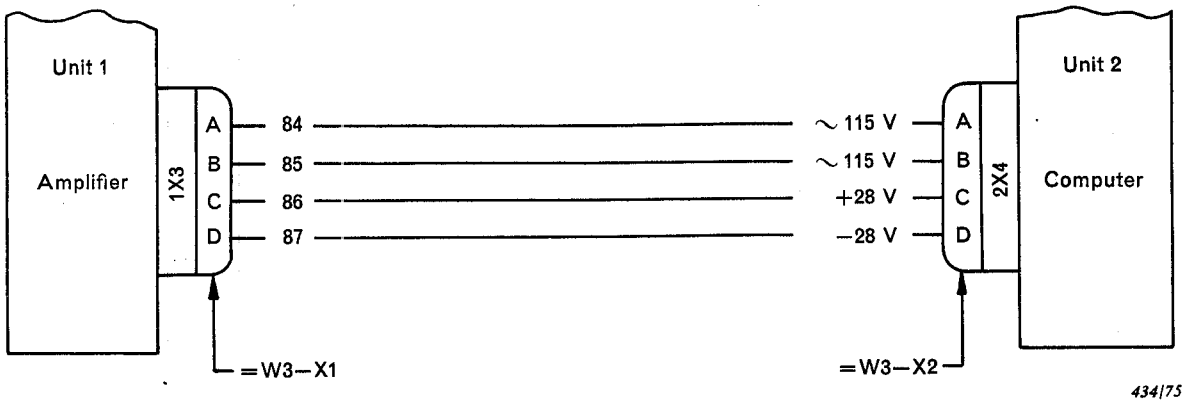

FIGURE 3

Groups of lines having the same destination may be replaced by a single line for some part of their length, provided corresponding ends are suitably designated. See Figure 4. This method should be used to simplify diagrams which otherwise would contain a large number of lines difficult to follow.

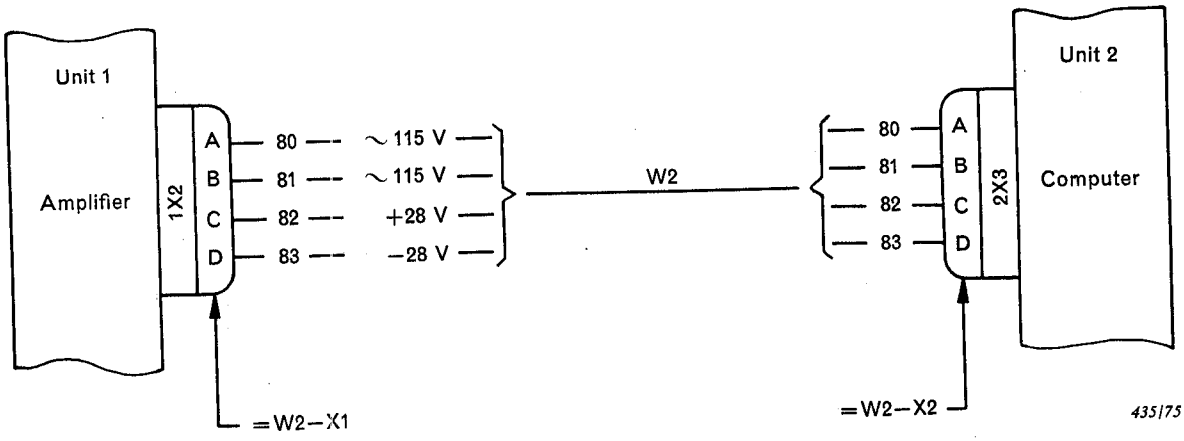

FIGURE 4

This method may be extended by branching the single line where groups of lines have different destinations. In such cases, information on the other end termination may usefully be shown at both ends of every line representing an individual connection. See Figure 5.

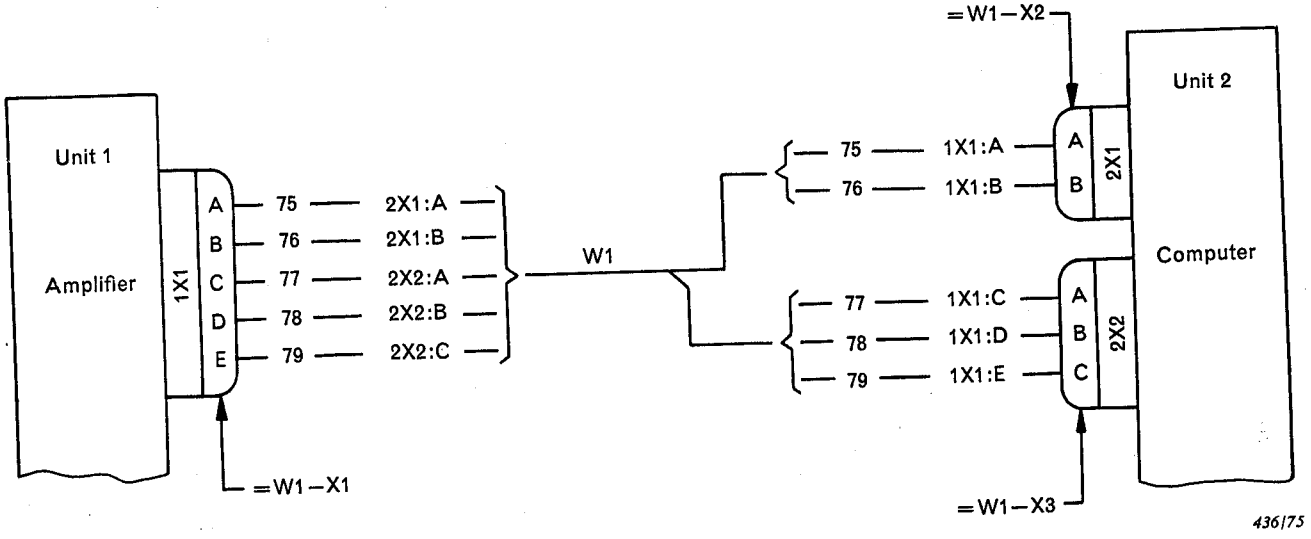

FIGURE 5

Repeated information at the ends can generally be omitted. See Figure 6.

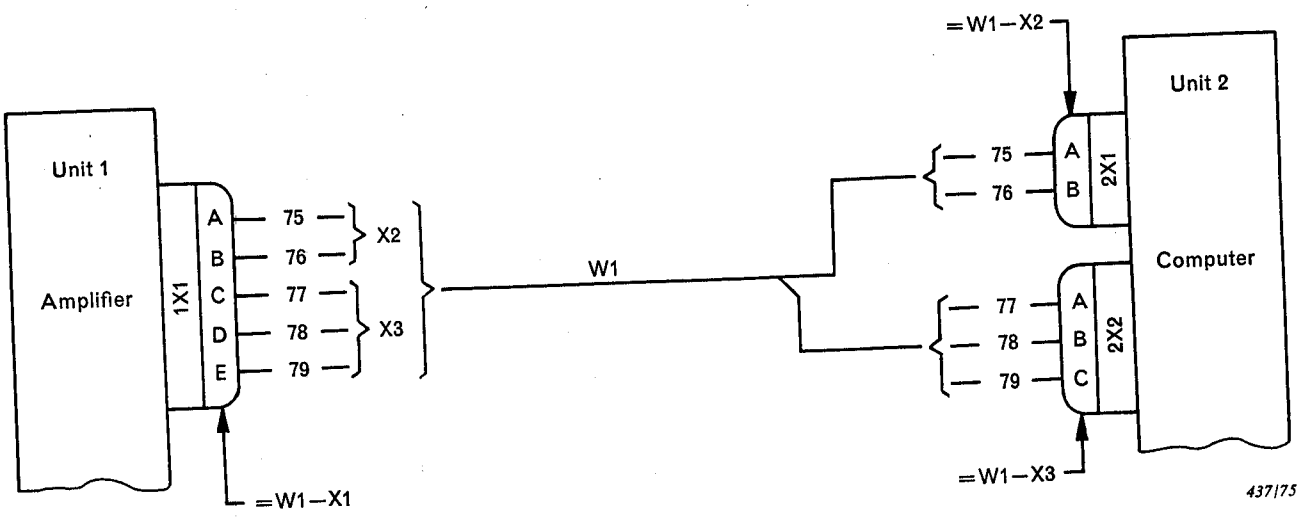

FIGURE 6

Alternatively, it is permissible to omit the individual lines for most of their length provided corresponding ends are suitably identified and information on remote end destination is included. See Figure 7.

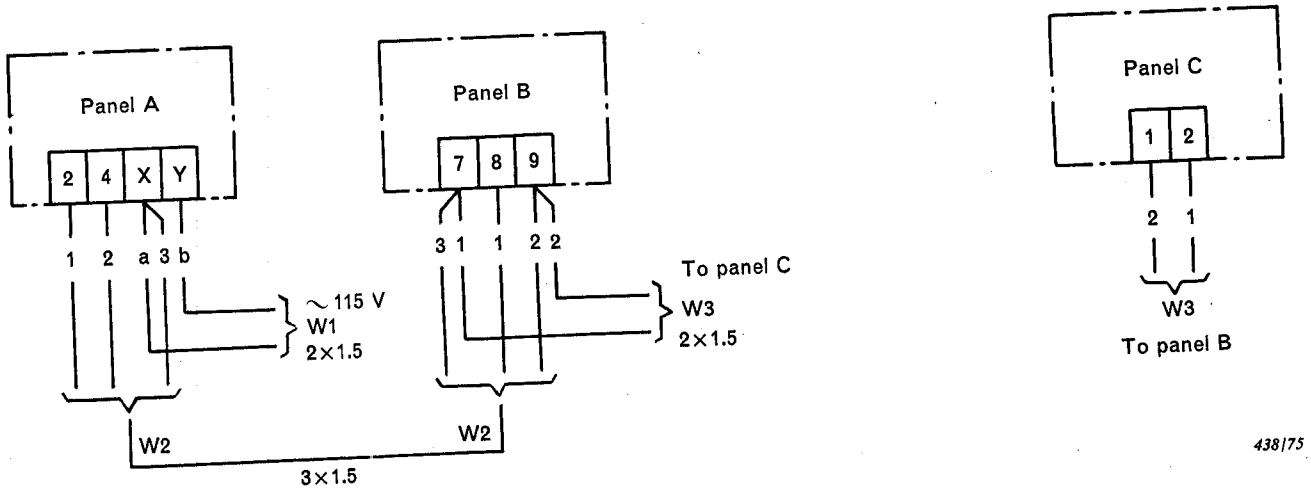

FIGURE 7

5.3.2 *Representation of cables and other multiconductor assemblies*

Each multiconductor assembly (cable, conductors in sheath, etc.) connecting the various items of equipment should be represented by a single line. See Figure 8.

Lines representing multiconductor assemblies may be omitted for part of their length provided the residual ends are identified and opposite end destinations are given.

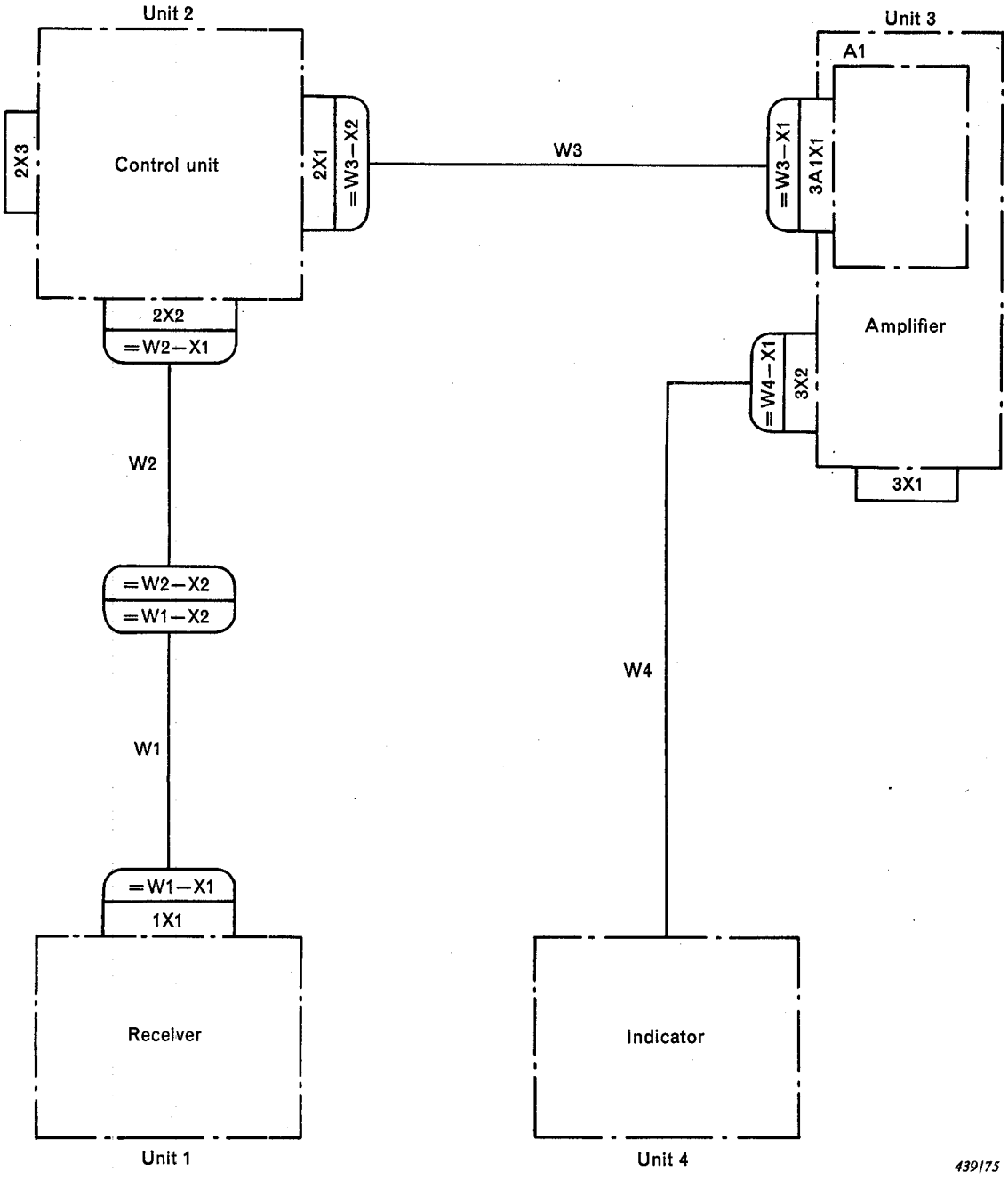

FIGURE 8

6. Interconnection tables

The information given by interconnection diagrams can conveniently be given by tabular listing. Usually each line of information relates to an individual connection. The information relating to all connections to a given unit may be presented on sequential lines of this table. Alternatively, the information may be listed in circuit order.

The details of tabular arrangement will depend on the circumstances of each case. The basic data must include information regarding the connection points and the conductor. Because many satisfactory variants are possible, no examples are shown in this standard.

Tables may be supplemented with equipment layout information showing:

a) the relative location of all portions of the equipment;

b) the terminal arrangement and identification of unmarked terminals. The data should show a wiring side view of the terminal arrangement. A left-to-right and top-to-bottom sequence assignment of terminal identification is recommended;

c) any special wiring arrangements which cannot be conveyed by tabular information alone;

d) the paths of the wiring when such paths are not readily determined.