

ECMA

Standardizing Information and Communication Systems

Handling of Bi-Directional Texts

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Brief History

In April 1988, ECMA TC1 decided to produce a Technical Report on specific control functions required for presentation of texts in scripts using different writing directions.

The requirement for such control functions resulted from ECMA activities in the area of coding of bilingual character sets such as Latin/Arabic and Latin/Hebrew. The control functions were to provide for the proper presentation of bi-directional texts on character imaging devices.

An ECMA TC1 ad-hoc group was formed and instructed:

- to establish the new additional control functions required in Standard ECMA-48 for handling bi-directional texts;
- to determine the required modifications to existing control functions in Standard ECMA-48 for handling bi-directional texts;
- prepare the necessary explanatory information for inclusion in Standard ECMA-48;
- to provide worked examples for the handling of bi-directional text, applying the new and the modified control functions described in this ECMA Technical Report and included in the fifth edition of Standard ECMA-48;
- to consider in particular a horizontal line orientation and a top-to-bottom line progression.

This ECMA Technical Report explains the particularities to be considered when handling bi-directional texts. It is also intended to be used as a guidance to implementors of bi-directional text applications in a character-coded environment.

This ECMA Technical Report was used as the basis for making the necessary enhancements and changes to Standard ECMA-48. The changes in and the additions to Standard ECMA-48 are also reflected in the latest edition of the corresponding International Standard, viz. ISO/IEC 6429:1992.

Adopted as an ECMA Technical Report by the General Assembly of June 1992.

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1 Scope

This ECMA Technical Report specifies technical means to handle bi-directional text in character-imaging devices in the case of:

- texts in a single script of which specific parts need to be presented in an opposite direction (for example, numbers in Arabic or Hebrew);
- texts in different scripts presented in opposite directions (like Latin and Arabic or Latin and Hebrew);
- texts presented with a horizontal line orientation and a top-to-bottom line progression.

Other presentation directions may be the subject of further studies.

2 General Considerations

In this ECMA Technical Report a bi-directional device model is used to explain the handling of bi-directional texts. To be able to use the device model with Standard ECMA-48 the following modifications to that Standard were necessary:

- the device concept had to be extended;
- two new modes had to be added;
- a set of new control functions had to be included;
- the definitions of a number of existing control functions had to be changed.

The fifth edition of Standard ECMA-48 includes the appropriate changes and additions.

The control functions are intended to be used imbedded in character coded data for interchange with character imaging input/output devices that are capable of handling bi-directional texts.

The architecture of such devices is reflected by the bi-directional device model described in 6.

The method for the coded representation of the new bi-directional control functions is identical with that already used in Standard ECMA-48.

The technical capabilities of the bi-directional devices to which this Technical Report and the extended specifications of the fifth edition of Standard ECMA-48 apply, can vary according to the levels of bi-directional support which is required or provided. Different bi-directional technical means may, therefore, be selected for implementation, depending on the particularities of the specific application.

3 References

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| ECMA-48 | Control functions for coded character sets (1991); |
| ISO/IEC 6429:1992 | Information technology - Control functions for coded character sets. |

4 Notations and definitions

4.1 Notation

In this ECMA Technical Report the same convention as in Standard ECMA-48 has been adopted to assist the reader. Capital letters are used to refer to a specific control function, mode, mode setting, or graphic character in order to avoid confusion, for example, between the concept "space" and the graphic character SPACE.

It is intended that this convention and the acronyms of the modes and the control functions be retained in all translations of the text.

4.2 Definitions

In this ECMA Technical Report the same definitions as in the fifth edition of Standard ECMA-48 apply.