INTERNATIONAL TELECOMMUNICATION UNION

# ITU-T S.1

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

(03/93)

## TELEGRAPHY

## ALPHABETICAL TELEGRAPH TERMINAL EQUIPMENT

---

# INTERNATIONAL TELEGRAPH ALPHABET No. 2

## ITU-T Recommendation S.1

(Previously "CCITT Recommendation")

---

## FOREWORD

The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the International Telecommunication Union. The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Conference (WTSC), which meets every four years, established the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

ITU-T Recommendation S.1 was revised by the ITU-T Study Group IX (1988-1993) and was approved by the WTSC (Helsinki, March 1-12, 1993).

---

NOTES

1 As a consequence of a reform process within the International Telecommunication Union (ITU), the CCITT ceased to exist as of 28 February 1993. In its place, the ITU Telecommunication Standardization Sector (ITU-T) was created as of 1 March 1993. Similarly, in this reform process, the CCIR and the IFRB have been replaced by the Radiocommunication Sector.

In order not to delay publication of this Recommendation, no change has been made in the text to references containing the acronyms "CCITT, CCIR or IFRB" or their associated entities such as Plenary Assembly, Secretariat, etc. Future editions of this Recommendation will contain the proper terminology related to the new ITU structure.

2 In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

© ITU 1994

All rights reserved. No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the ITU.

# CONTENTS


| | | Page |
|---|---|---|
| 1 | Introduction | 1 |
| 2 | Character repertoire | 1 |
| 3 | Coding | 2 |
| 4 | Particular combinations | 2 |
| | 4.6 Use of capital and small letters | 3 |
| | 4.7 Use of combination No. 32 | 4 |
| 5 | Graphic representation of control characters | 4 |

# INTERNATIONAL TELEGRAPH ALPHABET No. 2

*(Malaga-Torremolinos, 1984; amended Melbourne, 1988 and Helsinki, 1993)*

## 1 Introduction

**1.1** This Recommendation defines the repertoire of the graphic and control characters used in International Telegraph Alphabet No. 2 (ITA2) and the coded representation of these characters for communication purposes. It also contains provisions concerning the use of certain specific combinations.

**1.2** The coded character set of ITA2 is based on a 5-unit-structure.

**1.3** ITA2 is also defined in Recommendation F.1 for the international public telegram service, and it is specified in Recommendation F.60 that it should also be used for the telex service. It may also be used for other applications, such as specialized or leased circuits.

**1.4** For definitions concerning alphabetic telegraphy, see definitions in Recommendation R.140 and the International Electrotechnical Vocabulary (IEV), Chapter 721.

## 2 Character repertoire

**2.1** Graphic characters that have a corresponding signal in ITA2 are:

- the 26 latin alphabetic characters: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z;
- decimal figures: 0 1 2 3 4 5 6 7 8 9;
- punctuation marks and miscellaneous signs:

| | |
|---|---|
| Full Stop | . |
| Comma | , |
| Colon or division sign | : |
| Question mark | ? |
| Apostrophe | ’ |
| Cross or addition sign | + |
| Hyphen or dash or subtraction sign | – |
| Fraction bar or division sign | / |
| Equal sign or double hyphen | = |
| Left-hand bracket (parenthesis) | ( |
| Right-hand bracket (parenthesis) | ) |

**2.2** Three graphic characters (such as accented letters and currency signs) may be applied for national or private use (see 4.2).

**2.3** This Recommendation does not define the particular printing style, font or case (capital or small letters) of graphic characters, nor does it define the layout of keyboards in teleprinters or similar terminal devices.

**2.4** The control characters provided in ITA2 are:

- “Who are you?” (part of the signal to operate the answerback unit of the corresponding installation);
- operation of an audible signal of the corresponding installation;
- carriage return;
- line-feed;

– letter-shift;

– figure-shift;

– space or blank;

– all-space or null (no tape perforation).

## 3 Coding

**3.1** The 32 combinations available in ITA2 are produced by a sequence of five units, each of which may assume one of two significant conditions (A or Z), as shown in Table 1.

**3.2** Condition A corresponds to start polarity, no perforation in paper tape and symbol 0 of the binary notation. Condition Z corresponds to stop polarity, perforation in paper tape and symbol 1 in the binary notation.

For the equivalent frequency and amplitude modulation corresponding to conditions A and Z in voice-frequency telegraph equipment, see Recommendation V.1 and the relevant Series R Recommendations.

NOTES

1 The level and polarity of voltage and current corresponding to conditions A and Z (e.g. in the local end with its termination) are national options and hence are not defined internationally.

2 The terms "start" and "stop", "space" and "mark" have also been used to describe conditions A and Z respectively (see definition 31.37/R.140).

## 4 Particular combinations

**4.1** In accordance with Recommendations S.6, S.8 and the Series U Recommendations, WRU signal (who are you? combination Nos. 30 and 4) is used to operate the answerback unit of the corresponding instrument in the international telex and gentex services, and may also provide a printed symbol (as in Table 2).

**4.2** Since some Administrations assign combination Nos. 6, 7 and 8 in figure case for internal use whereas others do not, it is desirable to avoid varying interpretation in these circumstances that might result if they were used freely in international services. Consequently the use of combination Nos. 6, 7 and 8 in figure case is not defined and therefore should not be used in international services, except by direct agreement between Administrations; and it is recommended

– that, in all services, they should be shown in some special manner on the keyboards; and

– that services in which they are not used should place on the secondary position on the printing blocks (or on the equivalent mechanism) an arbitrary sign, for the letters F, G and H such as, for instance, a square. The appearance of such sign on the paper is to indicate an abnormal impression.

**4.3** Combination No. 10 "audible signal", may also provide a printed symbol (as in Table 2).

**4.4** Combinations Nos. 29 and 30, "letter-shift" and "figure-shift", respectively, are used to place the terminal installation in the "letter" or "figure" position, so that

– any combination No. 1 to 26 received engenders a printed signal in the "letter" case (second column of Table 1) if the last shift signal received is a "letter-shift" signal;

– any combination No. 1 to 26 received engenders a printed signal in the "figure" case (third column of Table 1) if the last shift signal received is a "figure-shift" signal", except as noted for combinations Nos. 4 and 10 in 4.1 and 4.3.

To ensure that terminal equipments located at both ends of a telex call are in the appropriate shift position, in new terminals, and as far as possible in existing terminals, the first combination to be transmitted, either after reception of characters or when commencing transmission, shall be either "letter-shift" or "figure-shift" (i.e. combination No. 29 or combination No. 30).

**4.5** Combinations Nos. 29 (letter-shift), 30 (figure-shift) and 32 (all-space, null or no tape perforation) shall not affect the spacing movement of terminal machines, except where their reception is indicated by printing a symbol, as mentioned in clause 5 below.

TABLE 1/S.1

**International Telegraph Alphabet No. 2 (ITA2)**

| Combination number | Letter case | Figure case | Coding | | | | |
|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 |
| 1 | A | – | Z | Z | A | A | A |
| 2 | B | ? | Z | A | A | Z | Z |
| 3 | C | : | A | Z | Z | Z | A |
| 4 | D | (subclause 4.1) | Z | A | A | Z | A |
| 5 | E | 3 | Z | A | A | A | A |
| 6 | F | (subclause 4.2) | Z | A | Z | Z | A |
| 7 | G | | A | Z | A | Z | Z |
| 8 | H | | A | A | Z | A | Z |
| 9 | I | 8 | A | Z | Z | A | A |
| 10 | J | Audible signal | Z | Z | A | Z | A |
| 11 | K | ( | Z | Z | Z | Z | A |
| 12 | L | ) | A | Z | A | A | Z |
| 13 | M | . | A | A | Z | Z | Z |
| 14 | N | , | A | A | Z | Z | A |
| 15 | O | 9 | A | A | A | Z | Z |
| 16 | P | 0 | A | Z | Z | A | Z |
| 17 | Q | 1 | Z | Z | Z | A | Z |
| 18 | R | 4 | A | Z | A | Z | A |
| 19 | S | ’ | Z | A | Z | A | A |
| 20 | T | 5 | A | A | A | A | Z |
| 21 | U | 7 | Z | Z | Z | A | A |
| 22 | V | = | A | Z | Z | Z | Z |
| 23 | W | 2 | Z | Z | A | A | Z |
| 24 | X | / | Z | A | Z | Z | Z |
| 25 | Y | 6 | Z | A | Z | A | Z |
| 26 | Z | + | Z | A | A | A | Z |
| 27 | Carriage-return | | A | A | A | Z | A |
| 28 | Line-feed | | A | Z | A | A | A |
| 29 | Letter-shift (subclause 4.5) | | Z | Z | Z | Z | Z |
| 30 | Figure-shift | | Z | Z | A | Z | Z |
| 31 | Space | | A | A | Z | A | A |
| 32 | (subclause 4.7) | | A | A | A | A | A |

NOTE – In serial transmission, code element 1 is transmitted first.

## 4.6 Use of capital and small letters

**4.6.1** In ITA2, it is possible to use teleprinters with two series of letter characters, capital and small letters.

**4.6.2** It is possible to use sequences of the shift combinations of ITA2 for transfer from one series to the other.

**4.6.3** If this possibility is used, it is essential to obtain compatibility with teleprinters having only one series of letter characters.

### 4.7 Use of combination No. 32

**4.7.1** Combination No. 32 can be used in certain sequences of switching signals; these uses are set out in Recommendations U.11, U.20, U.22 and S.4.

**4.7.2** Combination No. 32 must not be used during the phase of communication (after a call is set up) in the international telex service.

**4.7.3** Combination No. 32 can be used during the phase of communication after a call is set up in domestic national service or by bilateral agreement between two Administrations, as a command signal for certain functions, e.g. transfer to a national alphabet other than ITA2.

**4.7.4** Combination No. 32 must not be used for transfer from one form of characters to another while remaining within ITA2, nor for transfer from one international telegraph alphabet to another.

## 5 Graphic representation of control characters

Where a graphic indication of the reception or transmission of certain control characters is required, this should be effected by printing the symbols shown in Table 2.

TABLE 2/S.1

**Printed symbols for control characters**

| Function | Combination No. | Case | Symbol | Alphabetical representation |
|---|---|---|---|---|
| Who are you? (WRU) | 4 | Figure | ⊠ (Note 1) | EQ |
| Audible signal (bell) | 10 | Figure | ⊓ | BL |
| Carriage-return | 27 | Either | ← | CR |
| Line-feed | 28 | Either | ≡ | LF |
| Letter-shift | 29 | Either | ↓ | SL or LS |
| Figure-shift | 30 | Either | ↑ | SF or FS |
| Space | 31 | Either | Δ | SP |
| All-space: Null | 32 | Either | □ | NU |

NOTES

1 The pictorial representation shown is a schematic of ✠, which may also be used when equipment allows.

2 Each alphabetical representation is to be considered as a single symbol. It may occupy one position on a printed or displayed line.