

RECOMMENDATION ITU-R M.1677

International Morse code

(2004)

The ITU Radiocommunication Assembly,

considering

- a) that versions of the Morse code have been in use since 1844;
- b) that it continues to be used in some radiocommunication services including the amateur and amateur-satellite services, and to a diminishing extent in the mobile and fixed services;
- c) that the code needs to be updated from time-to-time to meet the needs of the radiocommunication services,

recommends

1 that Annex 1 should be used to define the Morse code characters and their applications in the radiocommunication services.

Annex 1**Operational provisions applying to Morse working****Part I – Morse code****1 Morse code signals**

1.1 The following are the written characters that may be used and the corresponding Morse code signals:

1.1.1 Letters

a	.-	i	..	r	.-.
b	-...	j	.----	s	...
c	-.-. .	k	-.-	t	-
d	-..	l	.-..	u	..-
e	.	m	--	v	...-
accented e	..-..	n	-. .	w	.-.-
f	..-. .	o	---	x	-..-
g	--.	p	.--. .	y	-.-.-
h	q	---.-	z	---..

1.1.2 Figures

1	. - - - -	6	-
2	.. - - -	7	- - . . .
3	... - -	8	- - . .
4 -	9	- - - - .
5	0	- - - - -

1.1.3 Punctuation marks and miscellaneous signs

Full stop (period)	[.]	. - . - . -
Comma	[,]	- - . . - -
Colon or division sign.....	[:]	- - - . . .
Question mark (note of interrogation or request for repetition of a transmission not understood)	[?]	. . - - . .
Apostrophe.....	[']	. - - - - .
Hyphen or dash or subtraction sign	[-]	- -
Fraction bar or division sign	[/]	- . . - .
Left-hand bracket (parenthesis)	[(]	- . - - .
Right-hand bracket (parenthesis).....	[)]	- . - - . -
Inverted commas (quotation marks) (before and after the words)	[“ ”]	. - . . - .
Double hyphen.....	[=]	- . . . -
Understood.....		. . . - .
Error (eight dots).....	
Cross or addition sign	[+]	. - . - .
Invitation to transmit.....		- . -
Wait - . . .
End of work - . -
Starting signal (to precede every transmission).....		- . - . -
Multiplication sign.....	[×]	- . . -
Commercial at ¹	[@]	. - . - .

2 Spacing and length of the signals

2.1 A dash is equal to three dots.

2.2 The space between the signals forming the same letter is equal to one dot.

2.3 The space between two letters is equal to three dots.

2.4 The space between two words is equal to seven dots.

2.5 On the Wheatstone instrument, where perforators are used, the space between two letters shall be equal to one *centre hole* perforation and the space between two words shall be equal to three *centre holes*.

¹ Vocabulary note: In December 2002, the French General Committee on Terminology approved the term “arobase” for the @ symbol used in e-mail addresses.

3 Transmission of signs for which there is no corresponding signal in the Morse code

3.1 Signs that have no corresponding signal in the Morse code, but that are acceptable in the writing of telegrams, shall be sent as follows:

3.2 Multiplication sign

3.2.1 For the multiplication sign, the signal corresponding to the letter X shall be transmitted.

3.3 Percentage or per thousand sign

3.3.1 To indicate the signal % or ‰, the figure 0, the fraction bar and the figures 0 or 00 shall be transmitted successively (i.e. 0/0, 0/00).

3.3.2 A whole number, a fractional number, or a fraction, followed by a % or ‰ sign, shall be transmitted by joining up the whole number, the fraction number, or the fraction to the % or ‰ by a single hyphen.

Examples: For 2%, transmit **2-0/0**, and not **20/0**

For $4\frac{1}{2}\%$, transmit **4-1/2-0/00**, and not **41/20/00**

3.4 Inverted commas (quotation marks)

3.4.1 The special signal for inverted commas shall be transmitted before and after the word or words. However, where code converters are used, the apostrophe may be transmitted twice before and twice after the word or words to signal inverted commas (quotation marks).

3.5 Minute and second signs

3.5.1 To transmit the minute (') or second (") signs, when such signs follow figures – for example 1'15" – the apostrophe signal (. – – – .) must be used once or twice as appropriate. The signal (. – . . – .) reserved for inverted commas may not be used for the second sign.

4 Transmission of groups of figures and letters, of ordinal numbers or of fractions

4.1 A group consisting of figures and letters shall be transmitted without spaces between figures and letters.

4.2 Ordinal numbers composed of figures and letters, 30me, 25th, etc., shall be transmitted in the form **30ME**, **25TH**, etc.

4.3 A number that includes a fraction shall be transmitted with the fraction linked to the whole number by a single hyphen.

Example: For $1\frac{3}{4}$, transmit **1-3/4**, and not **13/4**.

For $\frac{3}{4} 8$, transmit **3/4-8**, and not **3/48**.

For $363\frac{1}{2} 4 5642$, transmit **363-1/2 4 5642**, and not **3631/2 4 5642**

Part II – General transmission rules

1 All correspondence between two stations shall begin with the call signal.

1.1 For calling, the calling station shall transmit the call sign (not more than twice) of the station required, the word **DE** followed by its own call sign, the appropriate service abbreviation to

indicate a priority telegram, an indication of the reason for the call and the signal – . – unless there are special rules peculiar to the type of apparatus used. The call shall always be made at hand speed.

2 The station called must reply immediately by transmitting the call sign of the calling station, the word **DE** followed by its own call sign and the signal – . –

2.1 If the station called is unable to receive, it shall give the *wait* signal. If it expects the wait to exceed ten minutes, the reason and probable duration shall be given.

2.2 When a station called does not reply, the call may be repeated at suitable intervals.

2.3 When the station called does not reply to the repeated call, the condition of the circuit must be examined.

3 The double hyphen (– . . . –) shall be transmitted either to separate:

3.1 the preamble from the service indications;

3.2 the service indications from each other;

3.3 the service indications from the address;

3.4 the station of destination from the text;

3.5 the text from the signature.

4 A transmission, once begun, may not be interrupted to give place to a communication of higher priority except in a case of absolute urgency.

5 Every telegram shall be terminated with a cross signal (. – . – .).

6 The end of the transmission shall be indicated by the cross signal (. – . – .) followed by the *invitation to transmit* signal **K** (– . –).

7 The end of work shall be indicated by the station that transmitted the last telegram. The correct indication is the *end of work* signal (. . . – . –).

Part III – Transmission of telegrams with identical text

1 Identical texts

1.1 When a station has to transmit to the same station more than five telegrams having identical texts and comprising more than 50 actual words, it may transmit the text once only. In that case, the text shall be transmitted in the first telegram only, and the text of all the telegrams with identical text that follow shall be replaced by the words **TEXT NR . . .** (number of first telegram).

1.2 This procedure necessitates the transmission in succession of all telegrams with identical text.

1.3 The receiving station must be informed of the transmission of telegrams with identical text by a service note on the following lines:

. . . TELEGRAMS WITH IDENTICAL TEXT FOLLOW

1.4 When reception is possible by means of perforated tape, the receiving station should be informed in ample time to allow it to receive telegrams with identical text by tape.

Part IV – Transmission irregularities – Service notes

- 1 To indicate *wait*, the corresponding signal (. – . . .) shall be transmitted.
- 2 If the sending operator becomes aware of an error, he shall stop, give the error signal (.), repeat the last word correctly transmitted and continue the transmission.
- 3 If it is necessary to interrupt the transmission for any reason, the procedure shall be as follows until transmission stops.
 - 3.1 Morse simplex, transmit a series of dots.
 - 3.2 Morse duplex, transmit the letters **BK**.
 - 3.3 Once transmission has been stopped, the receiving operator shall repeat the last word correctly received followed by a question mark. The sending operator shall resume transmission from that word.
 - 3.4 If a repetition is asked for after a long interruption, the telegram and the part of the telegram in question must be precisely indicated.
- 4 Service notes **XQ** can be interposed between telegrams of a series.

Part V – Checking the number of words transmitted – Acknowledgement of receipt

1 Checking the number of words transmitted

1.1 Where the receiving operator finds a discrepancy between the number of actual words shown in the preamble line and the number received, he shall notify the sending operator by indicating the number of words received, followed by the first character of each word (example: **17 WDS J C R B 2 D . . .** etc.). If the sending operator has simply made an error in transmitting the number of words, he shall reply **ADMITTED** and indicate the actual number of words (example: **17 ADMITTED**); if not, he shall rectify the passage found to be incorrect according to the initials received. In both cases, he shall interrupt, if necessary, the transmission of the initials as soon as he is able to rectify or confirm the number of words.

2 Acknowledgement of receipt

2.1 After the verification of the number of words and the rectification of any errors, the receiving station shall acknowledge to the sending station the receipt of the telegram or telegrams forming the series.

2.2 A single telegram shall be acknowledged by the letter **R** followed by the number of the telegram received, for example: **R 436**.

2.3 For an **SVH** telegram, a government telegram with priority, or a telegram relative to the application of the United Nations Charter, receipt shall be acknowledged in the form: **R 436 SVH** or **R 436 ETAT**.

2.4 For a series of telegrams, the letter **R** shall be given with the number of telegrams received, and also the first and last numbers of the series, for example, **R 6 157 162**.

2.5 If the series includes **SVH** telegrams or government telegrams with priority, the acknowledgement of receipt shall be supplemented by the numbers of these telegrams thus:

R 6 157 162 INCLUDING 159 SVH 161 ETAT

2.6 In every case, the acknowledgement of receipt must be transmitted immediately in the following form:

LR 683 MISSING 680 RETAINED 665 This acknowledgement of receipt contains the last received (**683**), the number **680** missing and the number **665** retained.

2.7 The sending operator must request the acknowledgement of receipt immediately after the transmission of an **SVH** telegram, a government telegram with priority or a telegram relative to the application of the United Nations Charter. In such cases, the acknowledgement of receipt shall take the following form:

LR SVH 683

Part VI – Transmission procedures

1 Transmission may be conducted as follows, according to the volume of traffic:

1.1 alternate transmission of telegrams;

1.2 alternate transmission in series.

2 In alternate transmission, the receiving station shall not have the right to interrupt the transmission to give place to a communication of higher priority, except in cases of absolute urgency.

3 The exchange of telegrams in alternate order between two stations in direct communication shall follow the rules concerning the order of transmission.

3.1 A telegram of higher priority in order of transmission shall not count in the alternate order.

3.2 The station that has just finished a transmission shall have the right to continue when it has telegrams awaiting transmission or when telegrams reach it that are entitled to priority over those that the station in communication has to transmit, unless the latter has already begun its transmission.

3.3 When a station has finished transmitting, the station that has just received shall transmit in its turn; if the latter has nothing to transmit, the former shall continue to send its traffic. If neither has anything to transmit, the stations shall exchange the *end of work* signal.

4 When traffic so justifies, and subject to agreement between the stations in communication, telegrams shall be exchanged in series alternately.

4.1 Telegrams of the same series shall be considered as forming a single transmission. However, each correctly received telegram shall be retained at the receiving position until the next but one telegram begins or for the time normally required to transmit a telegram of average length.

4.2 Each series shall comprise a maximum of five telegrams. Nevertheless, every telegram containing more than 100 words on the Morse instrument or more than 150 words on sound-reading instruments shall count as a series or terminate a series already in course of transmission.

4.3 The sending station shall end a series in course of transmission when it has only letter telegrams to send. It shall not resume transmission until the station with which it is working has no more telegrams of higher priority on hand.
