

INTERNATIONAL TELECOMMUNICATION UNION



UNIVERSITÄTSBIBLIOTHEK HANMOVER TECHANOCHE IMPOPHERICHE BLIOTHEK

BLUE BOOK

VOLUME VII – FASCICLE VII.1

TELEGRAPH TRANSMISSION

SERIES R RECOMMENDATIONS

TELEGRAPH SERVICES TERMINAL EQUIPMENT

SERIES S RECOMMENDATIONS



IXTH PLENARY ASSEMBLY MELBOURNE, 14-25 NOVEMBER 1988



Geneva 1989

ISBN 92-61-03591-4

CONTENTS OF FASCICLE VII.1 OF THE BLUE BOOK

Part I - Series R Recommendations

Telegraph transmission

Rec. No.

Page

SECTION 1 – Telegraph distortion

R.2	Element error rate	3
R.4	Methods for the separate measurements of the degrees of various types of telegraph distortion	4
R .5	Observation conditions recommended for routine distortion measurements on interna- tional telegraph circuits	4
R.9	How the laws governing distribution of distortion should be arrived at	5
R.1 1	Calculation of the degree of distortion of a telegraph circuit in terms of the degrees of distortion of the component links	6

SECTION 2 - Voice-frequency telegraphy

R .20	Telegraph modem for subscriber lines	9
R.30	Transmission characteristic for international VFT links	13
R.31	Standardization of AMVFT systems for a modulation rate of 50 bauds	14
R.35	Standardization of FMVFT systems for a modulation rate of 50 bauds	17
R.35 bis	50-baud wideband VFT systems	23
R.36 to R.38 B	Report on voice-frequency telegraph channels for use above 50 bauds	24
R.36	Coexistence of 50-baud/120-Hz channels, 100-baud/240-Hz channels, 200-baud/ 360-Hz or 480-Hz channels on the same voice-frequency telegraph system	25
R .37	Standardization of FMVFT systems for a modulation rate of 100 bauds	27
R.38 A	Standardization of FMVFT system for a modulation rate of 200 bauds with channels spaced at 480 Hz	30

SECTION 3 - Special cases of alternating current telegraphy

R .40	Coexistence in the same cable of telephony and super-telephone telegraphy	39
R.43	Simultaneous communication by telephone and telegraph on a telephone-type circuit .	39
R .44	6-unit synchronous time-division 2-3-channel multiplex telegraph system for use over FMVFT channels spaced at 120 Hz for connection to standardized teleprinter networks	40
R.49	Interband telegraphy over open-wire 3-channel carrier systems	46

SECTION 4 – Transmission quality

R.50	Tolerable limits for the degree of isochronous distortion of code-independent 50-baud telegraph circuits	49
R.51	Standardized text for distortion testing of the code-independent elements of a complete circuit	50
R.51 <i>bis</i>	Standardized text for testing the elements of a complete circuit	51
R.52	Standardization of international texts for the measurement of the margin of start-stop equipment	52
R. 53	Permissible limits for the degree of distortion on an international 50-baud/120-Hz VFT channel (frequency and amplitude modulation)	52
R.54	Conventional degree of distortion tolerable for standardized start-stop 50-baud systems	53
R.55	Conventional degree of distortion	54
R.57	Standard limits of transmission quality for planning code-independent international point-to-point telegraph communications and switched networks using 50-baud start-stop equipment	55
R.58	Standard limits of transmission quality for the gentex and telex networks	56
R.58 bis	Limits on signal transfer delay for telegraph, telex and gentex networks	58
R .59	Interface requirements for 50-baud start-stop telegraph transmission in the maritime mobile satellite service	60

SECTION 5 – Correction of signals

	Conditions to be fulfilled by regenerative repeaters for start-stop signals of Interna- tional Telegraph Alphabet No. 2	63
R.62	Siting of regenerative repeaters in international telex circuits	64

Rec. No.

R.70

SECTION 6 - Telegraph maintenance

R.70 bis Numbering of international VFT channels	66
R.71 Organization of the maintenance of international telegraph circuits	68
R.72 Periodicity of maintenance measurements to be carried out on the channels of international VFT systems	69
R.73 Maintenance measurements to be carried out on VFT systems	69
R.74 Choice of type of telegraph distortion-measuring equipment	71
R.75 Maintenance measurements on code-independent international sections of international telegraph circuits	72
R.75 bis Maintenance measurements of character error rate on international sections of interna- tional telegraph circuits	73
R.76 Reserve channels for maintenance measurements on channels of international VFT systems	73
R.77 Use of bearer circuits for voice-frequency telegraphy	74
R.78 Pilot channel for AMVFT systems	77
R.79 Automatic tests of transmission quality on telegraph circuits between switching centres	78
R.80 Causes of disturbances to signals in VFT channels and their effect on telegraph distortion	85
R.81 Maximum acceptable limit for the duration of interruption of telegraph channels arising from failure of the normal power supplies	86
R.82 Appearance of false calling and clearing signals in circuits operated by switched teleprinter services	87
R.83 Changes of level and interruptions in VFT channels	88
R.90 Organization for locating and clearing faults in international telegraph switched networks	88
R.91 General maintenance aspects for the maritime satellite telex service	93
SECTION 7 – Time division multiplexing	
R.100 Transmission characteristics of international TDM links	95
R.101 Code and speed dependent TDM system for anisochronous telegraph and data transmission using bit interleaving	99
R.102 4800 bit/s code and speed dependent and hybrid TDM systems for anisochronous telegraph and data transmission using bit interleaving	113
R.103 Code and speed-dependant TDM 600 bit/s system for use in point-to-point or branch-line muldex configurations	123
R.105 Duplex muldex concentrator, connecting a group of gentex and telex subscribers to a telegraph exchange by assigning virtual channels to time slots of a bit-interleaved TDM system	129
R.111 Code and speed independent TDM system for anisochronous telegraph and data transmission	131

65

R.112	TDM hybrid system for anisochronous telegraph and data transmission using bit interleaving	140
R .114	Numbering of international TDM channels	143
R.115	Maintenance loops for TDM-systems	146
R.116	Maintenance tests to be carried out on international TDM systems	150
SECTION 8 -	Transmission quality above 50 bauds	
R.120	Tolerable limits for the degree of isochronous distortion of code-independent telegraph circuits operating at modulation rates of 75, 100 and 200 bauds	155
R .121	Standard limits of transmission quality for start-stop user classes of service 1 and 2 on anisochronous data networks	156
R .122	Summary of transmission plans for rates up to 300 bauds	157
SECTION 9 -	Definitions	
R .140	Definitions of essential technical terms in the field of telegraph transmission	163
SECTION 10 -	Availability and reliability of international telegraph circuits	۶.
R.15 0	Automatic protection switching of dual diversity bearers	195

Page

Part II - Series S Recommendations

Alphabetical telegraph terminal equipment

S.1	International Telegraph Alphabet No. 2	201
S.2	Coding scheme using International Telegraph Alphabet No. 2 (ITA2) to allow the transmission of capital and small letters	205
S.3	Transmission characteristics of the local end with its termination (ITA2)	209
S.4	Special use of certain characters of the International Telegraph Alphabet No. 2	212
S .5	Standardization of page-printing start-stop equipment and cooperation between page- printing and tape-printing start-stop equipment (ITA2)	214
S.6	Characteristics of answerback units (ITA2)	215
S.7	Control of teleprinter motors	216
S.8	Intercontinental standardization of the modulation rate of start-stop apparatus and of the use of combination No. 4 in figure case	217
S.9	Switching equipment of start-stop apparatus	218
S.10	Transmission at reduced character transfer rate over a standardized 50-baud telegraph channel	219
S.11	Use of start-stop reperforating equipment for perforated tape retransmission	220
S.12	Conditions that must be satisfied by synchronous systems operating in connection with standard 50-baud teleprinter circuits	220

X Fascicle VII.1 - Table of Contents

Rec. No.

S.13	Use on radio circuits of 7-unit synchronous systems giving error correction by automatic repetition	222
S.14	Suppression of unwanted reception in radiotelegraph multi-destination teleprinter systems	230
S.15	Use of the telex network for data transmission at 50 bauds	230
S.16	Connection to the telex network of an automatic terminal using a V.24 [1] DCE/DTE interface	234
S.17	Answer-back unit simulators	243
S.18	Conversion between International Telegraph Alphabet No. 2 and International Alphabet No. 5	244
S.19	Calling and answering in the telex network with automatic terminal equipment	249
S.20	Automatic clearing procedure for a telex terminal	252
S.21	Use of display screens in telex machines	253
S.22	"Conversation impossible" and or pre-recorded message in response to J/BELL signals from a telex terminal	255
S.23	Automatic request of the answerback of the terminal of the calling party, by the telex terminal of the called party or by the International Network	256
S.30	Standardization of basic model page-printing machine using International Alphabet No. 5	258
S.31	Transmission characteristics for start-stop data terminal equipment using International Alphabet No. 5	259
\$.32	Answer-back units for 200- and 300-baud start-stop machines in accordance with Recommendation S.30	260

SECTION 7 - Definitions

S.140 Definitions of essential technical terms relating to apparatus for alphabetic telegraphy . 263

Partie III - Supplement to the Series S Recommendations

Supplement No. 1	Minimal specifications for the bilingual (arabic/latin) teleprinter	277
------------------	---	-----

PRELIMINARY NOTES

1 The Questions entrusted to each Study Group for the Study Period 1989-1992 can be found in Contribution No. 1 to that Study Group.

2 In this Fascicle, the expression "Administration" is used for shortness to indicate both a telecommunication Administration and a recognized private operating agency.

Fascicle VII.1 - Table of Contents XI

Page