INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

V.92
Amendment 1
(07/2001)

SERIES V: DATA COMMUNICATION OVER THE TELEPHONE NETWORK

Simultaneous transmission of data and other signals

Enhancements to Recommendation V.90

Amendment 1

ITU-T Recommendation V.92 – Amendment 1

ITU-T Recommendation V.92

Enhancements to Recommendation V.90

AMENDMENT 1

Summary

This document provides an amendment to the 2000 edition of ITU-T V.92.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. 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 Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

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

INTELLECTUAL PROPERTY RIGHTS

ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the Recommendation development process.

As of the date of approval of this Recommendation, ITU had received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

ITU-T Recommendation V.92

Enhancements to Recommendation V.90

AMENDMENT 1

1) Table 18/V.92

Replace Table 18 with the following:

Table 18/V.92 – Definition of bits in INFO$_{1a}$ if PCM upstream is selected

INFO$_{1a}$ bits LSB:MSB	Definition
0:3	Fill bits: 1111
4:11	Frame sync: 01110010, where the left-most bit is first in time
12:13	Number of filter sections in precoder and prefilter 0 = $p_1(i)$ and $z_2(i)$ are supported 1 = $z_1(i)$, $p_1(i)$ and $z_2(i)$ are supported 2 = $p_1(i)$, $p_2(i)$ and $z_2(i)$ are supported 3 = $z_1(i)$, $p_1(i)$, $p_2(i)$ and $z_2(i)$ are supported
14:15	Integer number indicating the maximum number of coefficients supported by analogue modem in multiples of 64 starting at 192 $L_{tot} \geq LZ_1 + LP_1 + LZ_2 + LP_2$ 0 = 192; 1 = 256; 2 = 320; 3 = 384
16:17	Integer number indicating the maximum number of coefficients supported by analogue modem for each filter section in multiples of 64 starting at 128 $L_{max} \geq \max \{LZ_1, LP_1, LZ_2, LP_2\}$ 0 = 128; 1 = 192; 2 = 256; 3 = 320
18:24	Length of MD to be transmitted by the analogue modem during Phase 3. An integer between 0 and 127 gives the length of this sequence in 276 symbol (34.5 ms) increments
25:31	U_{INFO}: Ucode of the PCM codeword to be used by the digital modem for the 2-point train. The power of this point shall not exceed the maximum digital modem transmit power. U_{INFO} shall be greater than 66
32:33	Reserved for the ITU: These bits are set to 0 by the analogue modem and are not interpreted by the digital modem
34:36	Symbol rate of 8000 to be used by the analogue modem: The integer 6
37:39	Symbol rate of 8000 to be used by the digital modem: The integer 6
40:49	Reserved for the ITU: These bits are set to 1 by the analogue modem and are not interpreted by the digital modem (Note)
50:65	CRC
66:69	Fill bits: 1111
NOTE − These bits are set to 1 to avoid generating a tone.	

2)   Table 19/V.92

Replace Table 19 with the following:

Table 19/V.92 – Definition of bits in INFO$_{1a}$ if V.34 upstream is selected during short Phase 2

INFO$_{1a}$ bits LSB:MSB	Definition
0:3	Fill bits: 1111
4:11	Frame sync: 01110010, where the left-most bit is first in time
12:17	Reserved for the ITU: These bits are set to 0 by the analogue modem and are not interpreted by the digital modem
18:24	Length of MD to be transmitted by the analogue modem during Phase 3. An integer between 0 and 127 gives the length of this sequence in 35 ms increments
25:31	U$_{INFO}$: Ucode of the PCM codeword to be used by the digital modem for the 2 point train. The power of this point shall not exceed the maximum digital modem transmit power. U$_{INFO}$ shall be greater than 66
32	Reserved for the ITU: This bit is set to 0 by the analogue modem and is not interpreted by the digital modem
33	Set to 1 indicates that the high carrier frequency is to be used in transmitting from the analogue modem to the digital modem
34:36	Symbol rate to be used in transmitting from the analogue modem to the digital modem. An integer between 3 and 5 gives the symbol rate, where 3 represents 3000 and 5 represents 3429
37:39	Symbol rate of 8000 to be used by the digital modem: The integer 6
40:49	The integer −512 indicating that this field is to be ignored
50:65	CRC
66:69	Fill bits: 1111

3)   Clause 8.7.6/V.92

Replace 8.7.6 with the following:

8.7.6   TRN$_{2u}$

TRN$_{2u}$ is a 4- or 8-point constellation signal as requested by the digital modem via J$_p$ bits 48 and 49.

TRN$_{2u}$ consists of scrambled binary ones. The mapping of the scrambler output to symbols shall be done according to the rules defined in Tables 28 and 29. The scrambler shall be reset at the beginning of TRN$_{2u}$, except for the second TRN$_{2u}$ in a rate renegotiation with silence. The sign bit of TRN$_{2u}$ is differentially encoded by modulo 2 addition of the present sign bit with the previously transmitted sign bit. The differential encoder memory shall be initialized with the last transmitted sign bit of the preceding E$_{1u}$ sequence during initial train or retrain. It shall be initialized with zero for the first TRN$_{2u}$ of a rate renegotiation. It shall be initialized with the last transmitted sign bit of the preceding E$_{2u}$ sequence for the second TRN$_{2u}$ of a rate renegotiation. TRN$_{2u}$ shall be an integer multiple of 12 symbols in length. TRN$_{2u}$ may be used to estimate the analogue channel for upstream.

4)   Table 31/V.92

Replace Table 31 with the following:

Table 31/V.92 – Definition of bits in SUV$_d$

SUV$_d$ bits LSB:MSB	Definition
0:16	Frame Sync: 11111111111111111
17	Start bit: 0
18	SUV$_d$: 1
19:31	Reserved for the ITU: These bits are set to 0 by the digital modem and are not interpreted by the analogue modem
32	Set to 1 indicates that a silent period is requested. This may be used during rate renegotiation (see 9.8.1.1)
33	Acknowledge bit: 0 = modem has not received CP$_u$ from the analogue modem, 1 = received CP$_u$ from the analogue modem
34	Start bit: 0
35:50	CRC
51	Fill bit: 0
52:…	Fill bits: 0s to extend the SUV$_d$ sequence length to the next multiple of 6 symbols

5)   Clause 8.6.6/V.92

Replace 8.6.6 with the following:

8.6.6   SCR

SCR is a sequence of the PCM codeword whose Ucode is U$_{INFO}$ with signs generated by applying binary ones to the input of the scrambler and then differentially encoding the output of the scrambler. The scrambler shall not be initialized at the beginning of SCR. The differential encoder shall be initialized with the last transmitted sign bit of the preceding J$_p$´ sequence at the beginning of SCR. A sign of 0 represents a negative voltage and a sign of 1 represents a positive voltage. SCR shall be an integer multiple of 6 symbols long.

6)   Clause 9.11/V.92

Replace 9.11 with the following:

9.11   Cleardown

The cleardown procedure shall be used to terminate a connection. Cleardown is indicated by setting drn to 0 in CP$_t$, CP$_u$, or CP$_{us}$ by the analogue modem or in CP$_d$ by the digital modem. This may be signalled at any time that a modem sends a rate sequence. To cleardown from data mode, a modem shall initiate either a rate renegotiation or a fast parameter exchange in order to send a rate sequence with drn = 0. The initiating modem shall not request silence in the rate renegotiation and should wait until it receives a CP sequence with the acknowledgement bit set or 100 ms plus 1 round-trip delay after sending its CP sequence before disconnecting from the line. The responding modem should wait 100 ms plus 1/2 round-trip delay after sending its CP sequence with the acknowledgement bit set before disconnecting from the line.

7)   Table 32/V.92

Replace Table 32 with the following:

Table 32/V.92 – Definition of bits in MH sequences

MH bits LSB:MSB	
0:3	Fill bits: 1111
4:11	Frame sync: 01110010, where the left-most bit is first in time
12:15	Signal indication bits: 0011 MHreq Request remote modem to go on-hold 0101 MHack Indicate agreement to go on hold and timeout 0111 MHnack Deny on-hold, request cleardown or fast reconnect 1001 MHclrd Request cleardown 1011 MHcda Acknowledge cleardown 1101 MHfrr Request fast reconnect

16:19	Information bits:
	
	For signals MHreq, MHcda and MHfrr repeat signal indication bits
	
	For MHack:
	16:19 T1 – Timeout period for on-hold
	
	For MHclrd:
	16:19 0101 Cleardown due to incoming call
	        0110 Cleardown due to outgoing call
	        1010 Cleardown due to other reason
	
	For MHnack:
	16:19 0101 The current request for Modem-on-hold has been denied. Future requests for Modem-on-hold will also be denied. Therefore, the modem should not initiate another Modem-on-hold request due to an outgoing call request during this session.
	        0111 The current request for Modem-on-hold has been denied. The modem initiates for another Modem-on-hold request later.

20:35	CRC
36:39	Fill bits: 1111
NOTE 1 – Bit combinations not defined in bits 12-15 are reserved for the ITU. MH sequences with undefined bit combinations should be ignored.	
NOTE 2 – Bit combinations not defined in bits 16-19 for MHclrd and MHnack are reserved for the ITU and should not be interpreted by the receiving modem.	

8)   Clause 9.10.1/V.92

Replace 9.10.1 with the following:

9.10.1   Transmission of MH sequences

If Tone RT is transmitted before an MH sequence, its duration shall be at least 20 ms if the tone was preceded by another MH sequence, or at least 50 ms otherwise. The transition from data mode to an initiating MH sequence shall be performed by transmitting 70 ± 5 ms of silence followed by an optional Tone RT. MH sequences shall be transmitted repeatedly, with the first 4 fill bits immediately following the last 4 fill bits of the preceding sequence. Each transmitted sequence shall be completed before transmitting other signals.

9)   Figure 20/V.92

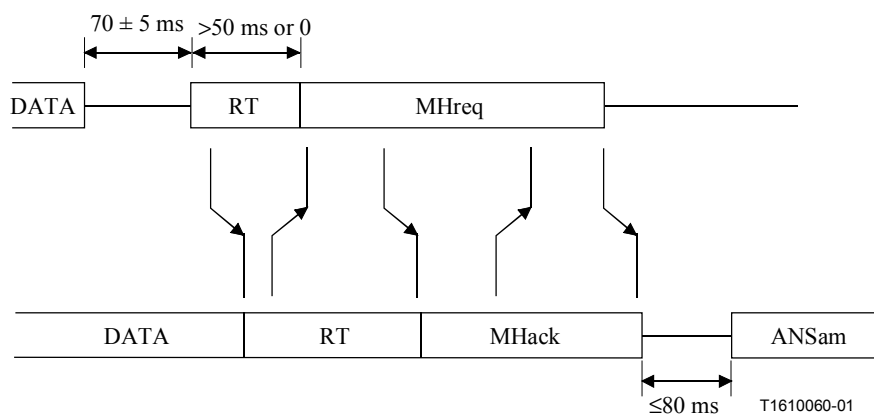*Replace Figure 20 with the following*:

Figure 20/V.92 – Modem-on-hold request acknowledged

SERIES OF ITU-T RECOMMENDATIONS

Series A	Organization of the work of ITU-T
Series B	Means of expression: definitions, symbols, classification
Series C	General telecommunication statistics
Series D	General tariff principles
Series E	Overall network operation, telephone service, service operation and human factors
Series F	Non-telephone telecommunication services
Series G	Transmission systems and media, digital systems and networks
Series H	Audiovisual and multimedia systems
Series I	Integrated services digital network
Series J	Cable networks and transmission of television, sound programme and other multimedia signals
Series K	Protection against interference
Series L	Construction, installation and protection of cables and other elements of outside plant
Series M	TMN and network maintenance: international transmission systems, telephone circuits, telegraphy, facsimile and leased circuits
Series N	Maintenance: international sound programme and television transmission circuits
Series O	Specifications of measuring equipment
Series P	Telephone transmission quality, telephone installations, local line networks
Series Q	Switching and signalling
Series R	Telegraph transmission
Series S	Telegraph services terminal equipment
Series T	Terminals for telematic services
Series U	Telegraph switching
Series V	**Data communication over the telephone network**
Series X	Data networks and open system communications
Series Y	Global information infrastructure and Internet protocol aspects
Series Z	Languages and general software aspects for telecommunication systems