



INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

V.100

**DATA COMMUNICATION OVER THE TELEPHONE
NETWORK**

**INTERCONNECTION BETWEEN PUBLIC DATA
NETWORKS (PDNs) AND THE PUBLIC
SWITCHED TELEPHONE NETWORKS (PSTN)**

ITU-T Recommendation V.100

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation V.100 was published in Fascicle VIII.1 of the *Blue Book*. This file is an extract from the *Blue Book*. While the presentation and layout of the text might be slightly different from the *Blue Book* version, the contents of the file are identical to the *Blue Book* version and copyright conditions remain unchanged (see below).

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

Recommendation V.100

**INTERCONNECTION BETWEEN PUBLIC DATA NETWORKS
(PDNs) AND THE PUBLIC SWITCHED
TELEPHONE NETWORKS (PSTN)**

(Malaga-Torremolinos, 1984)

The CCITT,

considering that

- (a) a data station may have an ingoing or outgoing access to a packet switched public data network (PSPDN) via the national¹⁾ PSTN;
- (b) the transmission characteristics of the data station may not be known at the PSPDN access level;
- (c) in this case, the transmission characteristics have to be negotiated between modems before establishing the connection;
- (d) half-duplex modems as well as full duplex modems may be used;

proposes

that Administrations may optionally introduce the following handshaking procedures including the types of modems to be supported.

1 Procedure description

According to the type of modem (see Table 1/V.100), a half-duplex or a duplex procedure is used.

1.1 Half-duplex procedure

See Figure 1/V.100.

1.1.1 Answer mode modem

- a) Following the transmission of the answer sequence in accordance with Recommendation V.25, the modem shall apply an ON condition to circuit 107, and then transmit a segment S1 in accordance with Table 1/V.100 for 294 ms. Interchange circuits 106 and 109 are in the OFF condition during the procedure.
- b) The modem remains silent until it detects S2 (defined in Table 1/V.100) or the synchronizing signals of a V.27 *ter* modem in the fallback mode.
- c) Then the modem conditions itself to the selected mode or disconnects.

If no response is detected within 2 seconds following the end of the S1 transmission, the modem resumes transmitting S1.

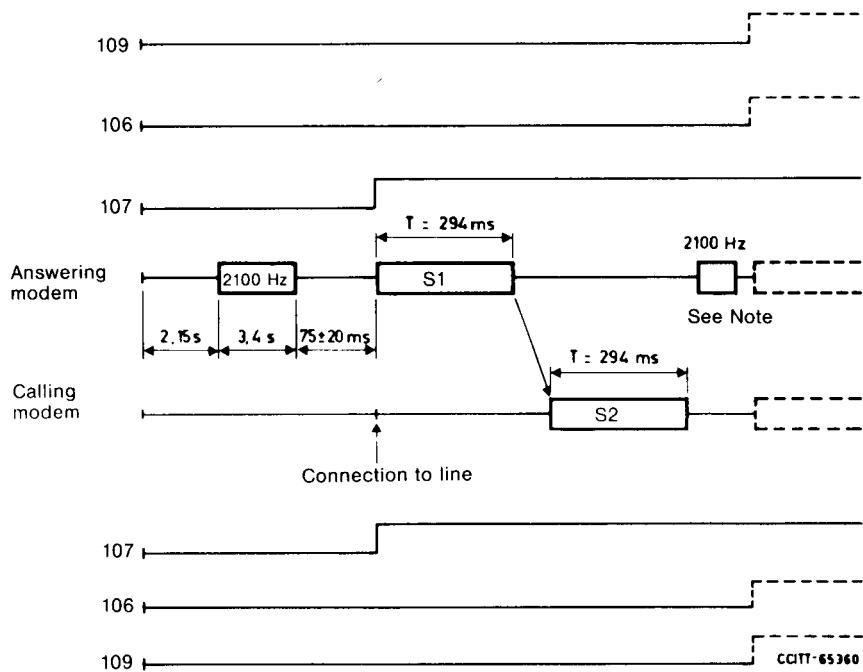
¹⁾ International access to a PSPDN via PSTN is not envisaged.

TABLE 1/V.100

S2 and S1 signals

Categories	Data rate (bit/s)	Recommendation	Procedure	S2 (calling DCE)	S1 (Answering DCE)
Duplex asynchronous	300 1200	V.21 V.22	Duplex Duplex	980 Hz 1200 Hz	1650 Hz 1800 + 2250 Hz
Duplex synchronous (FDM)	1200 2400	V.22 V.22 bis	Duplex Duplex	1200 Hz 1200 Hz	1800 + 2250 Hz 1800 + 2250 Hz
Duplex synchronous (ECT) ^{a)}	2400 4800 9600	V.26 ter V.32 V.32	Half-duplex Duplex Duplex	(See V.26 ter) (See V.32) (See V.32)	(See V.26 ter) (See V.32) (See V.32)
Half-duplex synchronous	2400 4800 9600	V.27 ter (fallback mode) V.27 ter (Under study)	Half-duplex Half-duplex Half-duplex	None 1400 Hz 1100 Hz	None 2200 Hz 2300 Hz
Asymmetric asynchronous	75/1200	V.23	Duplex	390 Hz	1300 Hz

a) ECT = echo cancellation technique.



Note — The 2100 Hz tone is transmitted to disable the echo suppressors in case of duplex transmission (see Recommendation V.26 ter). For half-duplex transmission, this tone is not mandatory.

FIGURE 1/V.100
Half-duplex procedure

If S2 indicates a capability not available, the modem shall disconnect from the line.

If S2 indicates a capability available, the modem conditions itself to this mode.

- d) After the end of reception of S2, in the case of a duplex modem (see V.26 *ter*), in accordance with Recommendation G.164, the modem transmits a 2100 ± 15 Hz tone for 500 ± 50 ms to disable echo suppressors, then remains silent for 75 ± 20 ms.

Note - In the case of half-duplex modems, the transmission of the 2100 Hz tone is not needed.

1.1.2 Call mode modem

- a) After connection to line, the modem shall apply an ON condition to circuit 107 (interchange circuits 106 and 109 are in the OFF condition during the procedure). The modem keeps silent during at least 400 ms.

During this period, it detects S1.

The calling modem selects a mode of interworking in accordance with S1 or its nominal one.

- b) Then, it transmits S2 in accordance with Table 1/V.100 or the synchronizing signals of a V.27 *ter* modem in the fallback mode at 2400 bit/s.
- c) Then, it conditions itself to the selected capability.

1.2 Duplex procedure

See Figure 2/V.100.

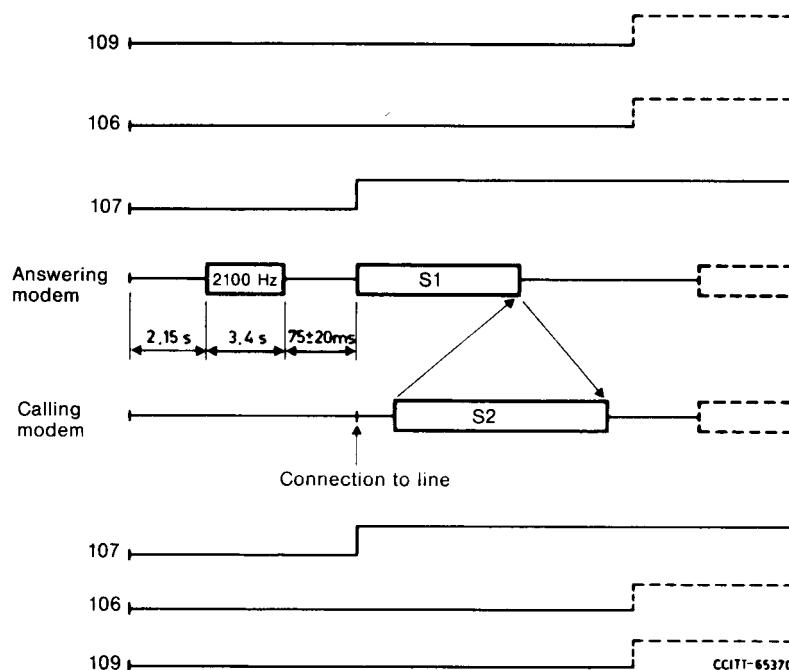


FIGURE 2/V.100
Duplex procedure

1.2.1 Answer mode modem

- a) Following the transmission of the answer sequence in accordance with Recommendation V.25, the modem shall apply an ON condition to circuit 107 (interchange circuits 106 and 109 are in the OFF condition during the procedure).
- b) Then, the modem transmits a segment S1 in accordance with Table 1/V.100 at least 40 ± 10 ms and until it has detected the end of transmission of S2.

Note - During this period, some exchanges may occur between the two modems according to the Series V Recommendation concerned (see Recommendation V.32).

If no response is detected within a time period (under study), the modem shall disconnect from line.

If S2 indicates a capability not available, the modem shall disconnect from the line.

If S2 indicates a capability available, the modem conditions itself to this mode.

1.2.2 Call mode modem

- a) In accordance with Recommendation V.25, after detection of the 2100 Hz tone and a silent period of 75 ± 20 ms, the modem shall apply an ON condition to circuit 107 (interchange circuits 106 and 109 are in the OFF condition during the procedure).
- b) The modem detects S1.

The calling modem selects a mode of interworking in accordance with S1 or its nominal one.

- c) Then, it transmits S2 in accordance with Table 1/V.100.

Note - If the modem has only one possibility, it may transmit S2 after being connected to line.

- d) Then, it conditions itself to the selected capability.

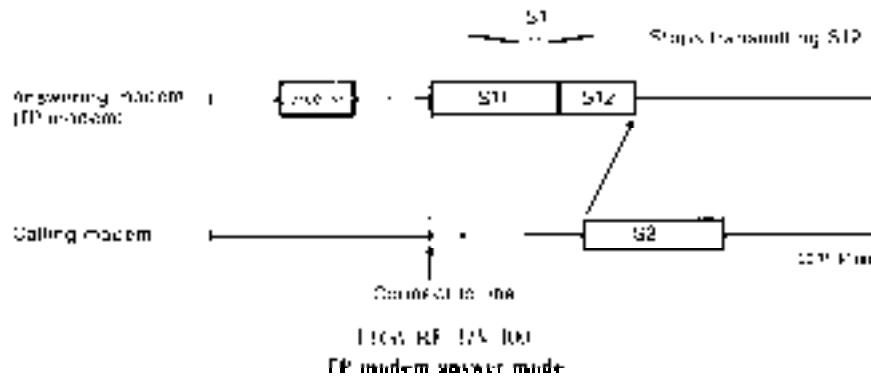
2 Combined half and duplex procedure

This section describes the interworking between a DCE having the capability of handling the two procedures [referred to as two procedures (TP)modem] and DCEs having only one procedure.

2.1 Interworking with half-duplex procedure

2.1.1 TP modem in the answering mode

See Figure 3/V.100.



2.1.1.1 Answer TP modem

- a) After the V.25 sequence, the modem will transmit S1 which is composed of two segments S11 and S12 (as described in Appendix I to Recommendation V.32).

S11 is a modulated signal transmitted during 294 ms in a 600-3000 Hz bandwidth, S12 is a tone out of the 600-3000 Hz band.

- b) After the transmission of S12, the modem is waiting for S2. When it detects S2, it stops transmitting S12 and proceeds with the half-duplex procedure.

2.1.1.2 Calling modem

The calling modem shall proceed with the half-duplex procedure taking into account that S12 is an out-of-band signal.

2.1.2 TP modem in the calling mode

See Figure 4/V.100.

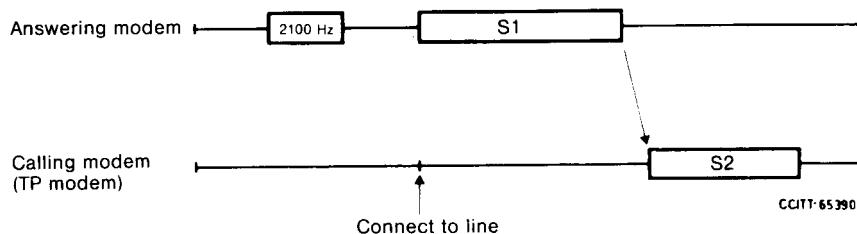


FIGURE 4/V.100
TP modem callmode

2.1.2.1 Answering modem

The answering modem shall proceed with the half-duplex procedure.

2.1.2.2 Calling TP modem

The calling TP modem after the V.25 sequence and connection to line remains silent. It detects S1 and shall proceed with the half-duplex procedure.

2.2 Interworking with duplex procedure

2.2.1 TP modem in the answering mode

See Figure 5/V.100.

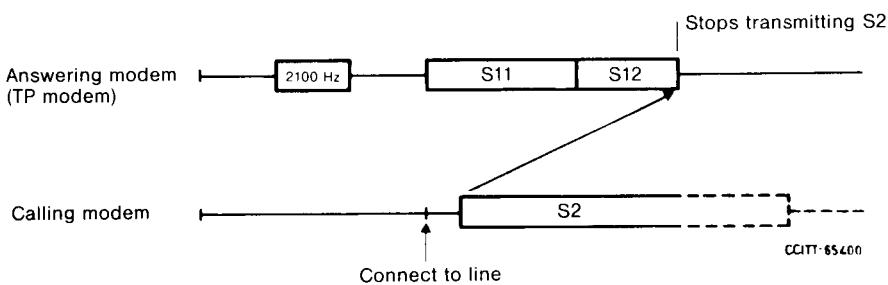


FIGURE 5/V.100
TP modem answer mode

2.2.1.1 Answering TP modem

The modem proceeds as in § 2.1.1.1 except that after detection of S2, it shall follow the duplex procedure.

2.2.1.2 Calling modem

The calling modem shall proceed with the duplex procedure.

2.2.2 TP modem in the calling mode

See Figure 6/V.100.

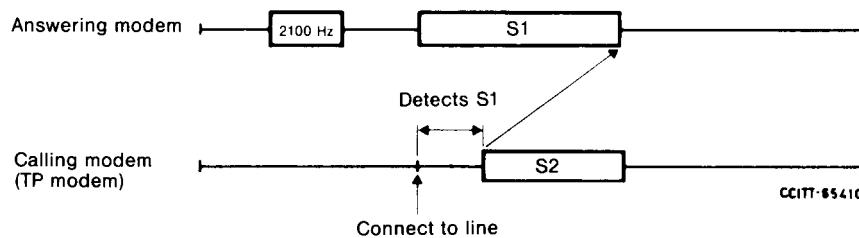


FIGURE 6/V.100
TP modem call mode

2.2.2.1 Answering modem

The answering modem shall proceed with the duplex procedure.

2.2.2.2 Calling TP modem

The calling TP modem after the V.25 sequence and connection to line remains silent. It detects S1 and shall proceed with the duplex procedure.