PHS MoU Document
C-IF1.01-02-TS

Title:	PHS-FWA System : Interface Specification between Terminal Equipment and Fixed Wireless Access Subscriber Unit-Analogue Subscriber Interface -
Version: 02	
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List of contents:	
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PHS MoU Group

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History of Revised Versions

Version	Date	Outline
01	Dec. 17, 1996	Established
02	June 7, 2000	Changed all WLL into FWA.

PHS-FWA System :
Interface Specification between Terminal Equipment and Fixed Wireless Access Subscriber Unit
Analogue Subscriber Interface

Contents

1. General

This specification describes about analogue subscriber interface of WSU. As analogue subscriber interface should be compatible for PSTN, the actual specification depends on the administrator or operating company.

2. Interface

Following sections describe the items that shall be considered in the administrator or operating company's analogue subscriber interface specification of WSU.

2.1 Function

WSU should have the following functions.

(1) Voice transmission

transmit voice and modem data on both way.

(2) Loop close detection

detect the loop close of TE and recognise off hook.

(3) Loop open detection

detect the loop open of TE and recognise on hook.

(4) Dial reception

receive the dial pulse or DTMF from TE.

(5) Hooking detection

receive the hooking signal from TE.

(6) Ringing signal sending

send ringing signal when terminating.

(7) Ring trip

detect the answer of TE during ringing signal sending.

(8) Power feeding to TE

feed DC current to TE for talking.

(9) Over voltage and current protection

protect over voltage and current from outside.

(10) Test

Test function for WSU shall be specified by the administrator or operating company. The test criteria of test result shall also be provided by administrator or operating company.

(11) Loop polarity reverse steady signal

send loop polarity reverse for answer signal.

(12) Loop polarity reverse pulse sending

send loop polarity reverse pulse for mate party on hook. This signal is also sent as metering signal.

(13) Metering signal sending

send metering signal. the administrator or operating company shall choose the metering signal type.

i) Loop polarity reverse pulse

ii) 12 kHz tone pulse

iii) 16 kHz tone pulse

(14) Ground start detection

detect off hook for ground start PBX.

(15) Calling number delivery

send the signals for calling number delivery service.

(16) Tone and Signal Sending

The used tone are selected by administrator or operating company.

i) Dial tone

ii) Busy tone

iii) Congestion tone

iv) Ring back tone

v) Howler tone

vi) Announcement

2.2 DC characteristics

The administrator or operating company shall specify the followings;

(1) Power feeding

(2) Off hook and on hook detection

(3) DP reception

(4) Hooking detection

(5) Ground start detection

2.3 AC characteristics

The administrator or operating company shall specify the followings;

(1) DTMF reception

(2) Ring trip

(3) Metering signal

(4) Transmission Characteristics

i) Transmission characteristics

ii) Echo suppression

2.4 Subscriber cable

The administrator or operating company shall specify the followings;

(1) loop resistance

(2) insulation resistance

(3) capacitance between wires

2.5 Over voltage and current protection

refer to ITU-T K.20.

3. Comments for Implementation

3.1 Howler Tone Sending

There are some case that howler tone is not able to sent from WSU. Operating company or administrator should specify the signal sequence and messages between WSU and SN regarding howler tone sending.

There are two method to sending howler tone. Operating company or administrator can choose from followings;

(1) Analogue Howler
To send over 3 dBm howler tone. Howler oscillator should be accommodated in WSU.

(2) Digital Howler
To send below 3 dBm howler tone, there is no need to accommodate howler oscillator in WSU because ADPCM can carry that tone from SN.

3.2 Power Feeding

Power feeding to TE from WSU is depend on operating company or administrator specification.

3.3 Battery Backed-up

WSU should have back up battery. Back up time will be specified by operating company or administrator.

3.4 Re- answer timing

In case of WIF3.01, release acknowledge signal does not expected. So, re- answer timing will be implemented at WSU timer. Timer value and sequence will be discussed to avoid state unmatched between WSU and SN.

4. References

(1) ITU-T K.20

5. Items for Further Study

5.1 WSU Service Range

5.2 Transmission Characteristics

5.3 Test Functions

ANNEX A

ANNEX describes the WSU analogue subscriber interface application examples. In those examples there are some assumptions as follows;

WIF3 is V5.1 or V5.2.

En-block originating is used.

Air channel is used during FWA subscriber is off hook after communication.

Howler oscillator is in WSU.

1. Definition of Signals, Messages and Timers Examples

Figure 1-1/C-IF1.01 shows the WSU functional block diagram.

Table 1-1/C-IF1.01 shows the signal definitions that are used in state transition tables.

Table 1-2/C-IF1.01 shows the timer definitions that are used in state transition tables.

Table 1-3/C-IF1.01 shows the state definitions that are used in state transition tables.

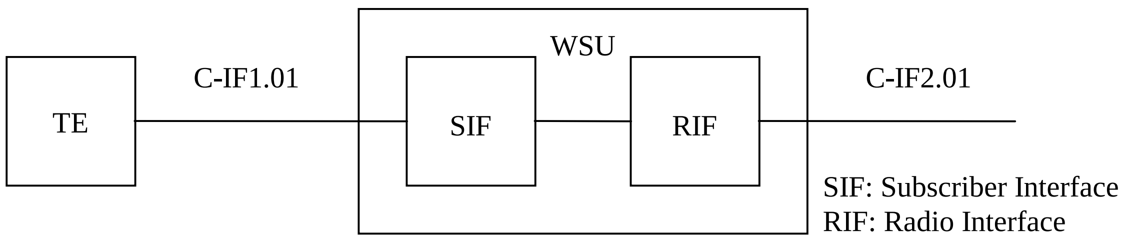

Figure 1-1/C-IF1.01 WSU Functional Block Diagram

Table 1-1/C-IF1.01 Signal Definition

signal	direction	meanings
TE loop closed	TE to SIF	TE makes loop closed
TE loop open	TE to SIF	TE makes loop open
TE DP/DTMF	TE to SIF	TE sends digit dial using DP or DTMF
TE reverse polarity	TE to SIF	TE makes two wire polarity reverse
TE normal polarity	TE to SIF	TE makes two wire polarity normal
TE G on Ring with loop	TE to SIF	TE sends ground on ring wire with loop closed
dt	SIF to TE	SIF sends DT to TE
bt	SIF to TE	SIF sends to TE
howler	SIF to TE	SIF sends Howler tone to TE
ringing	SIF to TE	SIF sends ringing signal to TE
loop closed	SIF to TE	SIF makes loop closed
loop open	SIF to TE	SIF makes loop open
dp/dtmf	SIF to TE	SIF sends digit dial using DP or DTMF
g on tip	SIF to TE	SIF sends ground on tip wire
meter pulsing signal	SIF to TE	SIF sends meter pulsing signal to TE
OFF HOOK	SIF to RIF	indicate SIF detects off hook
ON HOOK	SIF to RIF	indicate SIF detect on hook
DIGIT DIAL	SIF to RIF	send digit dial that SIF receives
REVERSE POLARITY	SIF to RIF	indicate SIF detects reverse polarity
NORMAL POLARITY	SIF to RIF	indicate SIF detects normal polarity
RELEASE	SIF to RIF	indicate SIF detects release
RIF seizure ack	RIF to SIF	sends seizure ack to SIF
RIF seizure nak	RIF to SIF	sends seizure nak to SIF
RIF release	RIF to SIF	sends release to SIF
RIF seizure	RIF to SIF	sends seizure to SIF
RIF meter pulsing signal	RIF to SIF	makes SIF sending meter pulsing signal
RIF reverse polarity	RIF to SIF	makes two wire polarity reverse
RIF normal polarity	RIF to SIF	makes two wire polarity normal
RIF loop open	RIF to SIF	makes SIF loop open

Table 1-2/C-IF1.01 Timer Definition

Timer	State	Cause for start	Normal stop	At the first expiry	Remarks
1	ST 1	send dt	receive first digit dial	send bt, ST 6	
2	ST 2	digit received	next digit reception	digit dial reception complete, ST 3	
3	ST 3	send off hook and digit dial to RIF	reception of seizure ack	send bt, ST 6	
5	ST 5	on hook detected	release received	send bt, ST 6	in case of WIF3.02 or WIF3.03, timer value is infinite. Timer Value is depend on originating or terminating
6	ST 6	send bt	on hook detected	send howler, ST 7	
7	ST 7	send howler	on hook detected	lock out, ST 8	
11	ST 11	start ringing	off hook detected	stop ringing, normal polarity, ST 0	NTT DDI
12	ST 12	dtmf sending complete	on hook detected	normal polarity, ST 0	NTT DDI

Table 1-3/C-IF1.01 State Definition

state No	state	individual	LS PBX	GS PBX	coin box	DDI PBX	NTT individual	NTT DDI
0	idle	on hook	on hook	on hook	on hook	on hook	on hook	on hook
1	dt send	sending DT	sending DT	sending DT	sending DT	sending DT	sending DT	sending DT
2	digit dial reception	digit dial reception	digit dial reception	digit dial reception	digit dial reception	digit dial reception	digit dial reception	digit dial reception
3	digit dial complete	complete digit dial reception	complete digit dial reception	complete digit dial reception	complete digit dial reception	complete digit dial reception	complete digit dial reception	complete digit dial reception
4	communication in progress	communication in progress	communication in progress	communication in progress	communication in progress	communication in progress	communication in progress	communication in progress
5	release guard	wait acknowledge for release	wait acknowledge for release	wait acknowledge for release	wait acknowledge for release	wait acknowledge for release	wait acknowledge for release	wait acknowledge for release
6	bt	sending BT	sending BT	sending BT	sending BT	sending BT	sending BT	sending BT
7	howler	sending Howler	sending Howler	sending Howler	sending Howler	sending Howler	sending Howler	sending Howler
8	lock out	Lock Out state	Lock Out state	Lock Out state	Lock Out state	Lock Out state	Lock Out state	Lock Out state
9	ringing	sending ringing signal	sending ringing signal	sending ringing signal	sending ringing signal	none	sending ringing signal	sending ringing signal
10	DDI PBX waiting answer	none	none	none	none	wait answer	none	none
11	NTT DDI sending dtmf	none	none	none	none	none	none	sending DTMF
12	NTT DDI waiting dial ack	none	none	none	none	none	none	waiting dial ACK
13	NTT DDI waiting 2nd answer	none	none	none	none	none	none	waiting 2nd answer

2. State Transition Table Examples

2.1 Individual Subscriber

Table 2-1/C-IF1.01 shows the WSU analogue subscribe interface state transition table for individual subscriber.

In this examples, there are no answer signal from SN.

Table 2-1/C-IF1.01 Interface State Transition Table, Individual subscriber

state / event	ST 0	ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9
TE loop closed	send dt, start T 1, ST 1	/	/	/	/	stop T 5, ST 4	/	/	/	stop ringing, send OFF HOOK, ST 4
TE loop open	-	stop T 1, ST 0	stop T 2, ST 0	stop T 3, ST 0	send ON HOOK, start T 5, ST 5	-	stop bt, stop T 6, ST 0	stop howler, stop T 7, ST 0	ST 0	/
TE DP/DTMF	/	stop dt, stop T 1, start T 2, ST 2	restart T 2	/	/	/	/	/	/	/
RIF seizure ack	/	/	/	stop T 3, ST 4	/	/	/	/	/	/
RIF seizure nak	/	/	/	stop T 3, send bt, start T 6, ST 6	/	/	/	/	/	/
RIF release	/	/	/	/	/	stop T 5, ST 0	/	/	/	stop ringing, ST 0
RIF seizure	start ringing, ST 9	/	/	/	/	/	/	/	/	/
Timeout T 1	/	stop dt, send bt, start T 6, ST 6	/	/	/	/	/	/	/	/
Timeout T 2	/	/	send OFF HOOK and DIGIT DIAL, start T 3, ST 3	/	/	/	/	/	/	/
Timeout T 3	/	/	/	send bt, start T 6, ST 6	/	/	/	/	/	/
Timeout T 5	/	/	/	/	/	org: RELEASE, ST 0 trm: ST 0	/	/	/	/
Timeout T 6	/	/	/	/	/	/	stop bt, start T 7, send howler, ST 7	/	/	/
Timeout T 7	/	/	/	/	/	/	/	stop howler, ST 8	/	/

- = No state change; / = Unexpected event, no state change;

2.2 Coin Box

Table 2-2/C-IF1.01 shows the WSU analogue subscribe interface state transition table for coin box.

Table 2-2/C-IF1.01 Interface State Transition Table, Coin Box

state event	ST 0	ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9
TE loop closed	send dt, start T 1, ST 1	/	/	/	/	stop T 5, ST 4	/	/	/	stop ringing, send OFF HOOK, ST 4
TE loop open	-	stop T 1, ST 0	stop T 2, ST 0	stop T 3, ST 0	send ON HOOK, start T 5, ST 5	-	stop bt, stop T 6, ST 0	stop howler, stop T 7, ST 0	ST 0	/
TE DP/DTMF	/	stop dt, stop T 1, start T 2, ST 2	restart T 2	/	/	/	/	/	/	/
RIF seizure ack	/	/	/	stop T 3, ST 4	/	/	/	/	/	/
RIF seizure nak	/	/	/	stop T 3, send bt, start T 6, ST 6	/	/	/	/	/	/
RIF release	/	/	/	/	/	stop T 5, ST 0	/	/	/	stop ringing, ST 0
RIF seizure	start ringing, ST 9	/	/	/	/	/	/	/	/	/
RIF meter pulsing signal	/	/	/	/	send meter pulsing signal	/	/	/	/	/
Timeout T 1	/	stop dt, send bt, start T 6, ST 6	/	/	/	/	/	/	/	/
Timeout T 2	/	/	send OFF HOOK and DIGIT DIAL, start T 3, ST 3	/	/	/	/	/	/	/
Timeout T 3	/	/	/	send bt, start T 6, ST 6	/	/	/	/	/	/
Timeout T 5	/	/	/	/	/	org: RELEASE, ST 0 trm: ST 0	/	/	/	/
Timeout T 6	/	/	/	/	/	/	stop bt, start T 7, send howler, ST 7	/	/	/
Timeout T 7	/	/	/	/	/	/	/	stop howler, ST 8	/	/

- = No state change; / = Unexpected event, no state change;

2.3 Loop Start PBX

Table 2-3/C-IF1.01 shows the WSU analogue subscribe interface state transition table for loop start PBX.

Table 2-3/C-IF1.01 Interface State Transition Table, Loop Start PBX

state event	ST 0	ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9
TE loop closed	send dt, start T 1, ST 1	/	/	/	/	stop T 5, ST 4	/	/	/	stop ringing, send OFF HOOK, ST 4
TE loop open	/	stop T 1, ST 0	stop T 2, ST 0	stop T 3, ST 0	send ON HOOK, start T 5, ST 5	-	stop bt, stop T 6, ST 0	stop howler, stop T 7, ST 0	ST 0	/
TE DP/DTMF	/	stop dt, stop T 1, start T 2, ST 2	restart T 2	/	/	/	/	/	/	/
RIF seizure ack	/	/	/	stop T 3, ST 4	/	/	/	/	/	/
RIF seizure nak	/	/	/	stop T 3, send bt, start T 6, ST 6	/	/	/	/	/	/
RIF release	/	/	/	/	/	stop T 5, ST 0	/	/	/	stop ringing
RIF seizure	start ringing, ST 9	/	/	/	/	/	/	/	/	/
RIF digit dial	/	/	/	/	/	/	/	/	/	/
RIF reverse polarity	/	/	/	send reverse polarity	/	send reverse polarity	/	/	/	/
RIF normal polarity	/	/	/	send normal polarity	/	send normal polarity	/	/	/	/
Timeout T 1	/	stop dt, send bt, start T 6, ST 6	/	/	/	/	/	/	/	/
Timeout T 2	/	/	send OFF HOOK and DIGIT DIAL, start T 3, ST 3	/	/	/	/	/	/	/
Timeout T 3	/	/	/	send bt, start T 6, ST 6	/	/	/	/	/	/
Timeout T 5	/	/	/	/	/	org: RELEASE, ST 0 trm: ST 0	/	/	/	/
Timeout T 6	/	/	/	/	/	/	stop bt, start T 7, send howler, ST 7	/	/	/
Timeout T 7	/	/	/	/	/	/	/	stop howler, ST 8	/	/

- = No state change; / = Unexpected event, no state change;

2.4 Ground Start PBX

Table 2-4/C-IF1.01 shows the WSU analogue subscribe interface state transition table for ground start PBX.

Table 2-4/C-IF1.01 Interface State Transition Table, Ground Start PBX

state event	ST 0	ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9
TE G on Ring with loop	send g on tip, send dt, start T 1, ST 1	/	/	/	/	stop T 5, ST 4	/	/	/	stop ringing, send OFF HOOK, ST 4
TE loop open	/	stop T 1, ST 0	stop T 2, ST 0	stop T 3, ST 0	send ON HOOK, start T 5, ST 5	-	ST 0	ST 0	ST 0	-
TE DP/DTMF	/	stop dt, stop T 1, start T 2, ST 2	restart T 2	/	/	/	/	/	/	/
RIF seizure ack	/	/	/	stop T 3, ST 4	/	/	/	/	/	/
RIF seizure nak	/	/	/	stop T 3, send bt, start T 6, ST 6	/	/	/	/	/	/
RIF release	/	/	/	/	/	stop T 5, ST 0	/	/	/	stop ringing, ST 0
RIF seizure	start ringing, ST 9	/	/	/	/	/	/	/	/	/
RIF digit dial	/	/	/	/	/	/	/	/	/	/
RIF reverse polarity	/	/	/	send reverse polarity	/	send reverse polarity	/	/	/	/
RIF normal polarity	/	/	/	send normal polarity	/	send normal polarity	/	/	/	/
Timeout T 1	/	stop dt, send bt, start T 6, ST 6	/	/	/	/	/	/	/	/
Timeout T 2	/	/	send OFF HOOK and DIGIT DIAL, start T 3, ST 3	/	/	/	/	/	/	/
Timeout T 3	/	/	/	send bt, start T 6, ST 6	/	/	/	/	/	/
Timeout T 5	/	/	/	/	/	org: RELEASE, ST 0 trm: ST 0	/	/	/	/
Timeout T 6	/	/	/	/	/	/	stop bt, start T 7, send howler, ST 7	/	/	/
Timeout T 7	/	/	/	/	/	/	/	stop howler, ST 8	/	/

- = No state change; / = Unexpected event, no state change;

2.5 DDI PBX

Table 2-5/C-IF1.01(1/2) shows the WSU analogue subscribe interface state transition table for DDI PBX, originating.

Table 2-5/C-IF1.01(2/2) shows the WSU analogue subscribe interface state transition table for DDI PBX, terminating.

Table 2-5/C-IF1.01 (1/2) Interface State Transition Table, DDI PBX, Originating

state event	ST 0	ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8
TE loop closed	send dt, start T 1, ST 1	/	/	/	/	stop T 5, ST 4	/	/	/
TE loop open	-	stop T 1, ST 0	stop T 2, ST 0	stop T 3, ST 0	send ON HOOK, start T 5, ST 5	-	stop bt, stop T 6, ST 0	stop howler, stop T 7, ST 0	ST 0
TE DP/DTMF	/	stop dt, stop T 1, start T 2, ST 2	restart T 2	/	/	/	/	/	/
RIF seizure ack	/	/	/	stop T 3, ST 4	/	/	/	/	/
RIF seizure nak	/	/	/	stop T 3, send bt, start T 6, ST 6	/	/	/	/	/
RIF release	/	/	/	/	/	stop T 5, ST 0	/	/	/
RIF reverse polarity	/	/	/	send reverse polarity	/	send reverse polarity	/	/	/
RIF normal polarity	/	/	/	send normal polarity	/	send normal polarity	/	/	/
Timeout T 1	/	stop dt, send bt, start T 6, ST 6	/	/	/	/	/	/	/
Timeout T 2	/	/	send OFF HOOK and DIGIT DIAL, start T 3, ST 3	/	/	/	/	/	/
Timeout T 3	/	/	/	send bt, start T 6, ST 6	/	/	/	/	/
Timeout T 5	/	/	/	/	/	RELEASE, ST 0	/	/	/
Timeout T 6	/	/	/	/	/	/	stop bt, start T 7, send howler, ST 7	/	/
Timeout T 7	/	/	/	/	/	/	/	stop howler, ST 8	/

- = No state change; / = Unexpected event, no state change;

Table 2-5/C-IF1.01 (2/2) Interface State Transition Table, DDI PBX, Terminating

state event	ST 0	ST 4	ST 5	ST 6	ST 7	ST 8	ST 10
TE reverse polarity	/	/	stop T 5, ST 4	/	/	/	stop T 10, send OFF HOOK, ST 4
TE normal polarity	/	start T 5, ST 5	stop T 5, send ON HOOK, ST 0	/	/	/	/
RIF seizure ack	/	/	/	/	/	/	/
RIF seizure nak	/	/	/	/	/	/	/
RIF release	/	/	stop T 5, ST 0	/	/	/	loop open, ST 0
RIF seizure	loop closed, send dp/dtmf, start T 10, ST 10	/	/	/	/	/	/
RIF reverse polarity	/	/	/	/	/	/	/
RIF normal polarity	/	/	/	/	/	/	/
RIF loop open	/	loop open, start T 5, ST 5	loop open, stop T 5 ST 0	/	/	/	/
Timeout T 3	/	/	/	/	/	/	/
Timeout T 5	/	/	loop open, ST 0	/	/	/	/
Timeout T 6	/	/	/	/	/	/	/
Timeout T 7	/	/	/	/	/	/	/
Timeout T 10	/	/	/	/	/	/	send bt, start T 6, ST 6

- = No state change; / = Unexpected event, no state change;

2.6 NTT individual Subscriber

State transition table of NTT individual subscriber is same as loop start PBX.

2.7 NTT DDI PBX

State transition table of NTT DDI PBX, originating is same as loop start PBX.

Terminating table is in table 2-6/C-IF1.01

Table 2-6/C-IF1.01 Interface State Transition Table, NTT DDI PBX, Terminating

state event	ST 0	ST 4	ST 5	ST 6	ST 7	ST 8	ST 11	ST 12	ST 13
TE loop closed	/	/	stop T 5, ST 4	/	/	/	stop ringing, stop T 11, send OFF HOOK	/	send normal polarity, ST 4
TE loop open	-	send ON HOOK, start T 5, ST 5	-	ST 0	ST 0	ST 0	-	stop T 12, ST 13	/
TE DP/DTMF	/	/	/	/	/	/	-	/	/
RIF seizure ack	/	/	/	/	/	/	/	/	/
RIF seizure nak	/	/	/	/	/	/	/	/	/
RIF release	/	/	/	/	/	/	/	/	/
RIF seizure	send reverse polarity, start ringing, start T 11, ST 11	/	/	/	/	/	/	/	/
RIF digit dial	/	/	/	/	/	/	send dtmf, start T 12, ST 12	/	/
RIF reverse polarity	/	/	/	/	/	/	/	/	/
RIF normal polarity	/	/	/	/	/	/	/	/	/
Timeout T 5	/	/	ST 0	/	/	/	/	/	/
Timeout T 6	/	/	/	/	/	/	/	/	/
Timeout T 7	/	/	/	/	/	/	/	/	/
Timeout T 11	/	/	/	/	/	/	stop ringing, send normal polarity, ST 0	/	/
Timeout T 12	/	/	/	/	/	/	/	send normal polarity, ST 0	/

- = No state change; / = Unexpected event, no state change;

3. Message Sequence Examples

3.1 Originating-Answer (Individual DP Line Sub.)

Figure 3-1/C-IF1.01 shows a WIF1 sequence of originating answer (Individual DP Line Subscriber).

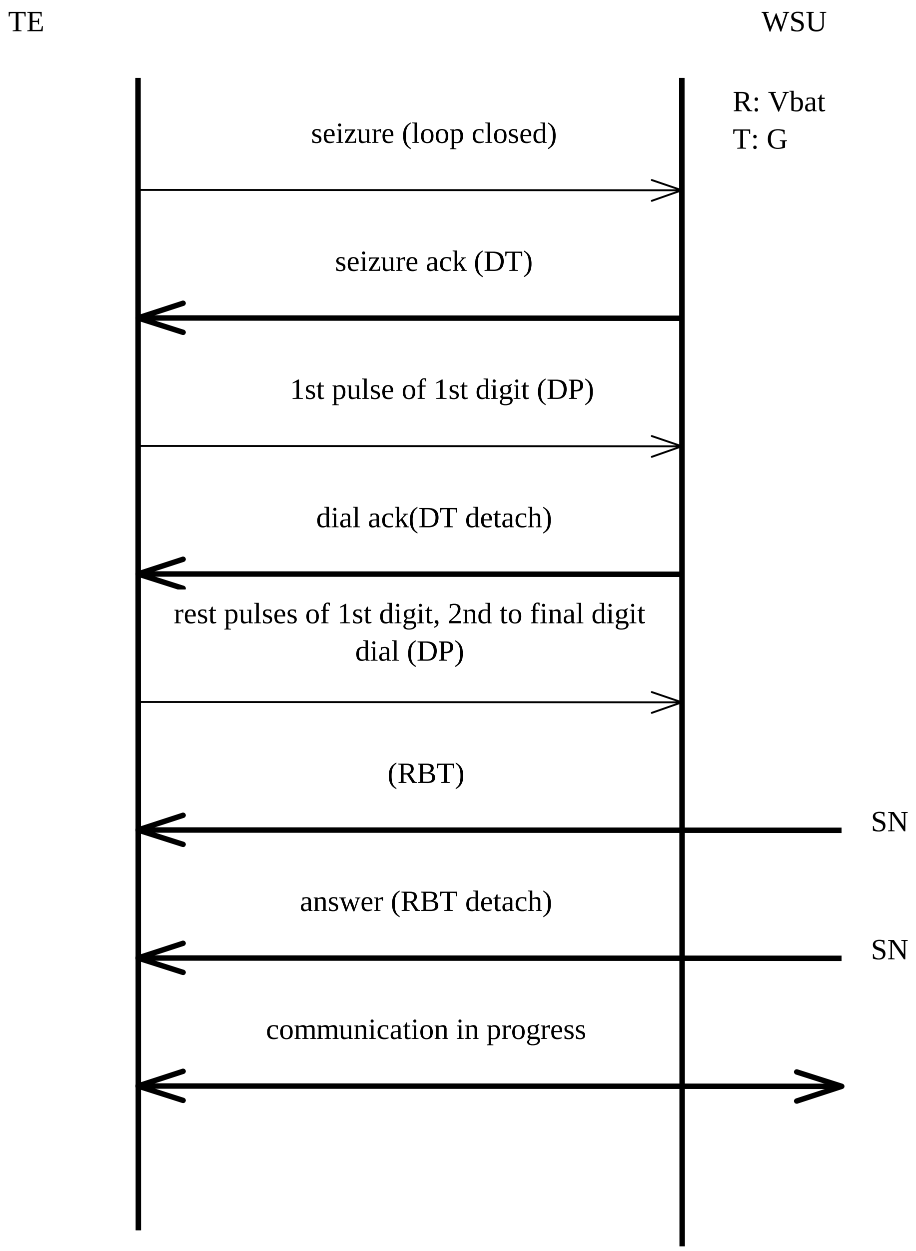

Figure 3-1/C-IF1.01 Originating - Answer (Individual DP Line Sub.)

3.2 Originating-Answer (Individual DTMF Line Sub.)

Figure 3-2/C-IF1.01 shows a WIF1 sequence of originating answer (Individual DTMF Line Subscriber).

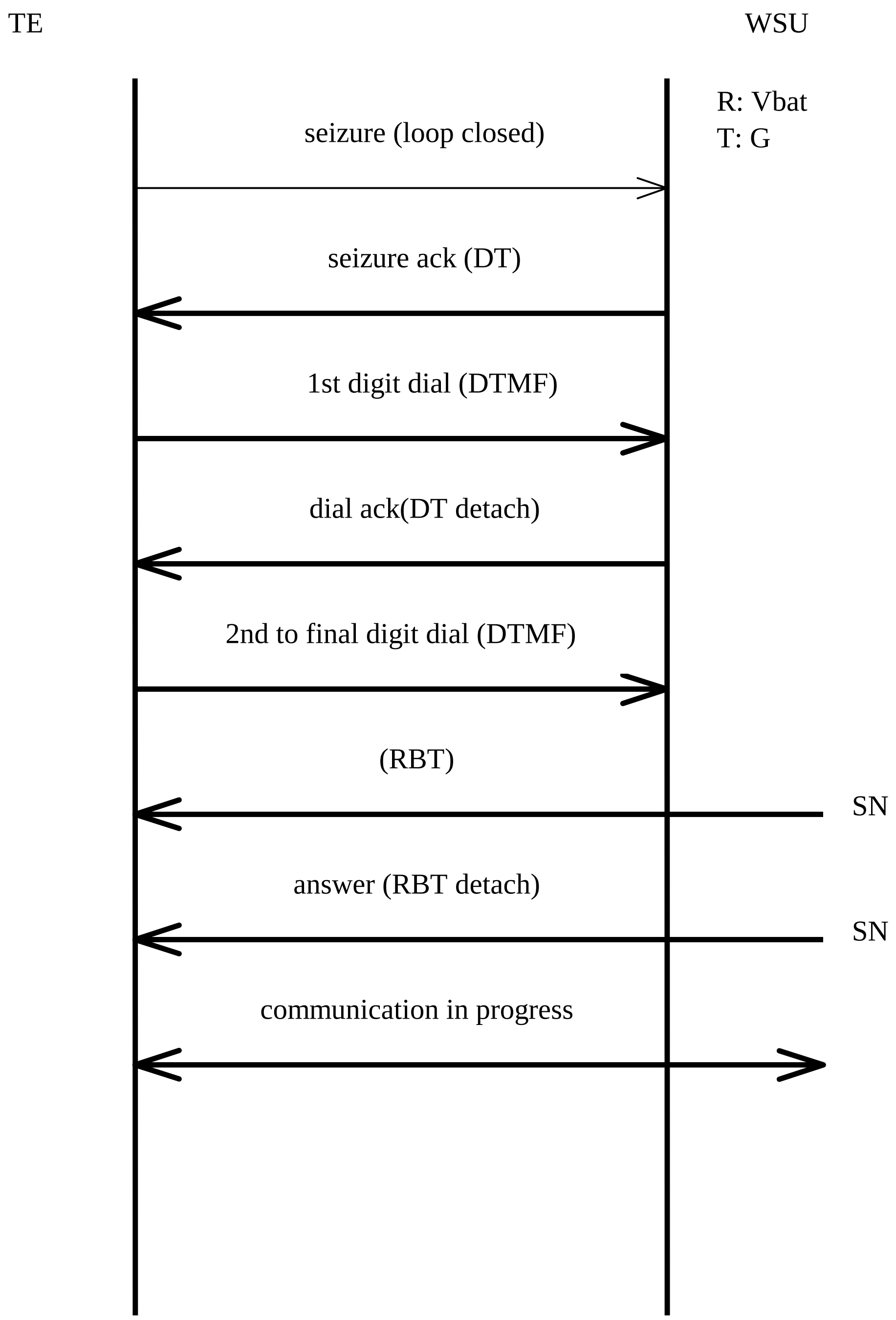

Figure 3-2/C-IF1.01 Originating - Answer (Individual DTMF Line Sub.)

3.3 Originating-Answer (Loop Start PBX)

Figure 3-3/C-IF1.01 shows a WIF1 sequence of originating answer (Loop Start PBX).

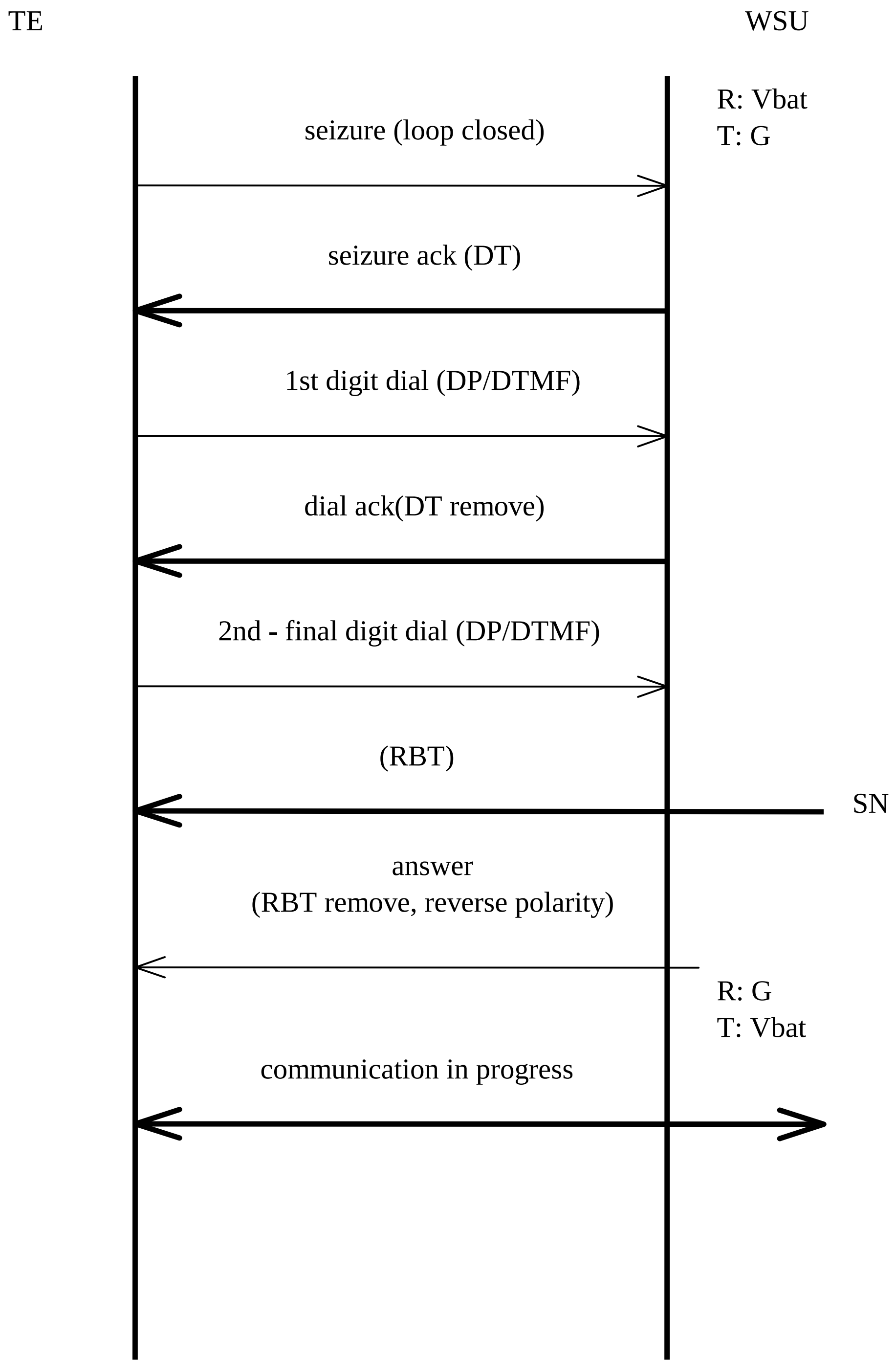

Figure 3-3/C-IF1.01 Originating - Answer (Loop Start PBX)

3.4 Originating-Answer (Ground Start PBX)

Figure 3-4/C-IF1.01 shows a WIF1 sequence of originating answer (Ground Start PBX).

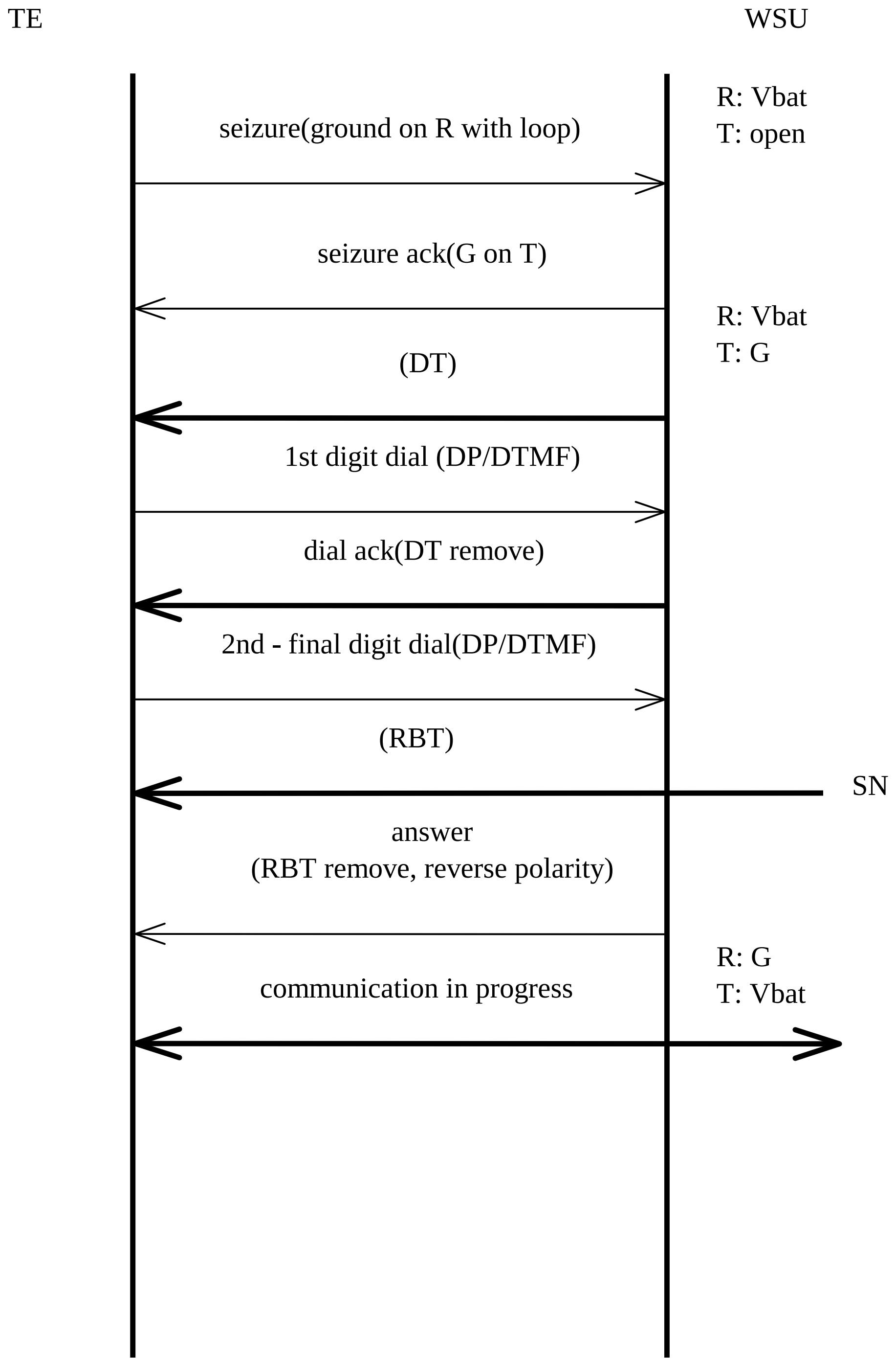

Figure 3-4/C-IF1.01 Originating - Answer (Ground Start PBX)

3.5 Originating-Channel Hunt NG

Figure 3-5/C-IF1.01 shows a WIF1 sequence of originating channel hunt NG.

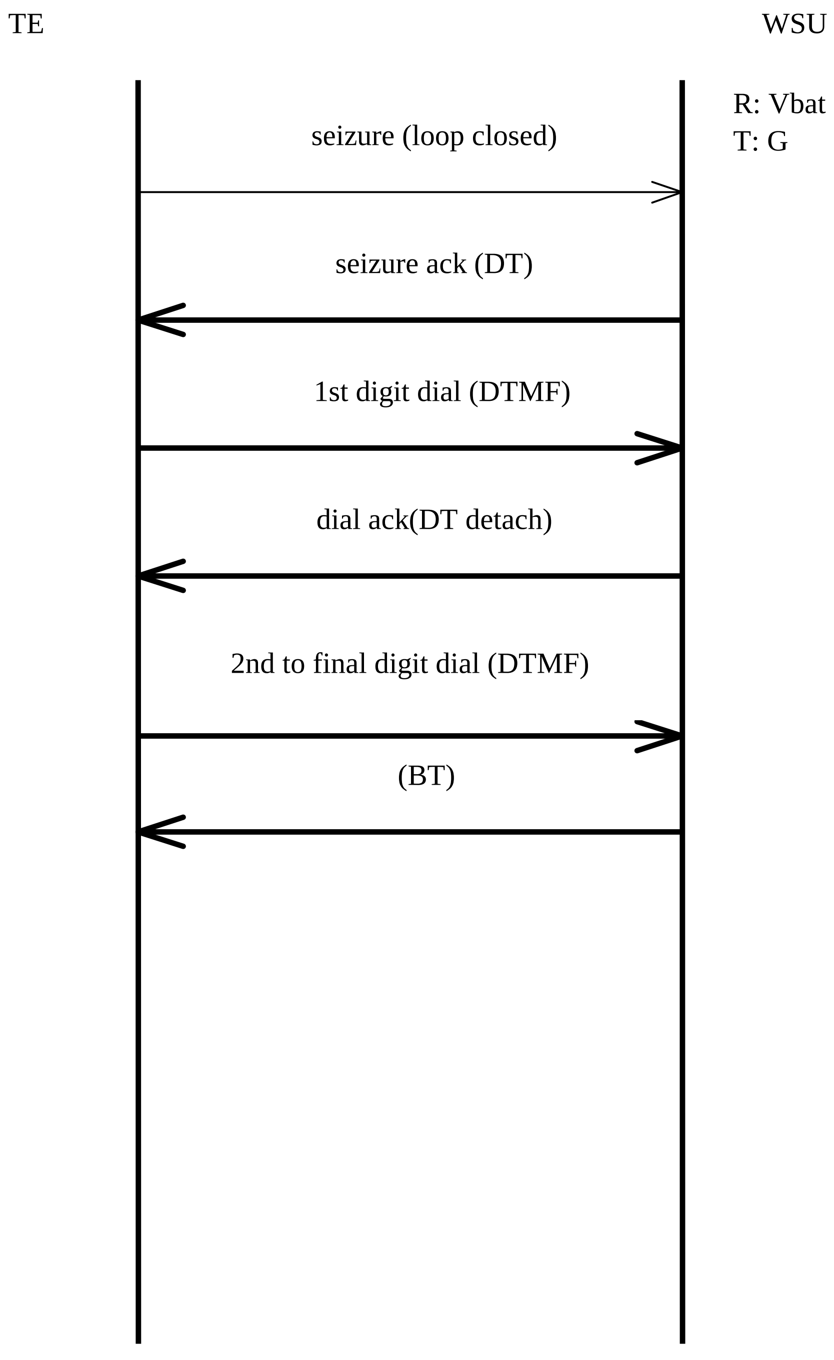

Figure 3-5/C-IF1.01 Originating - Channel Hunt NG

3.6 Release-before Dialling

Figure 3-6/C-IF1.01 shows a WIF1 sequence of release before dialling.

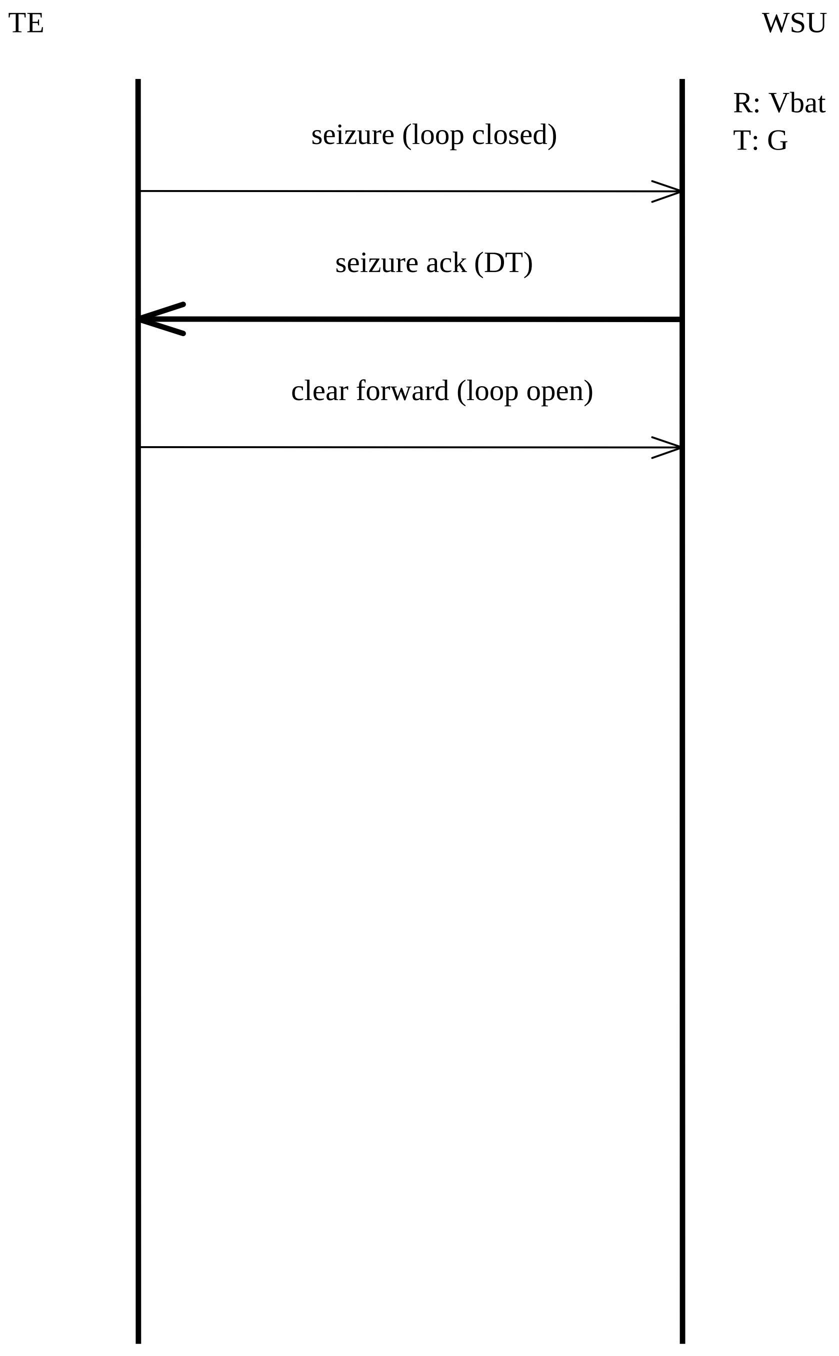

Figure 3-6/C-IF1.01 Release - before Dialling

3.7 Release-during Dialling

Figure 3-7/C-IF1.01 shows a WIF1 sequence of release before dialling.

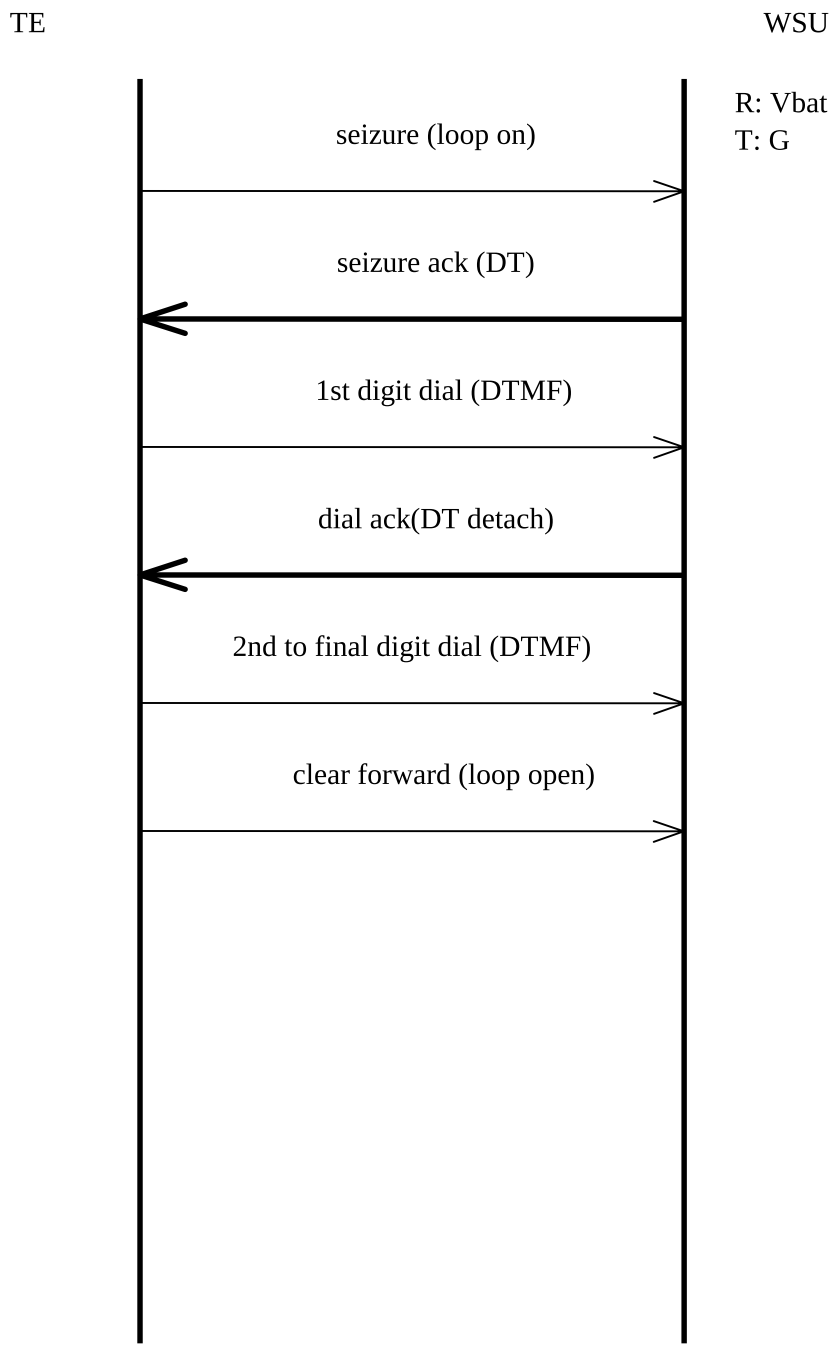

Figure 3-7/C-IF1.01 Release - during Dialling

3.8 Release-During Ringing

Figure 3-8/C-IF1.01 shows a WIF1 sequence of release before ringing.

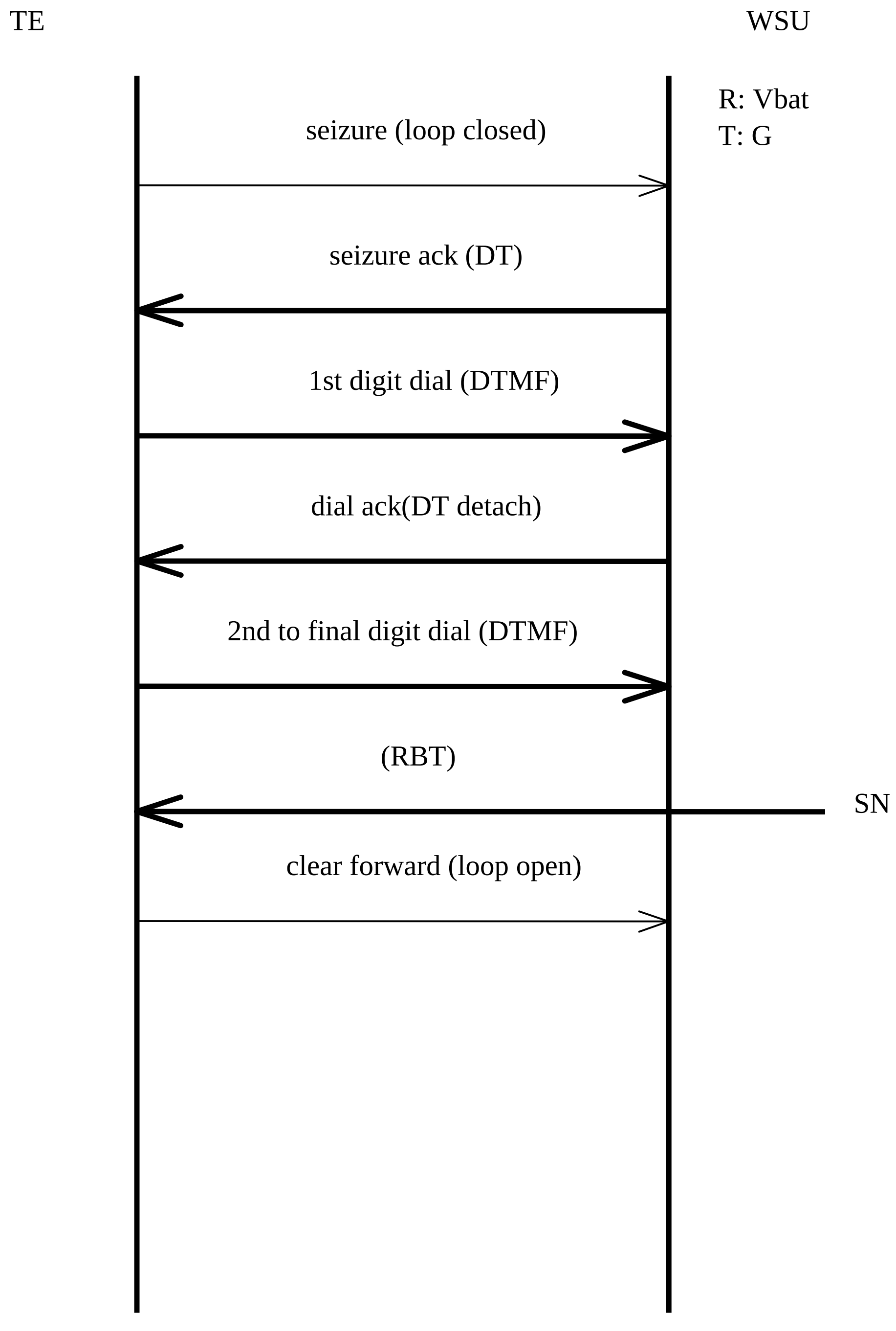

Figure 3-8/C-IF1.01 Release - during Ringing

3.9 Call Collision

This sequence is same as originating sequence.

Figure 3-9/C-IF1.01 shows a WIF1 sequence of call collision.

(This sequence is completely same as originating sequence.)

Figure 3-9/C-IF1.01 Call Collision

3.10 Calling Party Release-Individual Sub. Originating

Figure 3-10/C-IF1.01 shows a WIF1 sequence of calling party release individual subscriber originating.

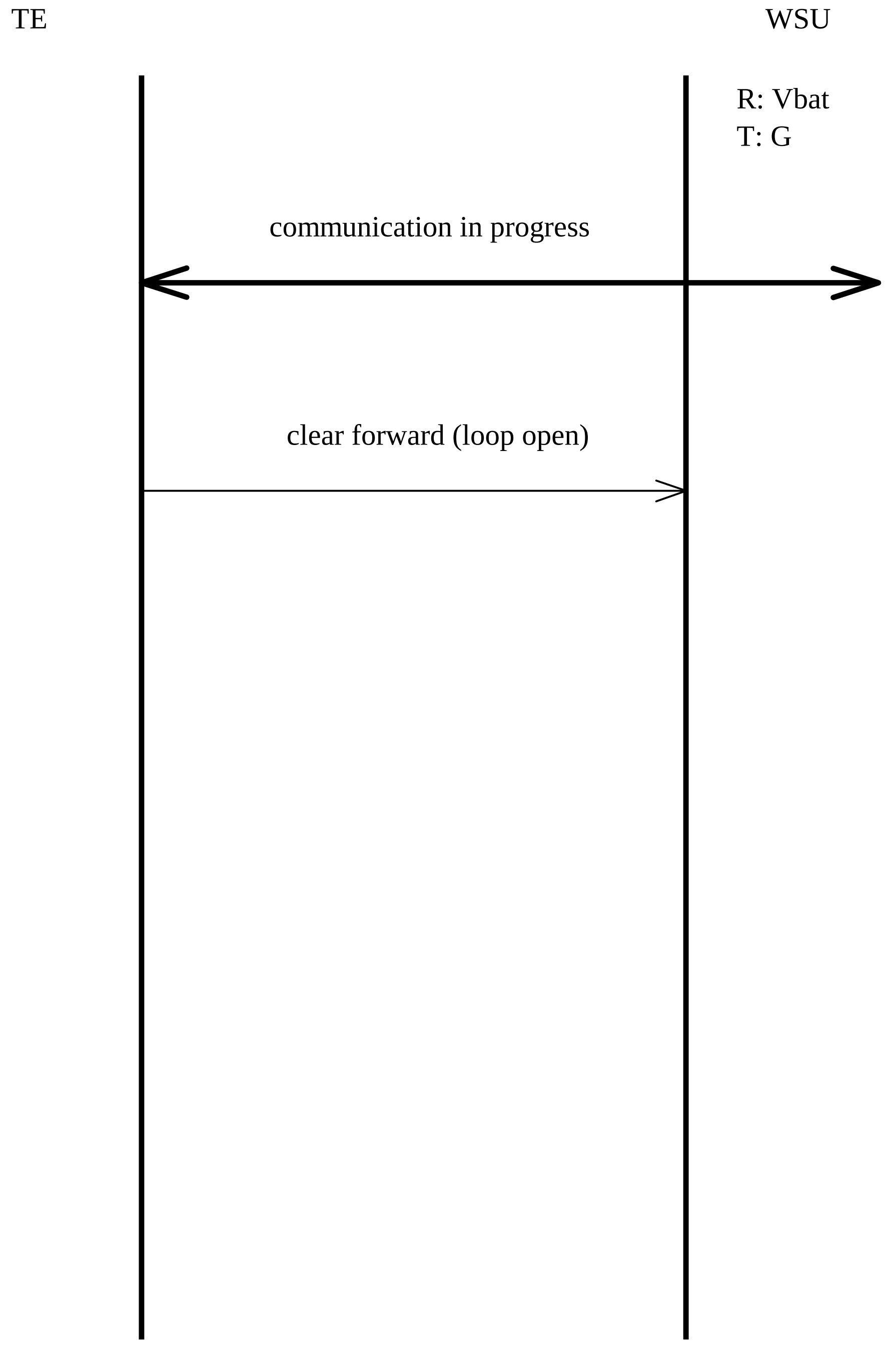

Figure 3-10/C-IF1.01 Calling Party Release - Individual Sub Originating

3.11 Called Party Release-Individual Sub. Originating

Figure 3-11/C-IF1.01 shows a WIF1 sequence of called party release individual subscriber originating

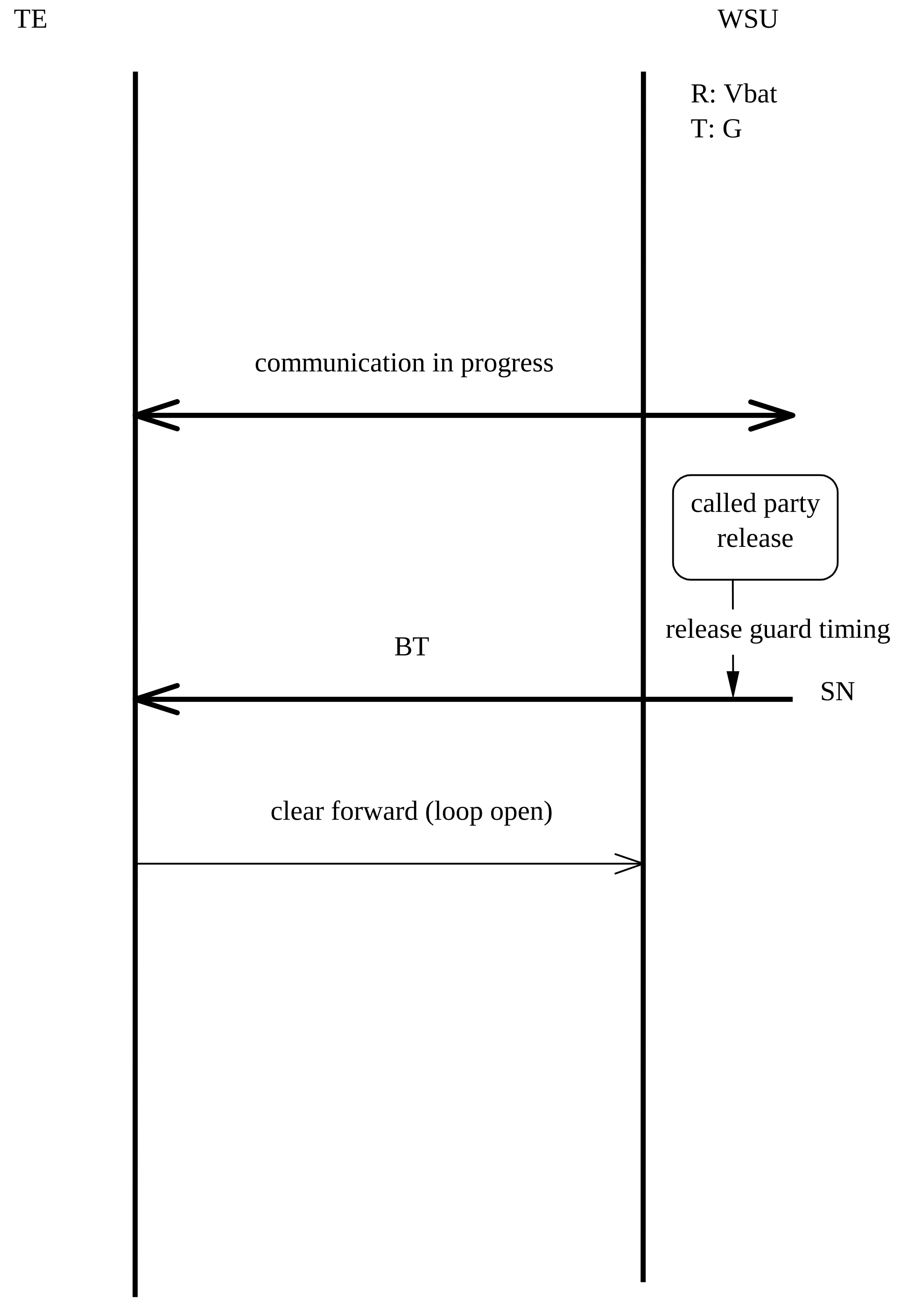

Figure 3-11/C-IF1.01 Called Party Release - Individual Sub Originating

3.12 Terminating-Answer

Figure 3-12/C-IF1.01 shows a WIF1 sequence of terminating answer.

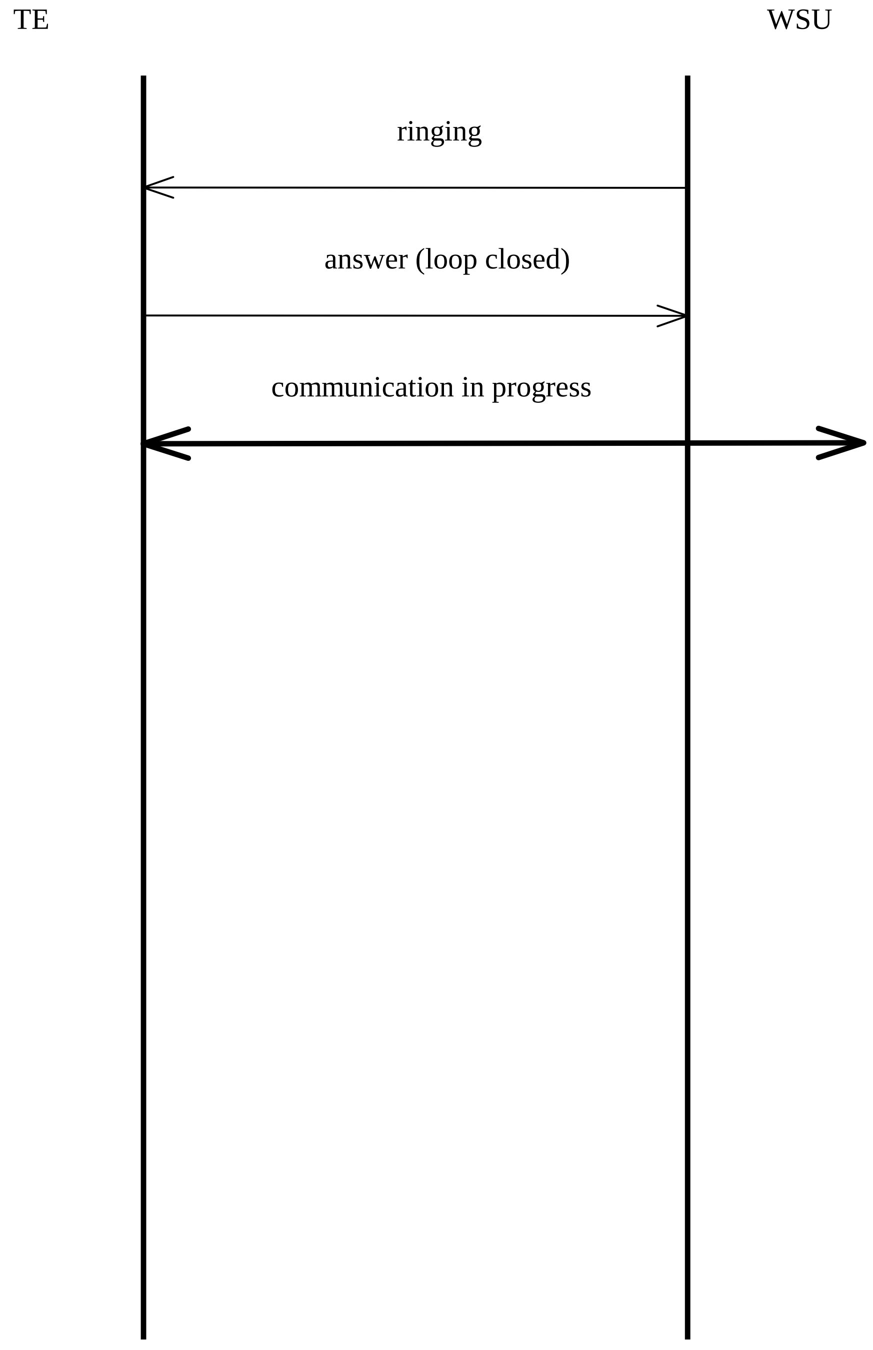

Figure 3-12/C-IF1.01 Terminating - Answer

3.13 Terminating-Answer (NTT DDI Spec.)

Figure 3-13/C-IF1.01 shows a WIF1 sequence of terminating answer (NTT DDI Specification).

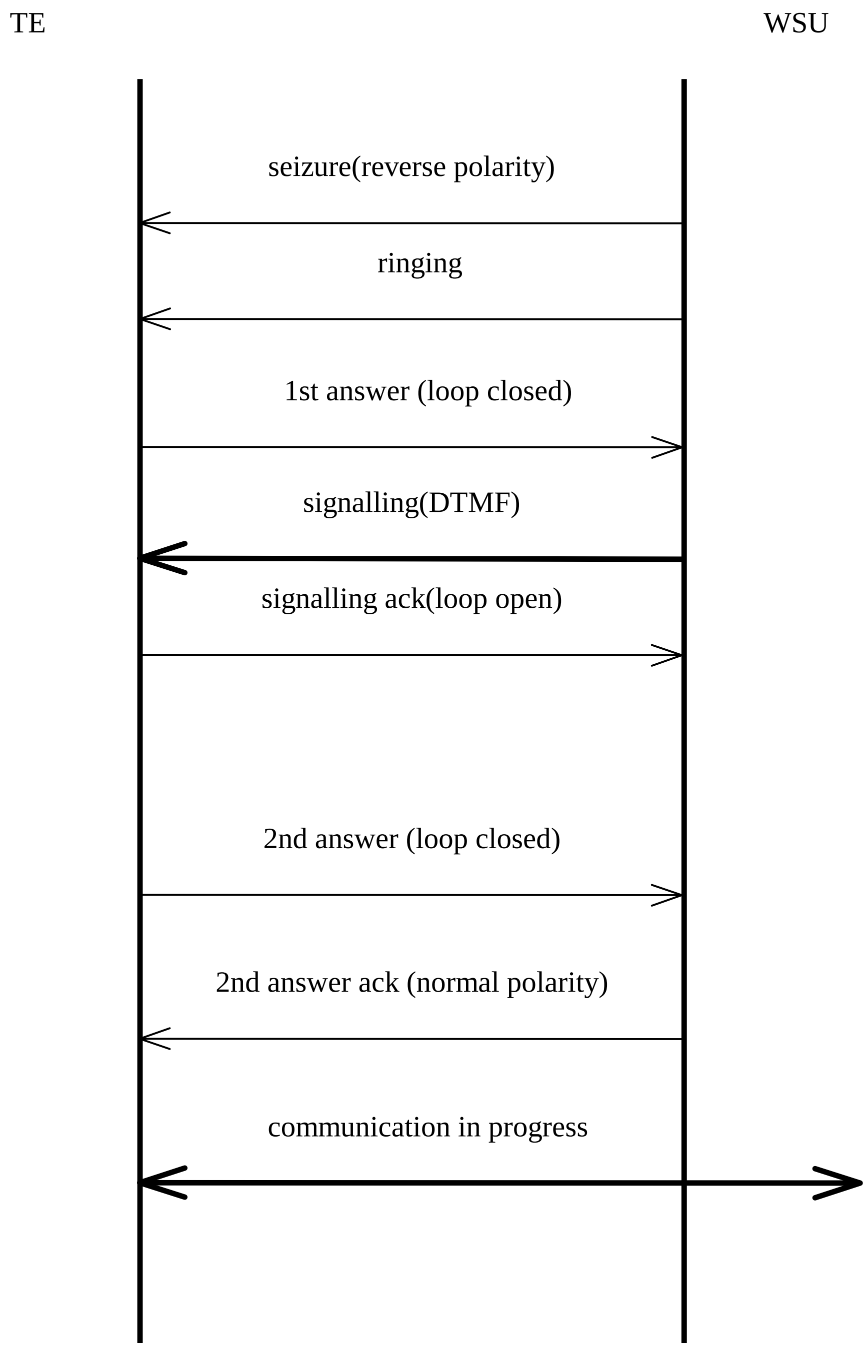

Figure 3-13/C-IF1.01 Terminating - Answer (NTT DDI Spec)

3.14 Terminating-Answer (DP type DDI)

Figure 3-14/C-IF1.01 shows a WIF1 sequence of terminating answer (DP type DDI).

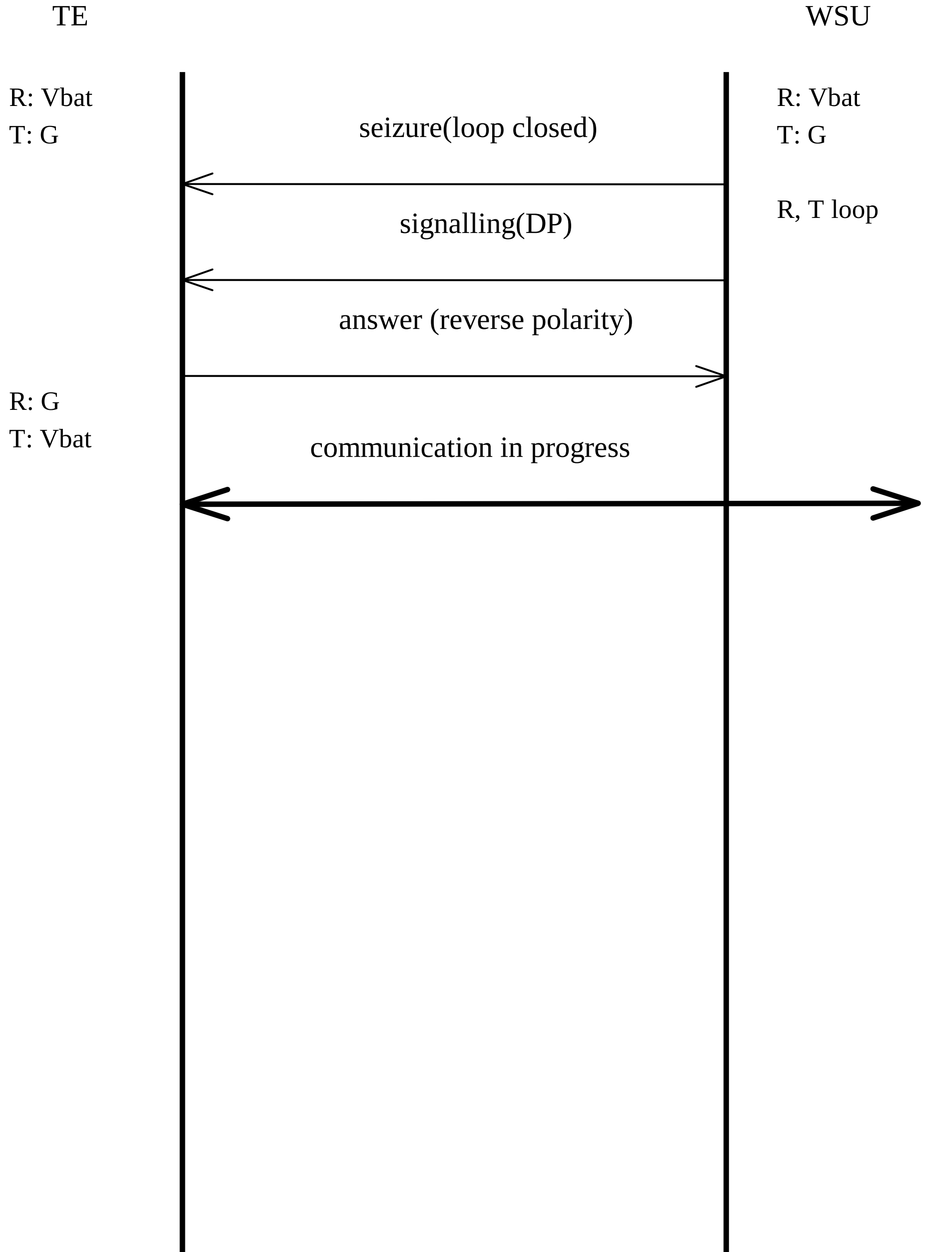

Figure 3-14/C-IF1.01 Terminating - Answer (DP Type DDI)

3.15 Terminating-Answer (DTMF Type DDI)

Figure 3-15/C-IF1.01 shows a WIF1 sequence of terminating answer (DTMF type DDI).

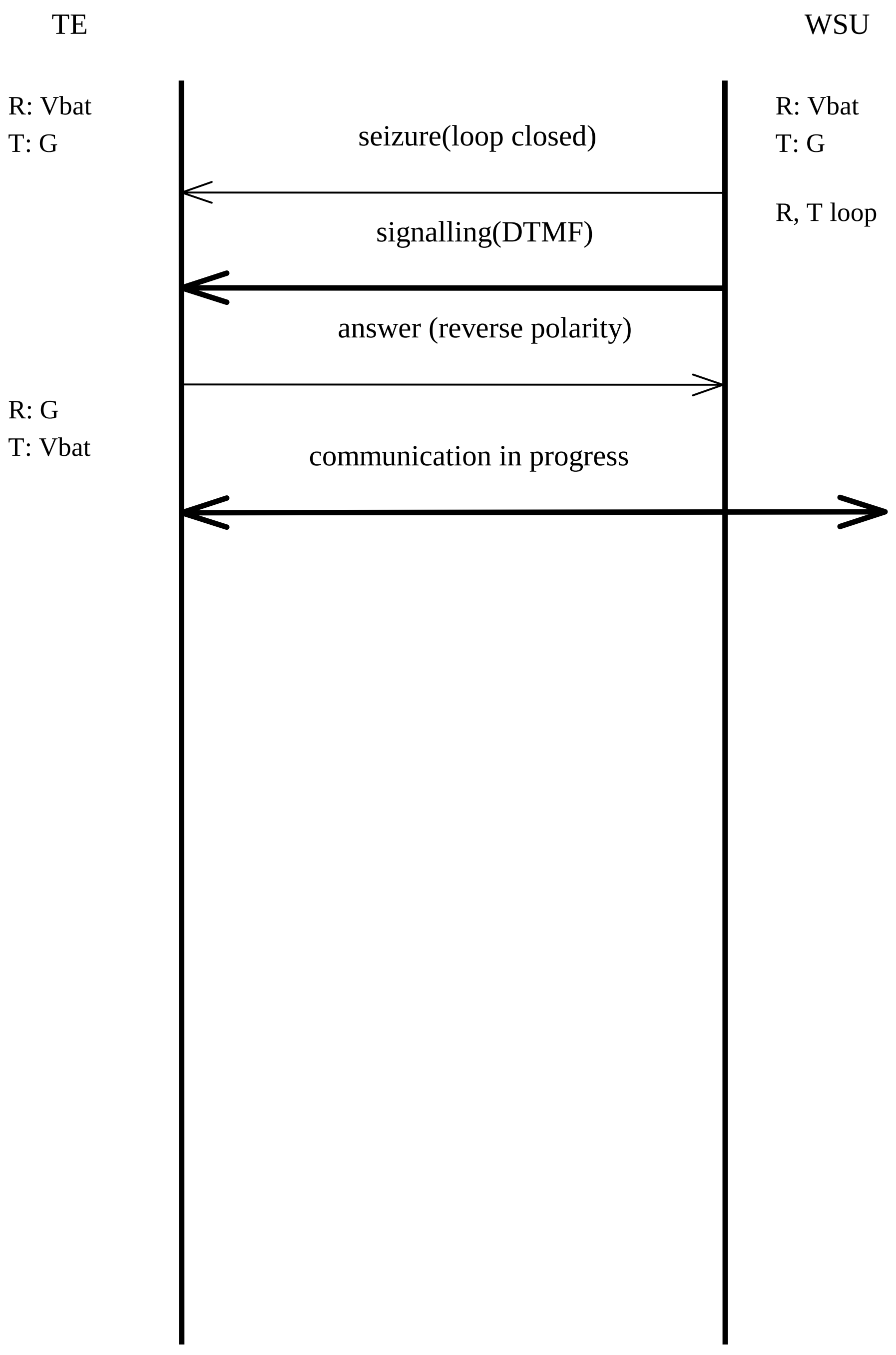

Figure 3-15/C-IF1.01 Terminating - Answer (DTMF Type DDI)

3.16 Calling Party Release-Individual Sub. Terminating

Figure 3-16/C-IF1.01 shows a WIF1 sequence of calling party release individual subscriber terminating.

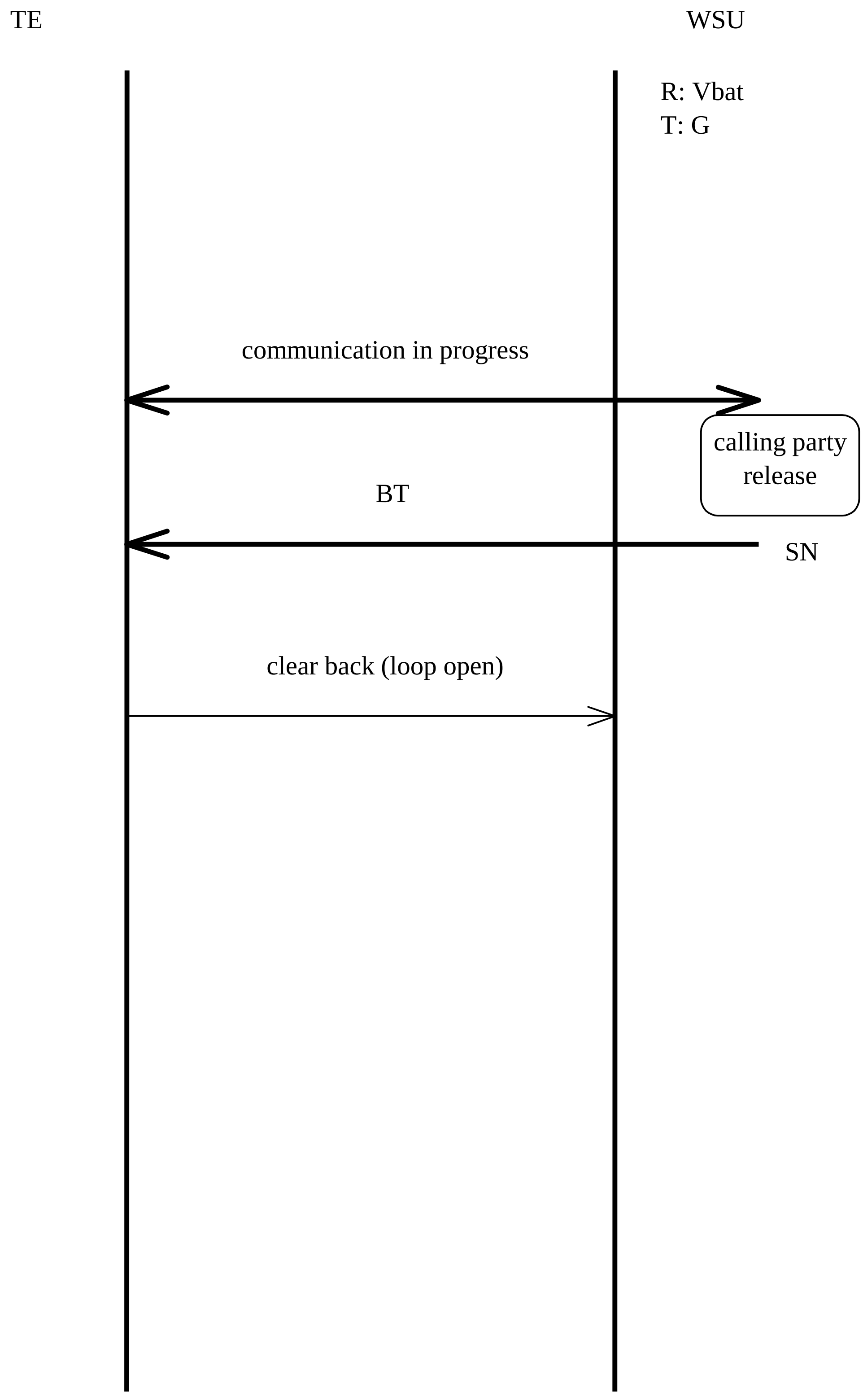

Figure 3-16/C-IF1.01 Calling Party Release - Individual Sub Terminating

3.17 Called Party Release-Individual Sub. Terminating

Figure 3-17/C-IF1.01 shows a WIF1 sequence of called party release individual subscriber terminating.

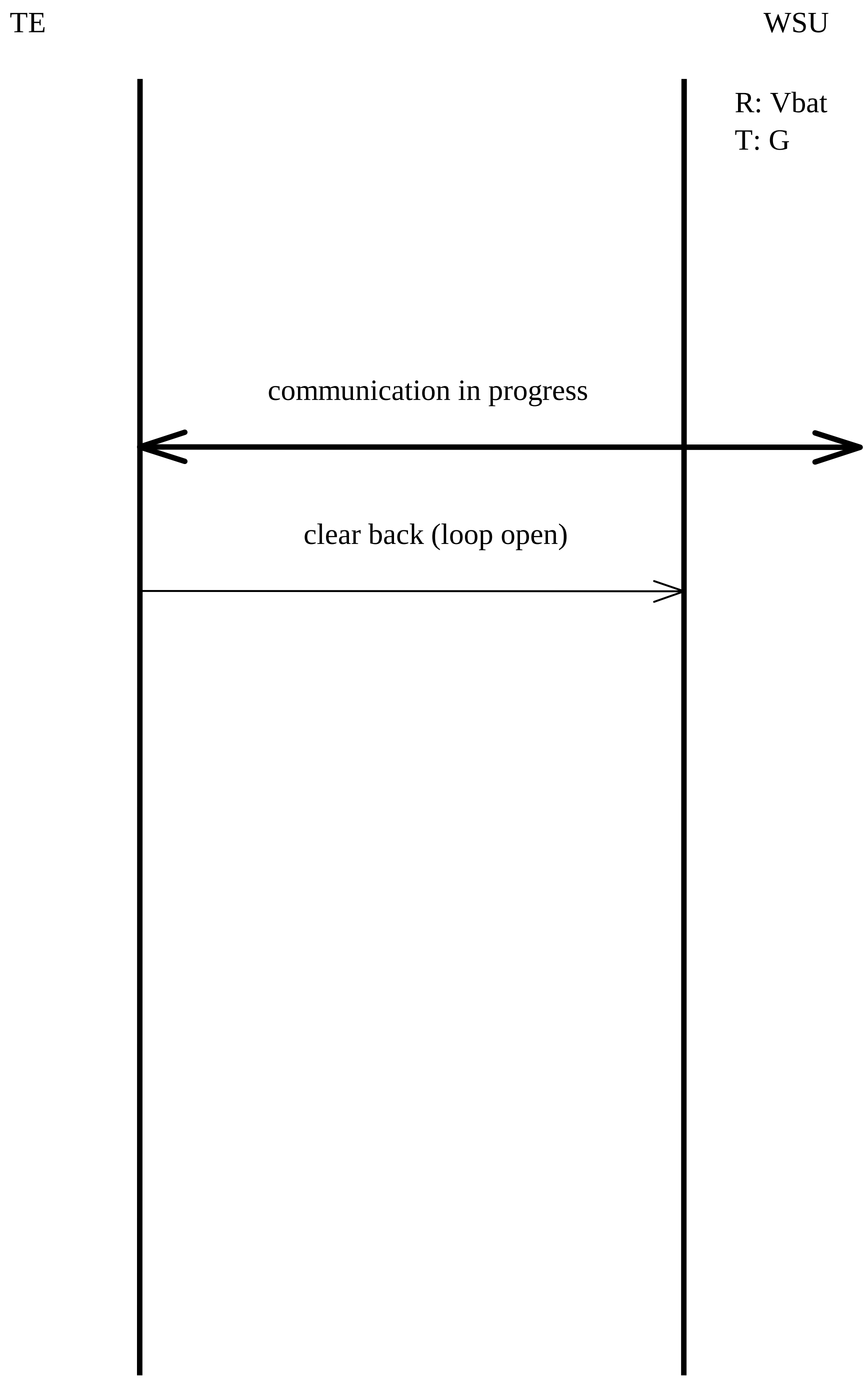

Figure 3-17/C-IF1.01 Called Party Release - Individual Sub Terminating

3.18 Hooking Monitoring

Figure 3-18/C-IF1.01 shows a WIF1 sequence of hooking monitoring.

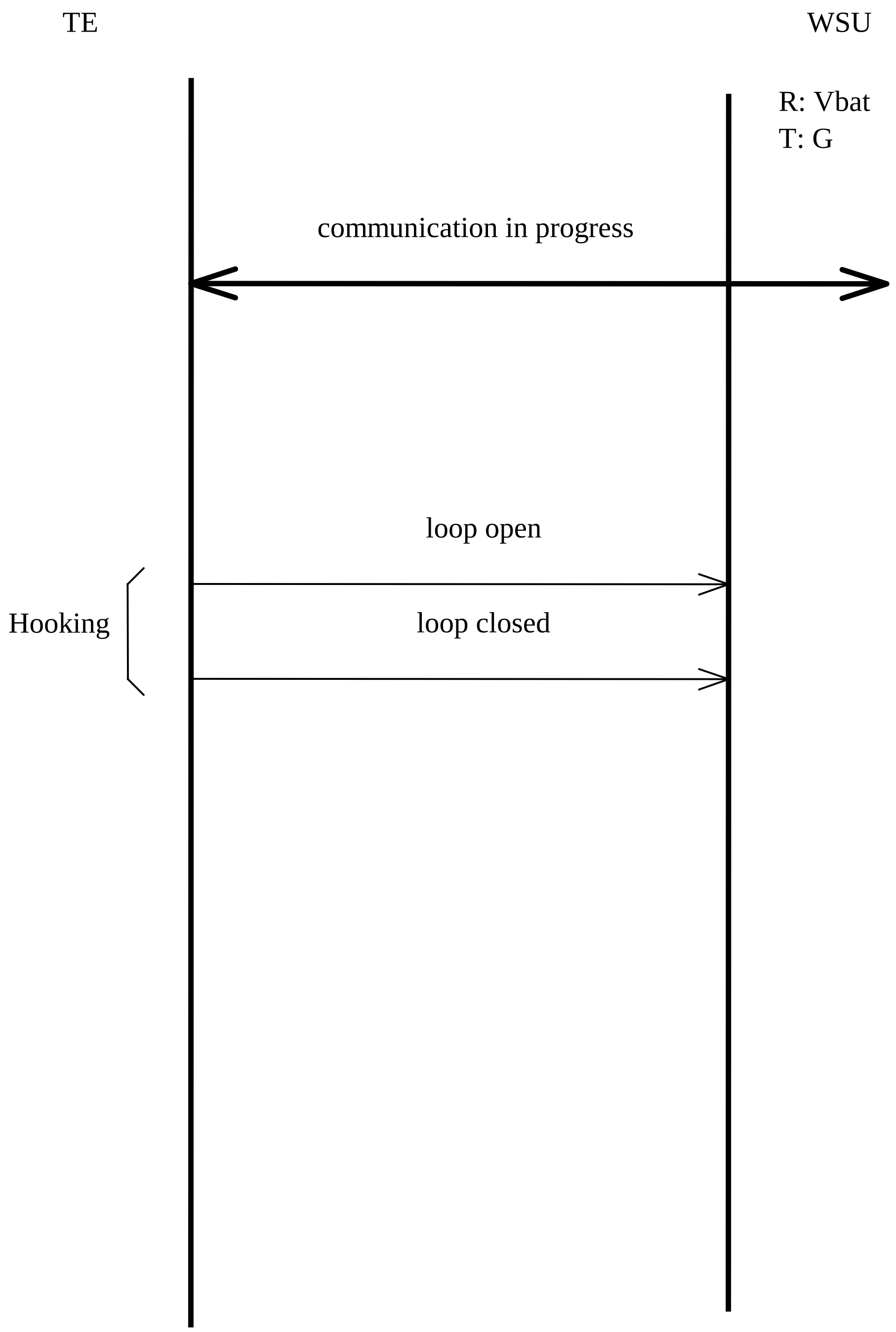

Figure 3-18/C-IF1.01 Hooking Monitoring

3.19 Meter Pulsing Signal Sending

Figure 3-19/C-IF1.01 shows a WIF1 sequence of metering pulsing signal sending.

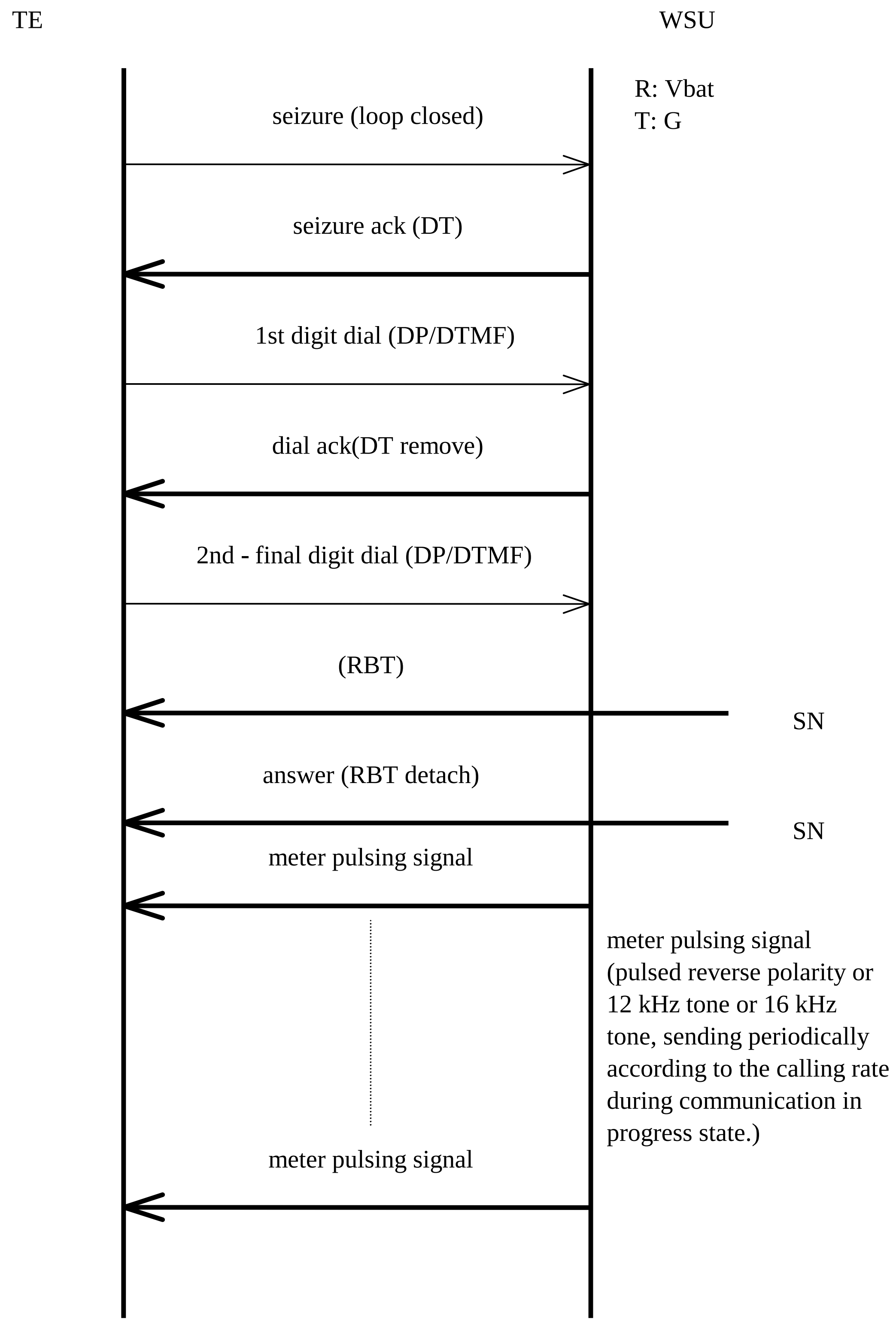

Figure 3-19/C-IF1.01 Meter Pulsing Signal Sending

3.20 Connection to Howler Tone

Figure 3-20/C-IF1.01 shows a WIF1 sequence of connection to howler tone.

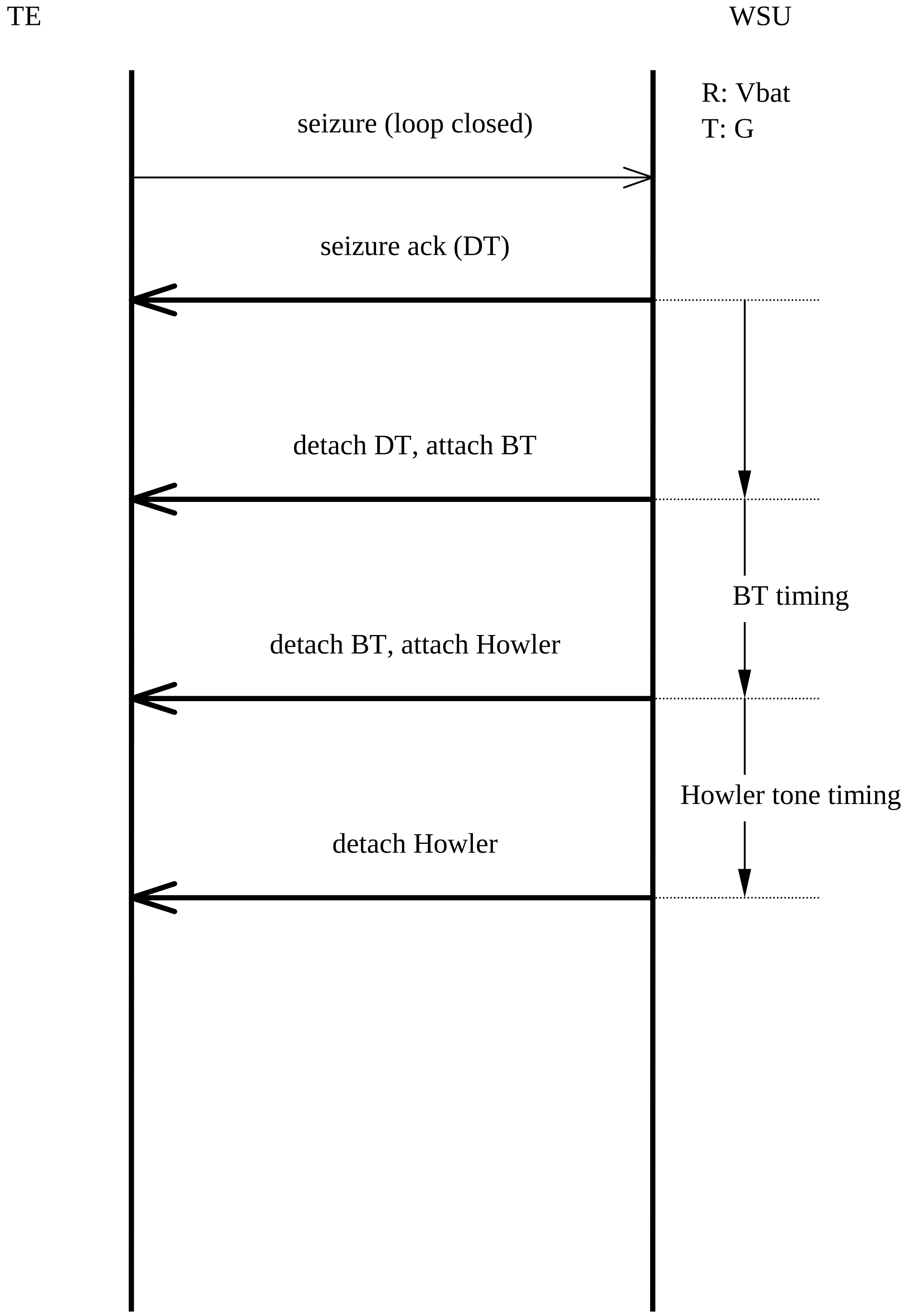

Figure 3-20/C-IF1.01 Connection to Howler Tone
(before dial abandon)