INTERNATIONAL TELECOMMUNICATION UNION

TELECOMMUNICATION STANDARDIZATION SECTOR

STUDY PERIOD 2009-2012

STUDY GROUP 16

TD 59R2 (WP 1/16)

English only

Original: English

Question(s): 14/16 Geneva, 26 October - 6 November 2009

TEMPORARY DOCUMENT

Source: Rapporteur Q14/16

Title: Consensus List for V.152

This document records the current status of the work concerning V.152 (V.VBD) at the conclusion of the November 2009 meeting of Study Group 16.

Deleted: February

Note: for the sake of brevity the consensus points that were used for the initial consent and approval of Recommendation ITU-T V.152 have been removed and only the points relevant to updates to the Recommendation are included. For reference the older points can be read in WP1 TD-16 of the January 2009 meeting of Study Group 16.

Introduction

This document records the agreements that the experts group reach consensus upon concerning the work of V.VBD. Also contained are questions that will require resolving in the course of the development of this work.

Note: With effect of the December 2005 version, the V.VBD Consensus list has been modified and renumbered to better track and manage the points. The points are no longer numbered in a single consecutive list, but have been gathered under topical sections.

The Consensus points used to develop the Original version of V.152 have been moved to a separate section and new points are indicated in a section that covers the maintenance of the Recommendation.

Contact: Keith Chu Tel: +1 714 508 8728
Fax:
Email: keith.chu@teridian.com

CONTENTS

V.152 MAINTENANCE CONSENSUS POINTS

The Consensus points and agreement in this section define the issues that have been raised post approval of the first version of V.152. Note to aid continuity the headings used are the same as for the original set. Closed or completed items are shown in strikeout font.

Deleted: grey

1 UPDATES TO V.152

1.1 ~~As a result of the reviews and discussion of Delayed 203 and 204, it was agreed to create a draft Corrigendum to V.152 (See Point 6.2) **Done** July/August 2005.~~

~~1.2 After consideration of Delayed 282 and 333(April 2006) it was agreed to create a second corrigendum to V.152 the address several issues (see Points 5.1, 5.2 and 7.1) below. **Done** Corrigendum published May 2006.~~

~~1.3 Agreed that Jun Zhang (Huawei) be the editor of the two annexes on Echo Canceller control and Data Signal Detection and Silence Suppression. **Done** February 2009~~

1.4 Agreed to support the request made in C-37 (2009) to investigate and undertake a review of the text of V.152 to address any text that may be considered ambiguous or requires additional clarification.

~~1.4.1 Agreed to send a Liaison to ETSI TISPAN asking them for their input on areas of V.152 that they think need clarifying. This is based upon their recent activity on V.152 interoperability.~~

1.4.2 TD-120 (GEN) is a response from ETSI TISPAN on the liaison sent to them (See clause Point 1.4.1 above. TISPAN WG3 have raised four points to our attention.

1.4.2.1 ETSI TISPAN request clarification on the statement in V.152 clause 1; *"A V.152 gateway only has the guarantee of inter-working with another gateway if that gateway also supports V.152". It was agreed to add a sentence following this text: "This does not preclude the interworking with non-V.152 gateways, however there are no guarantees of performance and supported functionality with such systems."*

1.4.2.2 ETSI TISPAN requested further clarification on the binding of the VBD handling actions and the VBD codec. Agreed to respond to ETSI TISPAN and indicate that this issue was not understood by the group. Q14/16 requests that ETSI TISPAN provide additional information and if possible proposed text they would like to see in V.152. See TD-70(WP1)

1.4.2.3 ETSI TISPAN noted the inconsistency of not requiring packet side detection of VBD stimuli in V.152 clause 9 and then the stated need in V.152 Clause 8 of being able to detect 2100Hz to control echo cancellers in the gateway. The group discussed this and the following solution is being considered.

[A gateway may provide IP side detection of VBD stimuli in order to control and manage VBD modes. If a gateway does not support such detection mechanism it shall at a minimum support the appropriate set of Network Telephony events as described RFC 4733 to allow a remote gateway to provide the necessary information to the peer gateway.]

Formatted: Indent: Before: 36 pt, No bullets or numbering, Tabs: Not at 39.7 pt

Deleted: f

This proposal contains a mandatory behaviour and will be subject ot review and consideration by the group before being included into the text of the Recommendation.

1.4.2.4 ETSI TISPAN requested the groups comments on a scenario of a call between a V152 compliant MG and a SIP Residential Gateway which supports the VBD media attribute (a=gpmd:vbd=yes) but not a dynamic payload type. The group agreed to request ETSI ~~T~~TISPAN for more information and will discuss this scenario further.

1.5 Agreed to use the proposed text and changes as described in sections 3.2.1, 4.2, 4.3, 4.5, 4.6, 5.4.1 and 7.2 in an Amendment to the Recommendation. The target is to complete this amendment at the October 2009 meeting of Study Group 16.

1.5.1 Due to the number and scope of the agreed changes to the Recommendation it was agreed that the group would merge all corrigenda and amendments and the subsequent agreed text changes and republish V.152 complete as a revised recommendation the target for this is July 2010.

3 IP TRANSPORT

3.1 Should the impact of RFC 2198 Redundancy on bandwidth management of channels be considered in a revision to V.152? This should be considered for both G.711 and compressed codec transitions to VBD. A call for papers on this topic will be made for the Dec 2005 meeting of TR30.1. (Sept 2005)

- Should such considerations be recorded as normative or informative material in V.152? (Sept 2005)

3.2 Agreed to implement the proposal made in C-101 (2009) (Alcatel-Lucent) to improve clarity by defining VBD mode in terms of some sub-modes relating to the applied IP transport service for VBD. V.152 describes all these elements, but it is distributed over the Recommendation text.

3.2.1 ~~Agreed to use the following text.~~

~~**6.3 IP transport services for VBD**~~

~~**6.3.1 Non-assured VBD mode**~~

~~The non-assured VBD transport service is defined by the mandatory capabilities of V.152, i.e. according clause 6.1,~~

~~• without RTP transport *redundancy* (according RFC 2198); and~~

~~• without *forward error correction* of RTP packets (according RFC 5109[1]).~~

~~The non-assured VBD mode should be sufficient in case of "good" IP network conditions. The non-assured VBD mode may be operated in two sub-modes with respect to the transfer of inband signals, see following sub-clauses.~~

~~**6.3.1.1 Non-assured transport of modem inband signals**~~

~~This is a non-assured VBD transport service~~

~~• without RTP payload format for *telephony events* (according RFC 4733[2]).~~

[1] Obsoletes RFC 2733.

Formatted: Tabs: Not at 39.7 pt
Formatted: Font: Not Italic, Complex Script Font: 12 pt
Deleted: S
Formatted: No bullets or numbering, Tabs: Not at 39.7 pt
Deleted: 1.5
Formatted: Outline numbered + Level: 2 + Numbering Style: 1, 2, 3, … + Start at: 2 + Alignment: Left + Aligned at: 0 pt + Tab after: 18 pt + Indent at: 18 pt
Formatted: Outline numbered + Level: 3 + Numbering Style: 1, 2, 3, … + Start at: 1 + Alignment: Left + Aligned at: 0 pt + Tab after: 36 pt + Indent at: 36 pt
Deleted: ¶
Formatted: Strikethrough
Formatted: Strikethrough
Formatted: Strikethrough
Formatted: Strikethrough
Formatted: Strikethrough
Formatted: Strikethrough

~~**6.3.1.2 Assured transport of modem inband signals**~~

~~RFC 4733 shall be used according clause 8 (i.e., the RFC 4733 NTE mode shall be used). Usage of RFC 4733 packets implies a negotiation process with the peer PSTN gateway (see also clause 2.4.1/RFC 4733).~~

~~**6.3.2 Assured VBD mode**~~

~~The assured VBD mode may be enabled in case of unreliable IP transport conditions. The assured VBD mode shall then use RFC 4733 for modem *inband signals*, and RFC 2198 or/and RFC 5109 for *modem data information*. Usage of RFC 2198 and RFC 5109 implies a negotiation process with the peer PSTN gateway:~~

- ~~RFC 2198 SDP elements for negotiation: see clause 5/RFC 2198;~~
- ~~RFC 5109 SDP elements for negotiation: RFC 4756.~~

3.2.2 If the text as proposed in item 3.2.1 is to be used. An update of the entire Recommendation with respect to its use and referencing of RFC 2833 and 2733 will be necessary.

4. MEDIA SWITCHING

~~4.1 It was agreed to add an Annexe/Appendix (TBD) that defines mechanisms and procedures to allow the re-enabling of echo cancellers based upon the detection of T.30 V.21 FLAGS as described in Contribution C-52 from the November 2006 meeting.~~ **~~(DONE)~~**

- ~~The goal is to have text ready for consent by January 2009.~~ **~~(DONE)~~**
- ~~The Annexe/Appendix shall consider and minimize impact of such a mechanisms on the performance of fax terminals.~~ **~~(DONE)~~**
- ~~Detection algorithms are implementation specific and shall not be specified by this text.~~ **~~(DONE)~~**
- ~~Methods to negotiate this capability needs to be defined.~~ **~~(DONE)~~**
- ~~The Annexe/Appendix will consider the control of both embedded and external echo cancellers.~~ **~~(DONE)~~**

~~4.1.1 Agreed to send a liaison to Study Group 11 asking them for their help in identifying or defining a method on how a controller can re-enable an echo canceller once it has been switched to its tone disabled state. In the meantime methods for the control of an external echo canceller may be left for future study. – This was not done, since SG11 transferred responsibility of this signalling to SG16. (CLOSED)~~

~~4.1.2 Text shall correctly define the re-enabled state. That is the procedure shall return it to the initial operating state with associated functionality. The disabled state is that where the echo canceller is in its tone disabled state.~~ **~~(DONE)~~**

~~4.1.3 First figure shall illustrate the interaction and control of the two echo cancellers that are normally situated in the example scenario.~~ **~~(DONE)~~**

[2] Obsoletes RFC 2833.

- ~~Q16/16 to be requested to assist in defining this Annexe/Appendix (where appropriate).~~

4.1.7 ~~In response to Contributions 179 and 190, it was agreed that should any determined interoperability issues or impact to network or network equipment be identified, they should be presented at the next meeting. In the absence of any such contributions the goal is to proceed with the consent of the proposed text for the control of echo cancellers in V.152 compliant media gateways.~~ **~~(DONE)~~**

Formatted: Strikethrough

4.1.8 ~~The baseline text for the annex on gateway echo control is provided in Appendix II of this document. Note by consensus it was agreed to supercede the text in Appendix II by that of TD22/WP1 (Jan 2009). It was also agreed to use this text and submit it for consent at the Jan 2009 meeting.~~ **~~(DONE)~~**

Formatted: Strikethrough

4.2 ~~Agreed to improve clarification of the text describing Procedures for transitioning between audio mode and VBD mode by adding section headers to partition the text. See Contribution 101 for details.~~ **~~(DONE)~~**

Formatted: Strikethrough

4.3 ~~Add the following proposed text to paragraph four in clause 10 of the Recommendation.~~

Formatted: Strikethrough

~~Detection of the stimuli described in clause 9 shall be carried out at least in the direction from the GSTN to the IP network; however, detection in the direction from the IP network to the GSTN network is not precluded. The bidirectional VBD stimuli detection capability of a VBD gateway improves the probability of correct and timely gateway local state transition, which offers a more robust VBD service and state transition.~~ **~~(DONE)~~**

4.4 ~~Agreed to add the following clarifying text as a new clause 10.3. This text was originally presented in Contribution 101.~~ **~~(DONE)~~**

Formatted: Strikethrough

Formatted: Strikethrough

~~10.3 Enforced state transitionproposed in by call/session control~~

~~The call/session control may enforce state transitioning based on detected VBD stimuli in the bearer path, which are reported to the call control, or the media capability negotiation during call establishment or modification, or other policies (like e.g. preferred media formats of a service provider). This capability is indicated by arrow "*MGC signalling or …*" in Figure 1.~~

4.4.1 Agreed to clarify (and provide explicit text) why this option is only possible for VBD-to-Audio transition, but not vice versa?

4.5 Contribution 101 requests that information be provided how V.152 state transistion may be done in V.IP2IP-VxF interworking functions (which may use enforced state transition on the T.38 side);

4.6 Agreed provide signalling examples (e.g. H.248 for MGC-controlled transition from VBD to Audio).

5 AUDIO AND VBD FUNCTIONALITY

5.1 ~~Delayed 333 (April 2006) request clarifying text to better explain the scope of the control echo canceller within V.152. This requires the modification of two clauses in V.152.~~ **~~(DONE)~~**

Formatted: Strikethrough

5.1.1 ~~Delete the following bullet found in clause 6:~~

Formatted: Strikethrough

~~"The use of echo cancellers on the VBD channel, as per ITU-T Rec. G.168."~~

5.1.2 ~~Modify clause 8 as follows:~~

Formatted: Strikethrough

~~The declaration of IETF RFC 2833 telephone-events ANS (32), /ANS (33), ANSam (34) and /ANSam (35) is optional. If these events are declared by a media gateway, the remote media gateway may use RFC 2833 to transmit these events. in place of VBD packet transmission. If both media gateways indicate support of the RFC 2833 telephone-events ANS (32), /ANS (33), ANSam (34) and /ANSam (35), then these events shall be used by the media gateways for a) the tone disabling (G.168) of the echo canceller function if provided and enabled in the media gateway control per ITU-T Rec. G.168 and b) for the generation of the appropriate signal on the TDM interface. If either end does not indicate this support, then the media gateways shall detect the 2100 Hz tone with phase reversals signal for echo canceller tone disabling on their incoming VBD packet stream.~~

Formatted: Strikethrough

~~When using IETF RFC 2833 telephone-events, the amount of in-band signal leakage into the IP Network for ANS, ANSam, /ANS, and /ANSam signals shall be less than 50 ms.~~

~~**(DONE)**~~

5.2 ~~On reviewing clause 8 other issues were discovered that require further editorial clarification. It was agreed in principle to use the following alternative text for a change to clause 8.~~

Formatted: Strikethrough

~~IETF RFC 2833 telephone-events ANS (32), /ANS (33), ANSam (34) and /ANSam (35) can optionally be used as an alternative method for the transport of these signals in Audio or VBD packets. . If both media gateways indicate the support of RFC 2833 telephone-events ANS (32), /ANS (33), ANSam (34) and /ANSam (35), the gateway generating the events shall suppress the transport of these signals in AUDIO or VBD packets, the amount of in-band signal leakage into the IP Network for ANS, ANSam, /ANS, and /ANSam signals shall be less than 50 ms.~~

~~RFC 2833 telephone-events ANS (32), /ANS (33), ANSam (34) and /ANSam (35) shall be used by the media gateways for the tone disabling (G.168) of the echo canceller function if provided and enabled in the media gateway and for the generation of the appropriate signal on the TDM interface. If either end does not indicate this support, then the media gateways shall detect the 2100 Hz tone with phase reversals signal for echo canceller tone disabling on their incoming VBD packet stream.~~

~~**(DONE)**~~

~~5.3 Should a Data Signal Detector and silence suppression method be added to V.152? (YES)~~

~~5.3.1 If so how?~~

~~Contribution C-51 from the November meeting provided further proposals on this question. It was agreed to support a Data Signal Detection (DSD) and silence suppression as optional mechanisms in an Annexe in V.152. **(DONE)**~~

Formatted: Strikethrough

~~The following consensus points were also agreed:~~

~~5.3.1 The DSD algorithm will not be defined by the Recommendation, but shall be left to the implementer.~~

~~5.3.2 The Annexe will provide basic performance requirements to ensure proper operation of the mechanism. For example thresholds, response and guard times will be defined.~~

5.3.2.1 Agreed that the data to silence detection shall be 85ms +/- 5ms to ensure inappropriate switching to silence during modem training and inter- signal periods which are either 70ms +/- 5ms or 75ms +/- 5ms.

5.3.2.2 What is the maximum response time for detecting a data signal and enabling transmission of the signal? After review group agreed to define a maximum response time of 1.5ms. This was chosen to avoid impact on detecting and transmission of V.34 HDX signal PPh which would follow a period of silence.

5.3.3 A definition of "silence" as to be interpreted by this Recommendation needs to be stated. Agreed that this be a signal with energy below -55dBm.

5.3.4 Does silence need to be faithfully re-created and played out at the receiver (similar to comfort noise as used in speech codecs)? Agreed not to require or specify the need for CNG.

5.3.5 Clarification is required on the interpretation of the proposed SDP gpmd attribute "dsd=no". Added text in TD21/WP1 proposal.

5.3.6 Agreed to use the proposed text in C-51 as baseline text for the new Annexe.

5.3.7 Baseline text for the proposed new Annex is in Appendix 1 of this document. (Note by consent this text has been superceded by the revised text from the editor in TD-021/WP1 (Jan 2009). It was also agreed to submit this revised text for consent and Jan 2009 meeting. **(DONE)**

5.4 Agreed to the request in Contribution 101 (2009) to add clarification to the text on the relationship between Echo Cancellers and VBD. **(DONE)**

5.4.1 The following new text was agreed:

6.2 Echo canceller and VBD mode

Formatted: Strikethrough

Echo cancellation and VBD mode are independent functions in a VBD gateway. The requirement for echo cancellation is not a VBD characteristic, but depends on the propagation delay in combination with a source of echo present in the connection and refers primarily to voice. A V.152 compliant implementation does not need to provide echo cancellation.

If an echo canceller (EC) is used on the VBD channel, then the EC shall be complaint to ITU-T Rec. G.168. The gateway autonomous control of the EC shall be thus orthogonal to the V.152 Audio-VBD state transitioning.

While G.168 implies the detection of inband events in both traffic directions, i.e. from circuit-switched and IP network side in case of a VBD gateway, it should be noted that this may introduce some level of complexity. This Recommendation does not mandate this behaviour but leaves the support of this particular requirement to the implementer.

6 CALL CONTROL FUNCTIONALITY

6.1 Parameters defined in V.152 ("vbd", "maxmptime" and "pmft") need to be registered with IANA. (June 2004)

6.2 As a result of the reviews and discussion of Delayed 203 and 204, it was agreed to create a draft Corrigendum to V.152 that provides clarification on the use of the gpmd parameter "vbd" and concerning the usage of reserve properties in cases without unambiguous resource specification. This Corrigendum was consented (August 2005).

Formatted: Strikethrough

6.3 Contribution 321 from November 2009 meeting proposes an update to V.152 based upon the most recent IETF RFC's, specifically the revised SDP Offer/Answer methods. Although not yet available as approved documents they are considered to be very stable. The group agreed to incorporate the proposed changes and it is anticipated that the RFCs described in C321 will be published before the next meeting of SG16 in 2010. This requirement was also requested by ETSI TISPAN WG3 in their Liaison Statement to Q14/16 (TD-198(GEN)).

Formatted: Indent: Before: 0 pt, First line: 0 pt

6.3 Contribution 322 proposes a mechanism to allow mid call control to V.152. This mechanism appears to be desirable and to improve flexibility for VBD management and was agreed by the group. This requirement was also requested by ETSI TISPAN WG3 in their Liaison Statement to Q14/16 (TD-198(GEN)).

Formatted: Indent: Before: 0 pt, Hanging: 36 pt, Space After: 6 pt, Tabs: 36 pt, Left

7 EDITORIAL CORRECTIONS TO V.152

7.1 ~~Delayed 282 (April 2006) indicates that Clause 10 of the Recommendation contains contradictory text. It was agreed to provide correction for this clause.:~~

Formatted: Strikethrough

~~**10 Procedures for transitioning between audio mode and VBD mode**~~

~~This clause describes the transitioning mechanism for an implementation that only supports VBD as per this Recommendation and Voice, but does not support any relay mechanisms such as RFC 2833, T.38 or V.150.1, nor VBD as per V.150.1.~~

Formatted: Strikethrough

7.2 ~~Agreed to the proposal in Contribution 101 to improve clarity of section 7 of the Recommendation by adding sub-headings to provide contextual separation in the existing text. See C-101 for details of these headings. They are not included in this document due to the large amount of text that is involved in displaying the new section headers. (DONE)~~

Formatted: Strikethrough

Appendix I

This appendix has the latest text for the proposed new Annex on support of DSD for V.152. It is based upon the edited version of C-282. – Deleted, suerceded by Text in TD22/WP1 January 2009

Start text

~~Annex [Y]~~

~~Use of data signal detection and silence insertion in Voice Band Data~~

~~[Y].1 Introduction~~

~~The use of a Data Signal Detector (DSD) and silence insertion in VBD mode is a method that reduce the transmission bandwidth over IP networks during the silence periods of a voice band data modem connection. This is especially efficient during half-duplex data transmissions. This Annex provides guidance on how to use DSD and silence insertion for gateways compliant to this Recommendation.~~

~~[Y].2 Guideline for use of DSD~~

~~When in the VBD state a Data Signal Detector (DSD) monitors and analyzes the input signals. The Data Signal Detector catergorizes the analyzed signal to be either a correct voice band modem signal or silence. The means of determining this signal catergorization is implementation specific and this Recommendation does not describe any particular method in detail. However, one example of detection is once in the VBD state, a gateway may monitor signal energy level and use that fro determining thepresence of silence. In this instance Eecho levels must be accounted for in the analysis process. Most modem procedures include short silence between different training and data mode phases. These vary from 70 ± 5 ms for ITU-T Rec. T.30, to 75 ± 5 ms for high speed duplex data modems. In these instances it is important to maintain the fidelity of these short silence period. A DSD detector shall use a silence validation time of greater than 80ms. The~~

~~Upon the qualified detection of silence the gateway transmits a Silence Insertion Description (SID) frame to inform the peer gatewy of the beginning of the silence period. G.711 Appendix II SID frame format or similar for the mutually negotiated VBD codec should be used. In the SID frame, the level field is set to zero and the N1~Nm field set to zero. Only an initial SID frame, needs to be transmitted.~~

~~The receiving gateway upon eceiveing a SID frame or packet shall play out silence or comfort noise per its configured mode of operation.~~

~~[Y].3 Negotiation of the DSD capability~~

~~Gateways shall mutually negotiate the capability of DSD. Clause 7.1/V.152 explains the detailed procedure for negotiation using SDP. The DSD negotiation shall comply with the procedures described in clause 7.1, and uses two a-line attriburtes to indicate support of DSD capability.~~

~~If VBD MGW supports DSD capability, the SDP attribute should indicate:~~

```
m=audio 3456 RTP/AVP 0 18 98 99
a=rtpmap:98 PCMA/8000
a=gpmd:98 vbd=yes
```

Formatted: Strikethrough

Formatted: Strikethrough

Formatted: Strikethrough

Comment [K...1]: Is it possible that played out comfort noise would upset a connected modem?

Formatted: Strikethrough

Comment [K...2]: Check on use of H.323??

```
a=rtpmap:99 CN/8000
a=gpmd:99 dsd=yes
```

"a=gpmd:99 dsd=yes" indicates that the device supports the DSD capability; "a=rtpmap:99 CN/8000" shows that the device sends SID frame with payload type 99.

IF mutually negotiated both gateways can use the DSD procedures described in this Annex. To maintain compatibility with gateways using a prior version of V.152 which would not support DSD capability. The absence of the gpmd attribute for DSD is interpreted to be the same as "dsd=no"

```
m=audio 3456 RTP/AVP 0 18 98 99
a=rtpmap:98 PCMA/8000
a=gpmd:98 vbd=yes
a=rtpmap:99 CN/8000
a=gpmd:99 dsd=no
```

"a=gpmd:99 dsd=no" indicates that the device does not support or does not want to use DSD capability.

End text

References

[1] ITU-T Rec. T.30 (2005/09), Procedure for document facsimile transmission in the general switched telephone network.

[2] ITU-T Rec. G.711 Appendix II (2000/02), A comfort noise payload definition for ITU-T G711 use in packet-based multimedia communication systems

Formatted: Strikethrough

Appendix II

~~Base line text for Annex on echo control. – Deleted, suerceded by Text in TD22/WP1 January 2009~~

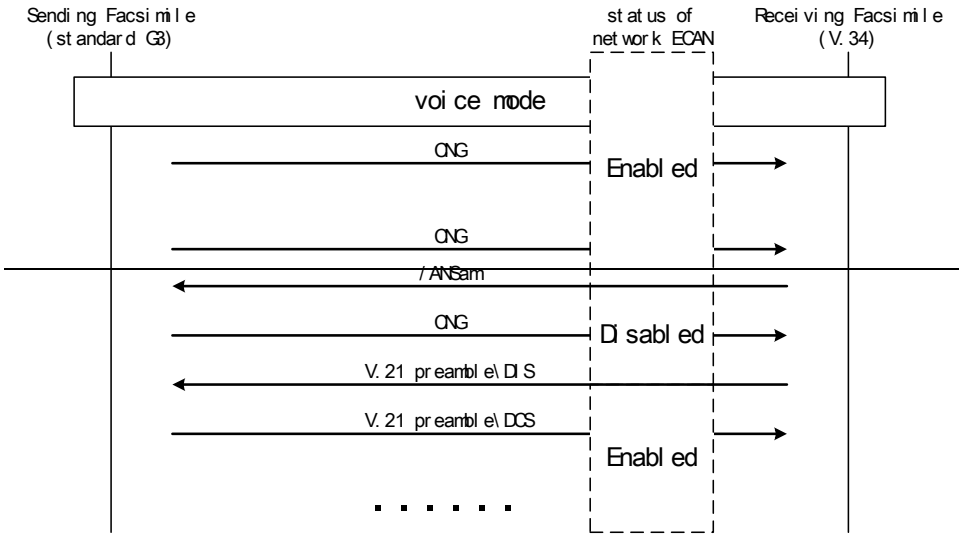
Formatted: Strikethrough

~~***Start text***~~

~~Annex [X]~~

~~Use of V.21 preamble for echo canceller control in a V.152 Gateway~~

~~For the scenario where a V.34 facsimile terminal is being called by a standard G3 facsimile terminal the procedures defined in ITU-T Recommendation T.30 stipulate that the connection proceed in standard G3 facsimile. In some instances the V.34 facsimile terminal will transmit a V.8 answer tone with phase reversals, thereby tone disabling any gateway echo cancellers in the connection. ITU-T Recommendations G.168 and G.161 require that echo cancellers be in their initial cancelling state in order to provide the best conditions for a facsimile transmission. However, with facsimile terminal compliant to pre 2006 version of T.30, Gateway echo cancellers will remain in their tone disabled state and the probability of connection failure increases.A method that may be used to rectify this undesirable condition in gateways compliant to this Recommendation is to use the detected presence of the V.21High Channel HDLC encoded FLAG preamble as defined in ITU-T Recommendation T.30 to initiate a transition from the tone disabled state back to the initial cancelling state. Once the echo canceller has returned to its initial state the standard G3 facsimile procedure can continue as normal (See figure X.1)~~



~~Figure [X].1 – Fax procedure and echo canceller status after enabling by V.21 preamble~~

~~Note: this figure has to be redrawn to include echo cancellers at both sides of the connection. Also in the figure the word 'disabled' has to be replaced with Tone Disabled State and 'enabled' is replaced with Initial cancelling state.~~

~~**Gateway to Echo Canceller signalling**~~

~~This procedure is only valid for media gateways compliant to this Recommendation. Note that in this application echo cancellers may be embedded within the media gateway or be external to it. The signalling of the gateway to the echo canceller can be via proprietary means if it is an embedded type in the gateway or by some standardized means if connected to an external echo canceller. The means definition of external echo canceller control is for further study.~~

End text