TSG-RAN Working Group 1 meeting #11
San Diego, CA, USA
February 29 – March 3, 2000

TSGR1#11(00)0243

Agenda item:

Source: Ericsson

Title: CR 25.212-049: Editorial changes to Annex A

Document for: Decision

This CR introduces some editorial updates to Annex in TS 25.212 V3.1.0. The main reason for the updates is that at least some printers (in particular those at Ericsson) for some reason cannot print figure A-1.

3GPP TSG RAN WG1 Meeting #11
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Document ???99???
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.212	**CR**	**049**	Current Version:	3.1.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	TSG-RAN #7	for approval	X	strategic	(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic	

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc

Proposed change affects: (U)SIM [ ] ME [X] UTRAN / Radio [X] Core Network [ ]
(at least one should be marked with an X)

Source: Ericsson **Date:** 2000-02-22

Subject: Editorial changes to Annex A

Work item:

Category:
(only one category shall be marked with an X)

F	Correction		**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification	X		Release 99	X
				Release 00	

Reason for change:
- Figure A.1 does not print on all printers
- General editorial cleanup

Clauses affected: Annex A

Other specs affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:

Annex A (informative): Blind transport format detection

A.1 Blind transport format detection using fixed positions

A.1.1 Blind transport format detection using received power ratio

This method is used Ffor the dual transport format case (the possible data rates, are 0 and full rate, and only transmitting CRC is only transmitted for full rate), blind transport format detection using received power ratio can be used.

The transport formatrate detection is then done using average received power ratio of DPDCH to DPCCH. Define the following:

- *Pc:* Received pPower per bit of DPCCH calculated from all pilot and TPC bits per slot over a radio10ms frame.
- *Pd:* Received pPower per bit of DPDCH calculated from *X* bits per slot over a radio10ms frame.
- *X:* the number of DPDCH bits per slot when transport format corresponds to full rate.
- *T:* Threshold of average received power ratio of DPDCH to DPCCH for transport formatrate detection.

The decision rule can then be formulated as

If *Pd/Pc* >*T* then

Full rate transport format detected"TX_ON"

else

Zero rate transport format detected."TX_OFF"

A.1.2 Blind transport format detection using CRC

- This method is used fFor the multiple transport format case (the possible data rates are: 0, …, (full rate)/r, …, full rate, and always transmitting CRC is transmitted for all transport formats), blind transport format detection using CRC can be used. When this method is used, no one transport format should have the same number of bits as any other transport format does within a TrCH.

- At the transmitter, the data stream with variable number of bits from higher layers is block-encoded using a cyclic redundancy check (CRC) and then convolutionally encoded. -CRC parity bits are attached just after the data stream with variable number of bits as shown in figure A-1.

- The receiver knows only the possible transport formats (or the possible end bit position $\{n_{end}\}$) by Layer-3 negotiation (see figure A-1). -The receiver performs Viterbi-decoding -on the soft decision sample sequence. -The correct trellis path of the Viterbi-decoder -ends at the zero state at the correct end bit position.

- The Bblind transport formatrate detection method by using CRC traces back the surviving trellis path ending at the zero state (hypothetical trellis path) at each possible end bit position to recover the data sequence. -For Eeach recovered data sequence is then error-detection is performed by checking theed by CRC, and if there is no error, the recovered sequence is declared to be correct.

- The following variable is defined:

$$s(n_{end}) = -10\log\left((a_0(n_{end}) - a_{min}(n_{end})) / (a_{max}(n_{end}) - a_{min}(n_{end})) \right) \text{ [dB]} \quad \text{(Eq. 1)}$$

- where $a_{max}(n_{end})$ and $a_{min}(n_{end})$ are, respectively, the maximum and minimum path-metric values among all survivors at end bit position n_{end}, and $a_0(n_{end})$ is the path-metric value at zero state.

In order to reduce the probability of false detection (this happens if the selected path is wrong but the CRC misses the error detection), a path selection threshold D is introduced. The threshold D determines whether the hypothetical trellis path connected to the zero state should be traced back or not at each end bit position n_{end}. If the hypothetical trellis path connected to the zero state that satisfies

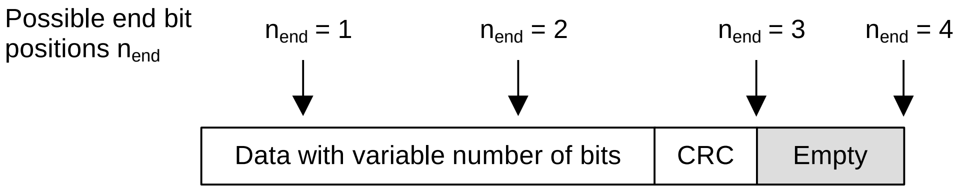
$s(n_{end}) \leq$ ~~=<~~ D (Eq. 2)

is found, the path is traced back to recover the frame data, where D is the path selection threshold and a design parameter.

If more than one end bit positions satisfying Eq. 2 is~~are~~ found, the end bit position which has minimum value of $s(n_{end})$ is declared to be correct.

If no path satisfying Eq. 2 is found even after all possible end bit positions have been exhausted, the received frame data is declared to be in error.

Figure A-2 shows the procedure of blind transport format detection using CRC.



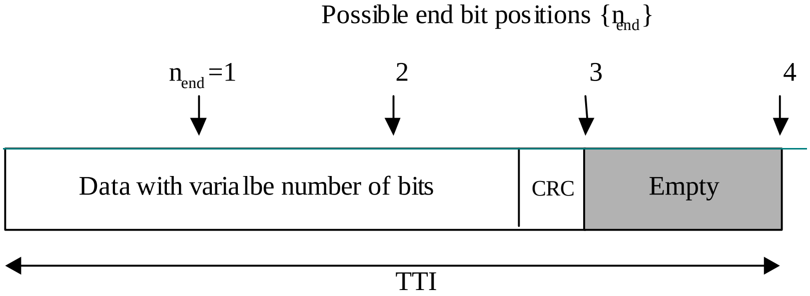


Figure A-1: An example of ~~the~~ data ~~format~~ with variable number of bits. Four possible transport formats, and transmitted end bit position n_{end} = 3.

~~(Number of possible transport formats = 4, transmitted end bit position n_{end} = 3)~~

A.2 Blind transport format detection with flexible positions

In certain cases where the CCT~~t~~rCH consists of multiple transport channels and a small number of transport format combinations are allowed, it is possible to allow blind transport format detection with flexible positions.

Several examples for how the blind transport format detection with flexible positions might be performed are:

- The blind transport format detection starts at a fixed position and identifies the transport format of the first present transport channel and stops. The position of the other transport channels and their transport format being derived on the basis of the allowed transport format combinations, assuming that there is a one to one relationship between the transport format combination and the transport format of the first present transport channel.
- The blind rate detection evaluates all transport format combinations and picks the most reliable one.

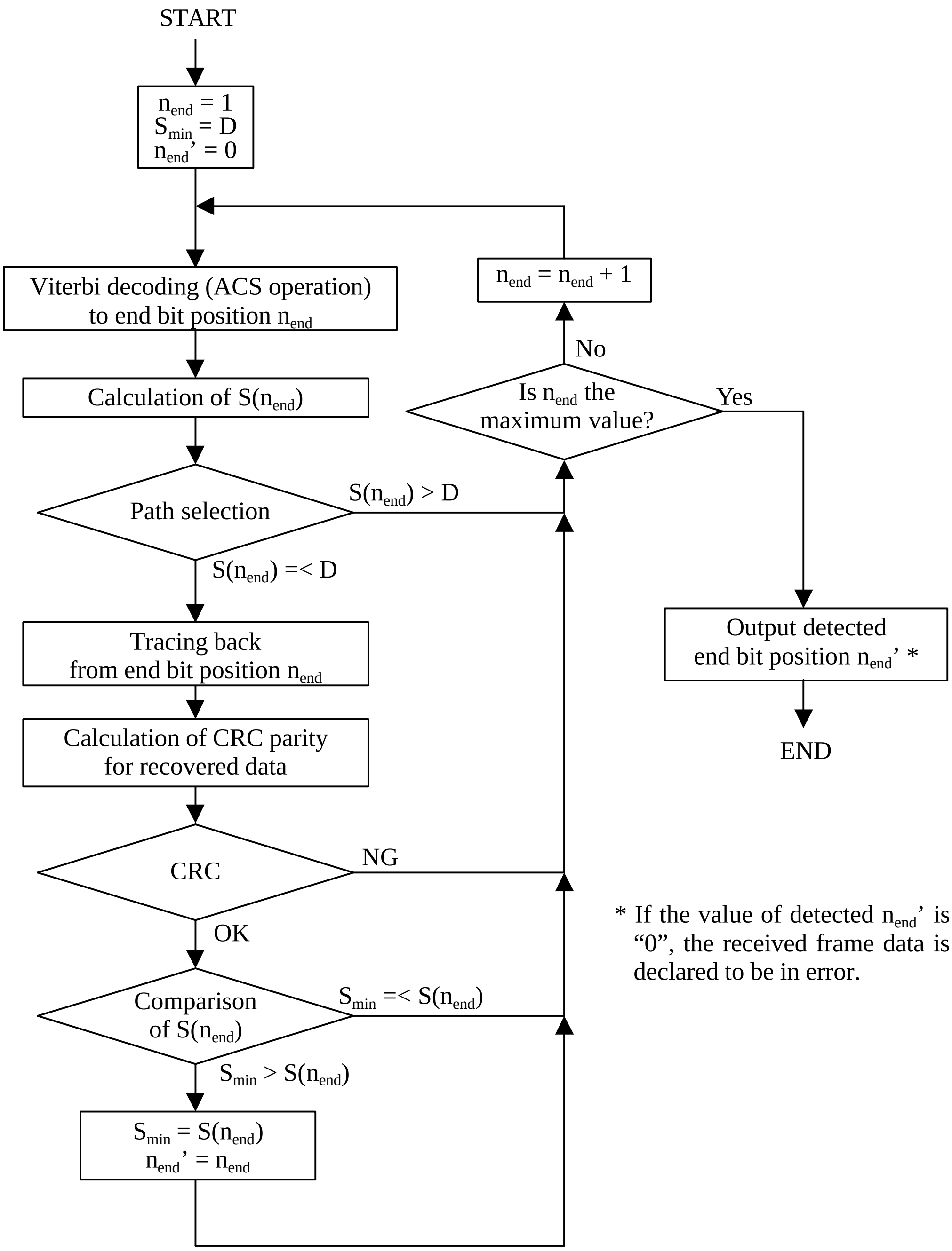


Figure A-2: Basic processing flow of blind transport format detection.