INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

G.707/Y.1322

Corrigendum 1
(06/2004)

SERIES G: TRANSMISSION SYSTEMS AND MEDIA, DIGITAL SYSTEMS AND NETWORKS

Digital terminal equipments – General

SERIES Y: GLOBAL INFORMATION INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS AND NEXT GENERATION NETWORKS

Internet protocol aspects – Transport

Network node interface for the synchronous digital hierarchy (SDH)

Corrigendum 1

ITU-T Recommendation G.707/Y.1322 (2003) – Corrigendum 1

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ITU-T Recommendation G.707/Y.1322

Network node interface for the synchronous digital hierarchy (SDH)

Corrigendum 1

Summary

This corrigendum contains editorial and technical corrections, to the 12/2003 revision of ITU-T Rec. G.707/Y.1322[1].

Source

Corrigendum 1 to ITU-T Recommendation G.707/Y.1322 (2003) was approved on 13 June 2004 by ITU-T Study Group 15 (2001-2004) under the ITU-T Recommendation A.8 procedure.

1 TSB NOTE – Changes to Appendices VII and VIII shown in this corrigendum are for agreement only and are not submitted to comments for the AAP process.

FOREWORD

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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.

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

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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.

CONTENTS

ITU-T Recommendation G.707/Y.1322

Network node interface for the synchronous digital hierarchy (SDH)

Corrigendum 1

1) Correcting the numbering of AU-3s formulas

7.3.1.2 Numbering of AU-3s (VC-3s) in a STM-256

Replace: Xth column = 1 + 192 × [E–1] + 48 × [D–1] + 12 × [C–1] + 3 × [B–1] + [A–1] + 768 × [X–1]

With: Xth column = 1 + 64 × [E–1] + 16 × [D–1] + 4 × [C–1] + [B–1] + 256 × [A–1] + 768 × [X–1]

7.3.2.2 Numbering of AU-3s (VC-3s) in an STM-64

Replace: Xth column = 1 + 48 × [D–1] + 12 × [C–1] + 3 × [B–1] + [A–1] + 192 × [X–1]

With: Xth column = 1 + 16 × [D–1] + 4 × [C–1] + [B–1] + 64 × [A–1] + 192 × [X–1]

7.3.3.2 Numbering of AU-3s (VC-3s) in an STM-16

Replace: Xth column = 1 + 12 × [C–1] + 3 × [B–1] + [A–1] + 48 × [X–1]

With: Xth column = 1 + 4 × [C–1] + [B–1] + 16 × [A–1] + 48 × [X–1]

7.3.3.3 Numbering of AU-4-4cs (VC-4-4cs) in an STM-16

Replace: Therefore, AU-4-4c (1,1,0,0) resides in columns 1…4, 17…20, …, 4305…4308 of the STM-16, and AU-4-4c (4,4,0,0) resides in columns 13…16, 29…32, …, 4317…4320 of the STM-16.

With: Therefore, AU-4-4c (1,0,0) resides in columns 1…4, 17…20, …, 4305…4308 of the STM-16, and AU-4-4c (4,0,0) resides in columns 13…16, 29…32, …, 4317…4320 of the STM-16.

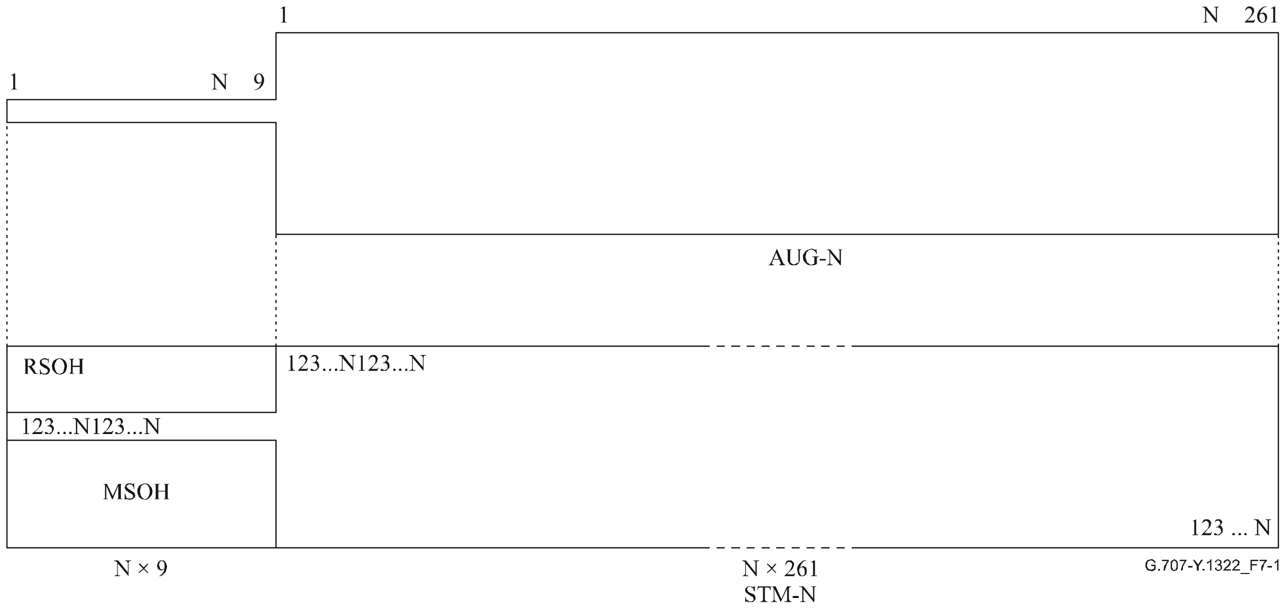
7.3.4.2 Numbering of AU-3s (VC-3s) in an STM-4

Replace: Xth column = 1 + 3 × [B–1] + [A–1] + 12 × [X–1]

With: Xth column = 1 + [B–1] + 4 × [A–1] + 12 × [X–1]

2) Improving Figures 7-1/G.707/Y.1322 and 7-2/G.707/Y.1322

Replace Figure 7-1/G.707/Y.1322



With:

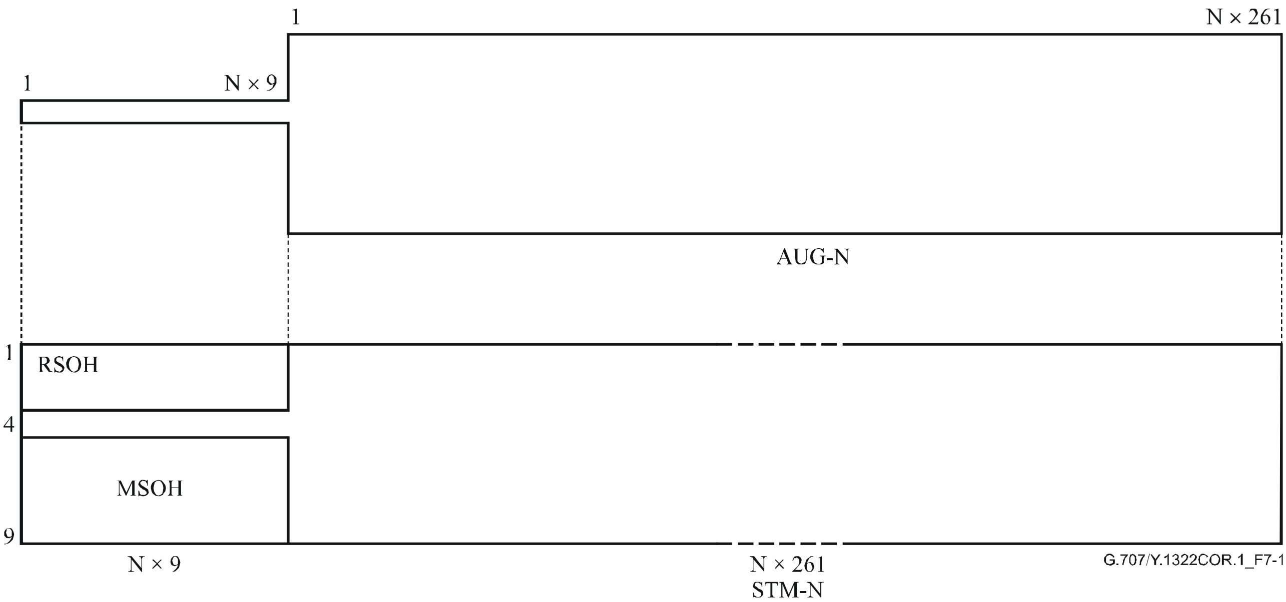
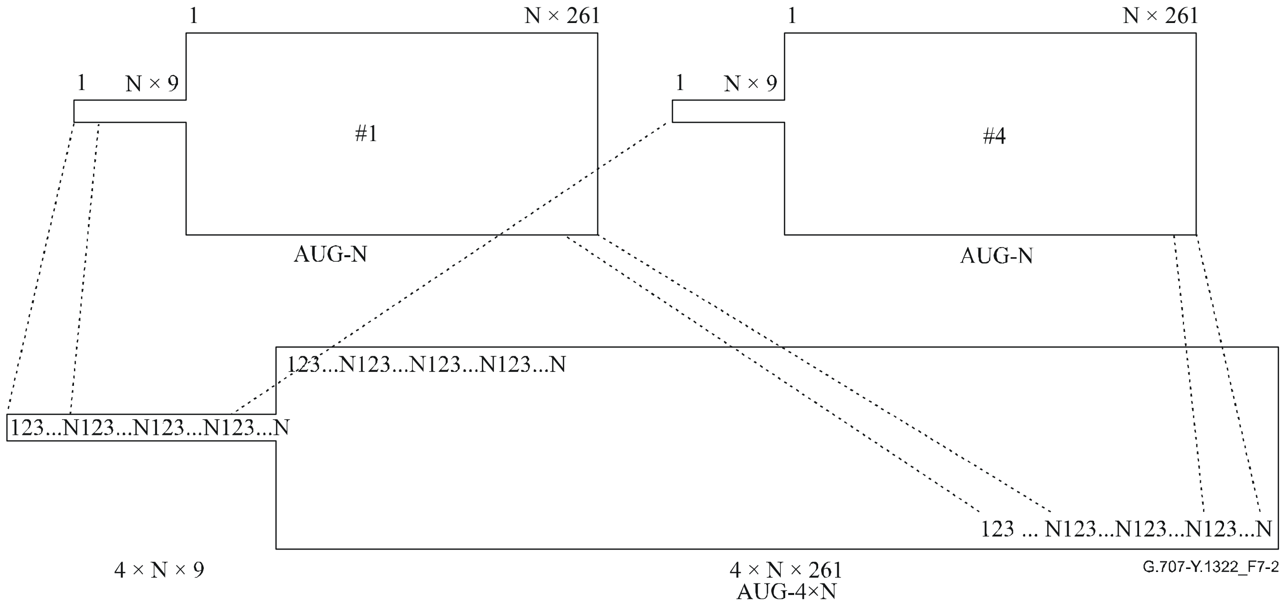


Figure 7-1/G.707/Y.1322 – Multiplexing of AUG-N into STM-N

Replace Figure 7-2/G.707/Y.1322



With:

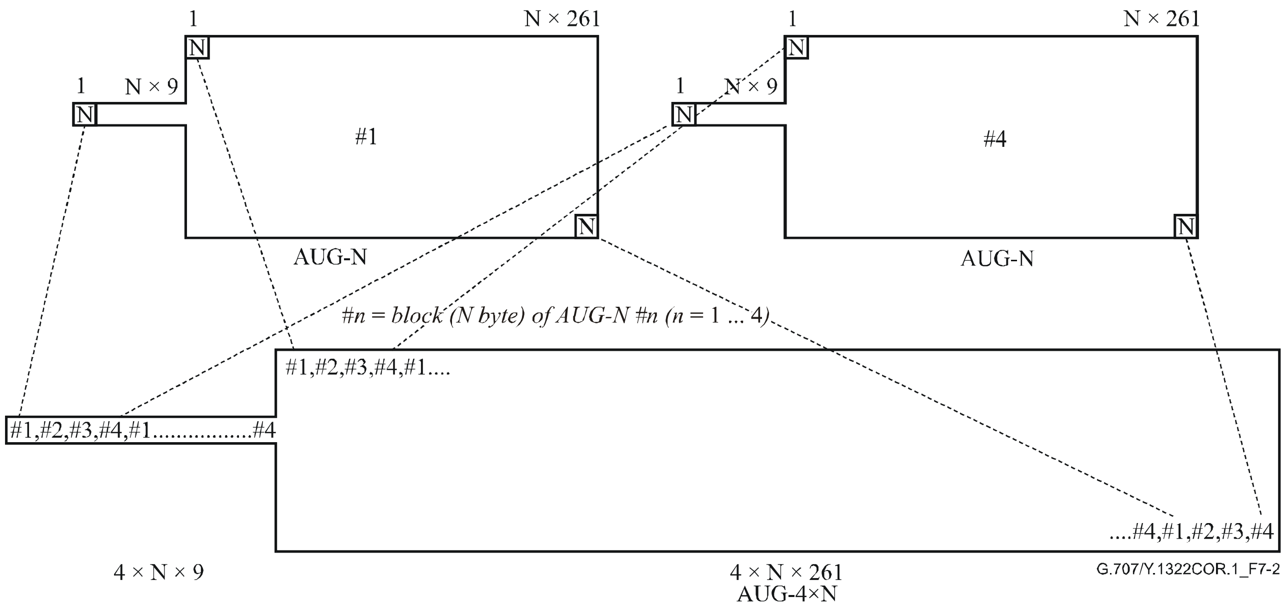


Figure 7-2/G.707/Y.1322 – Multiplexing of 4 AUG-Ns into AUG-4×N

3) Corrections to clause 3: Terms and definitions

Remove clause 3.9

~~**3.9 concatenation**: A procedure whereby a multiplicity of Virtual Containers is associated one with another with the result that their combined capacity can be used as a single container across which bit sequence integrity is maintained.~~

Replace clause 3.14

3.14 concatenation: The process of summing the bandwidth of a number of smaller containers into a larger bandwidth container. Two versions exist:

– Contiguous concatenation;

– Virtual concatenation.

With:

3.14 concatenation: The process of summing the bandwidth of a number of smaller containers into a larger bandwidth container. Two versions exist:

– Contiguous concatenation: maintains the contiguous bandwidth throughout the whole transport. Contiguous concatenation requires concatenation functionality at each network element.

– Virtual concatenation: breaks the contiguous bandwidth into individual VCs, transports the individual VCs and recombines these VCs to a contiguous bandwidth at the end point of the transmission. Virtual concatenation requires concatenation functionality only at the path termination equipment.

Remove from clause 3.4

~~One or more Administrative Units occupying fixed, defined positions in an STM payload are termed an Administrative Unit Group (AUG).~~

~~An AUG-1 consists of a homogeneous assembly of AU-3s or an AU-4.~~

Insert a new clause 3.9

3.9 administrative unit group (AUG): One or more Administrative Units occupying fixed, defined positions in an STM payload are termed an Administrative Unit Group (AUG).

An AUG-1 consists of a homogeneous assembly of AU-3s or an AU-4.

Remove from clause 3.5

~~One or more Tributary Units, occupying fixed, defined positions in a higher order VC-n payload is termed a Tributary Unit Group (TUG). TUGs are defined in such a way that mixed capacity payloads made up of different size Tributary Units can be constructed to increase flexibility of the transport network.~~

~~A TUG-2 consists of a homogeneous assembly of identical TU-1s or a TU-2.~~

~~A TUG-3 consists of a homogeneous assembly of TUG-2s or a TU-3.~~

Insert a new clause 3.18

3.18 tributary unit group (TUG): One or more Tributary Units, occupying fixed, defined positions in a higher order VC-n payload is termed a Tributary Unit Group (TUG). TUGs are defined in such a way that mixed capacity payloads made up of different size Tributary Units can be constructed to increase flexibility of the transport network.

A TUG-2 consists of a homogeneous assembly of identical TU-1s or a TU-2.

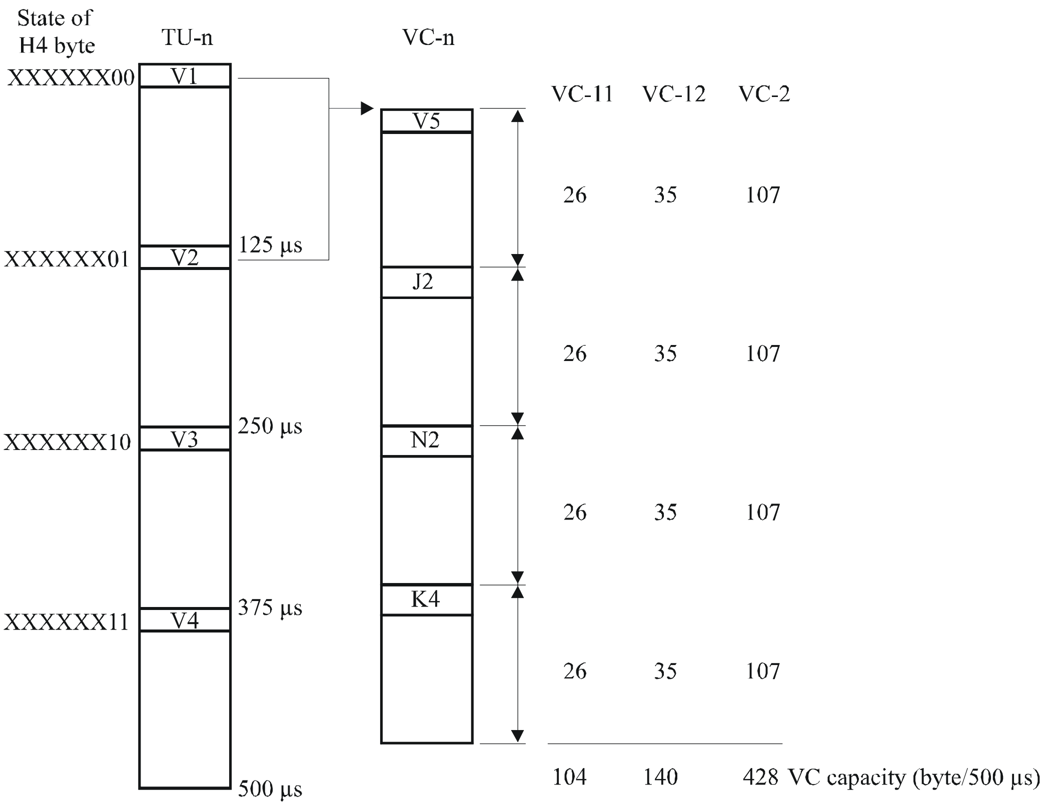
A TUG-3 consists of a homogeneous assembly of TUG-2s or a TU-3.

4) Correction to Figure 8-9/G.707/Y.1322

The VC capacity should be 500 µs instead of the shown 500 ms.

Replace Figure 8-9/G.707/Y.1322

With:



TU Tributary Unit
VC Virtual Container
V1 TU Pointer 1
V2 TU Pointer 2
V3 TU Pointer 3 (action)
V4 Reserved

NOTE – V1, V2, V3 and V4 bytes are part of the TU-n and are terminated at the pointer processor.

Figure 8-9/G.707/Y.1322 – Virtual container mapping in multiframed tributary unit

5) Correction to Figure 11-4/G.707/Y.1322

The maximum value of the MFI-2 should be 255 instead of the shown 256.

Replace Figure 11-4/G.707/Y.1322

With:

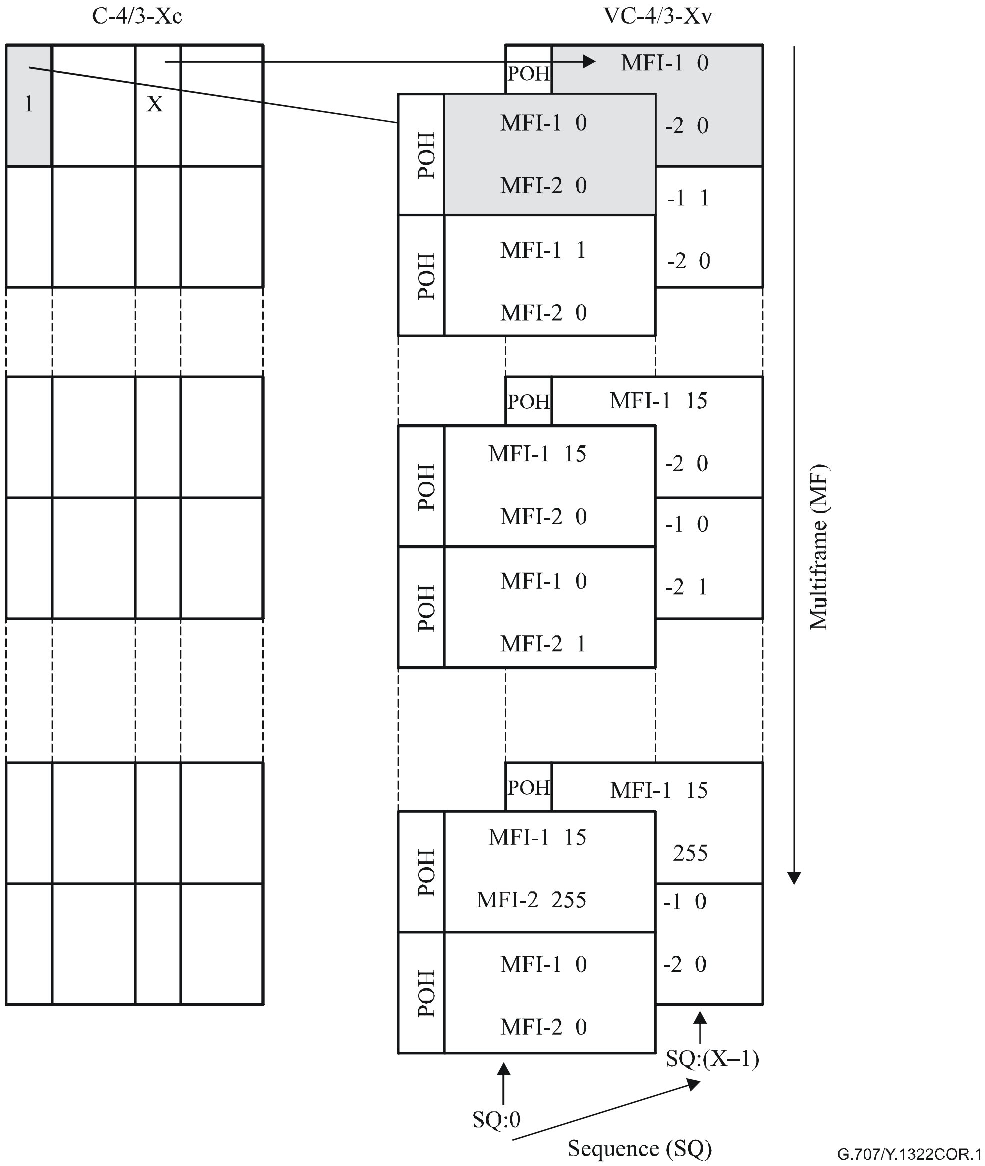


Figure 11-4/G.707/Y.1322 – VC-3/4-Xv multiframe and sequence indicator

6) Correction to maximum value of SQ for VC-12 VCG

Replace in Table 11-4/G.707/Y.1322 – Capacity of Virtually Concatenated VC-1n-Xv

NOTE – Limited to 64 due to: a) six bits for Sequence indicator in K4 bit 2 frame: and b) inefficient and unlikely to map more than 63 VC-11s in VC-4.

With:

> NOTE – Limited to 64 due to:
> a) six bits for Sequence indicator in K4 bit 2 frame; and
> b) inefficient and unlikely to map more than 64 VC-11s in VC-4.

Replace in Table 11-5/G.707/Y.1322

Frame number	**Member number**							
7, 15, 23, 31	56	57	58	59	60	61	62	NA
NOTE – There are eight member statuses reported per VC-m-Xv frame. The 63 members require eight frames at a frame rate of 16 ms each. This thus results in the member status being refreshed every 128 ms if there is only one return channel.								

With:

Frame number	**Member number**							
7, 15, 23, 31	56	57	58	59	60	61	62	63
NOTE – There are eight member statuses reported per VC-m-Xv frame. The 64 members require eight frames at a frame rate of 16 ms each. This thus results in the member status being refreshed every 128 ms if there is only one return channel.								

7) Correcting the use references to first order containers, VCs and TUs

3 Terms and definitions

3.3 virtual container-n (VC-n):

– *Lower order Virtual Container-n: VC-n (n = ~~1~~11, 12, 2, 3).*

This element comprises a single Container-n (n = ~~1~~11, 12, 2, 3) plus the lower order Virtual Container POH appropriate to that level.

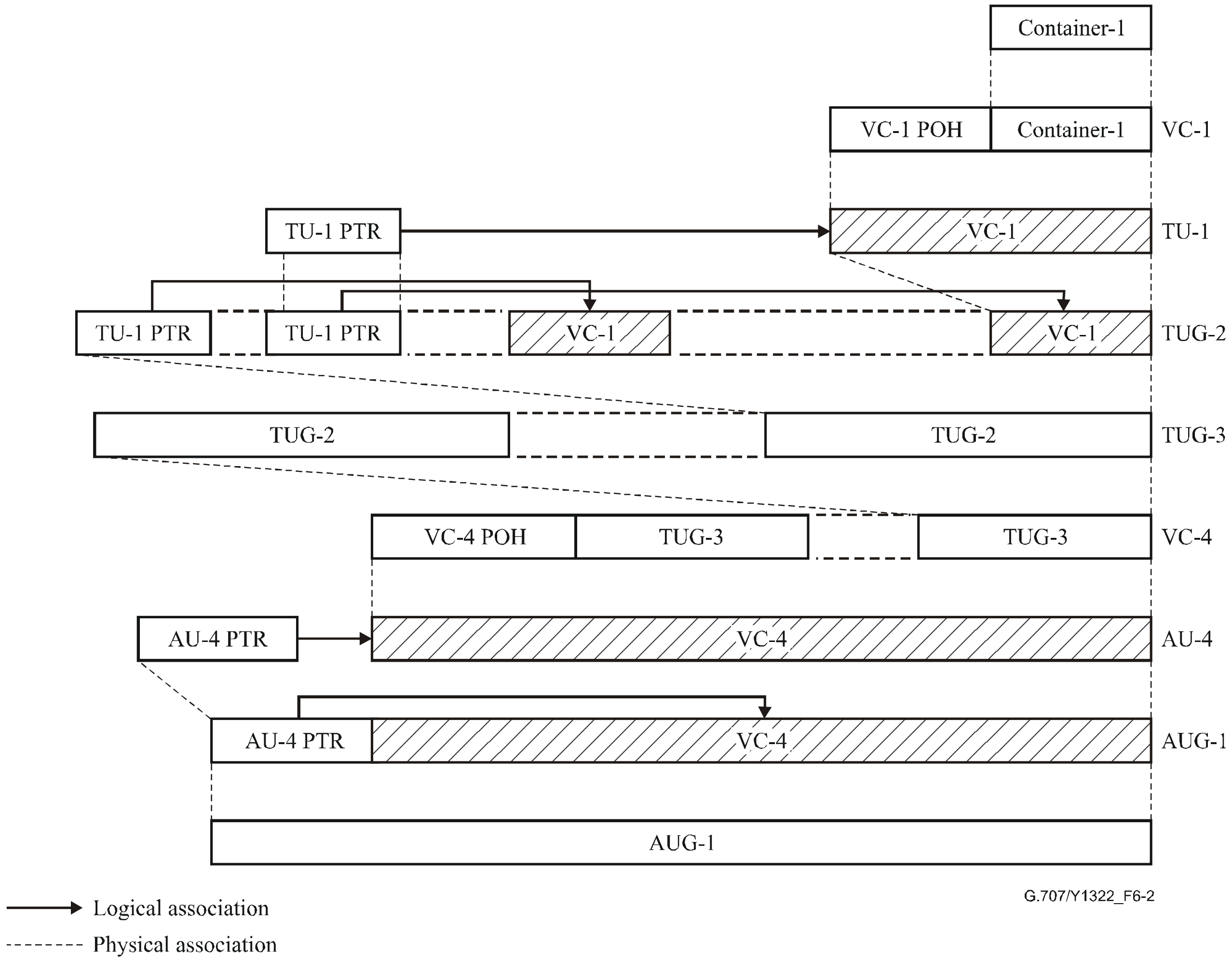
3.5 tributary unit-n (TU-n):

A TUG-2 consists of a homogeneous assembly of identical TU-11s, TU-12s or a TU-2.

3.6 container-n (n = ~~1–~~11, 12, 2, 3, 4):

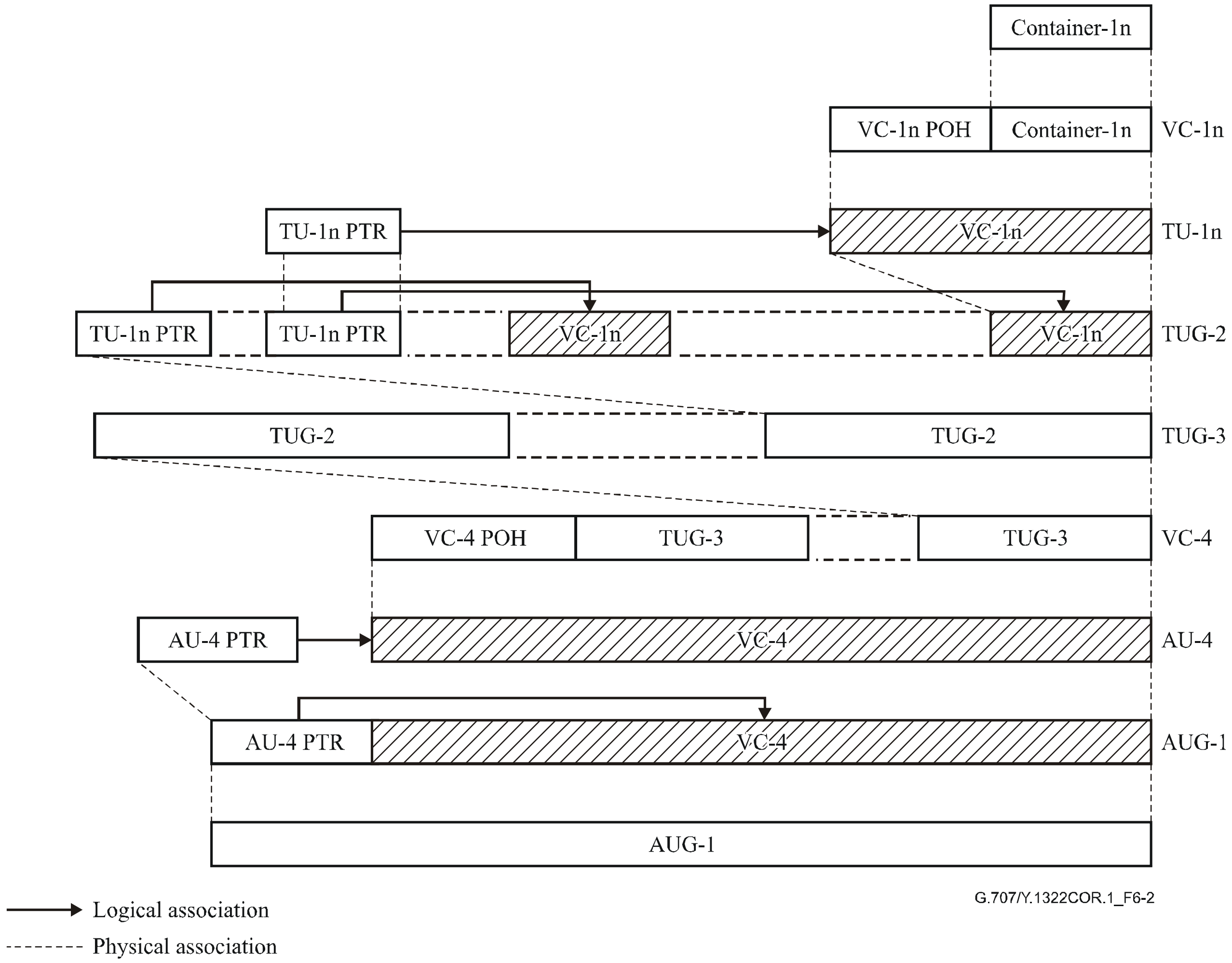
6.1 Multiplexing structure

Replace Figure 6-2/G.707/Y.1322



NOTE – Unshaded areas are phase aligned. Phase alignment between the unshaded and shaded areas is defined by the pointer (PTR) and is indicated by the arrow.

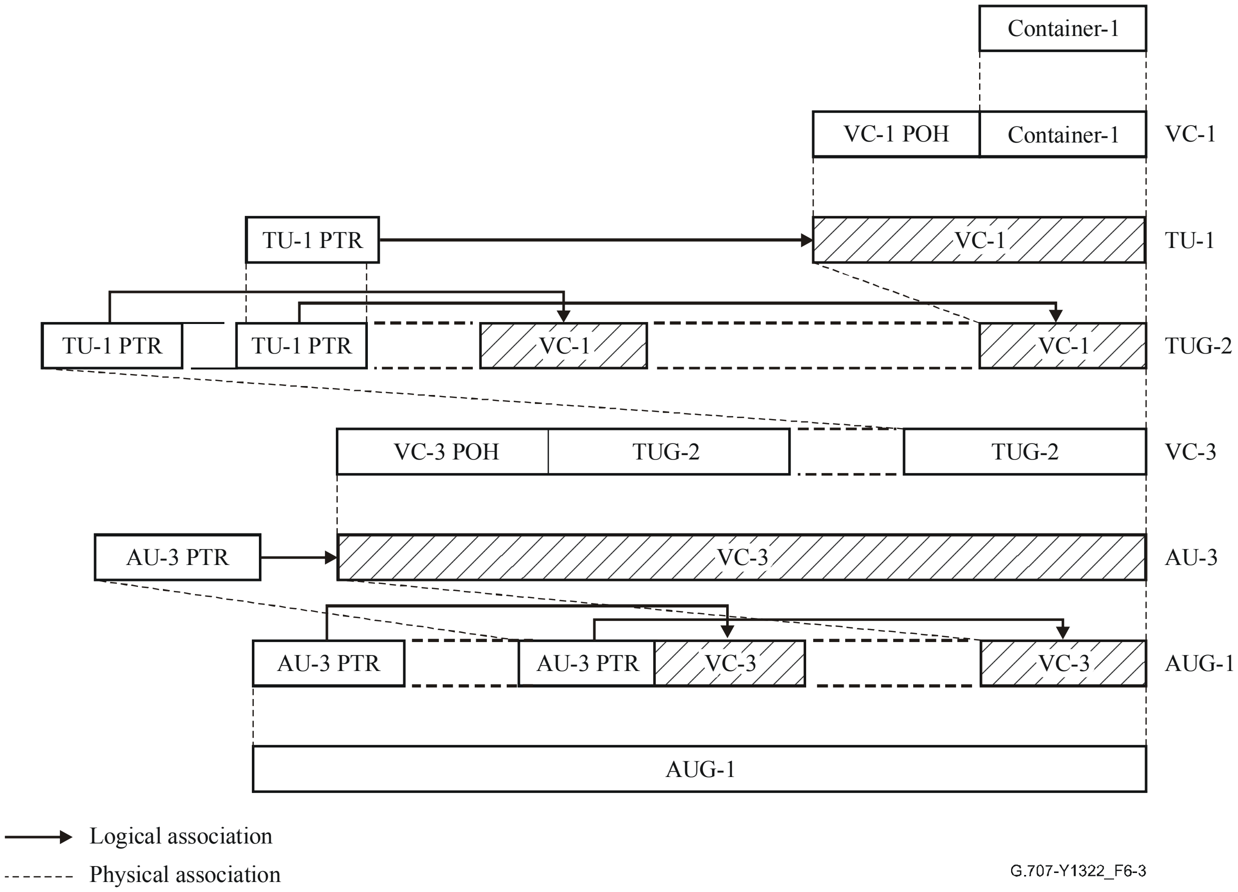
With:



NOTE 1 – Unshaded areas are phase aligned. Phase alignment between the unshaded and shaded areas is defined by the pointer (PTR) and is indicated by the arrow.
NOTE 2 – n = 1, 2.

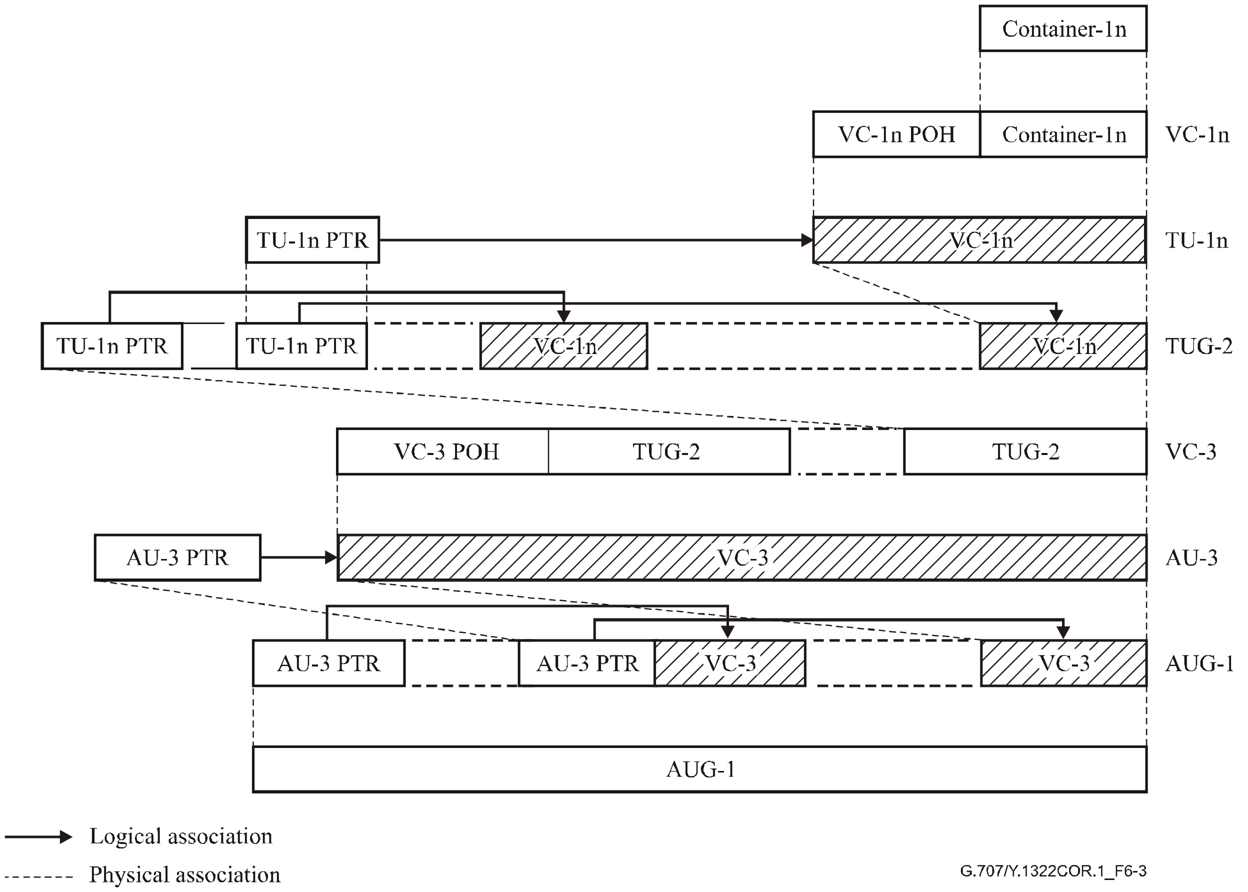
Figure 6-2/G.707/Y.1322 – Multiplexing method directly from Container-1<u>1/12</u> using AU-4

Replace Figure 6-3/G.707/Y.1322



NOTE – Unshaded areas are phase aligned. Phase alignment between the unshaded and shaded areas is defined by the pointer (PTR) and is indicated by the arrow.

With:



NOTE 1 – Unshaded areas are phase aligned. Phase alignment between the unshaded and shaded areas is defined by the pointer (PTR) and is indicated by the arrow.
NOTE 2 – n = 1, 2.

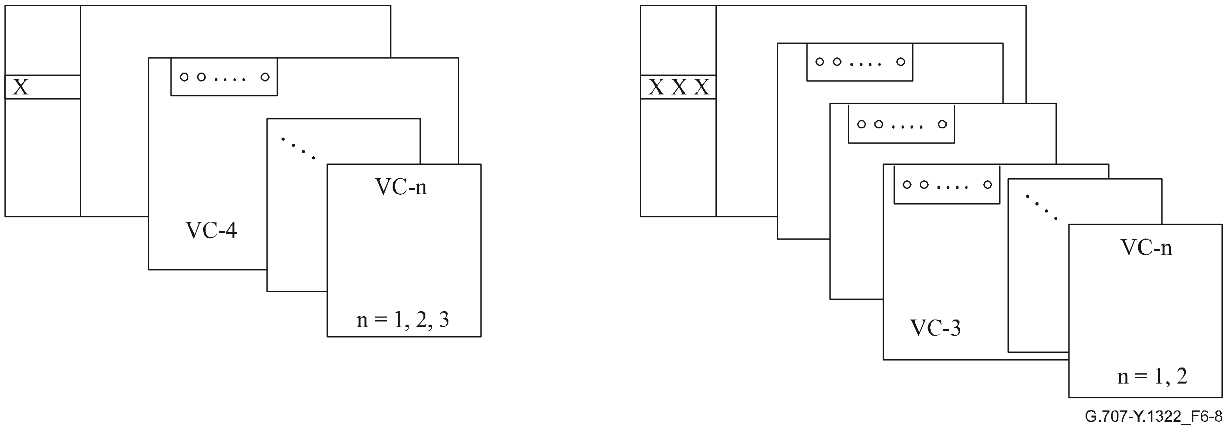
Figure 6-3/G.707/Y.1322 – Multiplexing method directly from Container-11/12 using AU-3

6.2.3 Administrative Units in the STM-N

The AU-4 may be used to carry, via the VC-4, a number of TU-ns (n = ~~1~~11, 12, 2, 3) forming a two-stage multiplex.

The AU-3 may be used to carry, via the VC-3, a number of TU-ns (n = ~~1~~11,12, 2) forming a two-stage multiplex.

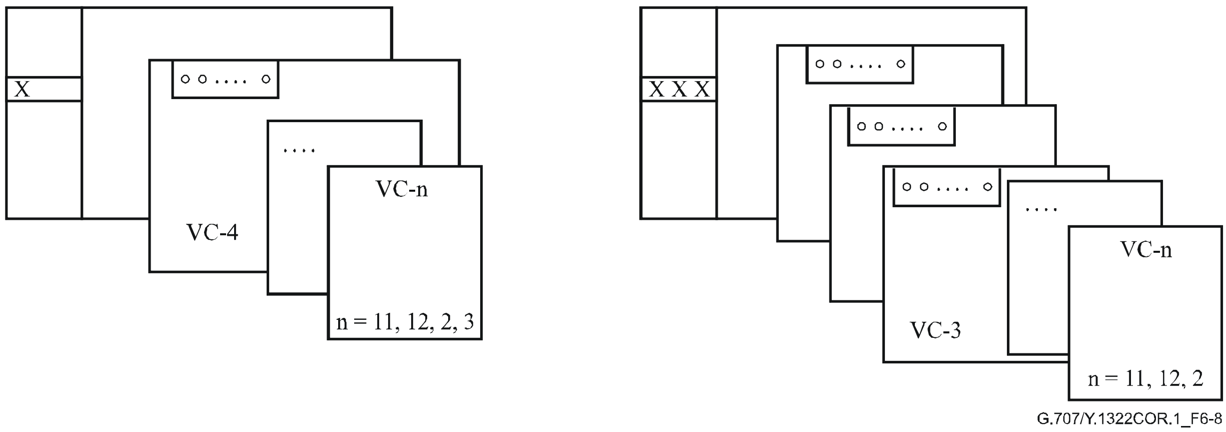
Replace Figure 6-8/G.707/Y.1322



a) STM-1 with one AU-4 containing TUs **b) STM-1 with three AU-3s containing TUs**

X AU-n pointer
o TU-n pointer
AU-n AU-n pointer + VC-n (see clause 8)
TU-n TU-n pointer + VC-n (see clause 8)

With:



a) STM-1 with one AU-4 containing TUs **b) STM-1 with three AU-3s containing TUs**

X AU-n pointer
o TU-n pointer
AU-n AU-n pointer + VC-n (see clause 8)
TU-n TU-n pointer + VC-n (see clause 8)

Figure 6-8/G.707/Y.1322 – Two-stage multiplex

6.2.4.1.3 AU/TU-AIS

The Tributary Unit AIS (TU-AIS) is specified as all "1"s in the entire TU-n (n = ~~1~~11, 12, 2, 3), including the TU-n pointer.

6.2.4.1.4 VC-AIS

VC-~~n~~ m (~~n~~m = ~~1~~11, 12, 2) AIS is specified as all "1"s in the entire VC-~~n~~ m with a valid network operator byte N2 – supporting TCM functionality – and a valid Error Detection Code in bits 1 and 2 of V5 byte.

6.2.4.2 Unequipped VC-n/m signal

6.2.4.2.1 Case of network supporting the transport of tandem connection signals

For the case of networks supporting the transport of tandem connection signals, the VC-~~n~~ m (~~n~~m = ~~1~~11, 12, 2) unequipped signal is a signal having an all "0"s in the lower order virtual container path signal label (bits 5, 6, 7 of byte V5), the tandem connection monitoring byte (N2) and the path trace byte (J2), and a valid BIP-2 (bits 1, 2 of byte V5).

6.2.4.2.2 Case of network not supporting the transport of tandem connection signals

For the case of networks not supporting the transport of tandem connection signals, the VC-~~n~~ m (~~n~~m = ~~1~~11, 12, 2) unequipped signal is a signal having an all "0"s in the lower order virtual container path signal label (bits 5, 6, 7 of byte V5) and the path trace byte (J2), and a valid BIP-2 (bits 1, 2 of byte V5).

6.2.4.3 Supervisory-unequipped VC-n/m signal

6.2.4.3.1 Case of network supporting the transport of tandem connection signals

For the case of networks supporting the transport of tandem connection signals, the VC-~~n~~ m (~~n~~m = ~~1~~11, 12, 2) supervisory-unequipped signal is a signal having an all "0"s in the lower order virtual container path signal label (bits 5, 6, 7 of byte V5) and the tandem connection monitoring byte (N2), a valid BIP-2 (bits 1, 2 of byte V5), a valid path trace byte (J2), and valid path status (bits 3 and 8 of byte V5).

The VC-~~n~~ m (~~n~~m = ~~1~~11, 12, 2) supervisory-unequipped signal is an enhanced unequipped VC-~~n~~ m signal.

These signals indicate to downstream transport processing functions (refer to ~~UIT~~ITU-T Rec. G.803) that the virtual container is unoccupied, and sourced by a supervisory generator.

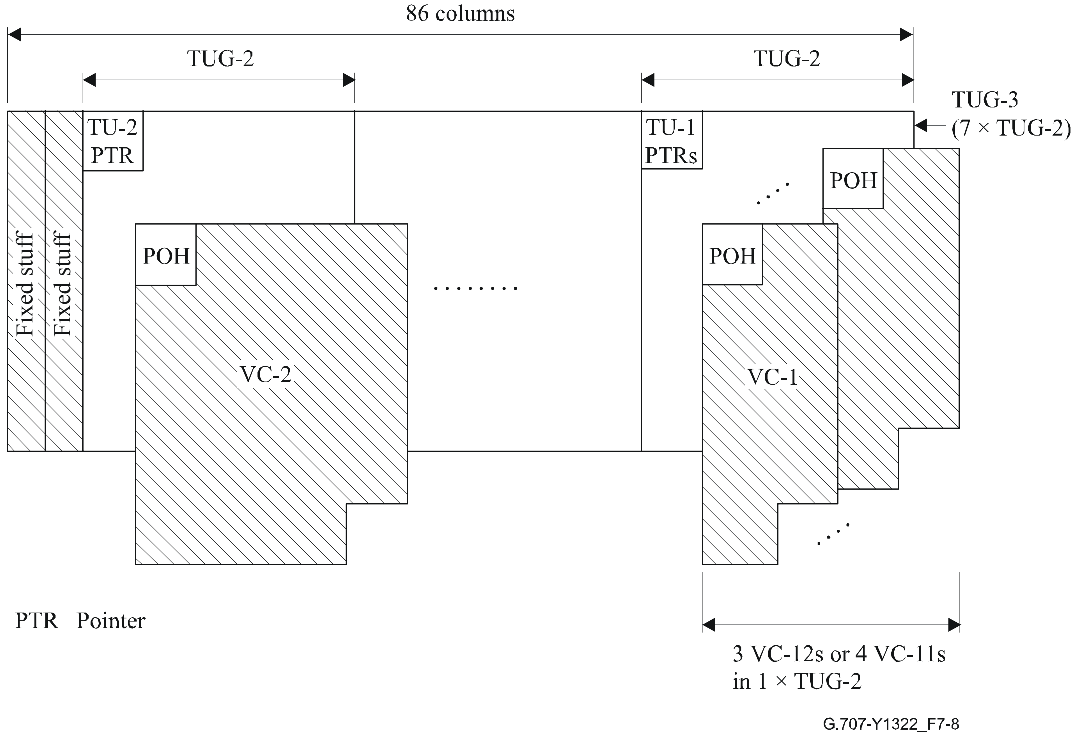
Within a Tandem Connection, a supervisory-unequipped VC-n/m signal generated before the Tandem Connection will have a valid (non all "0"s) Tandem Connection Monitoring byte (N1, N2).

6.2.4.3.2 Case of network not supporting the transport of tandem connection signals

For the case of networks not supporting the transport of tandem connection signals, the VC-~~n~~ m (~~n~~m = ~~1~~11, 12, 2) supervisory-unequipped signal is a signal having an all "0"s in the lower order virtual container path signal label (bits 5, 6, 7 of byte V5), a valid BIP-2 (bits 1, 2 of byte V5), a valid path trace byte (J2), and valid path status (bits 3 and 8 of byte V5).

7.2.3 Multiplexing of TUG-2s via a TUG-3

Replace Figure 7-8/G.707/Y.1322



With:

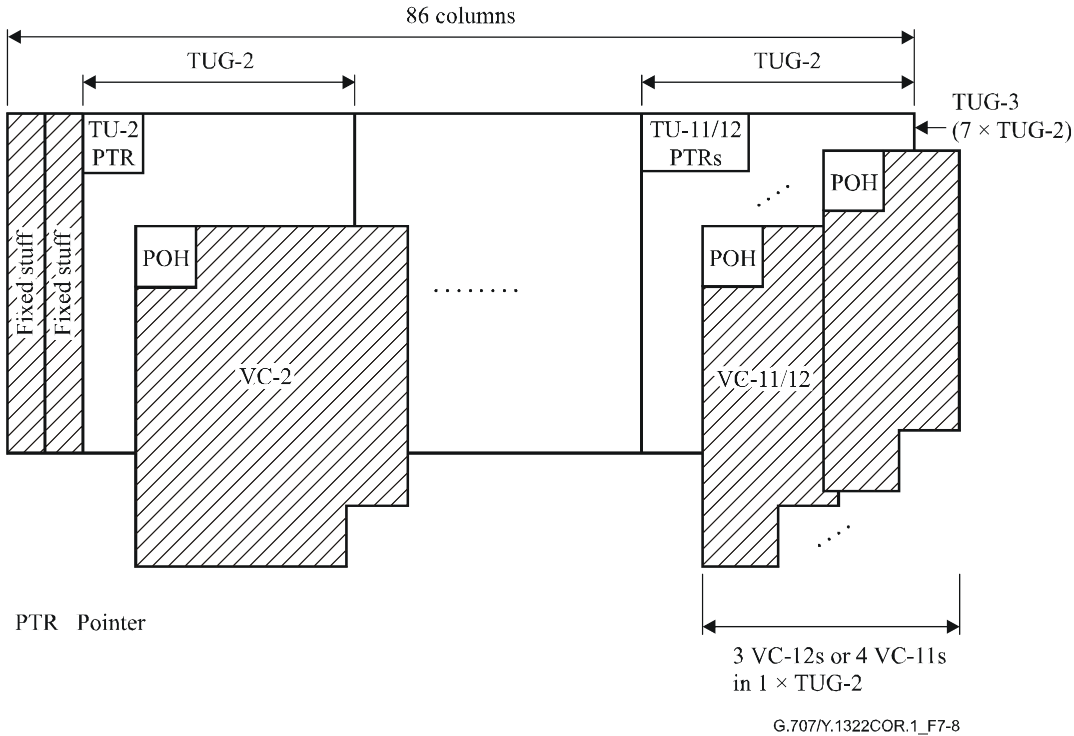
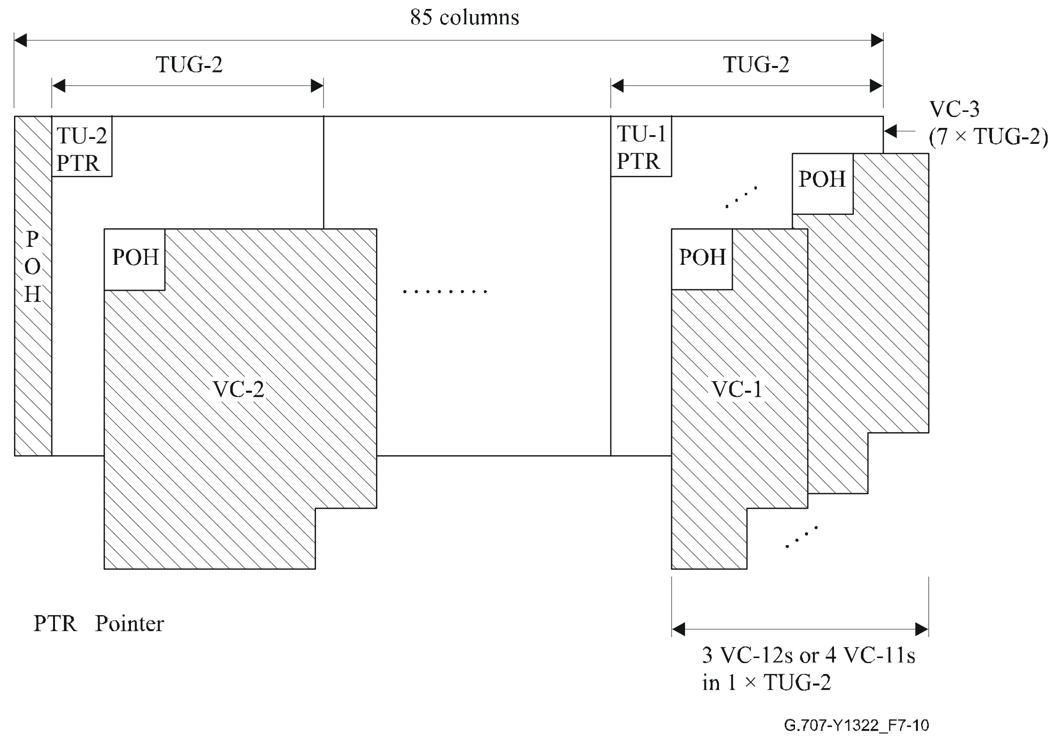


Figure 7-8/G.707/Y.1322 – Multiplexing of seven TUG-2s via a TUG-3

7.2.4 Multiplexing of TUG-2s into a VC-3

Replace Figure 7-10/G.707/Y.1322



With:

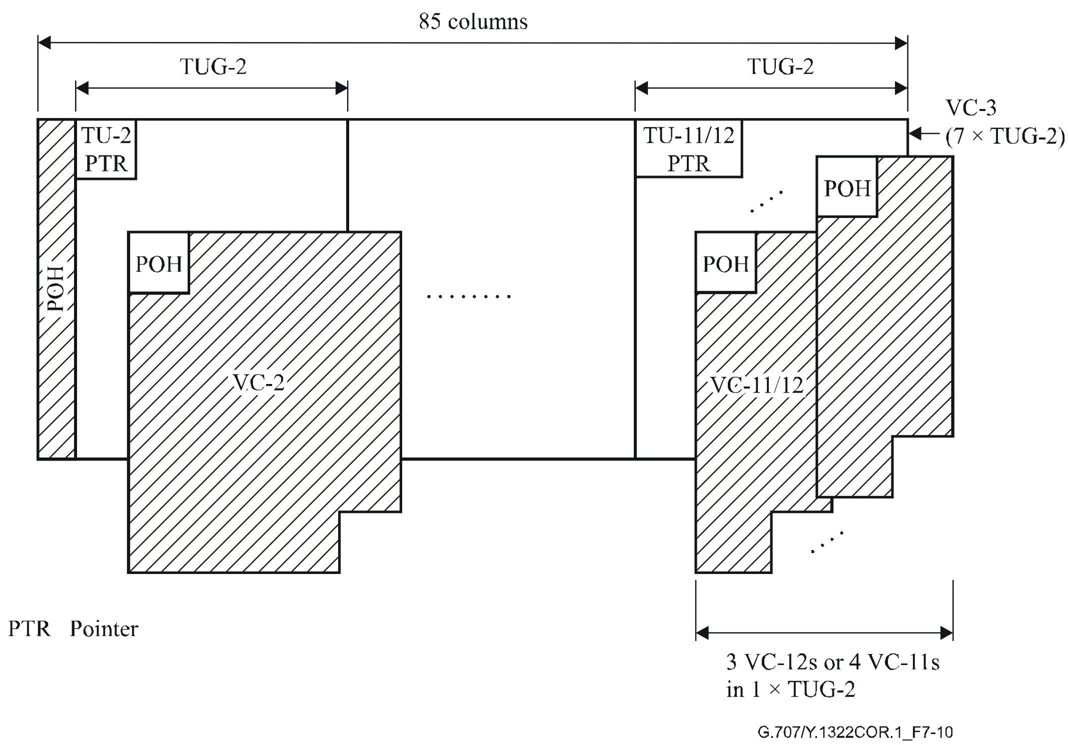


Figure 7-10/G.707/Y.1322 – Multiplexing of seven TUG-2s into a VC-3

7.2.6 Multiplexing of TU-~~1s~~11s or TU-12s via TUG-2s

The multiplexing arrangements of four TU-11s or three TU-12s via the TUG-2 are depicted in Figure 7-11. The TU-~~1s~~11/12s are one-byte interleaved in the TUG-2.

7.3 AU-n/TU-n numbering scheme

In the case of an AU-4 structured frame, the payload columns may be addressed by means of a three figure address (K, L, M) where K represents the TUG-3 number, L the TUG-2 number, and M the TU-~~1~~11/12 number.

8.3 TU-2~~/~~ and TU-~~1~~11/12 pointer

The TU-~~1~~11/12 and TU-2 pointers provide a method of allowing flexible and dynamic alignment of the VC-~~2/~~11/12 and VC-~~1~~2 within the TU-~~1~~11/12 and TU-2 multiframes, independent of the actual contents of the VC-~~2/~~11/12 and VC-~~1~~2.

8.3.1 TU-2~~/~~ and TU-~~1~~11/12 pointer location

The TU-2~~/~~ and TU-~~1~~11/12 pointers are contained in the V1 and V2 bytes as illustrated in Figure 8-9.

8.3.2 TU-2~~/~~ and TU-~~1~~11/12 pointer value

The Tributary Unit pointer word is shown in Figure 8-10. The two S bits (bits 5 and 6) indicate the Tributary Unit type.

Figure 8-10/G.707/Y.1322 – TU-2~~/~~ and TU-~~1~~11/12 pointer coding

The pointer value (bits 7-16) is a binary number which indicates the offset from V2 to the first byte of the VC-2~~/~~ or VC-~~1~~11/12. The range of the offset is different for each of the Tributary Unit sizes as illustrated in Figure 8-11. The pointer bytes are not counted in the offset calculation.

Figure 8-11/G.707/Y.1322 – TU-2~~/~~ and TU-~~1~~11/12 pointer offsets

8.3.3 TU-2~~/~~ and TU-~~1~~11/12 frequency justification

The TU-2~~/~~ and TU-~~1~~11/12 pointer is used to frequency justify the VC-2~~/~~ and VC-~~1~~11/12 exactly in the same way that the TU-3 pointer is used to frequency justify the VC-3.

8.3.5 TU-2~~/~~ and TU-~~1~~11/12 pointer generation and interpretation

The rules for generating and interpreting the TU-2~~/~~ and TU-~~1~~11/12 pointer for the VC-2~~/~~ and VC-~~1~~11/12 are an extension to the rules provided in 8.2.5 and 8.2.6 for the TU-3 pointer with the following modification:

– The term TU-3 is replaced with TU-2~~/~~ or TU-11/12 and the term VC-3 is replaced with VC-2~~/~~ or VC-~~1~~11/12.

8.3.7 TU-2~~/~~ and TU-~~1~~11/12 sizes

Bits 5 and 6 of TU-2~~/~~ and TU-~~1~~11/12 pointer indicate the size of the TU-n. Three sizes are currently provided; they are defined in Table 8-1 below:

Table 8-1/G.707/Y.1322 – TU-2~~/~~ and TU-~~1~~ 11/12 sizes

Size	Designation	TU-~~n~~ m pointer range (in 500 µs)
00	TU-2	0-427
10	TU-12	0-139
11	TU-11	0-103
NOTE – This technique is only used at the TU-2~~/~~ and TU-~~1~~ 11/12 levels.		

8.3.8 TU-2~~/~~ and TU-~~1~~ 11/12 multiframe indication byte

TU-2~~/~~ and TU-~~1~~ 11/12 multiframe indication byte (H4) relates to the lowest level of the multiplexing structure and provides a 500 µs (4-frame) multiframe identifying frames containing the TU-2~~/~~ or TU-~~1~~ 11/12 pointers. Figure 8-9 shows the VC-2~~/~~ and VC-~~1~~ 11/12 mapping in the multiframed TU-2~~/~~ and TU-~~1~~11/12.

Figure 8-12/G.707/Y.1322 – TU-~~1~~11/12 and TU-~~/~~2 500 µs multiframe indication ~~using~~ H4 byte

9.1.2 Virtual Container POH

– *Lower order Virtual Container POH (VC-3/VC-2/VC-12/VC-11 POH)*

Lower order VC-~~n~~ m (~~n~~m = ~~1~~11, 12, 2, 3) POH is added to the Container-~~n~~ m to form a VC-~~n~~m.

9.3.2 VC-2~~/~~ and VC-~~1~~ 11/12 POH

The bytes V5, J2, N2 and K4 are allocated to the VC-2~~/~~ and VC-~~1~~ 11/12 POH. The V5 byte is the first byte of the multiframe and its position is indicated by the TU-2~~/~~ or TU-~~1~~ 11/12 pointer.

9.3.2.1 V5 byte

The byte V5 provides the functions of error checking, signal label and path status of the VC-2~~/~~ and VC-~~1~~ 11/12 paths. The bit assignments of the V5 byte are specified in the following clauses and are illustrated in Figure 9-9.

Figure 9-9/G.707/Y.1322 – VC-2~~/~~ and VC-~~1~~ 11/12 POH V5

Bit 1 is set such that parity of all odd number bits (1, 3, 5 and 7) in all bytes in the previous VC-2~~/~~ or VC-~~1~~ 11/12 is even and bit 2 is set similarly for the even number bits (2, 4, 6 and 8).

Note that the calculation of the BIP-2 includes the VC-2~~/~~ or VC-~~1~~ 11/12 POH bytes but excludes bytes V1, V2, V3 (except when used for negative justification) and V4.

Bit 3 is a VC-2~~/~~ and VC-~~1~~ 11/12 path Remote Error Indication (REI) that is set to one and sent back towards a VC-2~~/~~ or VC-~~1~~ 11/12 path originator if one or more errors were detected by the BIP-2, and is otherwise set to zero.

Bits 5 through 7 provide a VC-2~~/~~ and VC-~~1~~ 11/12 signal label. Eight binary values are possible in these three bits. Value 000 indicates "VC-2~~/~~ or VC-~~1~~ 11/12 path unequipped or supervisory-unequipped". Value 001 is used by old equipment to indicate "VC-2~~/~~ or VC-~~1~~ 11/12 path equipped-non-specific payload". Other values are used by new equipment to indicate specific mappings as shown in Table 9-12. The value 101 indicates a VC-2~~/~~ or VC-~~1~~ 11/12 mapping given by the extended signal label described in 9.3.2.4. Any value received, other than 000, indicates an equipped VC-2~~/~~ or VC-~~1~~ 11/12 path.

Table 9-12/G.707/Y.1322 – VC-2~~/~~ and VC-~~1~~11/12 V5 Signal label coding

Bit 8 is set to 1 to indicate a VC-2~~/~~ or VC-~~1~~11/12 path Remote Defect Indication (RDI); otherwise it is set to zero. The VC-2~~/~~ or VC-~~1~~11/12 path RDI is sent back towards the trail termination source if either a TU-2~~/~~ or TU-~~1~~11/12 server signal failure or trail signal failure condition is being detected by the trail termination sink. RDI does not indicate remote payload or adaptation defects. Connectivity and server defects are indicated by RDI; for further detail see ITU-T Rec. G.783.

9.3.2.4 Extended signal label: K4 (b1)

The coding of the extended signal label is given in Table 9-13. The signal labels in Table 9-12 for the range "0" to "7" and the signal labels in Table 9-13 for the range of "08" to "FF" together forms the complete VC-11/12/2 signal label range of "00" to "FF".

Table 9-13/G.707/Y.1322 – VC-11/12/~~1/~~2 Extended Signal label byte coding

9.3.2.7 Reserved: K4 (b5-b7)

Bit 5 to 7 of K4 are reserved for an optional use described in Appendix VII.2.

10 Mapping of tributaries into VC-n/m

10.1 Mapping of G.702 type signals

Figure 10-1 shows TU-~~1~~11/12 and TU-2 sizes and formats.

Figure 10-1/G.707/Y.1322 – TU-~~1~~11/12 and TU-2 sizes and formats

10.1.4.1 Asynchronous mapping of 2048 kbit/s

In addition to the VC-12 POH, the VC-12 consists of 1023 data bits, six justification control bits, two justification opportunity bits and eight overhead communication channel bits.

10.1.5.1 Asynchronous mapping of 1544 kbit/s

In addition to the VC-11 POH, the VC-11 consists of 771 data bits, six justification control bits, two justification opportunity bits and eight overhead communication channel bits.

11 VC concatenation

VC-~~1n~~11/12 – to provide transport for payloads that require capacity greater than one Container-~~1~~11/12.

Two methods for concatenation are defined: contiguous and virtual concatenation. Both methods provide concatenated bandwidth of X times Container-~~N~~n at the path termination.

11.4 Virtual concatenation of X VC-11/12/~~1~~2s

A VC-11/12/~~1~~2-Xv provides a payload area of X Container-11/12/~~1~~2 as shown in Figures 11-6, 11-7 and 11-8. The container is mapped in X individual VC-11/12/~~1~~2s which form the VC-11/12/~~1~~2-Xv. Each VC-11/12/~~1~~2 has its own POH.

Each VC-11/12/~~1~~2 of the VC-11/12/~~1~~2-Xv is transported individually through the network. Due to this a differential delay will occur between the individual VC-11/12/~~1~~2s and, therefore, the order and the alignment of the VC-11/12/~~1~~2s will change. At the termination, the individual

VC-11/12/~~1~~2s have to be rearranged and realigned in order to re-establish the contiguous concatenated container.

Table 11-4/G.707/Y.1322 – Capacity of Virtually Concatenated VC-~~1n~~11/12/2-Xv

To perform the realignment of the individual VC-~~ns~~ ms (~~n~~ m = 2/12/11) that belong to a virtually concatenated group it is necessary to:

– compensate for the differential delay experienced by the individual VC-~~ns~~ms;

– know the individual sequence numbers of the individual VC-~~ns~~ms.

Bit 2 of the K4 byte of the Low Order VC-~~n~~ m POH is used to convey this information from the sending end to the receiving end of the virtually concatenated signal where the realignment process is performed.

NOTE – Virtually concatenated VC-11/12/2 must use the extended signal label. Otherwise the frame phase of the K4 bit 2 multiframe cannot be established.

The LO virtual concatenation sequence indicator identifies the sequence/order in which the individual VC-11/12/2s of the VC-11/12/2-Xv are combined to form the contiguous container VC-11/12/2-Xc as shown in Figures 11-6 to 11-8. Each VC-11/12/2 of a VC-11/12/2-Xv has a fixed unique sequence number in the range of 0 to (X–1). The VC-11/12/2 transporting the first C-11/12/2 of the C-11/12/2-Xc has the sequence number 0, the VC-11/12/2 transporting the second C-11/12/2 of the C-11/12/2-Xc has the sequence number 1 and so on up to the VC-11/12/2 transporting C-11/12/2 X of the C-11/12/2-Xc with the sequence number (X–1). For applications requiring fixed bandwidth the sequence number is fixed assigned and not configurable. This allows the constitution of the VC-11/12/2-Xv to be checked without using the trace.

Annex E

VC-2~~/~~ and VC-11/12 Tandem Connection Monitoring protocol

Appendix VII

VII.2 VC-2~~/~~ and VC-11/12 paths

As described in 9.3.2.1, bits 3, 4 and 8 of byte V5 are allocated to convey back to a VC-2~~/~~ or VC-~~1~~11/12 trail termination source the status and performance of the complete trail.

Appendix VIII

VIII.2 Entering AIS condition (in case of VC-11/12/2)

This problem does not occur at the VC-11/12/2 level; there is a real BIP-2 there, not an IEC.

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