INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

G.7043/Y.1343
Amendment 1
(01/2005)

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

Virtual concatenation of plesiochronous digital hierarchy (PDH) signals
**Amendment 1**

ITU-T Recommendation G.7043/Y.1343 (2004) – Amendment 1

ITU-T G-SERIES RECOMMENDATIONS

**TRANSMISSION SYSTEMS AND MEDIA, DIGITAL SYSTEMS AND NETWORKS**

| | |
|---|---|
| INTERNATIONAL TELEPHONE CONNECTIONS AND CIRCUITS | G.100–G.199 |
| GENERAL CHARACTERISTICS COMMON TO ALL ANALOGUE CARRIER-TRANSMISSION SYSTEMS | G.200–G.299 |
| INDIVIDUAL CHARACTERISTICS OF INTERNATIONAL CARRIER TELEPHONE SYSTEMS ON METALLIC LINES | G.300–G.399 |
| GENERAL CHARACTERISTICS OF INTERNATIONAL CARRIER TELEPHONE SYSTEMS ON RADIO-RELAY OR SATELLITE LINKS AND INTERCONNECTION WITH METALLIC LINES | G.400–G.449 |
| COORDINATION OF RADIOTELEPHONY AND LINE TELEPHONY | G.450–G.499 |
| TRANSMISSION MEDIA CHARACTERISTICS | G.600–G.699 |
| DIGITAL TERMINAL EQUIPMENTS | G.700–G.799 |
| DIGITAL NETWORKS | G.800–G.899 |
| DIGITAL SECTIONS AND DIGITAL LINE SYSTEM | G.900–G.999 |
| QUALITY OF SERVICE AND PERFORMANCE - GENERIC AND USER-RELATED ASPECTS | G.1000–G.1999 |
| TRANSMISSION MEDIA CHARACTERISTICS | G.6000–G.6999 |
| DIGITAL TERMINAL EQUIPMENTS | G.7000–G.7999 |
|   **General** | **G.7000–G.7099** |
|   Coding of analogue signals by pulse code modulation | G.7100–G.7199 |
|   Coding of analogue signals by methods other than PCM | G.7200–G.7299 |
|   Principal characteristics of primary multiplex equipment | G.7300–G.7399 |
|   Principal characteristics of second order multiplex equipment | G.7400–G.7499 |
|   Principal characteristics of higher order multiplex equipment | G.7500–G.7599 |
|   Principal characteristics of transcoder and digital multiplication equipment | G.7600–G.7699 |
|   Operations, administration and maintenance features of transmission equipment | G.7700–G.7799 |
|   Principal characteristics of multiplexing equipment for the synchronous digital hierarchy | G.7800–G.7899 |
|   Other terminal equipment | G.7900–G.7999 |
| DIGITAL NETWORKS | G.8000–G.8999 |

*For further details, please refer to the list of ITU-T Recommendations.*

# ITU-T Recommendation G.7043/Y.1343

## Virtual concatenation of plesiochronous digital hierarchy (PDH) signals

## Amendment 1

**Summary**

This amendment changes the specification of frame formats from nibbles to octets.

## FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

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.

## NOTE

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

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure e.g. interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met.  The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

## INTELLECTUAL PROPERTY RIGHTS

ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the Recommendation development process.

As of the date of approval of this Recommendation, ITU had not 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.

## ITU-T Recommendation G.7043/Y.1343

## Virtual concatenation of plesiochronous digital hierarchy (PDH) signals

## Amendment 1

*Modify clause 6.4 as follows:*

### 6.4    Interface at $N \times 44\ 736$ kbit/s with virtual concatenation of a clear channel payload

### 6.4.1    Multiframe format for $N \times 44\ 736$ kbit/s

The multiframe structure for 44 736 kbit/s signal described in ITU-T Rec. G.704 shall be used. For the case of an $N \times 44\ 736$ kbit/s signal, the first octet ~~(two nibbles)~~ following the first framing bit (X1) of the multiframe is used to carry the concatenation overhead in each constituent 44 736 kbit/s signal, as illustrated in Figure 6-8. This octet is reserved for all values of $N$ ($N = 1…8$).

### 6.4.2    Concatenation of $N$ 44 736 kbit/s signals

The concatenation overhead octet allows the virtual concatenation of $N$ 44 736 kbit/s signals to form a single channel referred to as a virtual concatenation group (VCG). The payload container bandwidth of the resulting VCG is $N \times (44\ 736)[(7)(680 - 8) - 8]/[(7)(680)]$ kbit/s $\approx$ $N \times 44\ 134$ kbit/s. Client data signals are mapped into the $N$ 44 736 kbit/s signal members of the VCG on a~~n~~ ~~nibble~~octet-wise, round robin basis. The round robin sequence follows the ascending order of the per-member sequence numbers that are communicated in each member's concatenation overhead octet. For example, if ~~the most significant nibble of GFP frame~~ data packet's octet 1 is mapped into the 44 736 kbit/s signal with sequence number 0, the ~~least significant nibble of GFP frame octet 1~~ next packet octet is mapped into the 44 736 kbit/s signal with sequence number 1, ~~the most significant nibble of GFP frame octet 2 is mapped into the 44 736 kbit/s signal with sequence number 2,~~ etc. Up to eight 44 736 kbit/s signals can be virtually concatenated into a single VCG.

NOTE – The bits F1, F2, F3 and F4 will be located in the middle of a data packet's octet.

## ITU-T Y-SERIES RECOMMENDATIONS

## GLOBAL INFORMATION INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS AND NEXT-GENERATION NETWORKS

| | |
|---|---|
| **GLOBAL INFORMATION INFRASTRUCTURE** | |
| General | Y.100–Y.199 |
| Services, applications and middleware | Y.200–Y.299 |
| Network aspects | Y.300–Y.399 |
| Interfaces and protocols | Y.400–Y.499 |
| Numbering, addressing and naming | Y.500–Y.599 |
| Operation, administration and maintenance | Y.600–Y.699 |
| Security | Y.700–Y.799 |
| Performances | Y.800–Y.899 |
| **INTERNET PROTOCOL ASPECTS** | |
| General | Y.1000–Y.1099 |
| Services and applications | Y.1100–Y.1199 |
| Architecture, access, network capabilities and resource management | Y.1200–Y.1299 |
| **Transport** | **Y.1300–Y.1399** |
| Interworking | Y.1400–Y.1499 |
| Quality of service and network performance | Y.1500–Y.1599 |
| Signalling | Y.1600–Y.1699 |
| Operation, administration and maintenance | Y.1700–Y.1799 |
| Charging | Y.1800–Y.1899 |
| **NEXT GENERATION NETWORKS** | |
| Frameworks and functional architecture models | Y.2000–Y.2099 |
| Quality of Service and performance | Y.2100–Y.2199 |
| Service aspects: Service capabilities and service architecture | Y.2200–Y.2249 |
| Service aspects: Interoperability of services and networks in NGN | Y.2250–Y.2299 |
| Numbering, naming and addressing | Y.2300–Y.2399 |
| Network management | Y.2400–Y.2499 |
| Network control architectures and protocols | Y.2500–Y.2599 |
| Security | Y.2700–Y.2799 |
| Generalized mobility | Y.2800–Y.2899 |

*For further details, please refer to the list of ITU-T Recommendations.*

# SERIES OF ITU-T RECOMMENDATIONS

| | |
|---|---|
| Series A | Organization of the work of ITU-T |
| Series D | General tariff principles |
| Series E | Overall network operation, telephone service, service operation and human factors |
| Series F | Non-telephone telecommunication services |
| **Series G** | **Transmission systems and media, digital systems and networks** |
| Series H | Audiovisual and multimedia systems |
| Series I | Integrated services digital network |
| Series J | Cable networks and transmission of television, sound programme and other multimedia signals |
| Series K | Protection against interference |
| Series L | Construction, installation and protection of cables and other elements of outside plant |
| Series M | Telecommunication management, including TMN and network maintenance |
| Series N | Maintenance: international sound programme and television transmission circuits |
| Series O | Specifications of measuring equipment |
| Series P | Telephone transmission quality, telephone installations, local line networks |
| Series Q | Switching and signalling |
| Series R | Telegraph transmission |
| Series S | Telegraph services terminal equipment |
| Series T | Terminals for telematic services |
| Series U | Telegraph switching |
| Series V | Data communication over the telephone network |
| Series X | Data networks, open system communications and security |
| **Series Y** | **Global information infrastructure, Internet protocol aspects and next-generation networks** |
| Series Z | Languages and general software aspects for telecommunication systems |