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SERIES T: TERMINALS FOR TELEMATIC SERVICES

Terminal characteristics for Group 4 facsimile apparatus

ITU-T Recommendation T.563

(Previously CCITT Recommendation)

ITU-T T-SERIES RECOMMENDATIONS

TERMINALS FOR TELEMATIC SERVICES

For further details, please refer to ITU-T List of Recommendations.

FOREWORD

The ITU-T (Telecommunication Standardization Sector) is a permanent organ of the International Telecommunication Union (ITU). The 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 Conference (WTSC), which meets every four years, establishes the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 1 (Helsinki, March 1-12, 1993).

ITU-T Recommendation T.563 was revised by ITU-T Study Group 8 (1993-1996) and was approved by the WTSC (Geneva, 9-18 October 1996)

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NOTE

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

CONTENTS

SUMMARY

This Recommendation defines the terminal characteristics for G4 facsimile apparatus. The descriptions of the terminal characteristics for colour extension are added as an option by this Recommendation. The coding schemes for colour image type and optional functions for colour facsimile are mainly defined. The references to the teletext service are removed.

Recommendation T.563

TERMINAL CHARACTERISTICS FOR GROUP 4
FACSIMILE APPARATUS

(revised 1994 and 1996)

The ITU-T,

considering

(a)   that Recommendation T.4 refers to Group 3 type apparatus for ISO A4 document transmission over a telephone-type circuit in approximately one minute;

(b)   that there is a demand for Group 4 apparatus which incorporates means for reducing the transmission time and assures essentially error-free reception of the documents;

(c)   that telematic terminals including Group 4 facsimile apparatus are to be standardized, taking into account the commonality among these terminals,

unanimously declares

that Group 4 facsimile apparatus as defined in Recommendation T.0 should be designed and operated according to the following standard.

1   General

1.1   Group 4 facsimile apparatus is used mainly on Public Data Networks (PDN) including circuit-switched, packet-switched, and the Integrated Services Digital Network (ISDN).

1.2   The procedures used with Group 4 facsimile apparatus enable it to transmit and reproduce image-coded information essentially without transmission errors.

1.3   Group 4 facsimile apparatus has the means for reducing the redundant information in facsimile signals prior to transmission.

1.4   The basic image type of the Group 4 facsimile apparatus is black and white. Continuous tone gray scale and colour image type of G4 facsimile apparatus are optional.

Other image types are for further study.

NOTE – The above definitions are extracted from Study Group 1 where "terminal" is used instead of "apparatus".

2   Scope of Recommendations concerning Group 4 facsimile apparatus

2.1   This Recommendation defines the general aspects of Group 4 facsimile apparatus.

2.2   The rules to be followed in the Group 4 facsimile services are defined in Recommendation F.184.

2.3   The Group 4 facsimile coding scheme and facsimile control functions are defined in Recommendations T.6, T.81 and T.82.

2.4   Group 4 facsimile apparatus communicates with unique procedures that are described as follows:

a)   the interface to the physical network is defined in this Recommendation (see Note);

b)   the transport end-to-end control procedure is defined in Recommendation T.70;

c)   Group 4 facsimile control procedures are defined in Recommendation T.62;

d)   Group 4 facsimile communication application profile is defined in Recommendation T.521;

e)   Group 4 facsimile document application profile is defined in Recommendation T.503.

2.5 For the continuous tone colour image, the continuous tone colour representation method for G4 facsimile is defined in Recommendation T.42.

3 General characteristics of the apparatus

3.1 Basic characteristics

3.1.1 The Group 4 facsimile apparatus provides the means for direct document transmission from any subscriber to any other subscriber.

3.1.2 All apparatus participating in the international Group 4 facsimile service have to be compatible with each other at the basic level defined in this Recommendation. Additional operational functions may be invoked.

3.1.3 The range of data rates is described in clause 5. Detailed arrangements on a national level are left to the Administrations concerned, as it is recognized that national implementation of the Group 4 facsimile service on various types of network may involve national operation at different data throughput rates.

3.1.4 The page is the basis for facsimile message formatting and transmission. Both A4 and North American paper formats are taken into account.

3.1.5 Facsimile coding schemes are applied in order to reduce the redundant information in facsimile signals prior to transmission.

3.1.6 The apparatus must have the ability to reproduce facsimile messages. The content, layer and format of facsimile messages must be identical at the transmitting and receiving apparatus.

3.1.7 The reproducible area is defined within which facsimile messages are assured to be reproduced. (See 3.2.6.)

3.1.8 The Group 4 facsimile apparatus should provide means for automatic reception.

3.1.9 Group 4 facsimile apparatus shall incorporate the functions defined as basic for the Group 4 facsimile service in 3.2 below. In addition, optional functions can be incorporated. In this Recommendation, the optional functions are divided into ITU-T standardized options and nationally and/or privately specified options.

3.2 Basic functions

3.2.1 Group 4 facsimile apparatus shall be capable of handling:

 a) communication application profile as defined in Recommendation T.521;

 b) document application profile as defined in Recommendation T.503;

 c) the basic facsimile coding scheme as defined in Recommendation T.6;

 d) the control function associated with the basic facsimile coding scheme as defined in Recommendation T.6.

3.2.2 Group 4 apparatus shall have the following provisions for facsimile messages:

 a) provision for scanning the documents to be transmitted (see 3.2.5);

 b) provision for receiving and presenting hard or soft copies of the documents.

3.2.3 Basic page formatting functions are as follows:

 a) vertical page orientation;

 b) paper size of ISO A4;

 c) reproducible area/printable area is defined, taking into account ISO A4 and North American paper formats and ISO standard 3535.

3.2.4 Terminal identification

Each Group 4 facsimile apparatus should be equipped with a unique identification. Details of the identification are given in Recommendation F.184.

3.2.5 Scanning

The message area should be scanned in the same direction in the transmitter and receiver. Viewing the message area in a vertical plane, the picture elements shall be processed as if the scanning direction were from left to right with subsequent scans adjacent to and below the previous scan.

3.2.6 Page size and reproducible area

3.2.6.1 Sometimes paper length may not be specified, because the paper end is detected by paper scanning.

3.2.6.2 The size of the guaranteed reproducible area for ISO A4 paper size is shown in Annex A.

3.2.7 Group 4 facsimile transmission pel density (resolution) requirements

The Group 4 facsimile resolution requirements and their tolerances are given in Table 1.

Standard pel transmission density for Group 4 facsimile is 200 pels/25.4 mm.

Table 1/T.563

Resolution (pels/25.4 mm)	Horizontal and vertical tolerance (%)
200×200	± 1
240×240	± 1
300×300	± 1
400×400	± 1

Lower resolution for continuous tone gray scale and colour image is for further study.

Centre line referencing will be used for paper positioning. Each page will be positioned on the scanner so that the centre line is in registration with the value: (number of pels/line)/2. (For further study.)

Specific values for the number of pels per line, scan line length and nominal number of scan lines per page are given in Tables 2a and 2b for all the Group 4 resolutions for ISO A4, North American Letter, ISO B4, ISO A3, Japanese Legal, Japanese Letter, North American Legal and North American Ledger paper.

Table 3 specifies the blanking procedure for all of the Group 4 paper sizes. An equal number of pels on the left and right side of the page are set to white to fit the paper format. Figure 1 illustrates the blanking procedure for ISO A4 and North American Letter paper. The same procedure is used for the other paper formats.

The raster point in the upper left corner of an ISO page is used as a reference for portrait mode character printing. This raster point, termed the raster reference point (1.1), is used as a starting point for determining character margins and positions. This is also illustrated in Figure 1.

3.2.8 Facsimile coding schemes

3.2.8.1 In order to reduce the redundant information in facsimile signals, the basic facsimile coding scheme is defined in Recommendation T.6. This coding scheme is used assuming that transmission errors are corrected by control procedures in lower levels.

3.2.8.2   On an optional basis, an apparatus can use other ITU-T standardized coding schemes defined in Recommendation T.6 or T.85.

3.2.8.3   When the encoded bit string based on Recommendation T.6 is arranged in the octet string of ASN.1, the first bit of encoded image should be placed in LSB of octet. The successive bits are placed in the direction of LSB to MSB of octet.

3.2.8.4   For colour facsimile of continuous tone image as described in 3.3.5 b) with more than one colour component, the coding scheme defined in Recommendation T.81 shall be used and the coding scheme defined in Recommendation T.82 is for further study. For colour facsimile of multi-colour image, the coding scheme defined in Recommendation T.82 is applicable. The colour facsimile of multi-colour is reserved for further study.

3.3   ITU-T-standardized optional functions of Group 4 facsimile apparatus

3.3.1   The possibility of using optional functions can be negotiated during a handshaking procedure in the communication application profile (see Recommendation T.521).

3.3.2   The optional functions are invoked by the communication application profile (see Recommendation T.521).

Table 2a/T.563 – Number of pels and scan line length for different paper sizes

		ISO A4	North American Letter	ISO B4	ISO A3	Japanese Legal	Japanese Letter	North American Legal	North American Ledger
Number of picture elements along a scan line	Resolution (pels/ 25.4 mm)								
	200	1728	1728	2048	2432	2048	1728	1728	2432
	240	2074	2074	2458	2918	2458	2074	2074	2918
	300	2592	2592	3072	3648	3072	2592	2592	3648
	400	3456	3456	4096	4864	4096	3456	3456	4864
Scan line length (mm) (P)		219.46	219.46	260.10	308.86	260.10	219.46	219.46	308.86
Paper width (mm) (Q)		210	215.9	250	297	257	182	215.9	279.4
P – Q		9.46	3.56	10.10	11.86	3.10	37.46	3.56	29.46

Table 2b/T.563 – Nominal number of scan lines for different paper sizes

		ISO A4	North American Letter	ISO B4	ISO A3	Japanese Legal	Japanese Letter	North American Legal	North American Ledger
Nominal number of scan lines per page for each pel-transmission density	Resolution (pels/ 25.4 mm)								
	200	2339	2200	2780	3307	2866	2024	2800	3400
	240	2806	2640	3335	3969	3439	2428	3360	4080
	300	3508	3300	4169	4961	4299	3035	4200	5100
	400	4677	4400	5559	6614	5732	4047	5600	6800
Nominal paper length (mm)		297	279.4	353	420	364	257	355.6	431.8

Table 3/T.563 – Blanking and address reference point for different paper sizes

Paper size	Resolution (pels/25.4 mm)	Pels per line	Pels per each paper size line	Blanking margin (pels)	Reference point	Total line length (mm)
ISO A4				(B)		
	200 × 200	1728	1654	37	(38.1)	219.46
	240 × 240	2074	1984	45	(46.1)	219.46
	300 × 300	2592	2480	56	(57.1)	219.46
	400 × 400	3456	3308	74	(75.1)	219.46
North American Letter				(A)		
	200 × 200	1728	1700	14	(15.1)	219.46
	240 × 240	2074	2040	17	(18.1)	219.46
	300 × 300	2592	2550	21	(22.1)	219.46
	400 × 400	3456	3400	28	(29.1)	219.46
ISO B4	200 × 200	2048	1968	40	(41.1)	260.10
	240 × 240	2458	2362	48	(49.1)	260.10
	300 × 300	3072	2952	60	(61.1)	260.10
	400 × 400	4096	3936	80	(81.1)	260.10
ISO A3	200 × 200	2432	2338	47	(48.1)	308.86
	240 × 240	2918	2806	56	(57.1)	308.86
	300 × 300	3648	3508	70	(71.1)	308.86
	400 × 400	4864	4676	94	(95.1)	308.86
Japanese Legal	200 × 200	2048	2024	12	(13.1)	260.10
	240 × 240	2458	2428	15	(16.1)	260.10
	300 × 300	3072	3036	18	(19.1)	260.10
	400 × 400	4096	4048	24	(25.1)	260.10
Japanese Letter	200 × 200	1728	1434	147	(148.1)	219.46
	240 × 240	2074	1720	177	(178.1)	219.46
	300 × 300	2592	2150	221	(222.1)	219.46
	400 × 400	3456	2868	294	(295.1)	219.46
North American Legal	200 × 200	1728	1700	14	(15.1)	219.46
	240 × 240	2074	2040	17	(18.1)	219.46
	300 × 300	2592	2550	21	(22.1)	219.46
	400 × 400	3456	3400	28	(29.1)	219.46
North American Ledger	200 × 200	2432	2200	116	(117.1)	308.86
	240 × 240	2918	2640	139	(140.1)	308.86
	300 × 300	3648	3300	174	(175.1)	308.86
	400 × 400	4864	4400	232	(233.1)	308.86

NOTE – The pels as defined in the blanking margin section (blanking margin A and B are shown in Figure 1) are equivalent to the discarded pels defined in Recommendation T.503.

3.3.3 The pel transmission densities of 240 and/or 300 and/or 400 pels/25.4 mm are optional.

3.3.4 As the service develops, additions and changes to the ITU-T-standardized optional function listed below may be needed.

    a) optional coding schemes defined in Recommendation T.6;

    b) control functions associated with optional coding schemes;

    c) gray scale images;

    d) colour images;

    e) resolution conversion algorithms.

3.3.5 Optional page formatting functions are as follows:

    a) page sizes of ISO B4, ISO A3, Japanese Legal, Japanese Letter, North American Legal and North American Ledger;
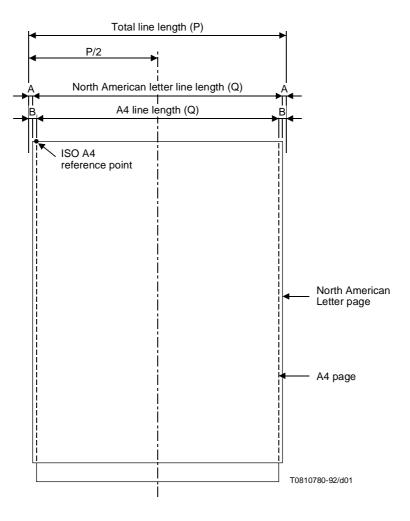
    b) other page formats are for further study.

Figure 1/T.563 – Reference point and blanking margins

3.3.6   Optional functions for gray scale and colour images:

a)   colour image data are expressed by direct colour expression using colour space "CIELAB";

b)   the basic image mode is gray scale and the optional mode is continuous tone colour;

c)   the basic value of bit per colour component is 8 bit/colour component. The optional value is 12 bit/colour component;

d)   continuous tone image may be coded losslessly by the coding scheme defined in Recommendation T.81 or Recommendation T.82;

e)   colour tolerance is for further study.

3.4   Optional functions of Group 4 facsimile apparatus for national standardization or private use

The ITU-T standardization includes the necessary rules and means for indication of, or escape into, functions specified nationally or for private use (see Recommendations T.62 and T.521).

3.5 Default conditions for Group 4 facsimile apparatus

In the absence of specific indications, the receiving apparatus shall assume the following conditions:

a) *communication* (as specified in Recommendation T.521):

– one way (calling apparatus transmitting the facsimile message);

– normal document;

b) *coding scheme:*

– basic facsimile coding scheme;

c) *image type:*

– black and white two-level image;

d) *presentation:*

– paper size of ISO A4;

– pel transmission density of 200 pels per 25.4 mm;

– number of picture elements along scan line of defined values in Table 3;

– blanking margin of defined values in Table 3;

– vertical page of orientation.

4 Communications

4.1 Storage

Receiving storage is not required for Group 4 apparatus.

4.2 Call identification

The control procedures include the exchange of reference information prior to sending any document. Details of the call identification line are covered in Recommendation F.184.

Printing capability of the Call Identification Line (CIL) is mandatory. The printing of the CIL is selected by the user.

If printing is selected, the CIL is printed on a reserved area at either the top of the page or the bottom. Refer to Figure A.1. The reserved area is 4.23 mm (200 BMU) in height and 183 mm (8640 BMU) in width. The size of the Basic Measurement Unit (BMU) is 1/1200 per 25.4 mm.

4.3 Communication application profile for Group 4 facsimile document

The communication application profile to be used is BT 0, specified in Recommendation T.521.

Specific parameter values to be used in the D-INITIATE and D-CAPABILITY service primitive are:

– The parameter value to represent the document application profile for Group 4 facsimile is defined in Recommendation T.503.

In case of continuous-tone colour and gray scale extension, the parameter value '05'H is used.

In case of file transfer function, the parameter value '06'H is used.

– The parameter value to represent the document architecture class is FDA, defined in Recommendation T.412.

5 Network-related requirements

5.1 Networks

The Group 4 facsimile transport service can be provided using a Circuit-Switched Public Data Network (CSPDN), a Packet-Switched Public Data Network (PSPDN) or an Integrated Services Digital Network (ISDN). In all types of network, the Group 4 facsimile apparatus will provide automatic answering, transmission, reception and clearing.

5.2 Circuit-Switched Public Data Network (CSPDN)

a) Function and procedural aspect of the interface: Recommendation X.21.

b) With external Data Circuit-terminating Equipment (DCE) – mechanical and electrical and characteristics of the interface: Recommendation X.21.

c) Bit rates: user classes of services 4 to 7 in Recommendation X.1.

d) Link procedure: LAPB/Recommendation X.75.

5.3 Packet-Switched Public Data Network (PSPDN)

a) Function and procedural aspects of the interface: Recommendation X.25, levels 1, 2 and 3.

b) Duplex transmission.

c) Bit rates: User classes of services 8 to 11 in Recommendation X.1.

d) Number of logical channels at a time: One or more.

5.4 Integrated Services Digital Network (ISDN)

The operations and rules of Group 4 facsimile apparatus on the ISDN are defined in Recommendation T.90. On the ISDN, Group 3 and Group 4 facsimile functions can be implemented in Group 4 facsimile. The operations and rules of the terminal having Group 3 and Group 4 facsimile functions are described in the Appendix I/T.90.

6 Indicators

6.1 Indicators should inform users about situations in which negative effects on the grade of service can be expected.

6.2 The following indicators are required:

a) apparatus unable to transmit (e.g. paper jam at transmitting end);

b) apparatus unable or soon unable to receive (e.g. paper jam or receiving memory nearly full);

c) operator assistance required;

d) message received in store.

7 Access to facsimile MHS

Users of Group 4 facsimile apparatus may wish to have access to the services offered by the Message Handling System (MHS). This requires the ability to generate control documents (see T.300-Series Recommendations). The details are left for further study.
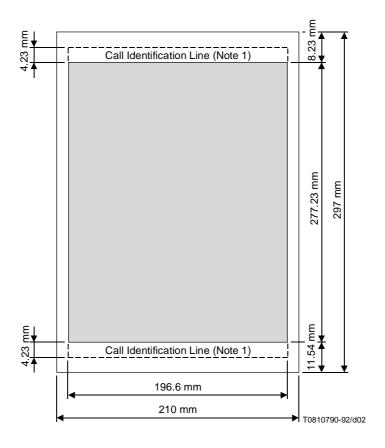
8 Implementation of apparatus

Although paper sizes are referred to, this does not always require physical paper scanner and/or printer to be implemented. Details may be defined by Administrations.

If the message is not generated from a physical scanner or displayed on paper, then the signals appearing across the network interface shall be identical to those which would be generated if paper input and/or output has been implemented.
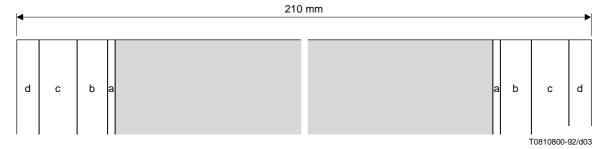
Annex A

Guaranteed reproducible area for Group 4 apparatus conforming to Recommendation T.563

NOTE 1 – The Call Identification Line is printed either on top or below the guaranteed reproducible area.

NOTE 2 – Paper characteristics (i.e. weight) are important parameters. Lightweight paper may cause additional paper handling errors and may result in a reduced guaranteed reproducible area.

NOTE 3 – Sheet feed mechanisms may reduce the guaranteed reproducible area.

NOTE 4 – All calculations were done using worst case values. Using nominal values increases the reproducible area.

NOTE 5 – The exact horizontal position of this area within the ISO A4 paper size as well as sizes larger than the above are subject to national recommendations and/or definitions.

Figure A.1/T.563 – Guaranteed reproducible area for Group 4 apparatus for use on facsimile services referring to ISO A4 paper size

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a Printer/scanner tolerances
b Loss caused by the enlarging effect due to TLL tolerance
c Loss caused by skew
d Record medium positioning errors

Figure A.2/T.563 – Horizontal loss

Table A.1/T.563 – Horizontal losses

Printer/Scanner	a	± 0.5 mm
Enlarging	b	± 2.1 mm
Skew	c	± 2.6 mm
Positioning errors	d	± 1.5 mm

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f Paper insertion loss
g Loss caused by CIL printing at the top of the page
h Loss caused by skew
i Scanning density tolerance
j Gripping loss

Figure A.3/T.563 – Vertical loss

Table A.2/T.563 – Vertical losses

Papel insertion	f	4.0 mm
CIL printing	g	4.23 mm
Skew	h	± 1.8 mm
Scan line tolerance (Note)	i	± 2.97 mm
Gripping loss	j	2.0 mm
NOTE – Scanning density tolerance will reduce to 0 mm on roll-fed machines.		

Annex B

Optional file transfer for Group 4

B.1   Introduction

This annex specifies the technical features of the file transfer for Group 4.

File transfer is an optional feature of Group 4 which permits to transmit any data file with or without additional information concerning the file to be transmitted.

The content of the data file itself may be of any kind of coding.

The file transfer applied to Group 4 equipments is based on Recommendation T.521.

From the point of view of service, file transfer is defined in Recommendation F.551 where alignment between different telematic applications (Group 3 and Group 4) is achieved.

B.2   Definitions

The definitions contained in this Recommendation and in Recommendation T.521 apply unless explicitly amended.

B.3   Normative references

In addition to this Recommendation and Recommendation T.521, this annex contains references to other ITU-T and ISO Standards:

[1]   CCITT Recommendation T.50 (1992), *International Reference Alphabet (IRA) (Formerly International Alphabet No. 5 or IA5) – Information technology – 7-bit coded character set for information interchange*.

[2]   CCITT Recommendation X.209 (1988), *Specification of basic encoding rules for Abstract Syntax Notation One (ASN.1)*.

[3]   ITU-T Recommendation T.434 (1996), *Binary file transfer format for the telematic services*.

[4]   ISO/IEC 9735:1988, *Electronic data interchange for administration, commerce and transport (EDIFACT) – Application level syntax rules*.

[5]   ITU-T Recommendation F.551 (1993), *Service Recommendation for telematic file transfer within telefax 3, telefax 4, teletex services and message handling services*.

[6]   CCITT Recommendation T.51 (1992), *Latin based coded characters sets for telematic services*.

[7]   ISO 8859-9:1989, *Information processing – 8 bit single-byte coded graphic character sets – Part 9: Latin Alphabet No. 5*.

B.4 Definition of the different file transfer modes

For the time being, four file transfer modes exist:

  – Basic Transfer Mode (BTM);

  – Document Transfer Mode (DTM);

  – Binary File Transfer (BFT);

  – EDIFACT Transfer (EDI).

For a comprehensive explanation, from the point of view of service, of the use of these four different file transfer modes, see Recommendation F.551 [5].

Additional file transfer modes besides these four modes may be issued in further versions of this Recommendation.

B.4.1   basic transfer mode (BTM): Basic transfer mode provides the user of a Group 4 equipment with a means to exchange files of any kind (binary files, word processor native format documents, bitmaps, etc.) without any additional information.

B.4.2   document transfer mode (DTM): Document transfer mode provides the user of a Group 4 equipment with a means to exchange files of any kind with additional information readable by the user and included in a file description.

The file description is a structured information regarding the file (e.g. file name, file type, file coding, etc.). On the receiving side, it can either be handled by automatic processing or read by the user.

The file description is transmitted ahead of the data file itself and concatenated with this latter.

B.4.3   binary file transfer (BFT): Binary file transfer provides the user of a Group 4 equipment with a means to exchange files of any kind with additional information included in a file description and automatically processed at the receiving side.

The file description is a structured document which contains information regarding the file (e.g. file name, contents types, etc.). It is mainly aimed to be automatically processed at the receiving side.

The coding rules which apply for the coding of the file description are technically aligned on those of FTAM (coding according to Recommendation X.209 [2]).

The file description is transmitted ahead of the data file itself and concatenated with this latter.

For technical description of the binary file transfer, see Recommendation T.434 [3].

B.4.4   EDIFACT transfer: EDIFACT transfer provides the user of a Group 4 equipment with a means to exchange EDIFACT files coded according to ISO/IEC 9735 [4] rules.

B.5 Coding of the file description

B.5.1 Basic Transfer Mode (BTM)

BTM mode does not require to transmit any additional information. Then, no file description exists. Only the file itself is sent.

B.5.2 Document Transfer Mode (DTM)

The character set which shall be used to code the file description is the primary set of graphic characters of Recommendation T.51 [6] plus character "SPACE" (this latter in position 2/0 of the table).

NOTE 1 – This set is exactly the same one as that of *International Reference Alphabet* (Recommendation T.50 [I]) and that of the left part of characters set ISO 8859-9 [7].

Coding of the file description sent by a Group 4 equipment.

For details of the utility of the different fields of the file description listed below, see Recommendation F.551 [5].

CR FF 6.1   :ADDITIONAL INFORMATION:

CR LF 1   :FILE NAME:

CR LF   [file name]   (72 characters maximum)

CR LF 2   :APPLICATION REFERENCE:

CR LF   [application reference]   (72 characters maximum)

CR LF 3   :TYPE:

CR LF   [coding]   (72 characters maximum)

CR LF 4   :ENVIRONMENT:

CR LF 4.1   :MACHINE:

CR LF   [machine]   (72 characters maximum)

CR LF 4.2   :OPERATING SYSTEM:

CR LF   [operating system]   (72 characters maximum)

CR LF 4.3   :PROGRAM:

CR LF   [program]   (72 characters maximum)

CR LF 4.4   :CHARACTER SET:

CR LF   [machine character set]   (72 characters maximum)

CR LF 5   :LAST REVISION:

CR LF   [last revision]   (72 characters maximum)

CR LF 6   :LENGTH:

CR LF   [file length]   (72 characters maximum)

CR LF 7   :PATH:

CR LF   [path name]   (72 characters maximum)

CR LF 8   :RESERVED:

CR LF   [reserved]   (72 characters maximum)

CR LF 9   :AUTHOR'S NAME:

CR LF   [author's name]   (72 characters maximum)

CR LF 10   :USER VISIBLE STRING:

CR LF   [user visible string]   (72 characters maximum)

CR LF 11   :FUTURE FILE LENGTH:

CR LF   [future file length]   (72 characters maximum)

CR LF 12   :STRUCTURE:

CR LF   [structure]   (72 characters maximum)

CR LF 13   :PERMITTED ACTIONS:

CR LF   [permitted actions]   (72 characters maximum)

CR LF 14   :LEGAL QUALIFICATIONS:

CR LF   [legal qualification]   (72 characters maximum)

CR LF 15   :CREATION:

CR LF   [date and time of creation]   (72 characters maximum)

CR LF 16   :LAST READ ACCESS:

CR LF   [last read access]   (72 characters maximum)

CR LF 17   :IDENTITY OF THE LAST MODIFIER:

CR LF   [identity of the last modifier]   (72 characters maximum)

CR LF 18   :IDENTITY OF THE LAST READER:

CR LF   [identity of the last reader]   (72 characters maximum)

CR LF 19	:RECIPIENT:		
CR LF		[recipient]	(72 characters maximum)
CR LF 20	:TFT VERSION:		
CR LF		[TFT version]	(72 characters maximum)
CR LF 21	:COMPRESSED:		
CR LF		[compression]	(72 characters maximum)
CR LF			
CR LF			

NOTE 2 – When only one [ ] is used, this element is included in one line. When [[ ]] is used, this element can be included in several lines.

NOTE 3 – Further additional information fields may be added in next versions of Annex B. An equipment shall not be disturbed by unknown fields.

NOTE 4 – The file description must contain at least the following information:

CR LF 6.1	:ADDITIONAL INFORMATION:		
CR LF 1	:FILE NAME:		
CR LF		[file name]	(72 characters maximum)
CR LF			
CR LF			

B.5.3   Binary File Transfer (BFT)

The structure of the additional information to be transmitted is described in Recommendation T.434 [3].

B.5.4   EDIFACT transfer

To transfer EDIFACT files, there is no need for a file description.

The structure of the information to be transmitted is described in the ISO/IEC 9735 specification [4].

B.6   Protocol aspects – ASN.1 definition of user data conveyed by session PDU

Abstract syntax definition of user data conveyed by session PDU applicable to Group 4 and encoding examples are described in this subclause. Each ASN.1 definition is composed of the Group 4 related parts which are defined in T.400-Series and T.500-Series Recommendations.

B.6.1   User data conveyed by SUD in CSS/RSSP

APDU	**:: = CHOICE {**	*-- see 8.2/T.433*
	[4] IMPLICIT ApplicationCapabilities }	

ApplicationCapabilities	**:: = SET {**	*-- see 8.2/T.433*
documentApplicationProfile	**[0] IMPLICIT OCTET STRING,**	
	-- '0206'H document application profile T.503 + File transfer function	
documentArchitectureClass	**[1] IMPLICIT OCTET STRING**	
	-- FDA'00'H -- }	

Example

    A4 07   ApplicationCapabilities
       80 02 02 06   documentApplicationProfile = T.503 + File transfer function
       81 01 00   documentArchitectureClass = FDA

B.6.2   User data conveyed by SUD in CDCL/RDCLP

APDU	**:: = CHOICE {**	*-- see 8.2/T.433*
	[4] IMPLICIT ApplicationCapabilities }	

```
ApplicationCapabilities              :: = SET {                                    -- see 8.2/T.433
    documentApplicationProfile           [0] IMPLICIT OCTET STRING,
                                             -- '0206'H document application profile T.503 File transfer function
    documentArchitectureClass            [1] IMPLICIT OCTET STRING,
                                             -- '00'H FDA
    nonBasicDocCharacteristics           [2] IMPLICIT NonBasicDocCharacteristics OPTIONAL,
    nonBasicStrucCharacteristics         [3] IMPLICIT NonBasicStrucCharacteristics OPTIONAL,
    filetransferCapabilities             [10] IMPLICIT SET OF FileTransferCapabilities OPTIONAL,
    privateCapabilities                  [11] IMPLICIT OCTET STRING OPTIONAL }

NonBasicDocCharacteristics           :: = SET {                                    -- see 5.6/T.415
    page-dimensions                      [2] IMPLICIT SET OF Dimension-pair OPTIONAL,
    ra-gr-coding-attributes              [3] IMPLICIT SET OF Ra-Gr-Coding-Attribute OPTIONAL,
    ra-gr-presentation-features          [4] IMPLICIT SET OF Ra-Gr-Presentation-Feature OPTIONAL }

FileTransferCapabilities             :: = INTEGER {
    bftCapabilities                      (0) ,
    transparentDataCapabilities          (1) ,
    dtmCapabilities                      (2) ,
    ediCapabilities                      (3) }

Dimension-pair                       :: = SEQUENCE {                               -- see 5.8/T.415
    horizontal                           [0] IMPLICIT INTEGER,
    vertical                             CHOICE {
        fixed                                [0] IMPLICIT INTEGER,
        variable                             [1] IMPLICIT INTEGER }}
                                             -- North American Letter      = (10 200, 13 200 fixed or variable)
                                             -- ISO B4                     = (11 811, 16 677 fixed or variable)
                                             -- ISO A3                     = (14 030, 19 840 fixed or variable)
                                             -- Japanese Legal             = (12 141, 17 196 fixed or variable)
                                             -- Japanese Letter            = (8598, 12 141 fixed or variable)
                                             -- North American Legal       = (10 200, 16 800 fixed or variable)
                                             -- North American Ledger      = (13 200, 20 400 fixed or variable)
                                             -- ISO A4                     = (9920, 14 030 fixed or variable)
                                     -- default value is ISO A4           = (9920, 14 030 fixed)
                                     -- basic value is ISO A4             = (9920, 14 030 fixed or variable)

Ra-Gr-Coding-Attribute               :: = CHOICE {                                 -- see 8.4/T.417
    compression                          [0] IMPLICIT Compression }

Compression                          :: = INTEGER  { uncompressed (0),             -- see 8.3/T.417
                                                     compressed (1) }
                                     -- default and basic value is compressed (1)

Ra-Gr-Presentation-Feature           :: = CHOICE  {                                -- see 8.4/T.417
    pel-transmission-density             [11] IMPLICIT Pel-Transmission-Density }

Pel-Transmission-Density             :: = INTEGER     {                            -- see 8.2/T.417
                                         p6 (1),  -- 6 BMU (200 pels/25.4 mm)
                                         p5 (2),  -- 5 BMU (240 pels/25.4 mm)
                                         p4 (3),  -- 4 BMU (300 pels/25.4 mm)
                                         p3 (4),  -- 3 BMU (400 pels/25.4 mm)  -- }
                                     -- default and basic value is p6 (1)
```

Example
```
    A4 0F          ApplicationCapabilities
        80 01 02 06          documentApplicationProfile = T.503 + File transfer function
        81 01 00             documentArchitectureClass = FDA
        AA 06                fileTransferCapabilities
                02 01 00          bftCapabilities
                02 01 02          dtmCapabilities
```

B.6.3   User data conveyed by SUD in CDS

```
S-ACTIVITY-START-user-data           :: = CHOICE {                                 -- see 7.2.4.1.4/T.433
                                         [4] IMPLICIT DocumentCharacteristics }
```

DocumentsCharacteristics	:: = SET {	-- *see 7.2.4.1.4/T.433*

```
DocumentsCharacteristics              :: = SET {                        -- see 7.2.4.1.4/T.433
        documentApplicationProfile        [0] IMPLICIT OCTET STRING,
                                              -- '06'H File transfer function
        documentArchitectureClass         [1] IMPLICIT OCTET STRING,
                                              -- '00'H FDA
        fileTransferCapabilities          [10] IMPLICIT FileTransferCapabilities OPTIONAL
                                              -- see B.6.2
                                          }
```

Example

```
    A4 0B          DocumentCharacteristics
        80 01 06              File transfer function
        81 01 00              documentArchitectureClass = FDA
        AA 03                 fileTransferCapabilities
            02 01 02              dtmCapabilities
```

B.6.4 Layout Object Descriptor (document layout root) conveyed by CSUI/CDUI in case of file transfer

This is not used for file transfer function.

B.6.5 Layout Object Descriptor (page) conveyed by CSUI/CDUI in case of file transfer

This is not used for file transfer function.

B.6.6 Data conveyed by CSUI/CDUI in case of file transfer

The segmented data of the file will be conveyed by means of CSUI/CDUI.

B.7 Communication concepts

B.7.1 General

A Group 4 facsimile may negotiate the capability to use the document application profile and the document architecture class within a session. This negotiation is accomplished with the CSS/RSSP and CDCL/RDCLP exchanges during the session establishment phase. However, only one type of document may be invoked at any given time during the document transfer phase. The negotiation and invocation are described below.

B.7.2 Negotiation

The application capabilities are negotiated as follows:

For CSS and RSSP, the application capabilities indicated within the Session User Data (SUD) parameter shall only indicate which document application profile(s) and document architecture class(es) are available as receiving capabilities of the sender of the command/response.

For CDCL, the application capabilities indicated within the SUD should include a list of non-basic document characteristics that may be needed at the receiver by the sender of this command.

For RDCLP, the non-basic document characteristics available should be indicated. The non-basic document characteristics are conveyed in the SUD, using the application capabilities protocol element.

B.7.3 Invocation

For CDS/CDC, the document characteristics indicated within the SUD should include the non-basic document characteristics or additional capabilities (e.g. file transfer) which are required for the document. The non-basic document characteristics or the additional capabilities are conveyed in the SUD, using the document characteristics protocol element. The document sender only sends documents or files which the sink has indicated it is capable of handling.

B.7.4 Data transfer

For file transfer, the document information is divided into segments such that the segment boundaries coincide with the minor synchronization points. Each segment consists of the divided data, the size of which is indicated by user.

Appendix I

Implementation Guide of Group 4 facsimile

This appendix is a summary of Group 4 facsimile related parts of T.400- and T.500-Series Recommendations as an implementation guide. This appendix is composed of the following subclauses:

1)   Document architecture;

2)   ASN.1 definition of user data conveyed by session PDU;

3)   Communication concepts.
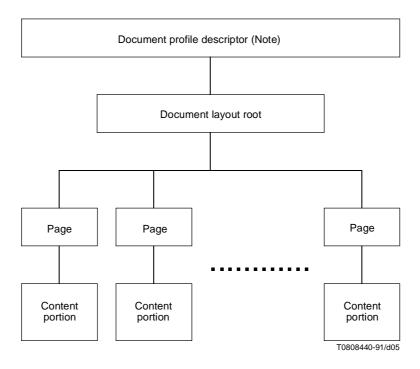
The references to T.400- and T.500-Series Recommendations are based on the *Blue Book* (1988).

I.1   Document architecture

Among document constituents defined by T.410-Series Recommendations (ODA/ODIF), four constituents are applied to Group 4, facsimile document. Figure I.1 illustrates the hierarchical structure of the Group 4 document.

I.2   ASN.1 definition of user data conveyed by session PDU

Abstract syntax definition of user data conveyed by session PDU applicable to Group 4 facsimile and encoding examples are described in this subclause. Each ASN.1 definition is composed of the Group 4 facsimile related parts which are defined in T.400- and T.500-Series Recommendations.

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NOTE – Document profile descriptor is not transmitted using session PDU.
The responding DTAM-PM may re-generate the document profile descriptor
based on the user data conveyed by SUD in CDS.

Figure I.1/T.563

I.2.1 User data conveyed by SUD in CSS/RSSP

APDU	**::=CHOICE {**	*-- see 8.2/T.433*
	[4] IMPLICIT ApplicationCapabilities }	

ApplicationCapabilities	**::=SET {**	*-- see 8.2/T.433*
documentApplicationProfile	**[0] IMPLICIT OCTET STRING,**	
	-- '02'H document application profile T.503	
documentArchitectureClass	**[1] IMPLICIT OCTET STRING,**	
	-- '00'H FDA --}	

Example

```
A4 06           ApplicationCapabilities
   80 01 02               documentApplicationProfile = T.503
   81 01 00               documentArchitectureClass = FDA
```

I.2.2 User data conveyed by SUD in CDCL/RDCLP

APDU	**::=CHOICE {**	*-- see 8.2/T.433*
	[4] IMPLICIT ApplicationCapabilities }	

ApplicationCapabilities	**::=SET {**	*– see 8.2/T.433*
documentApplicationProfile	**[0] IMPLICIT OCTET STRING,**	
	-- '02'H document application profile T.503	
documentArchitectureClass	**[1] IMPLICIT OCTET STRING,**	
	-- '00'H FDA	
nonBasicDocCharacteristics	**[2] IMPLICIT NonBasicDocCharacteristics OPTIONAL }**	

NonBasicDocCharacteristics	**::= SET {**	*-- see 5.6/T.415*
page-dimensions	**[2] IMPLICIT SET OF Dimension-pair OPTIONAL,**	
ra-gr-coding-attributes	**[3] IMPLICIT SET OF Ra-Gr-Coding-Attribute OPTIONAL,**	
ra-gr-presentation-features	**[4] IMPLICIT SET OF Ra-Gr-Presentation-Feature OPTIONAL }**	

Dimension-pair	**::= SEQUENCE {**	*-- see 5.8/T.415*
horizontal	**[0] IMPLICIT INTEGER,**	
vertical	**CHOICE {**	
fixed	**[0] IMPLICIT INTEGER,**	
variable	**[1] IMPLICIT INTEGER } }**	
	-- North American Letter	*= {10 200, 13 200 fixed or variable}*
	-- ISO B4	*= {11 811, 16 677 fixed or variable}*
	-- ISO A3	*= {14 030, 19 840 fixed or variable}*
	-- Japanese Legal	*= {12 141, 17 196 fixed or variable}*
	-- Japanese Letter	*= {8598, 12 141 fixed or variable}*
	-- North American Legal	*= {10 200, 16 800 fixed or variable}*
	-- North American Ledger	*= {13 200, 20 400 fixed or variable}*
	-- ISO A4	*= {9920, 14 030 fixed or variable}*
-- default value is ISO A4		*= {9920, 14 030 fixed}*
-- basic value is ISO A4		*= {9920, 14 030 fixed or variable}*

Ra-Gr-Coding-Attribute	**::= CHOICE {**	*-- see 8.4/T.417*
compression	**[0] IMPLICIT Compression }**	

Compression	**::= INTEGER {uncompressed (0),**	*-- see 8.3/T.417*
	compressed (1) }	
-- default and basic value is compressed (1)		

Ra-Gr-Presentation-Feature	**::= CHOICE {**	*-- see 8.4/T.417*
pel-transmission-density	**[11] IMPLICIT Pel-Transmission-Density }**	

Pel-Transmission-Density	**::= INTEGER {**	*-- see 8.2/T.417*
	p6 (1), *-- 6 BMU (200 pels/25.4 mm)*	
	p5 (2), *-- 5 BMU (240 pels/25.4 mm)*	
	p4 (3), *-- 4 BMU (300 pels/25.4 mm)*	
	p3 (4), *-- 3 BMU (400 pels/25.4 mm) -- }*	
-- default and basic value is p6 (1)		

Example

```
A4 35         ApplicationCapabilities
    80 01 02          documentApplicationProfile = T.503
    81 01 00          documentArchitectureClass = FDA
    A2 2D             nonBasicDocCharacteristics
        A2 1E              page-dimensions
        30 08                 SEQUENCE
            80 02 2F6D            horizontal = 12141 BMU
            80 02 432C            vertical = variable 17196 BMU (Japanese Legal)
        30 08                 SEQUENCE
            80 02 36 CE          horizontal = 14030 BMU
            81 02 4D80           vertical = variable 19840 BMU (ISO A3 variable)
        30 08                 SEQUENCE
            80 02 2E23           horizontal = 11811 BMU
            81 02 4125           vertical = variable 16677 BMU (ISO B4 variable)
        A3 03              ra-gr-coding-attributes
            80 01 00             compression = 0 (uncompressed)
        A4 06              ra-gr-presentation-features
            8B 01 03             pel-transmission-density = 3 (4 BMU)
            8B 01 04             pel-transmission-density = 4 (3 BMU)
```

I.2.3   User data conveyed by SUD in CDS

S-ACTIVITY-START-user-data	**::= CHOICE {**	*-- see 7.2.4.1.4/T.433*
	[4] IMPLICIT DocumentCharacteristics }	
DocumentCharacteristics	**::=SET {**	*-- see 7.2.4.1.4/T.433*
documentApplicationProfile	**[0] IMPLICIT OCTET STRING,**	
	-- '02'H document application profile T.503	
documentArchitectureClass	**[1] IMPLICIT OCTET STRING,**	
	-- '00'H FDA	
nonBasicDocCharacteristics	**[2] IMPLICIT NonBasicDocCharacteristics OPTIONAL**	
	-- see I.2.2 -- }	

Example

```
A4 26         DocumentCharacteristics
    80 01 02          documentApplicationProfile = T.503
    81 01 00          documentArchitectureClass = FDA
    A2 1E             nonBasicDocCharacteristics
        A2 14              page-dimensions
        30 08                 SEQUENCE
            80 02 2F6D            horizontal = 12141 BMU
            80 02 432C            vertical = variable 17196 BMU (Japanese Legal variable)
        30 08                 SEQUENCE
            80 02 36 CE          horizontal = 14030 BMU
            81 02 4D80           vertical = variable 19840 BMU (ISO A3 variable)
        A4 06              ra-gr-presentation-features
            8B 01 03             pel-transmission-density = 3 (4 BMU)
            8B 01 04             pel-transmission-density = 4 (3 BMU)
```

I.2.4   Layout Object Descriptor (document layout root) conveyed by CSUI/CDUI

Interchange-Data-Element	**::= CHOICE {**	*-- see 5.5/T.415*
layout-object	**[2] IMPLICIT Layout-Object-Descriptor }**	
Layout-Object-Descriptor	**::= SEQUENCE {**	*-- see 5.8/T.415*
object-type	**Layout-Object-Type,**	
descriptor-body	**Layout-Object-Descriptor-Body OPTIONAL }**	
Layout-Object-Type	**::= INTEGER { document-layout-root (0) }**	*-- see 5.8/T.415*

Layout-Object-Descriptor-Body	::= **SET {**	*-- see 5.8/T.415*
object-identifier	**Object-or-Class-Identifier OPTIONAL,**	
subordinates	**[0] IMPLICIT SEQUENCE OF NumericString OPTIONAL,**	
default-value-lists	**[7] IMPLICIT Default-Value-Lists-Layout OPTIONAL }**	

Object-or-Class-Identifier ::= **[APPLICATION 1] IMPLICIT PrintableString** *-- see 5.7/T.415*
-- only digits and space are used in the present version
-- of the standard; other characters are reserved for extensions;
-- a "null" value is represented by empty string.

Default-Value-Lists-Layout	::= **SET {**	*-- see 5.11/T.415*
page-attributes	**[2] IMPLICIT Page-Attributes OPTIONAL }**	

Page-Attributes	::= **SET {**	*-- see 5.11/T.415*
dimensions	**< Attributes OPTIONAL,**	
presentation-attributes	**< Attributes OPTIONAL }**	

Attributes	::= **CHOICE {**	
dimensions	**[1] IMPLICIT Dimension-Pair,**	
	-- see I.2.2	
presentation-attributes	**[3] IMPLICIT Presentation-Attributes**	
	-- see I.2.5 -- }	

Example

     A2 03   Layout-Object-Descriptor
         01 01 00   INTEGER = document-layout-root

I.2.5   Layout Object Descriptor (page) conveyed by CSUI/CDUI

Interchange-Data-Element	::= **CHOICE {**	*-- see 5.5/T.415*
layout-object	**[2] IMPLICIT Layout-Object-Descriptor }**	

Layout-Object-Descriptor	::= **SEQUENCE {**	*-- see 5.8/T.415*
object-type	**Layout-Object-Type,**	
descriptor-body	**Layout-Object-Descriptor-Body OPTIONAL }**	

Layout-Object-Type ::= **INTEGER {page (2) }** *-- see 5.8/T.415*

Layout-Object-Descriptor-Body	::= **SET {**	*-- see 5.8/T.415*
object-identifier	**Object-or-Class-Identifier OPTIONAL,**	
content-portions	**[1] IMPLICIT SEQUENCE OF NumericString OPTIONAL,**	
dimensions	**[4] IMPLICIT Dimension-Pair OPTIONAL,**	
	-- see I.2.2	
presentation-attributes	**[6] IMPLICIT Presentation-Attributes OPTIONAL }**	

Object-or-Class-Identifier ::= **[APPLICATION 1] IMPLICIT PrintableString**
-- see I.2.4

Presentation-Attributes	::= **SET {**	*-- see 5.10/T.415*
content-type	**Content-Type OPTIONAL,**	
raster-graphics-attributes	**[1] IMPLICIT Raster-Graphics-Attributes OPTIONAL }**	

Content-Type ::= **[APPLICATION 2] IMPLICIT INTEGER** *-- see 5.10/T.415*
                                    {formatted-raster-graphics (1) }

Raster-Graphics-Attributes	::= **SET {**	*-- see 8.2/T.417*
pel-path	**[0] IMPLICIT One-of-Four-Angles OPTIONAL,**	
line-progression	**[1] IMPLICIT One-of-Two-Angles OPTIONAL,**	
pel-transmission-density	**[2] IMPLICIT Pel-Transmission-Density OPTIONAL }**	
	-- see I.2.2	

One-of-Four-Angles ::= **INTEGER { d0 (0) -- 0 -- }** *-- see 8.2/T.417*
-- default and basic value is d0 (0)

One-of-Two-Angles ::= **INTEGER { d270 (3) -- 270 -- }** *-- see 8.2/T.417*
-- default and basic value is d270 (3)

Example 1

     A2 03   Layout-Object-Descriptor
         02 01 02   INTEGER = page
                    -- This means ISO A4 fixed and 200 pels/25.4 mm

Example 2

```
A2 16        Layout-Object-Descriptor
  02 01 02        INTEGER = page
  31 11           SET
    A4 08              dimensions
      80 02 26CO       horizontal = 9920 BMU
      81 02 36CE       vertical = 14030BMU (ISO A4 variable)
    A6 05          presentation-attributes
      A1 03          raster-graphics-attributes
        82 01 04         pel-transmission-density = 400pels/25.4mm
```

I.2.6   Content Portion conveyed by CSUI/CDUI

Interchange-Data-Element	**::= CHOICE {**	*-- see 5.5/T.415*
content-portion	**[3] IMPLICIT Text-Unit }**	
Text-Unit	**::= SEQUENCE {**	*-- see 5.12/T.415*
content-portion-attributes	**Content-Portion-Attributes OPTIONAL,**	
content-information	**Content-Information }**	
Content-Portion-Attributes	**::= SET {**	*-- see 5.12/T.415*
content-identifier-layout	**Content-Portion-Identifier OPTIONAL,**	
type-of-coding	**Type-of-coding OPTIONAL,**	
coding-attributes	**CHOICE {**	
raster-gr-coding-attributes	**[2] IMPLICIT Raster-Gr-Coding-Attributes} OPTIONAL }**	
Content-Portion-Identifier	**::= [APPLICATION 0] IMPLICIT PrintableString**	*-- see 5.7/T.415*
	-- only digits and space are used in the present version	
	-- of the Recommendation; other characters are reserved for extensions	
Type-of-Coding	**::= CHOICE {**	*-- see 5.12/T.415*
	[0] IMPLICIT INTEGER { t6 (1) }	
	-- default and basic value is t.6 (1) -- }	
Raster-Gr-Coding-Attributes	**::= SET {**	*-- see 8.3/T.417*
number-of-pels-per-line	**[0] IMPLICIT INTEGER OPTIONAL,**	
	-- see Table 3	
compression	**[2] IMPLICIT Compression OPTIONAL,**	
	-- see I.2.2	
number-of-discarded-pels	**[3] IMPLICIT INTEGER OPTIONAL**	
	-- see Table 3 -- }	
Content-Information	**::= OCTET STRING**	
	-- basic value is t.6 string	

Example 1

```
A3 LI      Text-Unit
  04 LI      XXXXXXXXXX(t.6 string)XXXXXXXXXX          OCTET STRING (primitive)
```

Example 2

```
A3 80        Text-Unit
  31 0A            content-portion-attributes
    A2 08               coding-attributes
      80 02 0800        number-of-pels-per-line = 2048
      83 02 000C        number-of-discarded-pels = 12
  24 80          OCTET STRING (constructed)
    04 LI      XXXXXXXXX(t.6 string)XXXXXXXXX    OCTET STRING (primitive)
    04 LI      XXXXXXXXX(t.6 string)XXXXXXXXX    OCTET STRING (primitive)
    0000          EOC
  0000        EOC
```

I.3 Communication concepts

I.3.1 General

A group facsimile may negotiate the capability to use the document application profile and the document architecture class within a session. This negotiation is accomplished with the CSS/RSSP and CDCL/RDCLP exchanges during the session establishment phase. However, only one type of document may be invoked at any given time during the document transfer phase. The negotiation and invocation are described below.

I.3.2 Negotiation

The application capabilities are negotiated as follows:

- For CSS and RSSP, the application capabilities indicated within the Session User Data (SUD) parameter shall only indicate which document application profile(s) and document architecture class(es) are available as receiving capabilities of the sender of the command/response.

- For CDCL, the application capabilities indicated within the SUD should include a list of non-basic document characteristics that may be needed at the receiver by the sender of this command.

- For RDCLP, the non-basic document characteristics available should be indicated. The non-basic document characteristics are conveyed in the SUD using the application capabilities protocol element.

I.3.3 Invocation

For CDS/CDC, the document characteristics indicated within the SUD should include the non-basic document characteristics which are required for the document. The non-basic document characteristics are conveyed in the SUD, using the document characteristics protocol element. The document sender only sends documents which the sink has indicated it is capable of handling.

I.3.4 Data transfer

The layout object descriptors and the text units are carried inside the session service data units (CSUI-CDUI T.62 commands). Within the data stream, the interchange data elements are ordered in accordance with "interchange format class B", as defined in Recommendation T.415. Every text unit follows immediately the descriptor of the associated lowest-level object.

When a document is transmitted, a synchronization point is set at each page boundary of the specific structure.

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