```
D(64)   _ I.431, I.440, I.441   _ B(64) _ I.431,     _
        _ I.450, I.451 (Note 3) _       _ U.202      _   FS
        _                       _       _ (Note 4)   _
————————+————————————————————————+————————+————————————+————————
Packet mode                     _       _          _
                                _       _          _
D(16)   _        "     (Note 1) _ D(16) _    FS      _   FS
————————+————————————————————————+————————+————————————+————————
```

Note 2 - Definition of protocols for OAM are FFS.

Note 3 - Layer 2 and 3 protocols are FFS.

Note 4 - Others are FFS.

8.Dynamic description

For further study.

This Recommendation does not cover charging principles. Future Recommendations in the D-Series are expected to contain that information. It shall be possible to charge the subscriber accurately for the service.

5.Interworking requirements

For further study.

6.Interaction with supplementary services

For further study.

7.Attributes/values

7.1a) Low layer attributes

Information transfer attributes

1.Information transfer mode: circuit; packet is FFS (Note 1)
2. Information transfer rate: 64 kbit/s
3. Information transfer capabilitiy: unrestricted
4. Structure: 8 kHz integrity
5. Establishment of communication: reserved/permanent
6. Communication configuration: point-to-point
7. Symmetry: bidirectional

Access attributes

8. Access channel: B/user information, D/signalling, D/telex user information is FFS (Note 1)
9.1 Signalling a.p. layer 1: I.430/I.431
9.2 Signalling a.p. layer 2: U.202
9.3 Signalling a.p. layer 3: U.202
9.4 Information a.p. layer 1: I.430/I.431
9.5 Information a.p. layer 2: U.202
9.6 Information a.p. layer 3: FS

b) High layer attributes

10. Type of user information: Telex
11. Layer 4 protocol: - -
12. Layer 5 protocol: - -
13. Layer 6 protocol: - -
14. Layer 7 protocol: - -

c) General attributes

c) General attributes: FS

Note 1 - The use of packet mode is for further study.

Note 2 - The use of the D Channel for Videotex information is for further study.

7.2 Videotex supported by an ISDN

In the following table the recommended overall support, and recommended support for the variations of the non-dominant attributes are given. The definition of E (Essential) and A (Additional) can be found in Recommendation I.240.

a) Overall support: A

b) Variations of non-dominant attributes:

b.1) Information transfer mode _ Support

circuit	user terminal-to-Videotex centre	A
	videotex centre to Videotex centre,	A
	external computer	
packet	Videotex centre to Videotex centre,	A
	external computer	

b.2) Establishment of communication _ Symmetry _ Communication configuration _ Support

demand permanent (Note 3)	bidirectional symmetric	pt-pt	E
demand permanent (Note 3)	bidirectional symmetric	multipoint (Note 3)	A

b.3) Access:

Signalling & OAM (Note 4) Channel & rate	Protocols	User information Channel & rate	Protocols	Support
Circuit mode				

D(64)	I.431, I.440, I.441, I.450, I.451, X.31	B(64)	I.431, ... FS
VC in B(64)	FS	B(64)	FS FS

Note 4 - Definition of protocols for OAM are FFS.

Note 5 - Demand services only. Others are FFS.

8.Dynamic description

The circuit mode dynamic description appears in Recommendation I.220.

I.241.5Videotex

The prose description for the Videotex service in ISDN is for further study and is intended to be based on Recommendation F.300.

1.Definition

The Videotex service in the ISDN is an enhancement of the existing Videotex service with retrieval and mailbox functions for text (alpha) and graphic information.

2.Description

For further study.

3.Procedures

For further study.

4.Network capabilities for charging

This Recommendation does not cover charging principles. Future Recommendations in the D-Series are expected to contain that information. It shall be possible to charge the subscriber accurately for the service.

5.Interworking requirements

For further study.

9.3 Signalling access protocol layer 3:	I.450/I.451	I.450/I.451, X.31
9.4 Information access protocol layer 1:	I.430/I.431	I.430/I.431
9.5 Information access protocol layer 2:	X.75 (SLP)	X.25 LAP B
9.6 Information access protocol layer 3:	ISO 8208	X.25 (PLP)

b) High layer attributes

10.	Type of user info:	Mixed mode
11.	Layer 4 protocol:	X.224, X.214
12.	Layer 5 protocol:	X.225, X.215
13.	Layer 6 protocol:	T.61, X.226, X.216 X.226, X.216
13.1	Resolution [ppi]:	300 x 300 240 x 240 400 x 400 optional, 600, 1200
14.	Layer 7 protocol:	T.501, T.522, T.561

c) General attributes

15. Supplementary services provided: FS
16. Quality of service: FS
17. Interworking possibilities: ISDN Teletex, ISDN Telefax 4;
    others: FS
18. Operational and commercial: FS

Note 1 - User information transferred via virtual channel on the D Channel is forfurther study.

Note 2 - The interworking arrangements with networks having restricted 64 kbit/s information transfer capability require further study.

Note 3 - Even if no structure is required the network may provide 8 kHz integrity.

7.2Mixed mode supported by an ISDN

The circuit mode dynamic description appears in Recommendation I.220.

I.241.4Mixed mode

The prose definition of the mixed mode service is an extract of Recommendation F.230.

1.Definition

This service provides combined text and facsimile communication for end-to-end transfer of documents containing mixed information of text and fixed images.The high layer attributes are based on the CCITT Recommendations for Teletex amd Telefax 4.

2.Description

For further study.

3.Procedures

For further study.

4.Network capabilities for charging

This Recommendation does not cover charging principles. Future Recommendations in the D-Series are expected to contain that information. It shall be possible to charge the subscriber accurately for the service.

5.Interworking requirements

For further study.

6.Interaction with supplementary services

For further study.

7.Attributes/values

7.1a) Low layer attributes

Information transfer attributes

	Circuit mode bearer capability	Packet mode bearer capability
1. Mode:	Circuit	Packet

10. Type of user info: Teletex
11. Layer 4 protocol: T.70
12. Layer 5 protocol: T.62
13. Layer 6 protocol: T.400-Series (Note 2)
13.1 Resolution [ppi]: 200 x 200 standard;
240 x 240, 300 x 300, 400 x 400 optional
14. Layer 7 protocol: T.503, 521, 563

c) General attributes

15. Supplementary services provided: see section 6/I.241.3
16. Quality of service: FS
17. Interworking possibilities: see section 5/I.241.3
18. Operational and commercial: FS

Note 1 - User information transferred via virtual channel on the D Channel is for further study.

Note 2 - Further study is required to identify a more precise reference in the T.400-Series of Recommendations.

Note 3 - The interworking arrangements with networks having restricted 64 kbit/s information transfer capability require further study.

Note 4 - Even if no structure is required the network may provide 8 kHz integrity.

7.2 Telefax 4 supported by an ISDN

In the following table the recommended overall support, and recommended support for the variations of the non-dominant attributes are given. The definition of E (Essential) and A (Additional) can be found in Recommendation I.240.

a) Overall support: A

b) Variations of non-dominant attributes:

b.1) Information transfer mode (Note 5)

	Support
circuit	A
packet	

b.2)

Establishment of communication	Symmetry	Communication configuration	Support
demand	bidirectional	pt-pt	E
	symmetric		

iii)User to User Signalling;

iv)Calling Line Identification Presentation;

v)Calling Line Identification Restriction;

vi)Connected Line Identification Presentation;

vii)Connected Line Identification Restriction;

viii)Direct Dialling In.

The use of other supplementary services is for further study. Supplementary services for Telefax 4 with packet mode of operation are for further study.

7.Attributes/values

7.1a) Low layer attributes

Information transfer attributes

	Circuit mode bearer capability	Packet mode bearer capability
1. Mode:	Circuit	Packet
2. Rate:	64 kbit/s	Maximum throughput of a given virtual circuit is less than or equal to the maximum bit rate of the user information access channel and the throughput class of the virtual circuit.
3. Info transfer cap:	Unrestricted (Note 3)	Unrestricted
4. Structure:	Unstructured (Note 4)	Service data unit integrity
5. Establishment:	Demand	Demand (VC), permanent (PVC)
6. Configuration:	Point-to-point	Point-to-point

apply. For international interworking between PSTN and ISDN, a (separate) Telefax 4 interworking unit may be necessary.

International routes between ISDNs for the Telefax 4 service shall be capable of supporting user data rates up to 64 kbit/s.

5.2Intercommunication with other services

5.2.1Intercommunication between basic mode and mixed mode Teletex terminals and Classes I, II and III Group 4 facsimile terminals connected to the Telefax 4 service is shown in Table 1/ I.241.3.

TABLE 1/I.241.3

Current status possible cases of direct intercommunication for Teletex and Group 4 facsimile terminals on the same network

From \ To	Facsimile Group 4 Class I	Facsimile Group 4 Class II	Facsimile Group 4 Class III	Teletex basic mode	Teletex mixed mode	Teletex proces-sable Mode 1
Facsimile Group 4 Class I	F	F	F			
Facsimile Group 4 Class II	F	F	F			
Facsimile Group 4 Class III	F	T, F, MM	T, F, MM	T	T, MM	T
Teletex basic mode	T	T	T	T	T	T

It is a requirement to allow the through-connection of a call between Group 4 facsimile terminals connected to a private automatic branch exchange (or similar systems) and those connected to public exchanges used for the Group 4 facsimile service.

Two-way alternate (TWA) communication is a capability of the Telefax 4 service, which also includes one-way communication (OWC); the calling subscriber will have full control of the Group 4 facsimile call.

3.3Call phases

The operations for each call may be divided into the following three phases:

a)preparation: preparation of the information to be transmitted;

b)transmission:

-call establishment (automatic);

-pre-information phase (see Note);

-information transfer (see Note);

-post information phase (see Note);

-call clearing.

Note - During these parts of the transmission phase the network must be transparent with respect to control procedures.

c)output: displaying the message either by immediate printing or from a storage medium upon control by the operator.

Note - The information may consist of one or more Telefax 4 documents each consisting of one or more Telefax pages.

The control procedures as specified in the Recommendations of the T.400-Series and T.62 shall be used as end-to-end communication procedures between terminals in the service.

The low layer protocols and the network independent basic transport protocol for Telefax 4 are specified in Recommendations T.70 and T.90.

The network dependent control procedures for the Telefax 4 service are those that are defined for ISDN.

3.4Call identification

		ISO 8208		
Packet mode				
D(16)	I.430, I.440, I.441, I.450, I.451, X.31	B(64) of D(16)	I.430, X.25 LAP B, X.25 (PLP)	A
D(64)	I.431, I.440, I.441, I.450, I.451, X.31	B(64)	I.431, X.25 LAP B, X.25 (PLP)	FS
VC in B(64)	FS	B(64)	FS	FS

Note 6 - In the interim period the circuit-mode method of operation is preferred.

Note 7 - Definition of protocols for OAM are FFS

Note 8 - Demand services only. Other are FFS.

8.Dynamic description

The circuit-mode dynamic description appears in Recommendation I.220.

I.241.3Telefax 4

The prose description of the Telefax 4 service is an extract of Recommendation F.184. If more detail is required this Recommendation should be referred to. As such this service is not strictly structured a wording to the substeps for Step 1.1 of the service description method. Further alignment with the substeps requires further study.

1.Definition

Telefax 4 is an international service enabling subscribers to exchange office correspondence in the form of documents containing facsimile coded information automatically via the ISDN.

2.Description

2.1General description

		restricted. Signalling may be provided via D and/or virtual circuit within B Channel.
9.1 Signalling access protocol layer 1:	I.430/I.431	I.430/I.431
9.2 Signalling access protocol layer 2:	I.440/I.441	I.440/I.441, X.31
9.3 Signalling access protocol layer 3:	I.450/I.451	I.450/I.451, X.31
9.4 Information access protocol layer 1:	I.430/I.431	I.430/I.431
9.5 Information access protocol layer 2:	X.75 (SLP)	X.25 LAP B
9.6 Information access protocol layer 3:	ISO 8208	X.25 (PLP)

Note 4 - The interworking arrangements with networks having restricted 64 kbit/s information transfer capability require further study.

Note 5 - Even if no structure is required the network may provide 8 kHz integrity.

b) High layer attributes

10. Type of user info: Teletex
11. Layer 4 protocol: T.70
12. Layer 5 protocol: T.62
13. Layer 6 protocol: T.61
14. Layer 7 protocol: T.60

c) General attributes

15. Supplementary services provided: See sub-section 6/I.241.2
16. Quality of service: FS

_mode	_	_	_	_	_	_	_
_Teletex _mixed _mode	_	_ T, MM	_ T, MM	_ T	_ T, MM	_ T	_
_Teletex _Proces- _sable _Mode 1	_	_ T	_ T	_ T	_ T	_ T, PM1	_

T:Basic Teletex document with character coded information only.
F:Group 4 Facsimile document with facsimile coded information only.
MM:Mixed-mode document with character and facsimile coded information.
PM1:Processable mode document with character coded information only.

6.Interaction with supplementary services

Each supplementary service description identifies the applicability with this teleservice.

For the ISDN, the international supplementary services which may be used for Teletex in the circuit mode using a B Channel:

i) Closed User Group;

ii) Multiple Subscriber Number;

iii) User-to-User Signalling;

iv) Calling Line Identification Presentation;

v) Calling Line Identification Restriction;

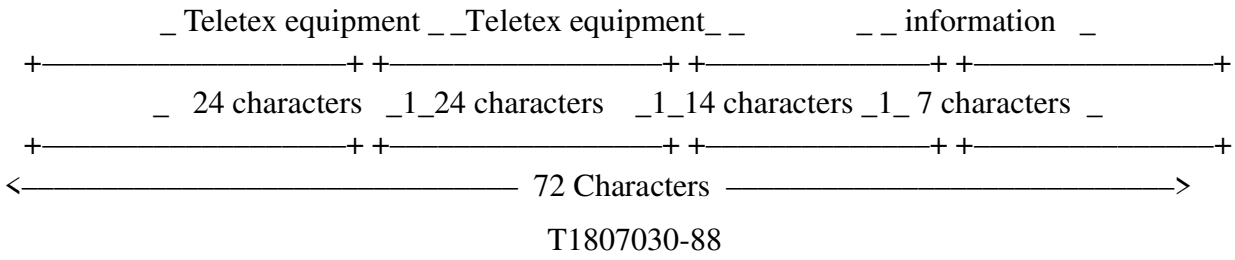
vi) Connected Line Identification Presentation;

vii) Connected Line Identification Restriction;

viii) Direct Dialling In;

The use of other supplementary services is for further study.

Supplementary Services for Teletex with packet mode of operation are for further study.



Field 1 - (identification of the called equipment) contains the identification of the called equipment. It is originated in the control procedures by the called equipment.

Field 2 - (identification of the calling equipment) contains the identification of the calling equipment. It is originated in the control procedures by the calling equipment.

Field 3 - (date and time) contains the date and time reference information showing the year, month, day, hour and minute in the fixed format of 14 characters thus YY-MM-DD-HH:MM. This field is originated in the control procedures by the calling equipment which obtains this information from the network. This time represents the local time at the calling equipment and is intended to represent the time of call origination.

Field 4 - (supplementary reference information) contains a document reference number, a hyphen (coding 2/13) as a separator and a page reference number as defined in Recommendation T.62. This field has a fixed length of seven character positions and is originated in the control procedures by the Teletex equipment that is sending the associated documents.

FIGURE 1/I.241.2

Format of the Call Identification Line

3.4Error protection

Within the Teletex service a high layer error detection and correction is provided in the session layer for all those errors which are not corrected by the network layers.

To ensure call integrity, error protection will be provided by Teletex control procedures (see Recommendations T.62, T.70 and T.90). The error rate on the pre-information, information and post-information phases should not exceed 1 in 10^6 characters.

4.Network capabilities for charging

This Recommendation does not cover charging principles. Future Recommendations in the D-Series are expected to contain that information. It shall be possible to charge the subscriber accurately for the service.

5.Interworking requirements

A virtual dialogue mode of operation, which appears to the subscriber as an interactive mode may become possible as a new standardized option within the Teletex service, both allowing communications between persons and data base access (refer to Recommendation I.210).

Processable mode of operation, as a standardized option within the Teletex service, allows the transfer of text containing information to permit convenient further editing and processing by the recipient (refer to Recommendation F.220).

Mixed mode of operation using the techniques of Telefax 4 for the transfer of facsimile-coded information and of Teletex for the transfer of character-codedtext is described as a standardized option within the Teletex service in Recommendation F.230.

Two-way alternate (TWA) communication is a capability of the Teletex service, which also includes one-way communication (OWC); the calling subscriber will have full control of the Teletex call.

3.Procedures

3.1Provision/withdrawal

The national and international facilities of the Teletex service, including the Teletex/telex conversion facilities, shall be open continuously.

Teletex subscriber equipment for which call numbers are published in the directories shall, in principle, be available to accept calls continuously.

In order to facilitate the twenty-four hour duration of the service it is permitted to use a centralized storage in the network to realize receiving memory capability of the terminal.

3.2Call phases

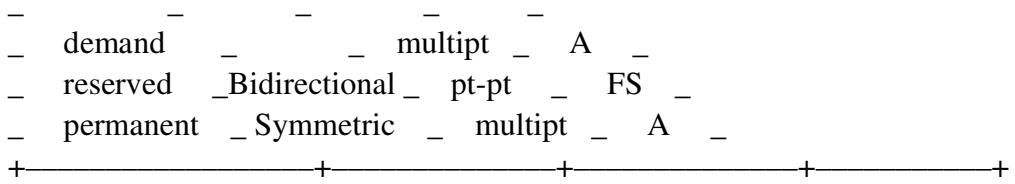
The operations for each call may be divided into the following three phases:

a) Preparation

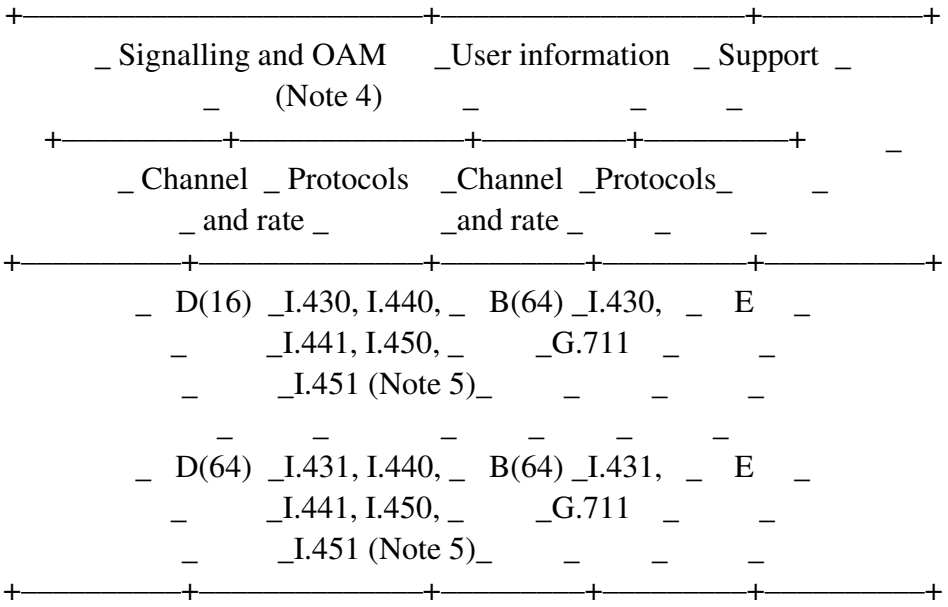
- preparation of the information in local mode;
- loading of the information into a memory,

b) Transmission (in principle, automatic)

- call establishment;
- pre-information phase (see note);
- information transfer from memory-to-memory (see note);



b3) Access:



Note 3 - It is anticipated that ISDNs offer telephony as a basic telecommunication service. Some networks will offer this as a teleservice. However, due to national regulation policies some networks will offer telephony as a bearer service rather than as a teleservice.

Note 4 - Definition of protocols for OAM are FFS.

Note 5 - Demand services only. Others are FFS.

8.Dynamic description

The circuit-mode dynamic description appears in Recommendation I.220.

I.241.2Teletex

The prose description of the Teletex service is an extract of Recommendation F.200. If more detail is required this Recommendation should be referred to. As such, this service description does not strictly follow the substeps for step 1.1 of the service description method. Further alignment with the substeps requires further study.

1.Definition

Teletex is an international service, enabling subscribers to exchange office correspondence in the

when a channel is busy with telephony.

2) User attempting to set up a call to a termination where the call is not accepted, i.e. no response indicating call acceptance is received, will after a defined period be given a call failure indication. (See Recommendations I.451 and I.220).

f) Failure situations due to network conditions

1) User attempting to set up a call but meeting problems in the network (e.g. congestion) will be given a suitable indication.

4.Network capabilities for charging

This Recommendation does not cover charging principles. Future Recommendations in the D-Series are expected to contain that information. It shall be possible to charge the subscriber accurately for the service.

5.Interworking requirements

5.1Interworking is required between the ISDN and PSTN.

6.Interaction with supplementary services

Not applicable. Each supplementary service description identifies the applicability with this teleservice.

7.Attributes/values

7.1a) Low layer attributes
Information transfer attributes

1. Information transfer mode: Circuit
2. Information transfer rate: 64 kbit/s
3. Information transfer capability: Speech
4. Structure: 8 kHz integrity
5. Establishment of communication: on demand
6. Communication configuration: Point-to-point
7. Symmetry: Bidirectional symmetric

Access attributes

Access channel (and rate): B(64) for user information, D for signalling (Note 2)

9.1 Signalling access protocol layer 1: I.430/I.431
9.4 Information access protocol layer 1: I.430/I.431; G.711
9.2 Signalling access protocol layer 2: I.440/I.441

quency response, quantizing distortion, etc. Overall requirements are given in the Recommendations in the P-Series.

b) Transmission delay

The maximum delay is that specified for the general telephone network (cf. Recommendation G.114). The permissible variation of the actual delay is for further study.

c) Retention Timer

This timer specifies the amount of time that the network retains the call information of the original call upon encountering busy or being released. This timer is a network provider option. The value for this timer is greater than 15 seconds.

3.Procedures

3.1Provision/withdrawal

3.1.1Provision of this service will be by pre-arrangement with the administration/RPOA.

3.1.2The teleservice is offered with several subscription options which apply separately to each ISDN number or group of ISDN numbers on the interface. For each subscription option, only one value can be selected. Subscription options for the interface are summarized below:

Subscription Option	Value
Maximum number of information channels available at user B	m, where m is not greater than the number of information channels on the interface
Maximum number of total calls present at user B	n, where n is not greater than the number of information channels on the interface

User B can be an ISDN number or group of ISDN numbers on the interface.
Note - More than one ISDN number can be associated with the service/interface only as a part of a supplementary service such as multiple subscriber number. In the case of one ISDN number, the option given above for the number of calls can only exceed the number of information channels in association with a supplementary service (e.g. call waiting). As a network provider option, separate values may be specified for incoming and for outgoing calls for either or both of the limits.

3.2Normal procedures

a) Originating the service (call set up)