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│                     Recommendation GSM 03.43                       │
│                                                                    │
│                 Technical Realization of Videotex                  │
│                                                                    │
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1. Reason for changes

No changes since the previously distributed version.

ETSI GSM

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Recommendation: GSM 03.43

Title: TECHNICAL REALIZATION OF VIDEOTEX

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0. SCOPE

This recommendation describes the technical realization of Videotex service within the GSM-PLMN network, taking into account the Teleservices 41, 42, 43 as specified in the Rec GSM 02.03.

It defines:

- the service and service elements

- the network architecture

- the reference configuration of the MS

- the signalling aspects

- the use of TAF

- the interworking with existing networks

- the support of roaming subscribers

- the access to foreign Videotex services

- the link layer protocol structure

1. SERVICE DEFINITION

The Videotex service is an interactive service that by means of proper access points and standardized procedures provide the access to computer-based information stored in data bases, utilizing public transmission networks.

The basic elements considered for the Videotex system are:

- the user terminal

- the telecomunication network

- the service access center (Videotex center)

- the data bases

The specific features that are relevant to the service are:

- a Videotex call is always a mobile-originated call

- it is an interactive service

- the requested information is generally in form of text and/or pictures.

- the information access is under the control of the user.

- there are three different types of service access profiles, depending on high layer attributes of the teleservice.

The teleservice attributes of the different Videotex access profiles are defined in Rec GSM 02.03, in term of:

- high layer capabilities

- terminal capabilities

- low layer capabilities

- general attributes

2. NETWORK ARCHITECTURE

The following network schemes are considered to operate the Videotex service in a GSM PLMN :

2.1. Videotex Centre Connected To PSTN/ISDN

When it is assumed that the Videotex centre is connected to the PSTN, the network scheme is shown in Fig 03.43/1a.

V.23

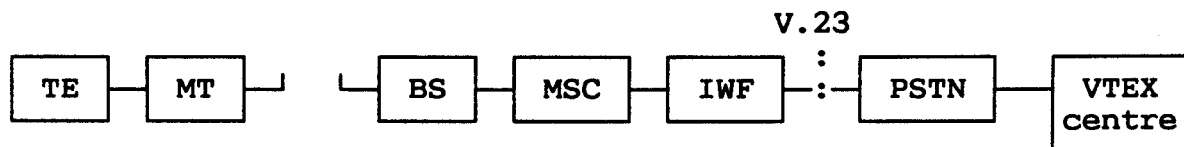| TE |—| MT |—┘ └—| BS |—| MSC |—| IWF |—:—| PSTN |—| VTEX centre |

Fig. 03.43/1a

Access to the Videotex Centre directly connected to the ISDN is for national matter; a possible network scheme is reportted in Fig.03.43/1b
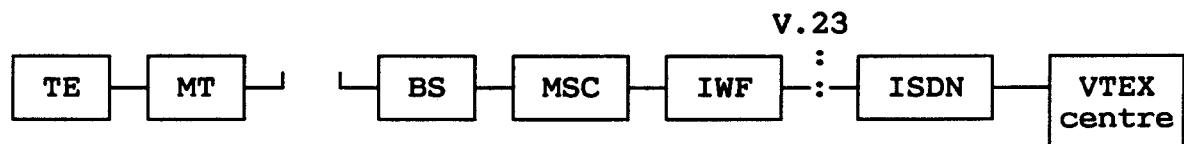
V.23

| TE |—| MT |—┘ └—| BS |—| MSC |—| IWF |—:—| ISDN |—| VTEX centre |

Fig. 03.43/1b

2.2. Videotex Centre Connected To PSPDN Via PAD

Access to the Videotex centre via PSPDN is for national matter;
a possible network scheme is reported in Fig. 03.43/2.

```
┌────┐   ┌────┐          ┌────┐  ┌────┐  ┌────┐  ┌────┐  ┌─────┐  ┌──────┐
│ TE │───│ MT │──┘    └──│ BS │──│MSC │──│ IWF│──│ PAD│──│PSPDN│──│ VTEX │
└────┘   └────┘          └────┘  └────┘  └────┘  └────┘  └─────┘  │centre│
                                                                  └──────┘
```
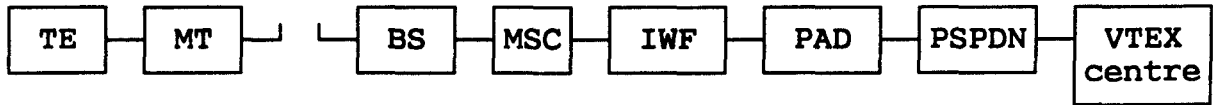
Fig. 03.43/2

2.3. Videotex Centre Connected Directly To The IWF

Direct connection between the IWF and the Videotex centre via a
Videotex Access Point (VAP), as shown in Fig. 03.43/3, is a
national matter.

```
                                                    V.24
                                                     :
┌────┐   ┌────┐          ┌────┐  ┌─────┐  ┌─────┐    :   ┌─────┐  ┌──────┐
│ TE │───│ MT │──┘    └──│ BS │──│ MSC │──│ IWF │───:───│ VAP │──│ VTEX │
└────┘   └────┘          └────┘  └─────┘  └─────┘        └─────┘  │centre│
                                                                  └──────┘
```

Fig. 03.43/3

3. REFERENCE CONFIGURATION OF THE MOBILE STATION (MS)

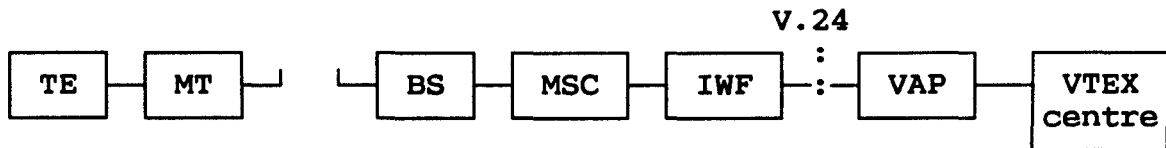The following types of reference configuration of the mobile station are considered:
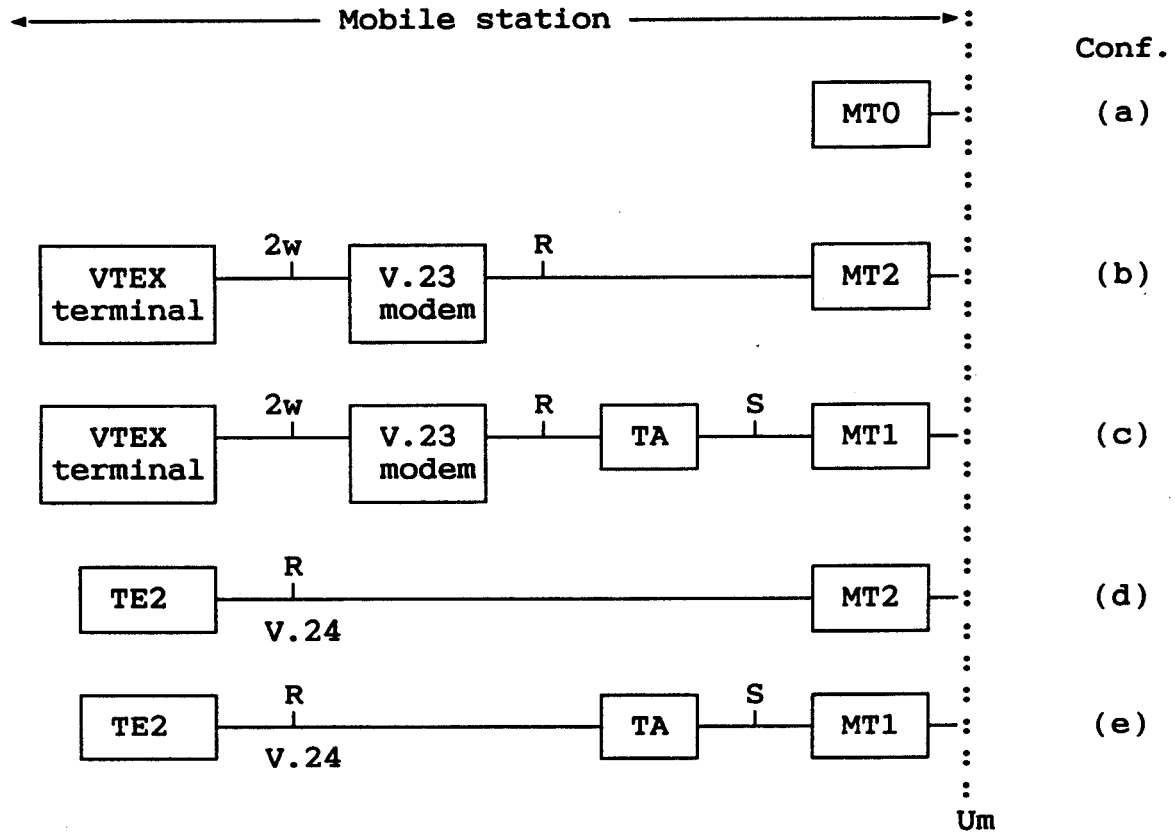
Fig. 03.43/4

The definitions of the functional groups shown in the figure are reported in Rec GSM 04.02.

4. CONNECTION TYPES AND SIGNALLING ASPECTS

The relationship between the Videotex profile 1, 2, 3 Teleservices and the connection elements are reported in table 6/GSM 03.10.

The modem type indication (V.23) is given in the BC and LLC information elements of the SET-UP message sent in the call attempt phase (see Annex).

The protocol models considered are the Model 1a, 1b, 3a, 3b reported in Fig 6/GSM 03.10.

4.1. Transparent Asynchronous Data

This model can be used for all 3 Videotex profiles; problems of error rate compared to the provision of Videotex service shall be investigated.

The reference are the protocol models 1a and 1b of figure 6/GSM 03.10.

4.2. Non-transparent Character Oriented

This model can be used for the Videotex profile 1, 2 and 3 in order to improve the quality transmission. The protocol reference model relating to the L2R function is reported in fig. 03.43/5

```
End                                                              End
System                                                           System

┌──────┐                                                        ┌──────┐
│      │                                                        │      │
│  L3  │.........Transparent higher layer protocol.........│  L3  │
│      │                                                        │      │
├──────┤                                                        ├──────┤
│      │                                                        │      │
│  L2  │...NTP...      ┌────────┐   ...L2RCOP....   ┌────────┐  ...NTP...│  L2  │
│      │   Char.       │    ┌───┤                   ├───┐    │     Char. │      │
│      │               │    │   │   .....RLP.....   │   │    │          ├──────┤
├──────┤               │    │   │                   │   │    │          │      │
│  L1  │.........       │    │   │                   │   │    │.........│  L1  │
│      │               │    │   │                   │   │    │          │      │
└──────┘               └────┴───┘                   └───┴────┘          └──────┘

VTEX                    MS                            IWF               VTEX
 TE                                                                    Centre
```
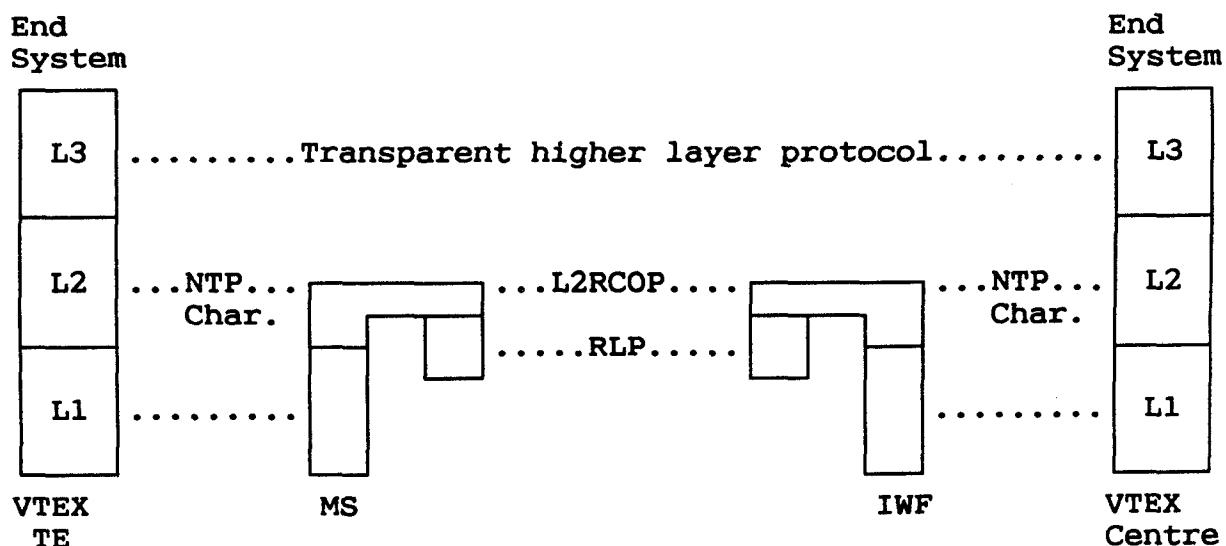
fig. 03.43/5

The L2R functionality for character oriented non-transparent protocol is described in Rec GSM. 07.02 (Annex 1).

Flow control in Videotex is not normally necessary since the host sends data on a screen by screen basis awaiting for a user prompt at the end of each screen full before the next screen full is sent.

In the non-transparent service, provision must be made for the IWF to buffer the equivalent of a screen full of data in order that ARQ's in the Radio link Protocol are able to function. For this purpose a 2 Kbyte buffer shall be provided in the interworking function for data being sent to the mobile. Buffering in the IWF for data received from the mobile is not necessary.

Further study is also needed on the effect of the L2RCOP delays on the high layer protocol.

4.3. Non-transparent Protocol With Specialized-layer 2

This model can be used for Videotex profile 1 in order to utilize the improvement of quality service due to the specific layer 2 provided in this profile. A special L2RP shall be defined for this application.

The protocol reference model relating to the L2R function is reported in fig. 03.43/6.
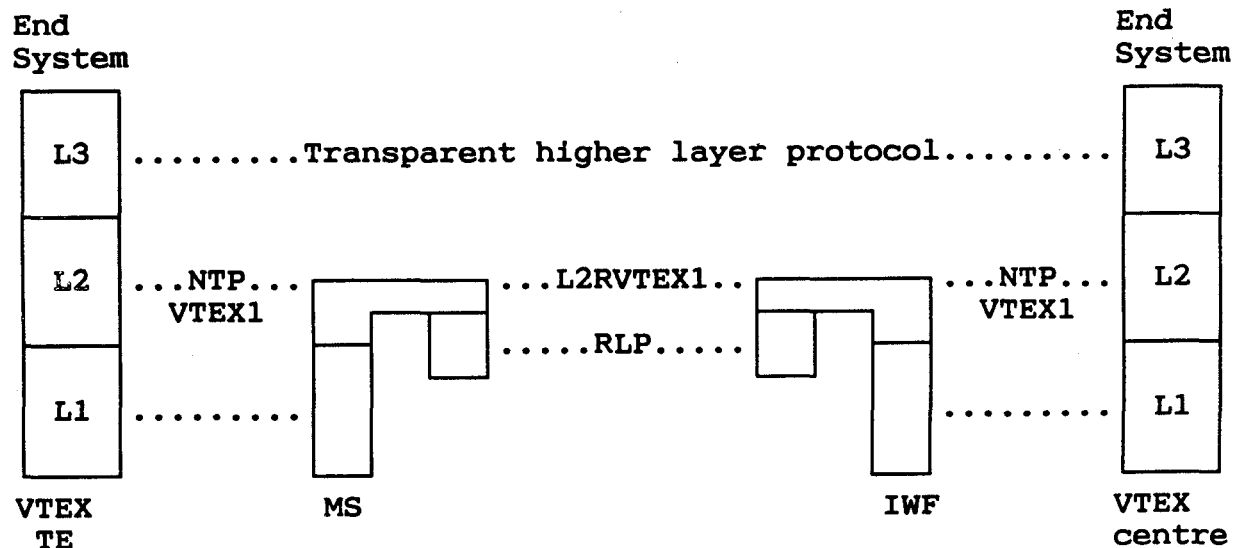
```
End                                                               End
System                                                            System

 ┌──────┐                                                        ┌──────┐
 │  L3  │ .........Transparent higher layer protocol..........   │  L3  │
 │      │                                                        │      │
 ├──────┤                                                        ├──────┤
 │  L2  │ ...NTP...   ┌──────┐  ...L2RVTEX1..  ┌──────┐ ...NTP... │  L2  │
 │      │   VTEX1   ┌─┘      └─┐             ┌─┘      └─┐  VTEX1   │      │
 │      │           │ .....RLP..... │                            │      │
 ├──────┤           │          │                      │          ├──────┤
 │  L1  │ ......... ─┘          └─             ─┘      └─ ........ │  L1  │
 └──────┘                                                        └──────┘
VTEX            MS                              IWF             VTEX
 TE                                                            centre
```

fig 03.43/6

Provision of L2RVTEX1 is for further study: it is needed, depending on the quality achieved with the transparent service or on problems detected in mapping Videotex profile 1 protocols in the standard L2RCOP.

5.   USE OF TAFS DEFINED FOR ASYNCHRONOUS SERVICES

The TAFs to be considered are those defined in section 1.2 of Rec GSM 07.02; they are divided in:

5.1. TAFs For Transparent Services

Regarding to the rate adaption V-series the reference is the section 2.1 of the Rec GSM 07.02. The rate adaption function shall comply with the Rec GSM 04.21 and 08.20, in particular the 1200/75 asyncronous rate adaption shall be considered.

Regarding to the Interchange circuit signalling mapping the reference is the section 2.2 of the Rec GSM 07.02, and the V.23 interchange circuits mapping shall be considered.

5.2. TAFs For Non-transparent Services

The reference for non-transparent character oriented protocol is the GSM 07.02.

The application of a specialized layer 2 non-transparent protocol is for further study.

5.3. Call Establishment Signalling Mapping

Regarding to the call establishment signalling mapping (see GSM 07.02 par 2.3), the manual call operation utilizing both unrestricted digital capability and alternate Speech/Data or Speech followed by Data is utilized for the configurations "b" and "c" reported in Fig. 03.43/4.

For the other configurations also the "autocalling" call operation can be utilized (see GSM 07.02 par 2.3).

The "autoanswering" call operation is not used for Videotex service.

6. INTERWORKING WITH PSTN

The key characteristics of the networks concerned are definited in section 6 of GSM 09.07.

In the case of Videotex service only mobile originated network interworking shall be considered (section 9.2.1 of GSM 09.07).

The selection of the interworking function based on V.23 type modem is provided on the basis of the information contained in the SET-UP message sent by the mobile terminal (see Annex).

6.1. Transparent Service Support

The reference for this item is the section 9.2.3 of GSM 09.07.

6.2. Non-transparent Service Support

The reference for non-transparent character oriented protocol is the GSM 07.02.

The application of a specialized layer 2 non-transparent protocol for profile 1 is for further study.

7. INTERWORKING WITH ISDN

In this case it is assumed that the Videotex service is transported by means of the 3.1kHz audio bearer service; the reference is the section 10.2 of GSM 09.07

8. SUPPORT OF ROAMING SUBSCRIBER

Some practical solutions are considered according to different scenarios:

8.1. Videotex Access To "home" Centre Via An International Call

No additional functions are required by terminals and Videotex centre, if the access is provided on the basis of dialling information; this implies the use of an international PSTN call when the user is in a "foreign" PLMN.

The roaming subscriber must be aware of the compatibility between the protocol characteristics of his terminal and those of the Videotex access centre that he has addressed.

8.2. Videotex Access To "local Centre"

The roaming user needs to be registered in the public Videotex service of any country in which he intends to have Videotex access; in order to overcome the protocol problems of different Videotex services, the roaming user may have a multi-profile terminal or the "local" center may provide a multi standard access.

More complex scenarios can be investigated when an integration among the various national Videotex centres will be possible.

9. ADDITIONAL FUNCTIONS

Some additional functions can be provided such as:

9.1. Direct Call

The GSM PLMN network, on the basis of the HLC information element included in the set-up message or of the terminal characteristics, can provide a direct call to the local videotex centre.

9.2. Charging Aspects

This service is mobile originated and therefore only charging aspects related to the outgoing service will be covered. The usage charges are time dependent both for PLMN and for PSTN/ISDN connection to the Videotex center. The particular charging aspects related to the Videotex information are outside the scope of this recommendation.

For PSPDN access to a VTEX Centre additional charges may be levied (see GSM 09.05).

Special charging method could be defined for access to local VTEX centre via a direct call.

ANNEX

The Bearer Capability information element is structured as shown in Fig. 10.53/GSM 04.08; the coding of the BC elements requested by the VTEX service is reported in the following table 1.

Transfer Mode	Circuit
Intermediate Rate	4 kbit/s
Information Transfer Capability	Unrestricted digital, Speech followed by unrestricted digital inform.,3.1 kHz Ex PLMN
Structure	Unstructured
Establishment	Demand
Configuration	Point to point
User Rate	1200/75 (The 75 is in the direction MS to Network)
Modem Type	V.23
Synch/Asynch	Asynchronous
Radio Channel requirements	Full rate, Half rate, Dual rate/half, Dual rate/full
Connection Element	Transparent, non-transparent
Number of Stop Bits	1, 2
Number of Data Bits	7
Parity	Odd, Even
Duplex Mode	Full duplex
User information Layer 2 protocol	Videotex profile 1, IA5, videotex profile 3
Rate Adaption Signalling access protocol	

Table 1: Bearer Capability Elements

The High Layer Compatibility (HLC) information element is structured as shown in fig 10.16/GSM 04.08. The following Table 2 contains the coding of the HLC elements requested by VTEX service.

High layer characteristics identification	Document application profile for videotex interworking between gateways (T.504)

Table 2: HLC Elements