



INTERNATIONAL ATOMIC ENERGY AGENCY
UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION



INTERNATIONAL CENTRE FOR THEORETICAL PHYSICS
34100 TRIESTE (ITALY) - P.O.B. 586 - MIRAMARE - STRADA COSTIERA 11 - TELEPHONE: 2240-1
CABLE: CENTRATOM - TELEX 460392 - I

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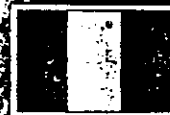
SECOND WORKSHOP ON
OPTICAL FIBRE COMMUNICATION

(14 - 25 March 1988)

INTERNATIONAL SITUATION AND
TECHNOLOGICAL EVOLUTION OF
BROADBAND NETWORKS

F. TOSCO
CSELT
Torino, Italy

FRANCE



PLAN CABLE (1982)

OBJECTIVES

- Diffusion of TV programs (videophone)
- Development of optoelectronics industry
- Development of services providers

SERVICES

- As Biarritz (videophone only in future)

CEET 20699

FRANCE



PLAN CABLE - TECHNIQUE

10 G. FIBRES - COAX - TV

1 G. INTERACTIVE SERVICES

- | | | |
|-----------------|----------|-------------------|
| A (Paris) | 1 fibre | 1 < 500 m |
| | 2 fibres | 1 > 500 m |
| B (Montpellier) | 5 fibres | for 4 subscribers |

CEET 20700

UNITED KINGDOM



MILTON KEYNES (1980)

LOCAL FRANCHISES (1983)

CELT 20707

UNITED KINGDOM



MILTON KEYNES

18 Subscribers

12 TV channels (over 16) + different alternatives
of services

PFM Modulation

CELT 20708

UNITED KINGDOM



11 LOCAL FRANCHISES (5 B.T.)

Now in progress: Westminster

Services: CATV over 20 channels, videotex,
videolibrary

Topology: switched star

Transmission Medium: fibres + coaxial

Modulation: analog

CELT 20709

UNITED KINGDOM



WESTMINSTER

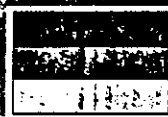
- 250 subscribers + 100 requests
- 100 hotel rooms + 800 requests

TARIFFS:

- £g 15/month CATV
- £g 27/month with first vision movies

GSE 20710

GERMANY



- BERLIN (1980)
- BIGFON (1983-84)
- NATIONAL VIDEOPHONE NETWORK (1985)
- NATIONAL VIDEOCONFERENCE NETWORK (1985)
- BPN (1987)

GSE 20702

GERMANY



BERLIN (1980)

370 Subscribers

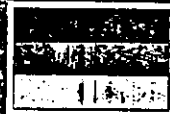
28 Optical cables

Services: CATV with remote selection

Analog transmission

CELT 20703

GERMANY



BIGFON

10 plants in 7 towns

6 producers

mainly digital techniques

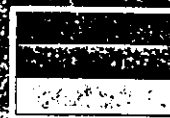
(70 + 140 Mbit/s)

320 subscribers 68 videotelephones

2 + 4 TV over 15

CELT 20704

GERMANY



VIDEOPHONE NETWORK

- Connection between 68 BIGFON subscribers
- Lines at 140 and 2 Mbit/s

VIDEOCONFERENCE NETWORK

- Calls with reservation
- 1985: 30 subscribers (12 public rooms)
- 1990: 300 Forecast subscribers
- Tariffs: 12,000 DM for permanent connection
2,500 DM per month
800 DM per hour for national calls
1,200 DM per hour for international calls

DEET 20705

GERMANY



BPN (Broadband Prototype Network - 1987/1992)

- Business subscribers oriented
- Videophone, Videoconference, high speed data
- 1000 Subscribers in 14 towns

DEET 20706

JAPAN



— HI-OVIS (1978)

— VIDEOCONFERENCE NETWORK (1983)

— INS (1984)

CSELT 20711

JAPAN



HI-OVIS

164 subscribers, mainly domestic

CATV and videophone

silica and plastic fibres

CSELT 20712

JAPAN



INS (Model)

star network 150 locations (2000 forecast)

videoconference, videophone, fax

multimode fibres

CELT 20714

JAPAN



VIDEOCONFERENCE NETWORK

13 business subscribers

Transmission: analog 4 MHz +
digital 6.3 Mbit/s (long distance)

CELT 20713

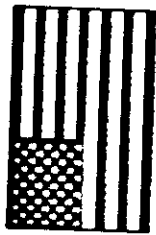
U.S.A.



- First laboratory experiments: 1986
- Field trials: 1987-88
- Digital techniques with single mode fibres, also with LED
- Non-conventional solutions with integrated Optics
- Interest for HDTV

USER 20716

USA



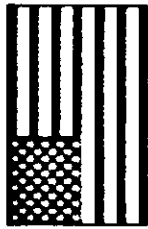
Announced Fiber-To-The-Home Trials (October 1987)

<i>Company</i>	<i>Location</i>	<i>~ Number of homes</i>
Bell South	Hunters Creek, FL	251
GTE	Cerritos, CA	5000
Bell South	Heathrow, FL	500
Mountain Bell	Phoenix, AZ	6800
SW Bell	Leawood, KS	50-100
PNB	Seattle, WA	150-200
IBT	Westmont, IL	100
Comtel	New York	600
Comtel	California	400
AT&T	Kansas City, MO	8525
Bell of PA	Pennsylvania	

Source: Bellcore

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OCT 17 1987

USA



Southern Bell's Heathrow Subscriber Loop Trial (Orlando, Florida)

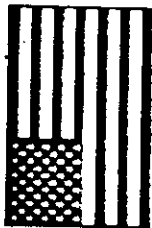
- First ISDN application to the residence
- First ISDN offering over fiber
- First application two-way voice, data and video over same single mode fiber

Key dates

- ISDN availability July, 1988
- CATV transport with Heathrow Telecom March, 1989

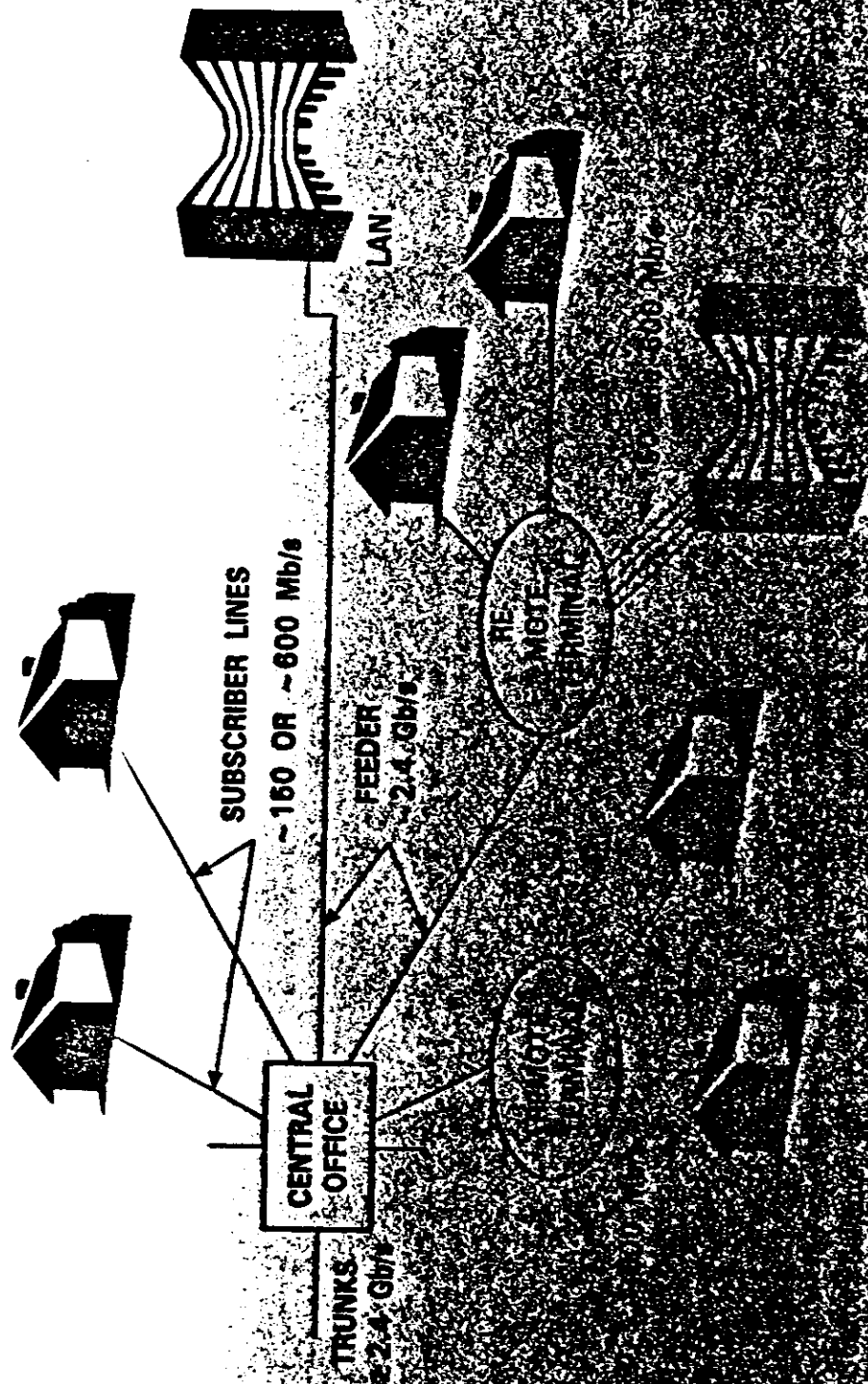
Southern Bellcore

HEATHROW



USA

Single-Mode Loop Distribution System



TECHNOLOGICAL EVOLUTION

TRENDS

Transmission Analog ⇔ Digital
Optical Fibres Multimode ⇔ Single-mode
Services CATV ⇔ New Video Services

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TRANSMISSION: Analog ⇔ Digital

- Better quality
- Repeaterless links
- Integration with ISDN
- Cost reduction with integrated devices

CEEL 20717

OPTICAL FIBRES: Multimode ⇔ Single Mode

- Very high Bandwidth
- Lower Attenuation
- Cost Reduction
- Compatibility with Integrated Optics
- Compatibility with Coherent Optical Technologies

CEET 20718

NEW VIDEO SERVICES

- HDTV
- Interactive and participative TV
- Videophone - videoconference

CEET 20719

