

THE DEVELOPMENT OF TELECOMMUNICATIONS SERVICES :  
A REVIEW OF PROJECTS

VOLUME 111

SUMMARIES AND BIBLIOGRAPHY

August 1979

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Manager, Business Development  
Bell Canada

C. D. Shepard  
Director, Research Policy Development  
Department of Communications Canada

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D48  
1979  
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munications Consultant

J. Costa  
Research Assistant  
Department of Communications Canada

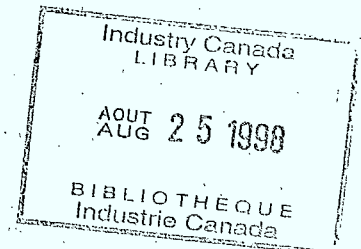
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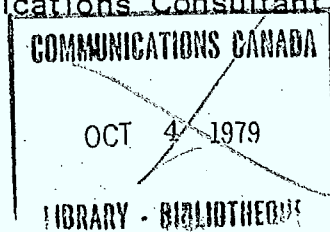


N. F. Leduc  
Manager, Business Development  
Bell Canada

C. D. Shepard  
Director, Research Policy Development  
Department of Communications Canada

F. Simpson  
Telecommunications Consultant

J. Costa  
Research Assistant  
Department of Communications Canada



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COMMUNICATIONS CENTER  
1979

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Bell Labs., Whippany, New Jersey, USA.  
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| Bell-Northern Research, Ottawa, Ontario, Canada.                  |    |
| Computer mediated system used internally.                         |    |
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| Non Medical Use of Drugs Directorate                              |    |
| Dept. of Health and Welfare, Ottawa, Ontario, Canada.             |    |
| * Multi-site computer conferencing used especially for            |    |
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| - EIES .....  | 50 |
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- CAN/OLE ..... 55  
National Science Library, Ottawa, Ontario, Canada.  
On-line interactive retrieval system dedicated to the retrospective searching of bibliographical data bases containing over 4,000,000 references and abstracts to all major fields of science and technology.
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- INFOMART ..... 56  
INFOMART, Toronto, Ontario, Canada.  
On-line searching information service. Provides access to over 16 data bases.
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- MAILBOX ..... 57  
I.P. Sharp Ass., Toronto, Ontario, Canada.  
\* Computer based store and forward system for sending messages between people.
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- MRDS ..... 58  
Vancouver Police Department, B.C., Canada.  
Interactive data communications system with full keyboard and plasma display terminals in police cars.
- 

- ONTYME ..... 59  
Tymenet, Cupertino, California, USA.  
\* Computer based store and forward system for sending messages between people.
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- HERMES ..... 60  
BBN, Boston, Massachusetts, USA.  
Computer Message System.
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- TELEMAIL ..... 61  
Telenet C.C., Washington, D.C., USA.  
\* Computer based terminal-to-terminal and store and forward system for sending messages between people.
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\* Computer-aided instruction system.

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- TAIM ..... 63  
Athabaska University, Edmonton, Alberta, Canada.  
Multi-site computer managed instructional system.

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- CARLETON-STANFORD ..... 64  
Carleton University, Ottawa, Ontario, Canada.  
Stanford University, Stanford, California, USA.  
Curriculum sharing experiment via satellite (Hermes)  
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- U.Q. TELEVISION NETWORK ..... 65  
Université du Québec, Ste-Foy, Québec, Canada.  
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- UNIVERSITY OF CALIFORNIA ITV NETWORK ..... 66  
University of California, Davis, California, USA.  
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- STANFORD ITV NETWORK (SITN) ..... 67  
Stanford University, California, USA.  
\* Instructional TV network with audio feedback.

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- SURGE, CO-TIE, AND BIO CO-TIE ..... 68  
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Video Tape system for research in graduate education.

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- GENESYS ..... 69  
Florida, USA.  
Point-to-point common carrier microwave system for the  
continuing education of engineers in industry.

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- PLATO IV ..... 70  
University of Illinois, Illinois, USA.  
Computer-aided instruction system marketed by Control Data.

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 OECA, Toronto, Ontario, Canada.  
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Ministry of Education, Vancouver, B.C., Canada.	
Satellite Tele-Education Program on the HERMES satellite.	
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University of Southern California, Los Angeles, California, USA.	
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| * On-demand programs of local text information in a CATV system by telephone call-up.               |     |
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| Teletext information retrieval systems for broadcast TV.  |     |
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| - ANTIIOPE .....  | 154 |
| CCETT, Rennes, France.  |     |
| Teletext system.  |     |
| <hr/>   |     |
| - CHARACTER INFORMATION BROADCASTING STATION (CIBS) .....   | 155 |
| Japan.  |     |
| Teletext system with sufficient resolution to show Japanese text and video pictures.                |     |
| <hr/>   |     |
| - CableText, INC. ....  | 156 |
| U.S.A.  |     |
| Teletext system offered over satellite to CATV stations equipped with Micro TV decoders.            |     |
| <hr/>   |     |
| - INTELTEXT .....   | 157 |
| U.S.A.  |     |
| Pilot test of Teletext system using Antiope decoders in hotels and apartment buildings.             |     |
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- IDR SYSTEM .....	158
Reuters, New York, N.Y., USA.	
* Information retrieval system via cable.	
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- INFO-TEXT .....	159
Philadelphia, Pennsylvania, USA.	
Pilot trial of a Teletext system similar to Ceefax.	
<hr/>	
- TELEDATA .....	160
Salt Lake City, Utah, USA.	
Teletext system using TIFAX decoders.	
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- LINE 21 SYSTEM .....	161
Washington, D.C., U.S.A.	
Teletext system for program captioning and additional information destined for the deaf community.	
<hr/>	
- .....	162
Natrona County Public Library, Casper, Wyoming, USA.	
Video reference service via CATV.	
<hr/>	

2. METERING / SECURITY

- A.M.R. ....	163
Edmonton Telephone, Alberta, Canada.	
Automated Meter Reading, Security (fire, burglar, medical, etc.), power shedding, etc. via telephone lines.	
<hr/>	
- NORTH YORK METERING TRIAL .....	164
Bell Canada, Toronto, Ontario, Canada.	
Automatic meter reading for electricity, gas and water using telephone lines.	
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- ERDA / EPRI .....	165
EPRI, Palo Alto, California, USA.	
Four projects on remote metering.	
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- .....	166
Monroe W.L. & G.C., Monroe, Georgia, USA.	
Remote monitoring via CATV.	
<hr/>	
- .....	167
LVO Cable, Carpentersville, Illinois, USA.	
Security monitoring via CATV.	
<hr/>	



- TOCOM 11 ..... 168  
 Tocom, Inc., Dallas, Texas, USA.
- \* Mini-computer based security and monitoring system  
 via CATV.
- 

### 3. COMMUNITY SERVICES

- PROJECT IRONSTAR ..... 169  
 Alberta Native Communications Society, Canada.  
 Audio and video programming for the north using the  
 HERMES satellite and audio return.
- 

- ..... 170  
 Channel 40, Milton-Keynes, England.  
 Local programming experiment.
- 

- ..... 171  
 Kablevision Kiruna, Sweden.  
 Local programming experiment in a remote community in the  
 far north.
- 

- MANHATTAN CABLE ACCESS ..... 172  
 Manhattan Cable TV, New York, USA.
- \* Public access.
- 

- MRC-TV ..... 173  
 Metropolitan Regional Council, New York, N.Y., USA.
- \* Multi-site teleconferencing system used for continuing  
 education, personnel management, etc.
- 

- ..... 174  
 Berks Cable TV, Reading, Pa., USA.
- \* Two-way cable system for senior citizens program and  
 school applications.
- 

### 4. SHOPPING

- COM-U-SHOP ..... 175  
 Simpsons-Sears, Toronto, Ontario, Canada
- \* Remote catalogue shopping using touch-tone telephones  
 and computer voice response.
-

5. MULTIPURPOSE SYSTEMS TO THE HOME AND BUSINESS

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|--|-----|
| - CALGARY .....  | 176 |
| A.G.T., Calgary, Alberta, Canada.  |     |
| Pilot trial of a videotex system for information retrieval that uses telephone lines and the TV set and integrates security and metering services. |     |
| <hr/>  |     |
| - .....  | 177 |
| B.C.T., Vancouver, B.C., Canada.   |     |
| Pilot trial of a videotex system using copper pair wires and the home TV set.  |     |
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| - ELIE .....   | 178 |
| M.T.S., Elie, Manitoba, Canada.  |     |
| Field trial of information retrieval and integrated telecommunications and broadcast services using fibre optic loops in a rural area.             |     |
| <hr/>  |     |
| - IDA .....  | 179 |
| M.T.S., Winnipeg, Manitoba, Canada.  |     |
| Pilot trial of a videotex system using two-way cable and the home TV and integrating services such as security and metering.                       |     |
| <hr/>  |     |
| - TELIDON .....  | 180 |
| Dept. of Communications, Ottawa, Ontario, Canada.  |     |
| Interactive videotex system with high quality display of characters and graphics.  |     |
| <hr/>  |     |
| - VISTA .....  | 181 |
| Bell Canada, Hull, Quebec, Canada.   |     |
| Field trial of a videotex system for on-demand information and transactions that uses the TV set for display and telephone lines.                  |     |
| <hr/>  |     |
| - PRESTEL / VIEWDATA .....   | 182 |
| British Post Office, London, England.  |     |
| Information retrieval via telephone lines using the TV set as display unit.  |     |
| <hr/>  |     |
| - DIAL-A-PROGRAM .....   | 183 |
| Rediffusion Int., Surrey, England.   |     |
| Switched Quist system providing on-demand TV and other services to subscribers and in professional applications.                                   |     |
| <hr/>  |     |
| - TELSET .....   | 184 |
| Helsinki, Finland.   |     |
| Pilot test of an interactive videotex system similar to Prestel.   |     |
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- TELETEL .....	185
Ille & Villaine, France.	
Pilot trials of an interactive videotex system for information retrieval, transactions, message services and telephone directory use.	
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- TIC TAC .....	186
P.T.T./C.N.E.T., 92, Issy les Moulineaux, France.	
Information retrieval via telephone lines using the TV set or CRT as a display unit. Now part of Antiope/Télétel.	
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- BILDSCHIRMTEXT .....	187
Germany.	
Pilot trials of an interactive videotex system similar to Prestel but including messaging capabilities.	
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- VIEWDATA .....	188
Holland.	
Interactive videotex system based on Prestel.	
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- HI-OVIS .....	189
V.I.S.D.A, Japan	
Two-way and interactive services on fibre optics.	
<hr/>	
- TAMA NEW TOWN .....	190
V.I.S.D.A, Japan.	
Two-way and interactive services on cable TV.	
<hr/>	
- CAPTAINS (character and pattern telephone access information network system) .....	191
Tokyo, Japan.	
Pilot test of an interactive videotex system over telephone lines with audio capabilities.	
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- DATAVISION .....	192
Stockholm, Sweden.	
Interactive videotex system compatible with Prestel.	
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- LOS GATOS .....	193
TelePrompter, Los Gatos, California, USA.	
Technical test bed for the project at El Segundo.	
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- EL SEGUNDO .....	194
Denver Research Inst., Denver, Colorado, USA.	
Proposed experiment of interactive services on cable TV.	
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- VIEWTRON .....	195
Miami, Florida, USA.	
Interactive videotex system accessed via telephone lines.	
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- POLY-COM .....	196
Orlando, Florida, USA.	
Various interactive services on cable TV.	

- VICOM ..... 197  
Telecable Corp., Overland Park, Kansas, USA.  
Two-way CATV with applications to education (handicapped children), merchandising (Sears) and polls.
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- MITRIX ..... 198  
Mitre Corp., Bedford, Mass., USA.  
Multi-media and multi-mode information transfer system on coaxial cable.
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- SRU ..... 199  
Community Information Systems, Inc., Chaska, Minnesota, USA.  
Two-way coaxial cable.
- 
- ..... 200  
RCA Labs., Princetown, N.J., USA.  
Lab test bed for a two-way cable system.
- 
- QUBE ..... 201  
Warner Communications, Columbus, Ohio, USA.  
30-channel CATV system with data upstream.
- 
- ..... 202  
Coaxial Communications, Inc., Columbus, Ohio, USA.  
Area multiplexing system for pay-TV.
- 
- COMMUNICON ..... 203  
Jerrold Electronics, Horsham, Pa., USA.  
Lab test bed for a sophisticated computer-based two-way cable TV system.
- 
- DOW JONES NEWS / RETRIEVAL SERVICE (DJS) ..... 204  
Major cities in the U.S. and Canada.  
Interactive information retrieval system over telephone lines using Apple II home computers.
- 
- GREENTHUMB ..... 205  
Farming communities in the USA.  
Interactive videotex system over telephone lines for farming communities.
- 
- PlayCable ..... 206  
U.S.A.  
Pilot test of an interactive videotex system offered over cable and providing a wide range of information processing applications and games.
- 
- THE SOURCE ..... 207  
U.S.A.  
Computer time-sharing information system accessed through telephone lines by a range of home computers.
-

INTRODUCTION

The Review of Projects on Future Communications Services was a joint study by Bell Canada and the Canadian Federal Government Department of Communications (DOC) initiated in late 1977. The intention was to gather information on the trials of tele-communication-based services undertaken in various countries. This material would then be available to both Bell Canada and DOC respectively in formulating plans for field trials and pilot tests of new communication services for the home and business.

Part III of the study provides summary information on projects reviewed. The basis for a choice of projects was that the service trialed extend the current uses of tele-communications and not yet be generally available to the public. Most of the projects reviewed used interactive communication systems. Clearly, all trial projects could not be covered but it is believed that sufficient were reviewed to warrant compilation of the material.

The projects are classified under the following categories and headings and within each heading they are grouped by country, state or province.

Teleconferencing

- 1. Video
- 2. Audio with Visual Aids
- 3. Graphic Conferencing Mechanisms

Computer Mediated Communications

- 1. Computer Conferencing
- 2. Computer Augmentation
- 3. Computer Messaging

Tele-Education

1. Universities
2. Schools
3. Specialized Training
4. Handicapped (Universities, schools, specialized training)

Telemedicine

1. Urban
2. Rural
3. Remote
4. Distributed

Services to the Public

1. Broadcast Information Retrieval
2. Metering / Security
3. Community Services
4. Shopping
5. Multipurpose Systems for the Home

The project sheets are prefaced by an index that identifies each entry by a project title (if such a distinct title exists) the name and location of the responsible organization, and gives a brief description of the project. Projects that were visited are marked by an asterisk.

In cases where bibliographic reference numbers are given on project sheets they refer to the appended bibliography. In a few cases references are listed directly on the sheets.

Some of the included projects are no longer in operation. Others have undoubtedly progressed, developed or been terminated since this study was undertaken.

1. TELECONFERENCING



1. TELECONFERENCING

PROJECT NAME

LOCATION

Melbourne, Australia (2)  
Sidney, Australia (1)SYSTEM  
CAPABILITIESThree-site configuration; audio, black and white video;  
each studio has:

- one camera for graphic material
- two monitors showing the remote participants
- maximum of 6 conferees/studio

SERVICE  
APPLICATIONSRoutine Business Meetings between members of the  
Australian Post Office

USERS

Australian Post Office Personnel

PARTICIPATING  
ORGANIZATIONS

Australian Post Office

SPONSORS/  
FUNDING

Internal funds

SYSTEM  
OPERATOR

Australian Post Office

TIME FRAME

Operational since 1969

CONTACT

Director  
Telecom-Australia Research Labs  
59 Lt. Collins St.  
Melbourne, Victoria  
Australia 3,000BIBLIOGRAPHIC  
REFERENCES

[ 436 ] , [ 636 ] , [ 886 ] .

PROJECT NAME British Columbia Telephone Co. Teleconferencing System

LOCATION Victoria, B.C., Canada  
Vancouver, B.C., Canada

SYSTEM CAPABILITIES Two-site configuration; audio and black and white video;  
each studio has:

- one camera to view the participants
- two monitors showing the remote participants
- one camera showing the local participants
- two desk microphones
- one graphics transmission monitor

SERVICE APPLICATIONS Intended for use by the business community

USERS British Columbia Telephone Co. Personnel

PARTICIPATING ORGANIZATIONS British Columbia Telephone Co.

SPONSORS/  
FUNDING Internal funds

SYSTEM OPERATOR British Columbia Telephone Co.

TIME FRAME Operational till 1973

CONTACT Mr. Anders Skoe  
British Columbia Telephone Co.  
377 Kingsway St.  
Burnaby, British Columbia

BIBLIOGRAPHIC REFERENCES [ 182 ]

PROJECT NAME Video Conferencing

LOCATION Ottawa, Ontario, Canada

SYSTEM CAPABILITIES Studio meeting-rooms for 6 people  
Full-duplex video and voice-switched audio channels between two sites.  
Black and white facsimile capability.  
Transmission by coaxial cable, analogue microwave, and satellite.  
Video color trials, three-way conference trials and portable equipment trials.

SERVICE APPLICATIONS Service trials between Canadian cities to determine cost-effective uses of video teleconferencing.  
Trials of bandwidth compression techniques. Studies in six cities.

USERS High level executives for meetings. Later promotion meetings. Oil companies trial use between Toronto, Edmonton and Calgary. Trial use by Inuit groups.

PARTICIPATING ORGANIZATIONS Bell Canada and other Canadian telephone companies.

SPONSORS/ FUNDING Bell Canada funded.  
Studio cost about \$250,000 of which \$190,000 is electronic hardware. Investment of \$200,000 to convert to color.  
Earth station costs for Calgary/Edmonton about \$250,000. Half-hour minimum billing rate plus studio charges.

SYSTEM OPERATOR Bell Canada

TIME FRAME Trial started in 1970-71 when Bell Canada built studios in Montreal and Ottawa for experimental black and white conferencing. Studios have been added in Toronto, Quebec City, Edmonton, Calgary.

CONTACT E. Frohloff,  
Bell Canada,  
410 Laurier Street,  
Ottawa, Ontario, Canada

Telephone Number: (613) 560-3820

BIBLIOGRAPHIC REFERENCES [ 441 ], [ 1397 ]

PROJECT NAME Saskebec

LOCATION University of Regina, Saskatchewan, Canada  
Baie St.Paul, Quebec, Canada

SYSTEM CAPABILITIES Two-site configuration; black and white video and audio; transmission via The Communications Technology Satellite (HERMES)

SERVICE APPLICATIONS Tele-Education and cultural exchange programs

USERS Students, teachers and residents of the two locations

PARTICIPATING ORGANIZATIONS Ministère d'Education, Quebec

SPONSORS/  
FUNDING Department of Communications,  
Ottawa, Ontario

SYSTEM OPERATOR

TIME FRAME Operational since February 17, 1978  
Final report March 1979

CONTACT University of Regina  
Saskebec Tele-Education Project  
Winnipeg & McNiven Streets  
Regina, Saskatchewan

BIBLIOGRAPHIC REFERENCES [ 1381 ]

PROJECT NAME

Confravision

7

LOCATION

London, England  
Birmingham, England

Bristol, England  
Manchester, England  
Glasgow, Scotland

SYSTEM  
CAPABILITIES

Multi-site configuration; audio and black and white  
video; each studio has:

- one camera for participants
- one camera for graphics
- maximum of 5 participants per studio

SERVICE  
APPLICATIONS

Used for meetings of British Post Office personnel.  
The studios are also leased to business groups for  
between £120-180 hr exclusive of VAT at 8%

USERS

British Post Office personnel, Business groups

PARTICIPATING  
ORGANIZATIONS

British Post Office

SPONSORS/  
FUNDING

Internal funds

SYSTEM  
OPERATOR

British Post Office

TIME FRAME

Operational since 1967

CONTACT

British Post Office Telecommunications Headquarters  
207 Old Street  
London EC1V 9PS  
England

BIBLIOGRAPHIC  
REFERENCES

[ 250 ], [ 1278 ]

PROJECT NAME Department of the Environment

LOCATION London, England

SYSTEM CAPABILITIES Two-site Confravision configuration; audio and black and white video

SERVICE APPLICATIONS Used for meetings between members of the Department of the Environment located at two different sites in London.

USERS Department of the Environment staff

PARTICIPATING ORGANIZATIONS Department of the Environment

SPONSORS/ FUNDING Internal funds

SYSTEM OPERATOR Department of the Environment

TIME FRAME Operational during part of 1973. Discontinued through lack of use.

CONTACT R.A. Bentley,  
Department of the Environment,  
2 Marsham Street,  
London SW1P 3EB, England

BIBLIOGRAPHIC REFERENCES

PROJET NAME Nippon Steel Corporation 9

LOCATION Kitakyushu, Japan

SYSTEM CAPABILITIES Three-site black and white video teleconferencing system. Each room has separate cameras for people, blackboard and graphics

- Video and audio channels downstream and up
- Symmetrical pair cable transmission
- Repeaters at 3 km spacing
- Video frequency 4 MHz
- Audio frequency 3.4 k Hz

SERVICE APPLICATIONS Internal Yawata Works meetings between the main office, Yawate and Tobata

USERS Managers for daily meetings, production groups and computer system planning office groups. About 22 hours per week

PARTICIPATING ORGANIZATIONS Nippon Steel Corporation, Yawaka Works, Fujitsu Ltd.

SPONSORS/ FUNDING Company funds  
\$306,000 US  
Estimated time saved is 280 hours per week

SYSTEM OPERATOR Administration and Equipment Departments

TIME FRAME Ongoing

CONTACT S. Tabata  
Communication Engineering and Planning  
Equipment Department  
Yawata Works  
Nippon Steel Corporation  
1-1-1 Edamitsu, Yahata-hyashi-ku  
Kitakyushu 805, Japan

BIBLIOGRAPHIC REFERENCES

PROJECT NAME Electrical Communications Lab 10

LOCATION Tokyo, Japan

SYSTEM CAPABILITIES Two-site configuration; audio and black and white video; each studio has:

- three cameras for the conferees
- four monitors for the remote conferees

SERVICE APPLICATIONS Internal meetings of the staff of the Electrical Communications Laboratories

USERS Nippon Telegraph & Telephone personnel

PARTICIPATING ORGANIZATIONS Nippon Telegraph & Telephone

SPONSORS/ FUNDING Internal funds

SYSTEM OPERATOR Nippon Telegraph & Telephone Co.

TIME FRAME Operational since 1973

CONTACT Electrical Communications Labs  
Nippon Telegraph & Telephone Public Corp.  
Musachino-Shi  
Tokyo 180  
Japan

BIBLIOGRAPHIC REFERENCES



PROJECT NAME Nippon Telegraph & Telephone

LOCATION Osaka, Japan  
Tokyo, Japan

SYSTEM CAPABILITIES Two-site configuration; audio and color video; each studio includes:

- three color cameras for the participants close-ups are possible
- one camera for the blackboard
- three overhead cameras show graphics
- two monitors show remote participants
- two monitors show the local participants. High speed facsimile equipment is also provided.

SERVICE APPLICATIONS Nippon Telegraph & Telephone  
Business meetings  
The system is also leased to companies (\$400.00/hour).

USERS Nippon Telegraph & Telephone personnel

PARTICIPATING ORGANIZATIONS Nippon Telegraph & Telephone

SPONSORS/FUNDING Internal funds

SYSTEM OPERATOR Nippon Telegraph & Telephone personnel

TIME FRAME Operational since 1976

CONTACT Nippon Telegraph & Telephone Public Corp.  
1-6  
Uchisaiwai-Cho  
1-Chome  
Chiyoda-Ku  
Tokyo 100  
Japan

BIBLIOGRAPHIC REFERENCES

PROJECT NAME New York Telephone Company - Teleconferencing System

LOCATION New York, N.Y., USA  
Albany, N.Y., USA

SYSTEM CAPABILITIES Two-site configuration; audio and black and white video;  
each studio has three cameras:

- one for the participants
- one for the blackboard
- one (overhead) for graphics
- one microphone per studio is used

SERVICE APPLICATIONS Internal management meetings

USERS New York Telephone Co.

PARTICIPATING ORGANIZATIONS New York Telephone Co.

SPONSORS/  
FUNDING Internal funds

SYSTEM OPERATOR New York Telephone Co.

TIME FRAME Operational since 1966

CONTACT New York Telephone Co.,  
1 World Trade Center  
New York, N.Y. 10048  
U.S.A.

Mr. Crawford Venn,  
American Telephone &  
Telegraph Co.,  
Room 718,  
195 Broadway,  
New York, N.Y., 10007  
U.S.A.

Tel. No.: (212) 395-0323 Tel. No.: (212)

BIBLIOGRAPHIC REFERENCES

PROJECT NAME EVCS - Energy Video Conferencing Service

PROJECT LOCATION Washington D.C.  
Germantown, Maryland,  
U.S.A.

SYSTEM CAPABILITIES Two-site black and white video. Similar to  
Picturephone meeting service.  
Camera for self-view, overview and close-ups.  
Tripod camera for blackboard.  
Overhead projector for documents,

SERVICE APPLICATIONS Regular internal meetings between two offices of the  
Dept. of Energy, (formerly E.R.D.A.), 20 miles apart.  
7-8 conferences per month.

USERS Average number of users per week - 75 (past 13 mo.  
average)  
Average number of hours and days used/week - 5/5

PARTICIPATING ORGANIZATIONS All DOE offices - Comptroller, Procurement,  
Construction, Employees Association, Toastmasters,  
Administrative Services, Solar Division Directors.

SPONSORS/  
FUNDING \$25,000 to put room together, with table, chairs,  
cabinets.  
\$75,000 1-time charge for installation.  
\$ 1,400/month/room for equipment rental.  
\$ 1,000/month/room for line rental.  
Terminal liabilities on equipment 2nd lines..

SYSTEM OPERATOR U.S. Dept. of Energy

TIME FRAME Operational February 1976..

CONTACT Robert M. Lewis,  
Computer Services Telecommunications Management,  
U.S. Dept. of Energy,  
Washington, D.C., 20545  
  
Telephone Number: (301) 353-4627

BIBLIOGRAPHIC REFERENCE

PROJECT NAME

LOCATION

Victoria, Australia  
Melbourne, Australia

SYSTEM  
CAPABILITIES

Multi-site configurations  
audio, speaker identification system and  
statistics mini-computer  
open microphone system

SERVICE  
APPLICATIONS

Technical & Personnel management meetings

USERS

Australian Research Labs personnel

PARTICIPATING  
ORGANIZATIONS

Telecom-Australia

SPONSORS/  
FUNDING

Internal funds

SYSTEM  
OPERATOR

Telecom-Australia Research Labs

TIME FRAME

Operational

CONTACT

Director,  
Telecom-Australia Research Labs  
59 Lt. Collins St.  
Melbourne, Victoria  
Australia 3,000

BIBLIOGRAPHIC  
REFERENCES

PROJECT NAME Audio Teleconferencing Network

LOCATION Ottawa, Ontario, Canada

SYSTEM  
CAPABILITIES Audio  
Eleven node system using the telephone  
Pylon bridge system  
50 A speaker-type telephones

SERVICE  
APPLICATIONS Early experiments in staff training and develop-  
ment between buildings in the National Capital  
Region and the Public Service Commission (PSC).  
Also trial of language training with the University  
of Quebec via Hermes satellite. Now used for  
administration and management purposes only.

USERS PSC offices across Canada

PARTICIPATING  
ORGANIZATIONS Public Service Commission

SPONSORS/  
FUNDING Public Service Commission funds  
Operating costs are line rental

SYSTEM  
OPERATOR PSC  
Government of Canada Telephone System  
Carrier leased from Bell Canada

TIME FRAME Initial experiments 1975-1977

CONTACT Bryan Byers  
Public Service Commission  
300 Laurier Avenue West  
Room 762  
Ottawa, Ontario, Canada

Telephone number: (613) 992-0093

BIBLIOGRAPHIC  
REFERENCES [991], [996], [997], [999]

PROJECT NAME Department of Communications (DOC)

LOCATION Ottawa ( 3 locations ) Toronto, Moncton,  
Montreal, Winnipeg, Vancouver,  
CANADA

SYSTEM CAPABILITIES Multi-site  
- 6 conference rooms  
- 4 microphones/room with voice switching  
included  
- audio

SERVICE APPLICATIONS Business meetings

USERS D.O.C. (Regional System)

PARTICIPATING ORGANIZATIONS

SPONSORS/  
FUNDING D.O.C.

SYSTEM OPERATOR G.T.A.  
Bell Canada

TIME FRAME Operational 1974 - 1975  
Now inoperative

CONTACT Director,  
Development and Engineering  
Government Telecommunications Agency  
300 Slater St.,  
Ottawa, Ontario K1A 0C8  
  
Telephone Number: (613) 995-7227

BIBLIOGRAPHIC REFERENCES Research report on Teleconferencing, volume 1 and 2,  
G.W. Jull, R.W. McCaughern, N.M. Mendenhall

PROJECT NAME	CRC - DOC Audio Teleconferencing System	17
LOCATION	100 Metcalfe St., Ottawa, & Shirley Bay, Ontario, Canada	
SYSTEM CAPABILITIES	Two-site configuration each studio had: <ul style="list-style-type: none"> <li>- 7 microphones (1 for each participant)</li> <li>- each conferee has "wish to interrupt button"</li> <li>- screen for graphics &amp; text</li> <li>- audio transmission (8 KHC Bandwidth channels) available from Bell (4 wire Duplex)</li> <li>- speaker identification panel</li> <li>- slow speed facsimile transmission</li> <li>- text transmission by telewriter: 1 phone line, 1 dedicated line, transmitter and overhead projector receiver</li> </ul>	
SERVICE APPLICATIONS	Experiments and studies of interactions via audio teleconferencing with graphic aids	
USERS	D.O.C. and C.R.C.	
PARTICIPATING ORGANIZATIONS	D.O.C. and C.R.C. joint experiments with Bell Canada " " " " the Canadian Public Service Commission " " " " the Université du Québec	
SPONSORS/ FUNDING	C.R.C.	
SYSTEM OPERATOR	D.O.C.	
TIME FRAME	Operational from 1972 to 1975	
CONTACT	Dr. George Jull Communications Research Center P.O. Box 11490 Shirley Bay, Station H, Ottawa, Ont. K2H 8S2  Telephone number: (613) 596-9217	
BIBLIOGRAPHIC REFERENCES	Research Report on Teleconferencing, DOC Reports 1281-1 and 1281-2. G.W. Jull, R.W. McCaughern, N.M. Mendenhall, J.R. Storey, A.W. Tassie, A. Zalatan, Ottawa, Ontario, January 1976.	

PROJECT NAME Dept. of Indian & Northern Affairs (D.I.N.A.)

LOCATION Ottawa, Canada

SYSTEM CAPABILITIES Multi-site

- 3 conference rooms
- 2 microphones/room
- voice switched
- all conferees can be simultaneously connected
- audio

SERVICE APPLICATIONS Business meetings between members of the Department located in the far north and in Ottawa

USERS D.I.N.A. (offices and sites in Canada)

PARTICIPATING ORGANIZATIONS

SPONSORS/ FUNDING D.I.N.A.

SYSTEM OPERATOR

TIME FRAME On-going

CONTACT Dept. of Indian & Northern Affairs,  
Ottawa, Ontario  
or  
Director, Development and Engineering  
Government Telecommunications Agency  
300 Slater St.  
Ottawa, Ontario K1A 0C8  
Telephone Number: (613) 995-7227

BIBLIOGRAPHIC REFERENCES



PROJECT NAME

LOCATION

Ste. - Foy, Québec, Canada

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SYSTEM  
CAPABILITIES

Audio, video and data teleconferencing system connecting scattered locations. Audio conferencing capability for 16 sites via telephone lines (direct dialing). Video conferencing extended to 8 locations with bi-directional video and two-way audio using microwave channels from common carriers. Computer-aided conferencing and instruction (PLATO System) recently installed.

SERVICE  
APPLICATIONS

Multi-purpose distributed communications network for a decentralized university community and affiliated research and teaching organizations. Used for meetings, consultations, information exchange, teaching, decision making, technological trials, evaluation of facilities, experiments via satellite systems.

USERS

Administrators, professors, students, researchers of the University of Québec.

Audio system averaged 30 teleconferences per month with 7 persons per conference in 1976/77.

Video system 25 to 30 hours per week in 1977/78

PARTICIPATING  
ORGANIZATIONS

University of Québec and affiliates.

SPONSORS/  
FUNDING

Audio teleconferencing linking seven points. Cost \$93.76 per hour in 1975. Audio consoles leased for \$750.00 per month, not including Centrex lines.

SYSTEM  
OPERATOR

University of Québec

TIME FRAME

Audio conferencing system operational in 1970. BADADUQ tele-documentation system in 1975. Video-conferencing system in September 1977. PLATO initial phase in May 1976.

CONTACT

Robert Dupuy,  
Agent de Recherche,  
University of Québec,  
Vice-Présidence aux Communications,  
2875 Bl. Laurier,  
Ste-Foy, Québec,  
Canada

Telephone Number: (418) 657-2299

BIBLIOGRAPHIC  
REFERENCES

PROJECT NAME U.K. Civil Service R.M.T.

LOCATION London Edinbrough  
Glasgow Manchester  
Norwich

SYSTEM CAPABILITIES

- Two-site configuration (audio)
- 7 in London and 1 each in Edinbrough, GIA Manchester, Norwich
- Any two sites can be connected via London
- each site has six microphones and seven loud speakers
- all speech is switched to the loud speaker attached to the microphone from which the strongest signal emanates

SERVICE APPLICATIONS Administration and Business meetings

USERS U.K. Civil Service

PARTICIPATING ORGANIZATIONS U.K. Civil Service

SPONSORS/  
FUNDING Internal funds

TIME FRAME Operational since 1972

CONTACT Telecommunications Division,  
Civil Service Department,  
Riverwalk House,  
Millbank, London S.W.I. England

BIBLIOGRAPHIC REFERENCES [ 1211 ], [ 1281 ], [ 1308 ]

PROJECT NAME Intelcentre

LOCATION France

SYSTEM CAPABILITIES Audio Telconferencing supported by:

- facsimile, telex
- high quality telephone and data
- system identical to Datapack

SERVICE APPLICATIONS

USERS Business community

PARTICIPATING ORGANIZATIONS

- Intercentre
- French PTT
- Datar

SPONSORS/  
FUNDING

SYSTEM OPERATOR France Cables & Radio

TIME FRAME Operational since 1976

CONTACT André Faye  
Faye Engineering

BIBLIOGRAPHIC REFERENCES

PROJECT NAME

Telecentre

22

LOCATION

Paris, France

SYSTEM  
CAPABILITIES

Multi-site Audio Conferencing system

- 17 sites in 17 cities by 1978
- facsimile service
- computer-controlled booking system for reservations
- each Telecentre accomodate 6 participants
- there is a telesécretariat which provides secretarial service remotely
- audio only

SERVICE  
APPLICATIONS

Commercial teleconferencing between distant groups.

USERS

Business community

PARTICIPATING  
ORGANIZATIONS

French P.T.T.

SPONSORS/  
FUNDING

TIME FRAME

CONTACT

M. B. Lefevre  
15 rue Chardon Lagache  
75016 Paris, France

BIBLIOGRAPHIC  
REFERENCES

PROJECT NAME TRIDIC (Triparameter Interframe Codic)

LOCATION Tokyo, Japan

SYSTEM CAPABILITIES Multi-site video teleconferencing system

- Uses public telephone lines and TV receivers
- Narrow band T.V. transmitting only changes or movements
- Receiver reconstitutes the picture
- Bandwidth reduced to 1MHz with resultant cost reductions

SERVICE APPLICATIONS Commercial teleconferencing between distant parties. Transportable conference equipment is planned.

USERS New technique developed by the Musashino Electrical Communication Lab. Ten companies interested and social users are anticipated.

PARTICIPATING ORGANIZATIONS Nippon Telegraph & Telephone Public Corporation (NTTPC)

SPONSORS/ FUNDING NTTPC  
4 MHz band trial system between Tokyo and Osaka costs 15,000 yen for 30 minutes.  
1 MHz system will reduce these costs.

SYSTEM OPERATOR NTTPC

TIME FRAME 4 MHz system started on trial basis in May 1976 and used by the corporation between Tokyo and Osaka.  
1 MHz system to be introduced in fiscal year 1978.

CONTACT Nippon Telegraph & Telephone Public Corporation  
1-6  
Uchisaiwai - Cho  
1 - Chome  
Chiyoda - Ku  
Tokyo 100  
Japan

BIBLIOGRAPHIC REFERENCES

PROJECT NAME

PHOENIX CRIMINAL JUSTICE

24

LOCATION

Phoenix, Arizona, U.S.A.

SYSTEM  
CAPABILITIES

High resolution black and white video, telephone.

- 8 special picture phones meeting TV standards in 5 relatively close locations.
- wide-angle camera and large screen display.
- 3 party conference calls.
- videotape signal capability.
- 4-5 MHZ coaxial cable and microwave cable connected through local telephone exchange.

SERVICE  
APPLICATIONS

Video telephone trial linking jail, courtrooms, public defenders, patrol officers and prosecutors. Principally to save time in transporting prisoners and that of public defenders.

USERS

Essentially one judge for simple arraignment appearances, public defenders and probation officers to communicate with prisoners. Other trials involved prisoner witnesses in the penitentiary and connections to medical expert witnesses.

PARTICIPATING  
ORGANIZATIONS

Phoenix Criminal Justice Administration, National Institute of Law Enforcement and Criminal Justice, Law Enforcement Assistance Administration, U.S. Department of Justice

SPONSORS/  
FUNDING

Annual operating budget in excess of \$46,000

SYSTEM  
OPERATOR

Phoenix Criminal Justice Administration. Maintenance by Mountain Bell Telephone of Phoenix.

TIME FRAME

Phoenix Project initiated in 1974, ran for 16 months. Present project is the post experimental experience. Public Defenders Office enthusiastic to continue use.

CONTACT

Gordon Allison,  
Maricopa County Superior Court,  
5th Floor, Superior Court Building,  
101 West Jefferson,  
Phoenix, Arizona, 85033  
U.S.A.

Telephone Number: (602)

BIBLIOGRAPHIC  
REFERENCES

[113]

PROJECT NAME

Bank of America

25

LOCATION

Los Angeles, U.S.A.  
San Francisco, U.S.A.

SYSTEM  
CAPABILITIES

Two-site system  
Audio  
Two microphones in Center of Tabic  
4 wire transmission ( 3 KhZ )

SERVICE  
APPLICATIONS

Regularly scheduled meetings by senior management

USERS

Bank of America service management employees

PARTICIPATING  
ORGANIZATIONS

Bank of America

SPONSORS/  
FUNDING

Internal funds

SYSTEM  
OPERATOR

Bank of America

TIME FRAME

Operational since 1963

CONTACT

Mr. Frank West  
Bank of America  
Dept. 3415, Box 37,000  
San Francisco, California 94137

BIBLIOGRAPHIC  
REFERENCES

PROJECT NAME

Union Trust Company

26

LOCATION

Stamford, Ct.  
New Haven, Ct., U.S.A.

SYSTEM  
CAPABILITIES

- two-site audio conferencing
- two rooms
- each room seats 12-14 conferees
- stereo system with plug-in microphones at the table
- facsimile transmission by dedicated line leased by the Southern New-England Telephone Co. (S.N.E.T.)
- Audio transmission also by S.N.E.T.

SERVICE  
APPLICATIONS

Administrative and business meetings.  
Management finds the system very satisfactory and feels that the video is not necessary.

USERS

Union Trust, 2 major meetings a week

PARTICIPATING  
ORGANIZATIONS

Federal Department of Housing and Urban Development  
Goldmark Communications Corp.

SPONSORS/  
FUNDING

H.U.D. grant of \$462,000.

SYSTEM  
OPERATOR

Goldmark Communications Corp.

TIME FRAME

Operational

CONTACT

Mr. Al Scitione  
Goldmark Communications Corp.  
98 Commerce Road  
Stamford, Ct. 06904

Telephone Number: (203) 327-7270

BIBLIOGRAPHIC  
REFERENCES



PROJECT NAME Westinghouse Communications Technology Satellite  
Test Phase 11

LOCATION Baltimore, Maryland, U.S.A.  
Lima, Ohio, U.S.A.

SYSTEM CAPABILITIES Two-site Configuration; Transmission Via C.T.S./Hermes  
Satellite; Color Video and Audio;  
Each studio has:

- one 4 x 6 advert screen to view remote participants
- two cameras showing the participants
- one self view monitor
- one black and white camera for graphics display
- one microphone per participant (clipped on)
- cough buttons

SERVICE APPLICATIONS Meetings between Westinghouse personnel

USERS Westinghouse Electric Co.

PARTICIPATING ORGANIZATIONS NASA

SPONSORS/  
FUNDING

SYSTEM OPERATOR Westinghouse

TIME FRAME Operational

CONTACT Mr. George Kuegher  
Westinghouse Electric Co.  
P. O. Box 1693  
Mail Stop 973  
Baltimore, Maryland 21203

BIBLIOGRAPHIC REFERENCES [ 688 ]

PROJECT NAME

N.A.S.A. Goddard Center

28

LOCATION

Green Bel, Maryland, U.S.A.

SYSTEM  
CAPABILITIES

Transmission by Satellite (C.T.S.); multi-site configuration; audio and black and white video; each studio has:

- two cameras showing the participants
- one camera for graphics display
- facsimile sent by regular telephone lines
- high speed facsimile transmitted by conditioned high quality phone lines

SERVICE  
APPLICATIONS

Internal meetings between N.A.S.A. centers

USERS

National Aeronautics and Space Administration (N.A.S.A.)

PARTICIPATING  
ORGANIZATIONS

National Aeronautics and Space Administration

SPONSORS/  
FUNDING

National Aeronautics & Space Administration

SYSTEM  
OPERATOR

N.A.S.A.

TIME FRAME

Operational

CONTACT

Mr. John Chitwood  
N.A.S.A. Goddard Space Flight Center  
Green Bel, Maryland  
U.S.A. 20771

BIBLIOGRAPHIC  
REFERENCES

[ 487 ]

PROJECT NAME Dow Chemical Co.

LOCATION Midland, Michigan, U.S.A.  
Freeport, Texas, U.S.A.

SYSTEM CAPABILITIES Transmission by dedicated microwave using ABC's/NBC's back up lines; two-site configuration, audio and color video; each studio has:

- one main monitor
- mobile cameras showing the participants
- one camera for graphics/blackboard display
- patch available for slides/movies

SERVICE APPLICATIONS Internal meetings between Dow Chemical personnel

USERS Dow Chemical Co.

PARTICIPATING ORGANIZATIONS Dow Chemical Co.

SPONSORS/  
FUNDING

SYSTEM OPERATOR Dow Chemical Co.

TIME FRAME Operational from 1974 - Mid '76

CONTACT Mr. Gordon Lee  
Dow Chemical Co.  
Midland, Michigan  
U.S.A. 48640

BIBLIOGRAPHIC REFERENCES Telephone Number : (517) 636-1000

PROJECT NAME

PICTUREPHONE MEETING SERVICE

30

LOCATION

Basking Ridge, New Jersey, U.S.A.

SYSTEM  
CAPABILITIES

- Multi-site B&W video system
- Capable of 2 mode conferences
- Three cameras, voice-switched, showing two persons at a time, at a table seating six
- Individual microphones
- Camera for documents, slides, blackboard, etc.
- Facilities for sending films, videotapes and facsimile print-out
- Microwave video (1 MHz)
- Digital Transmission and Switching

SERVICE  
APPLICATIONS

Meetings between groups at different locations, usually corporate, within AT&T or by corporate customers. Chiefly for saving travel time

USERS

AT&T and corporate customers studios in New York, Chicago, Washington D.C., San Francisco and various locations in New Jersey

PARTICIPATING  
ORGANIZATIONS

AT&T

SPONSORS/  
FUNDING

Meeting room costs \$60,000 to \$100,000 to install. Rates are \$2.50 to \$6.50 per minute depending on distance

SYSTEM  
OPERATOR

AT&T

TIME FRAME

Operational since 1974

CONTACT

Picturephone Meeting Service  
Marketing Manager  
AT&T Corporation  
295 North Maple Avenue  
Basking Ridge, New Jersey, 07920, USA

Tel.no.: (201) 221-6510

BIBLIOGRAPHIC  
REFERENCES

PROJECT NAME

Bell Laboratories

31

LOCATION

Murray Hill, New Jersey, U.S.A.  
Holmdel, New Jersey, U.S.A.

SYSTEM  
CAPABILITIES

Two-site configuration; audio and black and white  
video;  
each studio has:

- three cameras for the participants
- one overhead camera for graphic's display
- one camera for an overview
- three monitors for the remote studio
- one monitor for the local studio
- cameras are voice activated
- cough buttons

SERVICE  
APPLICATIONS

Internal meetings

USERS

Bell Laboratories

PARTICIPATING  
ORGANIZATIONS

Bell Laboratories

SPONSORS/  
FUNDING

Internal funds

SYSTEM  
OPERATOR

Bell Laboratories

TIME FRAME

Operational since 1967

CONTACT

Bell Laboratories  
600 Mountain Avenue  
Murray Hill, New Jersey, 07974  
U.S.A.

BIBLIOGRAPHIC  
REFERENCES

[ 936 ]

PROJECT NAME                    Banker's Trust Co. - Teleconferencing System

LOCATION                            New York, N.Y., U.S.A.

SYSTEM  
CAPABILITIES                    Two-site configuration; audio and black and white  
video;  
each studio has:

- one monitor for remote participants
- one camera for local participants and graphics display
- open microphones (two)

SERVICE  
APPLICATIONS                    Business meetings

USERS                             Managers from Banker's Trust

PARTICIPATING  
ORGANIZATIONS                    Banker's Trust

SPONSORS/  
FUNDING                          Internal funds

SYSTEM  
OPERATOR                         Banker's Trust Co.

TIME FRAME                        Operational from 1963-1968

CONTACT                            Mr. Bob Lawley  
Banker's Trust Co.  
7th floor  
1 Banker's Trust Plaza  
New York, N.Y.  
U.S.A.    10015

BIBLIOGRAPHIC  
REFERENCES

PROJECT NAME First National City Bank - Teleconferencing System

LOCATION New York, N.Y., U.S.A.

SYSTEM CAPABILITIES Two-site configuration; audio and black and white video;  
each studio has:

- one camera displaying all participants in studio
- one overhead camera used for graphics
- two microphones, two monitors per studio for displaying remote and local participants

SERVICE APPLICATIONS Management meetings

USERS First National City Bank

PARTICIPATING ORGANIZATIONS First National City Bank

SPONSORS/ FUNDING First National City Bank

SYSTEM OPERATOR First National City Bank

TIME FRAME Not presently in use. Operational in the early sixties but discontinued due to high costs. Speaker phone telephones now used for teleconferencing purposes.

CONTACT John Farris  
First National City Bank  
399 Park Avenue  
New York, N.Y.  
10043  
Telephone Number: (212) 559-1000

BIBLIOGRAPHIC REFERENCES

PROJECT NAME Philadelphia Police Closed Circuit TV System

LOCATION Philadelphia Pennsylvania, U.S.A.

SYSTEM CAPABILITIES Two-way cable video network system. Capacity for 32 channels downstream and 4 channels upstream. Two microwave dishes.

- B & W video and audio
- color video in broadcast mode
- 2 studios for production of programs and videotapes
- video conferencing - several simultaneous conferences. 25 VICON terminals
- high resolution and high speed facsimile

SERVICE APPLICATIONS Up-date information on police procedures, wanted and missing persons, training. Transmission of documents, finger prints, mug shots. Used inter-actively for conferencing, arraignment of prisoners, prisoner interviews.

USERS Divisional and district police headquarters. Other police locations

PARTICIPATING ORGANIZATIONS Philadelphia Police Department

SPONSORS/ FUNDING City of Philadelphia and Law Enforcement Assistance Administration (LEAA)  
Estimated cost of system \$3.7 million.  
Operating cost \$150,000 per year

SYSTEM OPERATOR Philadelphia Police Department

TIME FRAME Pilot microwave system 1970  
Assessment of cable system 1975  
Expansion ongoing - 20 of 33 locations using system

CONTACT James C. Herron, Chief Inspector  
Philadelphia Police Department,  
Room 212, Police Headquarters Building,  
8th and Race Streets,  
Philadelphia, Pa.  
U.S.A.

Telephone Number: (215) 686-3138

BIBLIOGRAPHIC REFERENCES



PROJECT NAME U.S. Dept. of Energy (formerly E.R.D.A.)

LOCATION Washington, D.C. , U.S.A.

SYSTEM CAPABILITIES Multi-site configuration, audio conferencing

- 10 locations
- Bell 50-A type conferencing units
- Facsimile copies are sent by their own message system

SERVICE APPLICATIONS Administrative meetings

USERS U.S. Dept. of Energy

PARTICIPATING ORGANIZATIONS U.S. Dept. of Energy

SPONSORS/ FUNDING U.S. Dept. of Energy internal funds

SYSTEM OPERATOR U.S. Dept. of Energy

TIME FRAME Operational since 1976

CONTACT Mr. Jesse Pate  
Division of Communications & Computer Operations  
U.S. Dept. of Energy  
Washington, D.C.  
20545

BIBLIOGRAPHIC REFERENCES



PROJECT NAME Visual Communication Network Studies

37

LOCATION Shirley Bay, Ontario, Canada

SYSTEM CAPABILITIES Narrowband communications over Datapac. Interactive graphic communications with the provision of a common visual space. CRT terminal with keyboard and light pen.

SERVICE APPLICATIONS

- Education and training (University of Manitoba)
- Man-machine interaction studies
- Dispersed programming experiment (Royal Military College)
- Military applications (Defence Research Establishment)

USERS (see below)

PARTICIPATING ORGANIZATIONS

Communications Research Center, Shirley Bay  
Royal Military College, Kingston  
University of Manitoba, Winnipeg  
Defence Research Establishment, Ottawa

SPONSORS/  
FUNDING

Communications Canada  
National Defence Canada

SYSTEM OPERATOR

Communications Research Center

TIME FRAME

Operational since December 1976

CONTACT

Mr. Herb Bown  
Manager  
Image Communications Research  
Communications Research Center  
Communications Canada  
Ottawa, Ontario

Telephone Number : (613) 569-9549

BIBLIOGRAPHIC REFERENCES

[164], [165], [166], [943], [944],  
[1125], [1126], [1358]

PROJECT NAME Interactive Visual Communications 38

LOCATION Nun's Island, Verdun, Quebec, Canada

SYSTEM CAPABILITIES The system uses a TV set as the visual terminal and light-pen to write on the screen and select menus. Any prestored visual or textual data base in Digital form can be brought to the screen, modified and subjected to compression algorithm. Transmission can be narrowband via telephone lines, or broadband via cable.

SERVICE APPLICATIONS Simulation scenario to determine the features most desirable in a visual communications terminal. Development of transmission compression techniques for digitally stored images.

USERS Professionals such as architects and medical doctors.

PARTICIPATING ORGANIZATIONS Bell Northern Research  
INRS - Telecommunications

SPONSORS/  
FUNDING Bell Northern Research

SYSTEM OPERATOR Bell Northern Research

TIME FRAME Operational since January 1978

CONTACT Prof. B. Prasada  
Bell-Northern Research  
3 Place du Commerce  
Nun's Island, Verdun, Quebec, Canada  
Tel.no.: (514) 768-6691 ext. 344

BIBLIOGRAPHIC REFERENCES

PROJECT NAME Strathclyde Fire Brigade

PROJECT LOCATION Hamilton, Scotland

SYSTEM CAPABILITIES Facsimile transmission to fire trucks.  
Muirhead facsimile recorder  
50 watt transmitter in FM mobile (VHF)

SERVICE APPLICATIONS Data transmission to moving and stationary  
vehicles.

USERS Strathclyde Fire Brigade in experimental trial.  
8 mile diameter bowl-shaped area was covered  
by an antenna on the side of the bowl. Reception  
excellent to both stationary and moving vehicles.

PARTICIPATING ORGANIZATIONS Strathclyde Fire Brigade

SPONSORS/  
FUNDING

SYSTEM OPERATOR Strathclyde Fire Brigade

TIME FRAME Trial about a year 1976/77  
Facility not continued as considered as not  
essential.

CONTACT R.G. Knowlton, Firemaster  
Strathclyde Fire Brigade Headquarters  
Rothwell Road  
Hamilton, ML3-OEA  
Scotland

BIBLIOGRAPHIC REFERENCES

PROJECT NAME INTERGRAPH 111 40

LOCATION Palo Alto, California, USA

SYSTEM CAPABILITIES Interactive display system for graphics and alpha-numeric using two telephone lines, one for hands-free audio, the other for data

- microprocessor with diskette storage
- keyboard, light pen constructs, modifies display or stores information
- CRT with pointing capability (movable cursor)
- hands-free telephone for audio
- currently two-terminals, can be connected, multi-mode anticipated

SERVICE APPLICATIONS Simultaneous visual common working space and audio teleconferencing over telephone lines.

USERS Intended for companies, agencies and business operations with units displaced geographically. Trials being conducted by industrial and communications companies in Canada and USA.

PARTICIPATING ORGANIZATIONS Bell Canada  
Northern Telecom International  
Bell - Northern Research  
BNR Inc.

SPONSORS/  
FUNDING Bell Canada  
Northern Telecom International  
Bell - Northern Research

SYSTEM OPERATOR Intended for customer operation

TIME FRAME Research and development, 1972-1977  
Phototype production, 20 units in 1979

CONTACT Mr. R. Lindsay  
NTI  
Stanford Industrial Park  
3174 Porter Drive  
Palo Alto, California, USA  
CA 94304  
Tel. no.: (415) 494-3942

BIBLIOGRAPHIC REFERENCES

PROJECT NAME           The San Diego Telenote 100 Project

LOCATION                 San Diego, California, U.S.A.

SYSTEM CAPABILITIES    Multi-site configuration; audio-graphic; transmission by regular phone lines; handwriting input terminal

SERVICE APPLICATIONS   Education of homebound students  
Teacher and student communication by audio and handwriting with students situated in different locations.

USERS                   Homebound students

PARTICIPATING ORGANIZATIONS   H.E.W.  
San Diego Unified School District

SPONSORS/FUNDING        The Dept. of Health, Education and Welfare (H.E.W.)

SYSTEM OPERATOR        Pacific Telephone Co.  
San Diego School District

TIME FRAME             Operational since 1975

CONTACT                 Mr. C. Robert Calhoun  
Supervisor, Programs for Physically Handicapped  
San Diego Unified School District  
4100 Normal St.  
San Diego, California 92103

BIBLIOGRAPHIC REFERENCES   Thompson, Claudia, "The Sand Diego Telenote 100 Project",  
San Diego City Schools, San Diego, Ca.

PROJECT NAME Electronic Blackboard

LOCATION Holmdel, New Jersey, U.S.A.

SYSTEM CAPABILITIES Large pressure - sensitive device written on with chalk and reproduced on a conventional T.V. display. Transmission in real time over a narrow band telephone line. Interactive writing from two or more locations. Partial erase and automatic switching between blackboards. Two-way voice communication on separate telephone line using 50A1 Portable Conference Telephone Set. Writing transmitted at 40 HZ sampling rate as digitally - encoded data with 202 type data set. Half-duplex transmission. Graphics transmission can be recorded on a conventional audio recorder.

SERVICE APPLICATIONS Remote teaching and training, conferences and other business applications.

USERS University of Illinois with experimental Bell Lab equipment

PARTICIPATING ORGANIZATIONS Bell Telephone Laboratories  
University of Illinois

SPONSORS/  
FUNDING AT&T internal funds

SYSTEM OPERATOR Improved system developed by Bell Laboratories

TIME FRAME Earlier experimental system used by the University of Illinois since 1974.  
Improved system developed 1977.

CONTACT G.P. Torok,  
Bell Telephone Laboratories, Incorporated,  
Holmdel, New Jersey,  
U.S.A.

Telephone Number:

BIBLIOGRAPHIC REFERENCES [ 353 ], [ 439 ], [ 1147 ], [ 1266 ]



PROJECT NAME

TOPES

43

LOCATION

Whippany, N.J., USA  
Greensboro, N.C., USA

SYSTEM  
CAPABILITIES

Computer-based real time, interactive graphics system.  
Simple keyboard commands to change display.  
Separate voice circuit.  
Tektronic 4014-1 terminal and 4631 copier.  
1200 baud rate drawing transfer through host computer  
5 functional software units for message news, engineering  
information on equipment, computer aids etc., designing,  
off-line storage of drawings.

SERVICE  
APPLICATIONS

Telephone office planning and engineering

USERS

Space-planning engineers in the Operating Telephone  
Companies and operating consultants in AT&T,  
Bell Telephone Laboratories and Western Electric  
Company.

PARTICIPATING  
ORGANIZATIONS

AT&T

SPONSORS/  
FUNDING

Developed by Bell Laboratories Office Planning Department  
Software owned by Western Electric Company

SYSTEM  
OPERATOR

AT&T and operating companies

TIME FRAME

Expected to encompass all AT&T companies with  
more than 50 stations by the end of 1978.

CONTACT

W. Pferd  
Office Planning Department  
Bell Laboratories  
Whippany, N.J., USA

BIBLIOGRAPHIC  
REFERENCES

2. COMPUTER MEDIATED COMMUNICATIONS

PROJECT NAME CMI

LOCATION Ottawa, Ontario, Canada

SYSTEM CAPABILITIES Computer mediated interaction system  
PDP 11/45 minicomputer  
Served 100 users (8 simultaneous) over  
the Trans-Canada Telephone System  
Open or closed conferences  
Message system files for English and French  
Computer response tailored to the users' level  
of familiarity  
Input/editing and formatting to the receiving terminal.

SERVICE APPLICATIONS Trial to monitor user reactions and study message  
switching features. Substitute for travelling  
used to increase communication between users at different  
locations.

USERS At its peak 80 users from four different work disciplines,  
stretching across Canada, used the system.

PARTICIPATING ORGANIZATIONS Bell-Northern Research  
Bell Canada  
Trans-Canada Telephone System (TCTS)

SPONSORS/  
FUNDING Bell-Northern Research and TCTS funding.

SYSTEM OPERATOR Bell-Northern Research  
TCTS

TIME FRAME System in operation the latter part of 1975  
Trial of the system from late January through  
April 1976.

CONTACT Gwen Edwards  
C.C. Market Planning  
Bell Canada  
160 Elgin Street  
Floor 8 Green  
Ottawa, Ontario  
Tel. no.: (613) 239-4334

BIBLIOGRAPHIC REFERENCES

PROJECT NAME	MINT (Move Information No Time)	45
LOCATION	Ottawa, Canada	
SYSTEM CAPABILITIES	Computer conferencing system with terminals across Canada. Interactive programs with message capability and allowing multiple participants to interact simultaneously with the same data base and event set. - Sigma 9 computer - FORTRAN program (Comshare)	
SERVICE APPLICATIONS	To send messages and conduct discussions. Chief application is intended to be project control and activity direction in regional offices.	
USERS	Non-medical Use of Drugs Directorate (NMUD), Health Protection Branch, Department of National Health and Welfare, with 15 or 16 terminals in regional offices of NMUD. Also used by other federal government departments	
PARTICIPATING ORGANIZATIONS	Department of Health and Welfare, Ottawa Communications Research Centre, Ottawa	
SPONSORS/ FUNDING	Non-Medical Use of Drugs Directorate Annual Costs \$140,000 \$1 to \$1.50 to send a typical message	
SYSTEM OPERATORS	MNUD	
TIME FRAME	System approved in 1974 Conversion to FORTRAN in December 1975 FORTRAN program (Comshare) working well by August 1976	
CONTACT	Craig Taylor, Head Information Systems Hugh Pett, Computer Systems Consultant Non-Medical Use of Drugs Directorate, Department of Health and Welfare Canada, Room 962 Journal Tower South, 365 Laurier Avenue West, Ottawa, Ontario, Canada K1A 1B6  Telephone Number: (613) 996-5779, 996-6053	
BIBLIOGRAPHIC REFERENCES		

PROJECT NAME Confer

LOCATION Teddington, Middlesex, England

SYSTEM CAPABILITIES Multi-site configuration; system runs on a PDP 11/40

SERVICE APPLICATIONS Conferences sponsored by the National Physical Laboratory

USERS National Physical Laboratory Personnel

PARTICIPATING ORGANIZATIONS National Physical Laboratory

SPONSORS/ FUNDING Internal funds

SYSTEM OPERATOR

TIME FRAME Operational

CONTACT National Physical Laboratory  
Teddington  
Middlesex  
TW11 0LW  
England

BIBLIOGRAPHIC REFERENCES [ 239 ]

PROJECT NAME Planet, Topics, Notepad, Caselog

LOCATION Palo Alto, California, USA

SYSTEM CAPABILITIES Computer conferencing systems offered by a corporation that works with other organizations to provide the computer network services. The intent is to extend commercial computer conferencing to study their impact and to develop new systems.

SERVICE APPLICATIONS FORUM and PLANET are assembly-language programs developed by the Institute of the Future. PLANET is offered as a comprehensive conferencing system. NOTEPAD and CASELOG are being developed to integrate file management, information retrieval and improve editing.

USERS Corporations, foundations, national agencies, etc., for different conference styles and needs such as seminars, parallel seminars, day to day information exchange, synchronous interaction of stored messages, etc.

PARTICIPATING ORGANIZATIONS Infomedia Corporation  
Institute of the Future  
Various computer networks (Tymnet, Telenet)

SPONSORS/  
FUNDING Charges for network time, computer resources, amount of storage, use of system, number of participants.

CONTACT Jacques Vallée  
Richard Miller  
Infomedia Corporation  
Room 212  
430 Sherman Avenue  
Palo Alto, California 94306 USA  
Tel. no.: (415) 321-2682

BIBLIOGRAPHIC REFERENCES

PROJECT NAME Confer

LOCATION Urbana, Illinois, USA

SYSTEM CAPABILITIES Multi-site (experimental)  
This system runs on a CYBER-73 computer and is a part of the Plato system at the University of Illinois.

SERVICE APPLICATIONS Computer-assisted instruction to the community and related activities

USERS University of Illinois staff and students, members of the community living near the university

PARTICIPATING ORGANIZATIONS University of Illinois

SPONSORS/ FUNDING Internal funds

SYSTEM OPERATOR University of Illinois

TIME FRAME Operational since 1973

CONTACT Mr. George Carter  
4750 Center Ave., Apt. 14  
Pittsburg, Pennsylvania

Telephone Number : (412) 683-3164

BIBLIOGRAPHIC REFERENCES

PROJECT NAME                    CONFER II

LOCATION                         Ann Arbor, Michigan, U.S.A.

SYSTEM  
CAPABILITIES                    Multi-site computer conferencing system. Provides the freedom to participate in typed communication with others. Includes personal contributions, messages to others, reminders to self. Available through the Michigan Terminal System (MTS) operating on the University of Michigan host computer (Amdahl 470/V6) and telex line.

SERVICE  
APPLICATIONS                    Conferences must further research/teaching goals of members of the University Community. Program explores new avenues for facilitating group discussion and decision making.

USERS                            Groups of up to 50 most easily accommodated. Selected groups: Individuals in major cities of the U.S. , Canada and Western Europe can access CONFER through the link between the Merit Computer Network and the Telenet data network.

PARTICIPATING  
ORGANIZATIONS                    University of Michigan

SPONSORS/  
FUNDING                         CONFER costs about \$3.00 per hour for users through MTS. Use of Telenet to access MTS adds about \$4.80 per hour.

TIME FRAME                      On-going project

CONTACT :                        Robert Parnes,  
                                     Karl L. Zinn,  
                                     Centre for Research on Learning and Teaching,  
                                     University of Michigan,  
                                     109 East Madison Street,  
                                     Ann Arbor, Michigan 48109  
                                     U.S.A.

                                     Telephone Number: (313) 763-0158

BIBLIOGRAPHIC  
REFERENCES



PROJECT NAME EIES

LOCATION Newark, N.J., U.S.A.

SYSTEM CAPABILITIES Multi-site computer conferencing system for information exchange. INTERDATA 7/32 minicomputer connected via separate disk controller to a DIVA DD/32 dual-disk system of more than 200 million bytes. The system can be accessed through the TELENET network. EIES is a multi-user system regulated by events rather than time slicing. A special feature is a microprocessor that responds to messages from other conferences for routines, and phones other computers for information. The conference system becomes a focal point for a group using a variety of computer systems for a common objective.

SERVICE APPLICATIONS EIES is used by small groups of researchers with common interests to communicate during the course of projects.

USERS Scientists in four projects funded by the National Science Foundation. 300 to 400 users expected in 1978.

PARTICIPATING ORGANIZATIONS New Jersey Institute of Technology  
National Science Foundation (NSF)

SPONSORS/  
FUNDING \$600,000 from NSF from mid 1975 to Nov. 30, 1977.  
\$300,000 expected in 1978 (\$220,000 for computer support, the rest for terminals).  
\$200,000 worth of hardware at the central location.  
TELENET charges (\$3.50 per hour) covered by separate NSF grants.

SYSTEM OPERATOR New Jersey Institute of Technology.

TIME FRAME EIES became operational in October 1976. Some features based on the EMISARI system started in 1971.

CONTACT Professor M. Turoff,  
Room 201, Weston Hall,  
New Jersey Institute of Technology,  
367 High Street,  
Newark, N.J. 07102  
U.S.A.

Telephone Number: (201) 645-5321

BIBLIOGRAPHIC REFERENCES

PROJECT NAME DEP Conferencing System 51

LOCATION Springfield, Virginia, USA

SYSTEM CAPABILITIES Multi-site configuration.  
This system operates on a Univac 1108 computer.  
Designed for real-time and/or delayed communication interactions. This system includes the ability to poll participants to support opened discussions.

SERVICE APPLICATIONS Group discussions and on-going dialogue

USERS University of Wisconsin students and staff  
Federal Preparedness Agency personnel  
NTIS personnel

PARTICIPATING ORGANIZATIONS University of Wisconsin  
Federal Preparedness Agency  
National Technical Information Service

SPONSORS/  
FUNDING Federal Preparedness Agency

SYSTEM OPERATOR Federal Preparedness Agency

SYSTEM DISTRIBUTOR NTIS

TIME FRAME Operational

CONTACT National Technical Information Service (NTIS)  
5385 Port Royal Road  
Springfield, Virginia 22161

BIBLIOGRAPHIC REFERENCES

PROJECT NAME N.L.S. (oN Line System)/AUGMENT

LOCATION Menlo Park, California, USA

SYSTEM CAPABILITIES Computer-based interactive office automation and communication system designed to help the knowledge worker improve his performance individually and within a distributed group.

- PDP 10
- linking of files
- option of supplementary audio and line graphics

SERVICE APPLICATIONS Complete and sophisticated system for dealing with complex forms of communication. Includes communications and text processing, exchange of messages and shared work space, printing, formatting, editing, retrieval, file exchange, linking.

USERS U.S. Government agencies, industry, research centers and institutes (clients)

PARTICIPATING ORGANIZATIONS Augmentation Research Center (ARC), Stanford Research Institute (SRI)  
Advanced Programs Research Agency (ARPA)  
Tymnet

SPONSORS/FUNDING ARPA funds (✓ \$1 M per year for 12 years)  
Industrial and military clients on a subscription basis for 3 years.  
Tymeshare (public message system called AUGMENT)

SYSTEM OPERATOR ARC, SRI until 1977  
Tymeshare since 1978

TIME FRAME Started at ARC in early 1960's.  
Started on subscription basis in January 1974.  
Sold to Tymnet January 1978 (simplified version)

CONTACT

James H. Bair	James Norton
Augmentation Research Center	Tymeshare Incorporated
Stanford Research Institute	
Menlo Park, California	Cupertino, California, 95014
USA	USA
Tel. no.: (415) 326-6000	Tel. no.: (408) 446-6249

BIBLIOGRAPHIC  
REFERENCES

James H. Bair, "Evaluation and Analysis of Augmented Knowledge Workshop". Final Report to RADC, Air Force Systems Command, 1973.

D.W. Conrath and J. H. Bair, "The Computer as an Interpersonal Communication Device: A Study of Augmentation Technology and Its Apparent Impact on Organizational Communications". Proc. of the 2nd International Conference on Computer Communications, Stockholm, August 1974.

D.C. Engelbert, R.W. Watson, and J.C. Norton, "The Augmented Knowledge Workshop". National Computer Conference Proceedings, New York: AFIPS Press, June 1973.

J.C. Norton, J.H. Bair, and D.C. Englebert, " AKW System Capabilities and Features: An Overview? ", Stanford Research Institute, September 1976.

PROJECT NAME QUIC-LAW

LOCATION Kingston, Ontario, Canada

SYSTEM CAPABILITIES Information Retrieving using CRT or teletypewriter terminals from bibliographic and legal data bases. Transmission via the switched telephone network.

SERVICE APPLICATIONS Information retrieval

USERS Libraries, researchers, lawyers

PARTICIPATING ORGANIZATIONS Q.L. Systems

SPONSORS/  
FUNDING Q.L. Systems originated in the development of QUIC-LAW at Queen's University with funding from IBM Canada and the Government of Canada, starting in the late sixties.

SYSTEM OPERATOR Q.L. Systems Limited

TIME FRAME Operational since 1976

CONTACT Mr. Hugh Lawford  
Q.L. Systems Limited  
322 Brock St.  
Kingston, Ontario  
K7L-1S9  
Tel. No.: (613) 549-4611

BIBLIOGRAPHIC REFERENCES

PROJECT NAME                    CAN/OLE (Canadian On-Line Enquiry)                    55

LOCATION                            Ottawa, Ontario, Canada

SYSTEM CAPABILITIES            On-Line interactive retrieval system via typewriter terminal or CRT  
Transmission via DATAPAC

SERVICE APPLICATIONS           a) Searches of Bibliographical data bases  
b) On-Line ordering of documents

USERS                             Subscribers to the system pay-as-you-go basis (per connect hour)

PARTICIPATING ORGANIZATIONS    Over 360 terminal users across Canada in government, universities and industry

SPONSORS/FUNDING                National Research Council Canada

SYSTEM OPERATOR                Canada Institute for Scientific and Technical Information, National Research Council Canada

TIME FRAME                        February, 1974 -

CONTACT                          Mr. L. Grigaitis  
CAN/OLE Coordinator  
Canada Institute for Scientific and Technical Information  
National Research Council Canada  
Montreal Road, Building M-55  
Ottawa, Ontario  
K1A 0S2

                                    Telephone Number : (613) 993-3791

BIBLIOGRAPHIC REFERENCES        Heilik, J. 1976. CAN/OLE: A Technical Description.  
In: Canadian Association for Information Science. Annual Meeting, 4th, London, Ontario. 1976. May 11-14, Proceedings: Information Services in Canada. Ottawa, Ontario: Canadian Association for Information Science; 1976. 47-55

PROJECT NAME            INFOMART

LOCATION                 Toronto, Ontario, Canada  
(field offices in Vancouver, Ottawa, Quebec)

SYSTEM CAPABILITIES    Electronic retrieval of newspapers and on-line data retrieval by computer. Three computers are accessed; the System Development Corporation's information retrieval system (using an Amdhal 470/V5 computer), the New York Times Information Bank (IBM 370/145 computer) and the Globe and Mail's data bank called Info Globe. All standard dial-up data terminals (110 to 1200 baud) are compatible.

SERVICE APPLICATIONS   Textual data searching in over 45 different data bases covering business, scientific and technical and news/current events information. Over 17 million records are on-line. A videotex division was set-up in 1979.

USERS                    Government            Industry            Academic            Other  
                          25%                    45%                    25%                    5%

PARTICIPATING ORGANIZATIONS   Free Press Publications, Toronto  
Southam Press Ltd., Toronto  
The Toronto Star, Toronto  
New York Times Information Bank, New York  
System Development Corporation, Santa Monica

SPONSORS/FUNDING        Southam Press, Toronto Star, Free Press Publications  
Charges for computer time and telecommunication usage  
Search rates vary with each data base and range from under \$1 to just over \$2.

TIME FRAME              Operational since November 1975  
Augmented service December 1977

CONTACT                 G. Haslow  
Infomart, Suite 806  
One Yonge Street  
Toronto, Ontario, Canada  
M5E 1E5  
  
Tel. no.: (416) 366-3904

BIBLIOGRAPHIC REFERENCES

PROJECT NAME

MAILBOX

57

LOCATION

Toronto, Ontario, Canada

SYSTEM  
CAPABILITIES

Computer-based store and forward message system between closed user groups.

- Packet switched network with 46 microcomputer based nodes. To be optimized at 70 nodes
- 2 host computers and leased data lines
- automatic fault diagnosis
- rapid data transmission
- low speed asynchronous terminals
- computer language is APL

SERVICE  
APPLICATIONS

Emphasis on communication between people rather than between geographic locations. Users each have unique codes, can text edit, enquire about status of messages for him or messages sent by him. Simple log-on procedures. Real time information exchanges possible. Ease of use, rapidity and reliability emphasized.

USERS

1000 people in September 1977. I.P. Sharp Associates staff. Companies or special interest groups for internal message exchange. Often sold with other computer services.

PARTICIPATING  
ORGANIZATIONS

I.P. Sharp Associates and customers

SPONSORS/  
FUNDING

Development costs very low  
No specific charge. Revenues from use of the computer system.

SYSTEM  
OPERATOR

I.P. Sharp Associates Ltd.

TIME FRAME

On-going

CONTACT

I.P. Sharp Associates,  
Suite 1400,  
145 King Street West,  
Toronto, Ontario, Canada  
M5H 1J8

Telephone number: (416) 346-5361

BIBLIOGRAPHIC  
REFERENCES



PROJECT NAME            Mobile Radio Data System (MRDS)

LOCATION                 Vancouver Police Department  
Vancouver, British Columbia, Canada

SYSTEM CAPABILITIES    Full keyboard & plasma display terminals in  
police cars, signal transmitted by radio.

SERVICE APPLICATIONS    Police information retrieval, confidential  
dispatching, car to car and dispatch centre  
to car communications.

USERS                    3 dispatch centre terminals) during field  
12 mobile terminals            ) trial

                          5 dispatch centre terminals)  
60 terminals                    ) full operation

PARTICIPATING ORGANIZATIONS    Department of Communications  
Vancouver Police Department  
Canadian Police Information Centre

SPONSORS/  
FUNDING                 Department of Communications            \$500,000.00  
Vancouver Police Department            \$800,000.00  
Canadian Police Information Centre      \$ 75,000.00

SYSTEM OPERATOR        Vancouver Police Department

TIME FRAME              System implemented in 1978.

CONTACT                 Staff Inspector K.R. Cocke  
Information & Communications Division  
Vancouver Police Department  
312 Main Street,  
Vancouver, B.C.  
V6A 2T2

BIBLIOGRAPHIC REFERENCES    Canadian Electronics Engineering August 1976,  
"Digital Techniques Speed Police Communications".

PROJECT NAME	ONTYME	59
LOCATION	Cupertino, California, U.S.A.	
SYSTEM CAPABILITIES	<p>Computer based store and forward message system. Each message has a master message number. Time and date noted on each message sent and received.</p> <p>Message can be sent to multiple users or predefined groups.</p> <p>Output sequence numbers assigned for user control.</p> <p>On-line storage of recent messages for immediate retrieval.</p> <p>Archival copies of messages on tape.</p> <p>Provision of traffic analysis data to facilitate control.</p> <p>In-house version of ONTYME also offers:</p> <ul style="list-style-type: none"> <li>Tailoring to meet customer requirements.</li> <li>Support of a variety of communications facilities.</li> <li>Interface to other computer systems.</li> <li>Switching and simultaneous execution of user-written programs.</li> <li>Backup by the public message switching service.</li> </ul>	
SERVICE APPLICATIONS	<p>Public message switching system.</p> <p>In-house switching system.</p>	
USERS	<p>Customers that use Telex and TWX services.</p> <p>Tymnet reaches half the population of the U.S.</p>	
PARTICIPATING ORGANIZATIONS	<p>Tymnet Inc.</p> <p>Tymshare Inc.</p>	
SPONSORS/ FUNDING	<p>Typical public message charges average \$0.30 to \$0.40</p> <p>In-house systems cost \$150,000 to \$300,000</p>	
SYSTEM OPERATOR	<p>Tymnet Inc.</p>	
TIME FRAME	<p>Message service offered since August 1977.</p>	
CONTACT	<p>Walter E. Ulrich Jr.,  Manager, Message Switching,  Tymnet Incorporated,  20705 Valley Green Drive,  Cupertino, California, 95014  U.S.A.</p> <p>Telephone Number: (408) 446-6249</p>	

PROJECT NAME HERMES

LOCATION Cambridge, Massachusetts, U.S.A.

SYSTEM CAPABILITIES Advanced ARPANET computer mail system  
- Text editing, filing, retrieval and other message handling tasks. The system can also be accessed through Telenet.

SERVICE APPLICATIONS Message system with the capability to handle a message over its full life cycle. (Creation, transmission, and storage).  
Average message length seems to be around 150 words.

USERS Chiefly Bolt, Beranek and Newman (BBN) users who are computer scientists.

PARTICIPATING ORGANIZATIONS BBN  
Telenet Communications Corporation

SPONSORS/FUNDING BBN and ARPA funding  
Estimated optimized total cost/message \$2.81  
Estimated cost without network charges/message \$1.59

SYSTEM OPERATOR Telenet

TIME FRAME 1976/1977  
HERMES led to a simplified version called TELEMAIL, authorized in 1977.

CONTACT Bolt, Beranek and Newman Inc.  
Cambridge, Massachusetts  
U.S.A.  
  
Telephone number : (617) 491-1850

BIBLIOGRAPHIC REFERENCES

PROJECT NAME

TELEMAIL

61

LOCATION

Washington, D.C., USA

SYSTEM  
CAPABILITIES

Terminal to terminal and store and forward message system offered over a national packet-switching network (Telenet).  
Seven major switching centres (central offices).  
74 concentration and access points (central offices).  
High speed digital and analog leased lines.  
Central offices provide variety of access ports.  
Variety of incompatible devices can communicate through the network.  
Powerful error-control software  
Terminals or computers connected by "virtual connections".  
Conversion from mini-computers to microprocessors underway in network.

SERVICE  
APPLICATIONS

Computer-based message service between people in real time or on a deferred basis.

USERS

U.S. customers and Telenet Corporation. Interface with Datapak.

PARTICIPATING  
ORGANIZATIONS

Telenet Communications Corporation (TCC).  
Other companies involved in message service, such as BBN, AT&T, Bell Canada.

SPONSORS/  
FUNDING

Total investment about \$10M

SYSTEM  
OPERATOR

Telenet Communications Corporation

TIME FRAME

Telenet authorized April 1974 (value-added carrier)  
Service commenced August 1975  
Telemail authorized 1977

CONTACT

Stuart L. Matheson, Vice President  
Telenet Communications Corporation,  
850-1050 17th Street, N.W.,  
Washington, D.C., 20036  
USA  
Tel. no.: (202) 637-7929

BIBLIOGRAPHIC  
REFERENCES

3. TELE - EDUCATION

PROJECT NAME Division of Educational Research Services Computer-Assisted Instruction Facility

LOCATION Faculty of Education, The University of Alberta, Edmonton, Alberta, Canada.

SYSTEM CAPABILITIES IBM 1500 System with 22 terminals, 18 of which contain CRT display, light pencil, audio play unit, and film (16 mm) projector (static). There are currently nine courses of greater than 20 hours, some as long as 80 hours (average) available on the system.

SERVICE APPLICATIONS Computer-assisted instruction, credit courses.

USERS Students and members of the participating organizations. Approximately 26,000 terminal-hours of instruction per year. Operates 72 hours per week including weekends and evenings.

PARTICIPATING ORGANIZATIONS University of Alberta.  
Northern Alberta Institute of Technology.  
Royal College of Physicians and Surgeons.  
Edmonton Public School System.  
Edmonton Separate School System.

SPONSORS/  
FUNDING Faculty of Education, The University of Alberta.  
Rental cost of IBM 1500 System is approximately \$12,000 per month.

SYSTEM OPERATOR The Division of Educational Research Services.

TIME FRAME Operational since 1968.

CONTACT Dr. Steve Hunka  
Room 3-104 Education Centre North,  
Division of Educational Research Services,  
Faculty of Education,  
The University of Alberta, Canada.  
Edmonton, Alberta,  
T6G 2G5

Telephone Number: (403) 432-3762

BIBLIOGRAPHIC REFERENCES [631]

PROJECT NAME TAIM

LOCATION Edmonton, Alberta, Canada.

SYSTEM CAPABILITIES TAIM computer managed instructional system, run on the computer at the University of Alberta. Groups of students will use the system on an overnight basis. Educational prescriptions are given to students through the computer. Although at present the system is individually based, the goal is to emulate a classroom situation independently of student locations.

SERVICE APPLICATIONS Part of a computing science course.

USERS Ten hours of instruction will be available. Between 20 and 40 students will share 2 terminals to test the system.

PARTICIPATING ORGANIZATIONS Learning centres of Athabasca University at:  
Calgary  
Edmonton  
Fort McMurray

SPONSORS/  
FUNDING Athabasca University  
Alberta Department of Advanced Education and Manpower

SYSTEM OPERATOR Athabasca University

TIME FRAME A pre-experiment pilot trial is to start in June 1978 to test and evaluate the TAIM system.

CONTACT G.M. Richmond  
Athabasca University  
14515 122 Avenue,  
Edmonton, Alberta.  
T5L 2W4  
  
Telephone Number: (403) 452-9990

BIBLIOGRAPHIC REFERENCES

PROJECT NAME Carleton-Stanford Curriculum Sharing Experiment

LOCATION Ottawa, Ontario, Canada  
Stanford, California, USA.

SYSTEM CAPABILITIES The HERMES satellite was used to transmit video, audio, and data in each direction. A key engineering feature of the experiment is the use of real-time video compression in conjunction with channel coding and quadra-phase modulation for reducing the bandwidth and power required for video transmission. The communications link operates in two basic modes: Video one-way with audio feedback for classes in both directions simultaneously or full-duplex video for interactive teleconferencing experiments. Studio classrooms are used at each end of the link.

SERVICE APPLICATIONS Classes, special discussion seminars, student counselling and problem sessions.

USERS Graduate students. Four courses (two from Stanford and two from Carleton), were exchanged each week, as well as a seminar session originating at Stanford.

PARTICIPATING ORGANIZATIONS Carleton University, Ottawa, Ontario  
Stanford University, Stanford, California  
NASA-Ames Research Centre, Moffett Field, California

SPONSORS/  
FUNDING Department of Communications Canada  
National Aeronautics and Space Administration

SYSTEM OPERATOR NASA (satellite)

TIME FRAME Operational from July 1976 to May 1977

CONTACT Prof. Donald A. George,  
Wired City Laboratory,  
Department of Systems Engineering and  
Computing Science,  
Carleton University,  
Ottawa, Ontario, Canada.  
K1S 5B6

Telephone number: (613) 231-2601

BIBLIOGRAPHIC REFERENCES [ 295 ], [ 296 ], [ 297 ], from [ 517 ], to [ 521 ], and [ 523 ].



PROJECT NAME U.Q. Television Network

LOCATION Sainte-Foy, Quebec, Canada

SYSTEM CAPABILITIES Two-way video and audio via microwave links.  
Six video rooms.  
Equipped for tele-teaching, teleconferencing and multi-media presentations.

SYSTEM APPLICATIONS Teaching classes, conferencing, university management and work.

USERS U.Q. community scattered in different cities.

PARTICIPATING ORGANIZATIONS Université du Québec (U.Q.)  
- at Chicoutimi  
- at Rimouski  
- at Trois-Rivières  
- at Montréal  
- at Ecole Nationale d'Administration Publique (ENAP)  
- at CEUOQ (Hull)

SPONSORS/  
FUNDING Université du Québec  
- Installation cost: \$100,000 to \$125,000 per video room.

SYSTEM OPERATOR Université du Québec  
le Vice-présidence aux communications  
Bell Canada (leased microwave system)  
Quebec Telephone (leased microwave system)

TIME FRAME Operational since September 1977, 25 to 30 hours per week.

CONTACT Pierre Patry  
Directeur de la coordination,  
Vice-Présidence aux Communications,  
Université du Québec,  
2875 boulevard Laurier,  
Sainte-Foy, Québec, Canada.  
G1V 2M3  
  
Telephone Number : (418) 657-2307

BIBLIOGRAPHIC REFERENCES [ 81 ], [ 82 ], [ 120 ], [ 194 ], [ 354 ], [ 360 ],  
[ 750 ], [ 1032 ], [ 1064 ], [ 1158 ], [ 1252 ], [ 1268 ],  
[ 1306 ], and [ 1307 ].

PROJECT NAME           ITV Network

LOCATION                 Davis, California 95616, USA

SYSTEM CAPABILITIES     Five microwave/ITFS links. Three links are two-way, two are one-way only. Audio talkback to originating classrooms. Programs are 98% by live TV, mostly black and white transmission

SERVICE APPLICATIONS    Instructional programs, mainly graduate engineering.

USERS                    Mainly graduate students at about fifteen receiving sites. A little use by lawyers, nurses, veterinarians, educators, administrators, doctors and computer students. Total use 1977-78: 2,843 hours.

PARTICIPATING ORGANIZATIONS   University of California, Davis, Lawrence Livermore Laboratories, Sandia Livermore Laboratories, Dept. of Applied Science, California State University, Chico Yuba College, Solano College, Diablo Valley College, San Joaquin/Delta College, Aerojet, Water Resources, Dept. of Transportation, professional organizations.

SPONSORS/FUNDING         University of California, Davis  
Operations costs - \$59,000/yr.  
Installation cost approx. - \$520,000.

SYSTEM OPERATOR         Instructional Media, University of California, Davis

TIME FRAME               First link (two-way, two-hop) started in 1971.

CONTACT                  Dr. Charles L. Nearing  
Director, Instructional Media  
University of California, Davis  
Davis, California 95616 USA

                          Telephone number : (916) 752-6516

BIBLIOGRAPHIC REFERENCES    [ 782 ], [ 822 ], [ 923 ].

PROJECT NAME                   Stanford Instructional Television Network (SITN)

PROJECT LOCATION               Stanford, California, U.S.A.

SYSTEM CAPABILITIES           4 channels of the Instructional Television Fixed Service (ITFS) (25 miles, 160<sup>0</sup>) plus directed microwave beams to San Francisco and Berkely.  
4 studio class rooms plus an auditorium with TV cameras.  
Coaxial cable to master control switches and microwave link to broadcast transmitter.  
Receiving locations down-convert to VHF for cable distribution.  
Audio talk-back by FM from remote class rooms.  
Video tapes of lectures available for delayed instruction.

SERVICE APPLICATIONS         Part time training of staff in participating companies, research centres, etc. Graduate courses in Engineering, Computer Science, Math, Physics, Statistics. Other courses in Business Administration, Management and Supervision and courses of general interest. Experiments to extend service via satellites.

USERS                           Over 60 organizations (chiefly high technology) in the California area. Students at Stanford. Stanford-Carleton University experiments using Hermes satellite. 5000 off-campus involvements per year. 230 courses per year.

PARTICIPATING ORGANIZATIONS   Stanford University  
Association for Continuing Education (ACE).  
Carleton University, Canada, (satellite experiment).

SPONSORS/FUNDING               Development, design, construction, modification costs \$725,000. Operating costs \$200,000 per year. Member organizations pay for remote facilities and pay SRI on a per student basis.

SYSTEM OPERATOR               Stanford University and the Association for Higher Education

TIME FRAME                     Feasibility study in spring 1967  
SITN built in 1968/69.

CONTACT                         Kenneth S. Down, Director  
Room 401, Durand Building  
Stanford University  
Stanford, California, 94305  
U.S.A.  
  
Telephone (415) 497-3616

BIBLIOGRAPHIC REFERENCES       [ 278 ], [ 527 ], [ 1004 ], and [ 1005 ].

PROJECT NAME SURGE, CO-TIE, and BIO CO-TIE

LOCATION Fort Collins, Colorado, USA.

SYSTEM CAPABILITIES Video tape production and distribution system. There are five studio classrooms and a central recording faculty on the Colorado State University campus. In each studio classroom there are three TV cameras. When a 'live' student asks a question it is also recorded on video tape. Interaction between the professor and remote students is by means of off-line telephone conversations and personal visits by the professor to each site at least once per semester.

SERVICE APPLICATIONS Graduate education. The project SURGE is directed towards graduate students in industrial companies and the projects CO-TIE and BIO CO-TIE are video tape course work provided to junior colleges in Colorado.

USERS About 400 students in plants take courses each semester. Several hundreds of students use the system every year. About 600 tapes per week are produced.

PARTICIPATING ORGANIZATIONS Colorado State University.  
40 companies along the eastern slope of the Rocky Mountains, stretching from Fort Collins to Colorado Springs 140 miles away.  
Colleges.

SPONSORS/  
FUNDING The project is self supported through enrolment. Operating costs (about the same as a live system):  
\$10 to \$30 per hour.  
Reusable supply of video tapes: \$40,000

SYSTEM OPERATOR Colorado State University

TIME FRAME Operational since 1967

CONTACT Dr. John Snider,  
Director,  
SURGE,  
Rockwell Hall,  
Colorado State University,  
Fort Collins, Colorado, 80523  
U.S.A.  
Telephone number: (303)491-5206

Dr. Preston Davis,  
Director,  
Office of Educational  
Media,  
Colorado State University,  
Fort Collins, Colorado, 80523  
U.S.A.  
Telephone number: (303)491-5416

BIBLIOGRAPHIC REFERENCES [ 62 ], [ 365 ], [ 782, p. 106 ], [ 822, p. 948 ], and, [ 1190 ].

PROJECT NAME GENESYS (Graduate Engineering Education SYstem)

LOCATION Gainesville, Florida, USA.

SYSTEM CAPABILITIES Closed circuit television system with talk-back. Transmission via point-to-point common carrier microwave. Each studio classroom was equipped with two TV cameras and up to four TV monitors.

SERVICE APPLICATIONS Continuing education.

USERS Engineers in industry. Over 200 students completed advanced degree requirements through GENESYS.

PARTICIPATING ORGANIZATIONS GENESYS originated programs in the University of Florida, Gainesville campus, and at Cape Kennedy, Orlando, and Daytona Beach. Receiving only sites were located at Patrick AFB, Kennedy Space Center, the Naval Training Device Center, and Boca Raton.

SPONSORS/ FUNDING The system was funded by an appropriation of \$1,511,000 by the Florida State Legislature. Leased microwave line costs: over \$150,000 per year.

SYSTEM OPERATOR University of Florida.

TIME FRAME Operational from Fall 1964 to 1972.

CONTACT Prof. R.S. Leavenworth,  
303 Eeil Hall,  
Department of Industrial and Systems  
Engineering,  
University of Florida,  
Gainesville, Florida, 32611,  
USA.

Telephone number: (904) 392-1464

BIBLIOGRAPHIC REFERENCES [ 822, p. 949-950 ], [ 921 ], [ 922 ].

PROJECT NAME Plato IV

LOCATION Urbana, Illinois, USA.  
Minneapolis, Minnesota, USA.  
Florida, USA.  
Quebec City, Quebec, Canada.

SYSTEM CAPABILITIES Two-way Data  
Downstream: broadcast (ITFS channel, 8 watts all directions, 20 miles radius, 1000 terminals)  
or  
telephone lines (4 terminals/line. Future: 8 terminals/line).  
Upstream: telephone lines, Now - 32 terminals/phone line. Future: 256 terminals/phoneline.

SERVICE APPLICATIONS Computer Aided Instruction

USERS Potential: 20,000 students.  
1000 terminals are used, 5000 terminal hours/day between 8 and 10 pm i.e. 5 students/day term.  
  
Terminals are located everywhere:  
- university locations  
- business  
- prisons  
- government  
- dormitories, etc.

PARTICIPATING ORGANIZATIONS University of Illinois  
Control Data

SPONSORS/  
FUNDING University of Illinois (State of Illinois).  
Federal Funds (\$400K to \$500K year).  
ARPA.  
Smaller Grants.  
Revenue Services.

SYSTEM OPERATOR Urbana: Computer Based Education Research Laboratories,  
University of Illinois

TIME FRAME Operational since 1960  
Plato IV operational since 1970  
Plato V expected operational 1980

CONTACT Donald L. Bitzer,  
Computer-Based Education Research  
Laboratory,  
University of Illinois,  
Urbana, Illinois, 61081,  
U.S.A.  
  
Telephone Number: (217) 333-5210

BIBLIOGRAPHIC REFERENCES [19], [26], from [134] to [140], [421], [570], [796], [893], [1228], [1229], and [1304].

PROJECT NAME University of Nebraska Medical Center 71  
College of Nursing Network

LOCATION Omaha/Lincoln, Nebraska, USA.

SYSTEM CAPABILITIES Microwave 2-way colour video, audio land line, sharing some Nebraska Educational Television Network facilities.

SERVICE APPLICATIONS Joint instruction of student nurses enrolled on the two campuses making possible shared faculty; administration meetings, college committee activities.

PARTICIPATING ORGANIZATIONS University of Nebraska Medical Center:  
College of Nursing, Omaha, and  
College of Nursing, Lincoln Division.

SPONSORS/  
FUNDING U.S. Department of Health, Education and Welfare (HEW).  
State of Nebraska.

SYSTEM OPERATOR University of Nebraska Medical Center.

TIME FRAME Operational since 1976.

CONTACT Reba A. Benschoter,  
Biomedical Communications,  
University of Nebraska Medical Center,  
42nd and Dewey,  
Omaha, Nebraska 68105  
USA.  
  
Telephone Number: (402) 541-4304

BIBLIOGRAPHIC REFERENCES From [106] to [112], [856], [890], [973, pp. 21-25],  
and from [1409] to [1414].

PROJECT NAME Oklahoma Higher Education Televised Instruction System  
(Talkback Television) 72

LOCATION Oklahoma City, Oklahoma, USA.

SYSTEM CAPABILITIES Private point-to-point microwave system with ITFS systems at eleven locations. Two to four educational channels with talkback capabilities from all receiving sites. Return audio channel via microwave link where duplex, or dedicated telephone lines. Future plans include the extension of the network to all institutions of higher education in the state of Oklahoma.

SERVICE APPLICATIONS Education, full range of areas.

USERS From 80 to 100 credit courses per semester. Average of 3000 students enrolled per semester. Operational 7:30 am to 10:00 pm, 5 days per week, with seminars, conferences and workshops on week-ends.

PARTICIPATING ORGANIZATIONS Eleven institutions at twelve locations can originate programs: University of Oklahoma at Norman, University of Oklahoma Health Sciences Center at Oklahoma City, Oklahoma State University at Stillwater, University of Tulsa at Tulsa, Oscar Rose Junior College at Midwest City, Central State University at Edmond, Northeastern Oklahoma State University at Tahlequah, East Central Oklahoma State University at Ada, College of Osteopathic Medicine at Tulsa, Western Oklahoma State College at Altus, South Oklahoma City Junior College at Oklahoma City and Langston University at Langston.

In addition about 60 other locations can receive programs (with talkback).

SPONSORS/  
FUNDING Operational Cost \$500,000 per year - State Funds.  
Original Installation Cost \$1.7 Million.  
The expansion of the network is funded by the Campus Master Plan Capital Funds.

SYSTEM OPERATOR Oklahoma State Regents for Higher Education.

TIME FRAME Operational since Fall 1971.

CONTACT Mr. Jerry L. Hargis,  
Director,  
Televised Instruction,  
500 Education Building,  
State Capital Complex,  
Oklahoma City, Oklahoma 73105  
USA.

Telephone Number: (405) 521-2444 Extension: 71

BIBLIOGRAPHIC REFERENCES [741], [782], and [822].



PROJECT NAME

73

LOCATION Philadelphia, Pennsylvania, USA.

SYSTEM ITFS transmission to 5 centres.  
CAPABILITIES Downstream: video and audio (2 channels. One or two  
23" TV sets at each centre.  
Upstream: audio.

SERVICE Graduate Engineering and Management, Undergraduate  
APPLICATIONS Education, Precollege Program, and Adult and Continuing  
Education.

USERS Students currently enrolled and professionals continuing  
education (45 to 50 students at peak use).

PARTICIPATING ORGANIZATIONS University of Pennsylvania

SPONSORS/  
FUNDING University of Pennsylvania

SYSTEM OPERATOR University of Pennsylvania

TIME FRAME 1973-1976

CONTACT Prof. O.M. Salati,  
Director-Television System,  
College of Engineering and Applied Science,  
103 Moore School D-2,  
University of Pennsylvania,  
Philadelphia, Pa., 19174  
U.S.A.

Telephone Number: (215) 243-8110

BIBLIOGRAPHIC  
REFERENCES

PROJECT NAME TAGER SYSTEM

LOCATION Dallas, Texas, USA. 74

SYSTEM CAPABILITIES ITFS is used for area coverage (30 to 50 miles range from Richardson) and point-to-point microwave links to interconnect 10 area institutions. Colour video and audio downstream and audio upstream via dedicated telephone lines or dial-up (automatic dialers with 1.5 sec. delay). Future plans include the use of satellite links to cable TV systems to reach homes, hospitals, and schools in the state of Texas on an experimental basis.

SERVICE APPLICATIONS Graduate and undergraduate education (mainly engineering computer science and business management). Two types of programs: Continuing Education (outreach) and Inter-institutional Programs.

USERS Students at the participating organizations. 120 courses per semester total (between 40 and 46 courses taught from SMU). 1500 students per year from industry. Between 225 and 250 students per year at SMU. A typical course would have 15 on-campus students and 15 students in the remote locations.

PARTICIPATING ORGANIZATIONS Ten institutions can originate and receive programs: Southern Methodist University (SMU), Bishop College, the University of Dallas, the University of Texas at Dallas, Austin College, Texas Christian University, Texas Wesleyan College, Dallas Baptist College, the University of Texas (Southwestern) Medical School at Dallas, the University of Texas at Arlington. Locations which can only receive programs (with talk-back):  
- between 15 and 20 industrial plants  
- about 100 elementary and secondary schools to reach teachers and communities. (Potential: 700 schools in Dallas).

SPONSORS/ FUNDING Annual operating budget \$500,000. School and institutions support the system through enrollments. Installation cost of microwave system was 2.2 million dollars (private sponsors).

SYSTEM OPERATOR Tager TV Network

TIME FRAME Operational Since 1966.

CONTACT Gilbert Peters,  
President,  
The Association for Graduate Education and Research of  
North Texas, (TAGER),  
P.O. Box 688,  
Richardson, Texas 75080  
USA.  
  
Telephone Number: (214) 231-7211

BIBLIOGRAPHIC REFERENCES [822, p. 950], [947, pp. II-38 and II-44], [1316], and [1382].

PROJECT NAME SEEN (Statewide Extension Education Network)

LOCATION Madison, Wisconsin, USA.

SYSTEM CAPABILITIES Four-wire telephone party line (dedicated network) for two-way audio and Electrowriter communication. Each location uses a Darome Edu-Com portable self-contained unit, which has one speaker and 4 manually switched microphones, and a Victor Electrowriter which permits the transmission, reception and projection of any line-drawn visual material which customarily would be displayed on a classroom chalkboard (diagrams, formulae, outlines, etc.).

SERVICE APPLICATIONS SEEN offers students a variety of undergraduate, graduate and continuing education courses each semester including courses in the arts, engineering, math, and business.

USERS Students in 24 different communities in Wisconsin (in UW campuses and center, county courthouses, libraries and within a large manufacturing firm).

PARTICIPATING ORGANIZATIONS University of Wisconsin-Extension  
Other agencies and institutions may use the medium by requesting it through a related Extension Department.

SPONSORS/  
FUNDING University of Wisconsin-Extension

SYSTEM OPERATOR Instructional Communications Systems

TIME FRAME Operational since 1970.

CONTACT Prof. Lorne A. Parker,  
Director,  
Instructional Communications Systems,  
University of Wisconsin-Extension,  
Radio Hall,  
Madison, Wisconsin, 53706,  
U.S.A.  
  
Telephone Number: (608) 262-4342

BIBLIOGRAPHIC REFERENCES From [980] to [999] and [1367].

PROJECT NAME IRTV

LOCATION Ottawa, Ontario, Canada 76

SYSTEM CAPABILITIES A program information bank and program distribution centre, both located in a telephone switching centre, are connected to the nearby schools by coaxial cable (12 channels). The information bank contained some 2600 tapes and films. The typical terminal has a standard 25-inch black and white educational television receiver for viewing and a telephone with a direct link to the library to make the requests.

SERVICE APPLICATIONS Instant on-demand access to a large educational library from the classrooms.

USERS In May 1970 alone 1640 programmes were transmitted into the 130 classrooms involved.

PARTICIPATING ORGANIZATIONS 5 schools in Ottawa, Ontario:  
one high school  
four elementary schools

SPONSORS/  
FUNDING Bell Canada  
OISE  
Ottawa Board of Education  
They contributed about \$250,000 each in equipment, software, and man-hours.

SYSTEM OPERATOR Bell Canada.

TIME FRAME Operational from 1968-1971

CONTACT Mr. Ernie Froloff,  
Bell Canada,  
470 Laurier Street  
Ottawa, Ontario, Canada,  
K1R 7T3  
  
Telephone Number: (613) 560-3820

BIBLIOGRAPHIC REFERENCES [122], [832], and [966].

PROJECT NAME SITE (Satellite Instructional Television Experiment)

LOCATION India

SYSTEM CAPABILITIES Satellite television broadcast using the ATS-6 satellite. About 2400 villages receive programs directly from the satellite through a community receiver. The receiver uses a 10-foot, inexpensive mesh antenna with a front-end converter to change the signal from UHF to VHF and from FM to AM. Certain other villages received programs via conventional VHF transmitters at the earth stations.

SERVICE APPLICATIONS Education for primary school children (Grades 1 - V). Adult programmes ranging from development messages on hygiene, nutrition, family planning, and agriculture to a few entertainment programmes of folk songs and plays.

USERS 2 direct-broadcast TV transmissions to 2,336 villages in 6 states .  
1 national program by re-diffusion to:  
Delhi and Amritsar and surrounding villages and 500 villages in Kheda district of Gujavat.

PARTICIPATING ORGANIZATIONS Ministry of Information and Broadcasting  
All-India Radio (AIR)  
Indian Space Research Organization (ISRO)  
With the collaboration of the Ministries of Education, Health, Family Planning, and Agriculture.

SPONSORS/ FUNDING Total Rs 160 million (9 Rs = \$1 )  
India Space Research Organization Rs 100 million  
Ministry of Info and Broadcasting Rs 35 million  
UNOP Rs 15 million  
Ministry of Education Rs 5 million  
State Governments Rs 5 million  
Ground systems designed and made in India. Each set costs \$800 (compares with \$3500 for U.S. sets).

SYSTEM OPERATOR Indian Space Research Organization  
Government of India

TIME FRAME Operational from August 1975 to July 1976

CONTACT Dr. Bella Mody, Kingscote Gardens, Apt. 49, 586 Lagunita Drive, Stanford, California 94305 USA.  
Dr. Dennis Foote, Institute for Communications Research, Stanford University, Stanford, California 94305 USA.  
Tel. no.: (415) 326-3767 Tel. no.: (415) 497-2300

BIBLIOGRAPHIC REFERENCES [ 9 ], [ 11 ], [ 268 ], [ 637 ], [ 692 ], [ 695 ], [ 1049 ], and [ 1122 ].

PROJECT NAME

LOCATION Tateyama City, Japan

SYSTEM CAPABILITIES Two-way closed circuit television system over a single coaxial cable: Eleven channels downstream from the Educational Centre to the terminals (schools, etc.) and four channels upstream.

SERVICE APPLICATIONS Distribution of Educational programs.

USERS Terminal users comprise 12 elementary schools, 7 junior high schools, 9 kindergartens and 10 public halls. Tateyama is a city situated about 70 km south of Tokyo and has a population of about 60,000 and is 110 km<sup>2</sup> in area.

PARTICIPATING ORGANIZATIONS Tateyama City Educational Committee  
Nippon Telegraph and Telephone Public Corporation

SPONSORS/  
FUNDING National and local government grants and matching funds from local taxpayers.

SYSTEM OPERATOR Tateyama City Educational Committee

TIME FRAME Operational since 1972

CONTACT Chairman, Ken'ichi Hiratsuka,  
Educational Committee, Engineering Bureau,  
Educational Center, Nippon Telegraph and Telephone  
Tateyama, Public Corporation (NTT),  
Japan. 1-6 Uchisaiwai-Cho,  
1-Chome,  
Chiyoda-Ku,  
Tokyo 100,  
Japan.

BIBLIOGRAPHIC REFERENCES [603], [1072], and [1240].

PROJECT NAME

79

LOCATION

Alaska, USA.

SYSTEM  
CAPABILITIES

ATS-6 and ATS-1 satellites.  
Downstream: audio and video  
Upstream: audio

SERVICE  
APPLICATIONS

Programs in instruction of basic oral language development, health education, and in-service teacher training. Community information broadcasts and cultural affairs.

USERS

17 remote communities: 13 Native Villages, plus 4 cities - Fairbanks, Juneau, Petersburg, and Valdez.

PARTICIPATING  
ORGANIZATIONS

Office of Telecommunications, Office of the Governor.  
Northwest Regional Educational Laboratory.  
University of Alaska.

SPONSORS/  
FUNDING

HEW (education programs)  
NASA (satellite)

SYSTEM  
OPERATOR

NASA

TIME FRAME

Operational since September 1974

CONTACT

Dr. Lawrence P. Grayson,  
National Institute of Education,  
616-1200 19th Street, N.W.,  
Washington, D.C. 20208  
U.S.A.

Telephone Number: (202) 254-6050

BIBLIOGRAPHIC  
REFERENCES

[552]

PROJECT NAME Irvine Video Communications Project 80

LOCATION Irvine, California, USA.

SYSTEM CAPABILITIES Transmission is on four midband channels in the local CATV system which already had two-way capabilities. Each location in the system has "off-the-shelf" video and audio equipment consisting of a black and white TV camera, microphones, microphone mixer, and modulator. The location also has two TV sets tuned to two midband channels. The leader appears on one channel and the participants share the other channel. This enables each location to see the two on-line participants and to become a participant itself upon invitation by the leader. This is a decentralized system for the schools in Irvine.

SERVICE APPLICATIONS Education: classes, games, debates during school hours and adult education courses in the evening. The teacher or activity leader must manage interactive learning rather than merely disseminate information to passive recipients.

USERS Students at school and at home. Used 6 days per week. Activities usually involve three or four locations with five to ten students at each location.

PARTICIPATING ORGANIZATIONS Twenty schools from elementary to high school.

SPONSORS/ FUNDING Irvine Unified School District (IUSD). Cost of leasing four dedicated channels from the local CATV operator is \$1500 per month. Cost of equipping a site for two-way audio and video is \$2000.

SYSTEM OPERATOR Irvine Unified School District (IUSD). Community Cablevision Co. (CATV operator)

TIME FRAME Operational since November 1974

CONTACT Prof. Mits Kataoka,  
UCLA,  
1747 Kelton Avenue,  
Los Angeles, California,  
U.S.A.

Telephone Number: (213) 556-4900  
(213) 825-3281

BIBLIOGRAPHIC REFERENCES [1130]



PROJECT NAME	Satellite Technology Demonstration	81
LOCATION	Denver, Colorado, USA.	
SYSTEM CAPABILITIES	ATS-6, ATS-3 Satellites. Downstream: audio and video Upstream: audio In addition, the transmitted materials are received by twelve of the thirteen public broadcast television stations in the region, two cable systems, and two translators.	
SERVICE APPLICATIONS	Career education courses to junior high school students, materials distribution systems for teachers, continuing education courses for adults on topics such as health care, problems of aging and land use, and teacher in-service training.	
USERS	56 Rural Communities throughout eight states (junior high school students, teachers, adults). The participating sites were chosen because of their isolated nature and because their populations are diverse.	
PARTICIPATING ORGANIZATIONS	The Federation of Rocky Mountain States (FRMS). Formed in 1966 as a partnership of Colorado, Idaho, Montana, New Mexico, Wyoming and Utah, FRMS was cooperating with Arizona and Nevada in this experiment.	
SPONSORS/ FUNDING	HEW (Educational Programming Portion) \$11 Million NASA (satellite)	
SYSTEM OPERATOR	Federation of Rocky Mountain States	
TIME FRAME	Operational since September 1974	
CONTACT	Dr. Lawrence P. Grayson, National Institute of Education, 616-1200 19th Street N.W., Washington, D.C., 20208 U.S.A.  Tel. No.: (202) 254-6050	
BIBLIOGRAPHIC REFERENCES	[226], [336, pp. 15-20], [552], [761], and [947, pp. II-38 and II-43].	

PROJECT NAME Appalachian Education Satellite Project (AESP)

LOCATION Lexington, Kentucky, USA.

SYSTEM CAPABILITIES Black and white video downstream using the ATS-6 satellite. There are 15 receiving sites arranged in five clusters of three sites each. All three sites in each cluster can receive the satellite broadcasts, only one of them however can transmit. The two receive-only sites interact directly with the instructor on television through the third site, to which they are connected by telephone. The transmitting site can transmit voice and teletype (not video) to the main studio. Interaction is accomplished, for the most part, through that hybrid teletype system.

SERVICE APPLICATIONS The AESP offers several courses in in-service training for rural teachers, one on basic elementary reading instruction and the other on career education instruction.

USERS There are approximately 20-25 students per class at each one of 15 sites.  
Served 1200 teachers initially.

PARTICIPATING ORGANIZATIONS Appalachian Regional Commission.  
Regional Education Services Agencies (RESA's) at the local level.

SPONSORS/  
FUNDING HEW  
NASA (satellite)

SYSTEM OPERATOR NASA

TIME FRAME Operational since September 1974

CONTACT Dr. Lawrence P. Grayson, National Institute of Education,  
616-1200 19th Street, N.W.,  
Washington, D.C. 20208  
U.S.A.  
Tel. No.: (202) 254-6050

Dr. Dave Buckinham,  
Appalachian Regional Commission,  
642-1666 Connecticut Ave., N.W.,  
Washington, D.C. 20235  
U.S.A.  
Tel. No.: (202) 673-7866

BIBLIOGRAPHIC REFERENCES [552]

PROJECT NAME

LOCATION Queens, New York, USA.

SYSTEM Downstream: ITV (2500 MHz) audio and video.  
CAPABILITIES Interactive: Slides and voice response controlled by computer. (IBM 360-40).  
Upstream: Data (touch tone telephone).

SERVICE Computer aided instruction remote computing, instructional television (ITV), etc.  
APPLICATIONS

USERS Phase I (voice return only)  
6 trained students at home  
(26 users total untrained)  
Phase II (ITV) 119 teachers

PARTICIPATING ORGANIZATIONS

SPONSORS/  
FUNDING Brooklin Catholic Schools  
IBM \$400,000 and computer facilities  
The ITV network already existed (\$1.2 million)

SYSTEM Brooklin Catholic Schools  
OPERATOR IBM

TIME FRAME Operational from January 1966 to September 1967

CONTACT Brother Austin David, FSC,  
Director,  
Data Systems Center,  
Archdiocese of New York,  
Seminary Avenue,  
Yonkers, New York, 10704  
USA  
  
Telephone Number: (914) 968-2303

BIBLIOGRAPHIC REFERENCES [361], [543], and [671].

PROJECT NAME Cable Television Project

84

LOCATION Tulsa, Oklahoma, USA.

SYSTEM CAPABILITIES A TV studio at the central education office in the Board of Education Building is used for the origination of most of the one-way programmes. Four mid-band channels in the CATV system are for the schools exclusive use (2 one-way channels and 2 two-way channels). 18 schools are connected. Four schools and the central office are equipped for two-way use. Three-way programmes among the central office and two schools can also be set up.

SERVICE APPLICATIONS One-way programming is used as a supplement to regular instruction. Two-way system is used for team teaching, debates, and presentations by specialists from the central office. The system has also been used to distribute live programmes to homes, after school hours.

USERS One-way programming from the Board of Education building is fully scheduled from 9 am to 3 pm, 5 days per week. Potentially, 2400 students in two high-schools and 950 students in two elementary schools could participate in the two-way pilot project.

PARTICIPATING ORGANIZATIONS 18 schools out of 103 schools in the Tulsa Unified School District (urban area) are connected to the CATV system (14 schools one-way, and 2 elementary schools and 2 high schools two-way).

SPONSORS/  
FUNDING Tulsa Unified School District  
Installation cost: \$150,000 per studio  
Operational cost: salaries only

SYSTEM OPERATOR Tulsa CATV (channels donated in fulfillment of FCC regulation). The Board of Education is responsible for the installations inside the schools.

TIME FRAME Operational since 1974

CONTACT Ms. Nancy Leake,  
Supervisor of Television,  
Tulsa Public Schools,  
P.O. Box 45208,  
Tulsa, Oklahoma 74145  
USA.

Telephone Number: (918) 743-3381

BIBLIOGRAPHIC REFERENCES [215] and [445].

PROJECT NAME

KSC-TV

85

LOCATION

Kutztown, Pennsylvania, USA.

SYSTEM  
CAPABILITIES

This is a centralized television system with three studios on campus plus a black and white control room and a 35-foot van equipped as a mobile colour control centre (3 colour TV cameras). The decentralized CCTV system connects half the buildings in the campus by underground coaxial cable; programs can be originated from any classroom by loaning the necessary equipment. The system is interconnected with the Keystone Cable System and the Berks Cable System. There is a two-way microwave link between Kutztown State College and the Berks Cable System.

The system can be set up for interactive television education among up to 5 high schools. Each location has at least one TV camera and two TV monitors, one for self view and the other to watch the professor or another group of students during question periods. An operator controls the video switcher at the head end of Berks Cable and maintains voice communications with all locations.

SERVICE  
APPLICATIONS

1) B.Sc. degree program in Television Production,  
2) Use of ITV on campus, 3) College courses off campus via interactive microwave and cable, especially for advanced high school students, 4) In-service training, 5) Community programs and public relations, 6) Television programs for off-campus organizations.

USERS

About 120 out of 350 faculty members at Kutztown use the system. Potential: 5000 students in Kutztown campus plus the students in other campuses.

PARTICIPATING  
ORGANIZATIONS

14 colleges and schools members of Berks Schoolcasting.  
Four hospitals in the area.

SPONSORS/  
FUNDING

Kutztown State College  
Equipment costs: \$1,500,000

SYSTEM  
OPERATOR

Kutztown State College  
Keystone Cable Company in Kutztown  
Berks Cable Company in Reading

TIME FRAME

Closed-circuit television system operational since 1968.  
Two-way television system operational since 1975.

CONTACT

Dr. Robert Fina,  
Director, KSC-TV  
Kutztown State College  
Kutztown, Pennsylvania 19530, USA  
Tel. no.: (215) 683-3511

BIBLIOGRAPHIC  
REFERENCES

[ 476 ].

PROJECT NAME TICCIT

LOCATION Reston, Virginia, USA

SYSTEM CAPABILITIES Time-share interactive computer-controlled information television (TICCIT)

- Subscriber used touch-tone telephone to dial into a MITRE computer
- Computer provided images on request on a TV channel at 60 per second
- Video tape-recorder picked off single frames
- Later development included two way cable in a cellular concept that allowed sharing of the frame grabber.

SERVICE APPLICATIONS Computerized assisted instruction and a variety of interactive services to television receivers in schools, homes, businesses. Evaluation design study.

USERS Reston Public Schools and others.

PARTICIPATING ORGANIZATIONS MITRE Corporation  
Reston Transmission Company

SPONSORS/  
FUNDING MITRE Funding and NSF grant  
Approximately (\$700,000 for evaluation design study)

SYSTEM OPERATOR MITRE Corporation

TIME FRAME Tests started in July 1971 when the first truly interactive TV system in the US was demonstrated. Also the first frame grabber. Demonstration continued 1971-1973.

CONTACT Kenneth Stetlen  
MITRE Corporation  
West Gate Research Park  
McLean, Virginia 21101  
USA

TELEPHONE NUMBER (703) 827-6731

BIBLIOGRAPHIC REFERENCES [ 313 ], [ 882 ], [ 1221 ], [ 1341 ].

PROJECT NAME Audio Teleconferencing Network for Staff Training.

LOCATION Ottawa, Ontario, Canada.

SYSTEM CAPABILITIES Audio teleconferencing  
Eleven node system using the telephone  
Pylon bridge system  
50 A speaker-type telephones

SERVICE APPLICATIONS Early experiments in staff training and development  
between buildings in the National Capital Region  
and the Public Service Commission (PSC).  
Also trial of language training with the University  
of Quebec via Hermes satellite. Now used for  
administration and management purposes only.

USERS PSC offices across Canada

PARTICIPATING ORGANIZATIONS Public Service Commission

SPONSORS/  
FUNDING Public Service Commission funds  
Operating costs are line rental

SYSTEM OPERATOR PSC  
Government of Canada Telephone System  
Bell Canada

TIME FRAME Initial experiments 1975-1977

CONTACT Bryan Byers  
Public Service Commission  
300 Laurier Avenue West  
Room 762  
Ottawa, Ontario  
  
Telephone number: (613) 992-0093

BIBLIOGRAPHIC REFERENCES [991 ], [996 ], [997 ], [999 ].

PROJECT NAME CAL (Computer-Aided Learning)

LOCATION Ottawa, Ontario, Canada

SYSTEM CAPABILITIES

- Interactive support of basic alphanumeric graphic and multi-media computer terminals for education and training.
- Remote data transmission via common carrier telephone lines.

SERVICE APPLICATIONS A central time-shared computer is used to support cooperative research and development in Computer-Aided Learning.

USERS Educational and Training Institutions

PARTICIPATING ORGANIZATIONS National Research Council, Universities of Victoria, British Columbia, Calgary, Western Ontario, Montreal, Carleton University, OISE and Canadian Forces.

SPONSORS/  
FUNDING Central facility is funded by the National Research Council's Laboratories; participating organizations are responsible for funding of local user costs.

SYSTEM OPERATOR National Research Council of Canada

TIME FRAME 1970-1981

CONTACT J.W. Brahan  
Head  
Information Science Section  
Division of Electrical Engineering  
National Research Council  
Montreal Road  
Ottawa, Ontario, Canada  
K1A 0R8

Telephone number: (613) 993-2484

BIBLIOGRAPHIC REFERENCES

A Terminal Development Facility for Computer-Aided Learning, A.M. Hlady et al., Proc. 2nd Canadian Symposium on Inst. Technology NRC, 1976.

NATAL-74 FIRST RESULTS. G.A. Brahan and M.L. Westrom. Proc. of 1978 ADCIS Conference - New Directions in Educational Computing, Dallas, March 1-4, 1978.

Education Wired for the Individual. Science Dimension 1978/4 National Research Council of Canada.



PROJECT NAME Summer Academy Brush Up your French

LOCATION Toronto, Ontario, Canada

SYSTEM CAPABILITIES Broadcast television, half-hour programmes, 5 days per week, during 4-5 weeks. Interaction takes place by means of off-line telephone conversations. The student is entitled to a 15-minute telephone conversation every day with a local tutor. Local workshops are also conducted in which films are shown, crafts, conversations, etc.

SERVICE APPLICATIONS French lessons. An English literature course was also given with the same system in Toronto in 1976.

USERS Students in:  
1975: Toronto  
1976: Toronto, Ottawa and Windsor  
1977, 1978, 1979: Toronto, Ottawa, Windsor, Chatham and Kitchener.

PARTICIPATING ORGANIZATIONS OECA  
Local tutors for the off-line telephone conversations

SPONSORS/ FUNDING Secretary of State  
In 1977 the students had to pay a \$25 fee to cover cost of books and tutor salaries. Books alone cost about \$8.00.

TIME FRAME The French course has been offered five times in July-August of 1975, 1976, 1977, 1978, 1979.

CONTACT Ms. Marget Jacot,  
OECA  
P.O. Box 200  
Station Q.  
Toronto, Ontario  
M4T 2T1  
Tel. no.: (416) 484-2600

BIBLIOGRAPHIC REFERENCES

PROJECT NAME S.T.E.P. (Satellite Tele-Education Program)

LOCATION Vancouver, British Columbia, Canada.

SYSTEM CAPABILITIES 2-way interactive television linking the studios of the Provincial Education Media Centre with remote classrooms at four community colleges and logging camp. Three Cable TV systems linked into system with telephone call back. Uses Hermes Satellite.

SERVICE APPLICATIONS Education Conferencing

USERS 3 universities, 4 community colleges, BCIT, British Columbia Forest Products and 4 provincial ministries

PARTICIPATING ORGANIZATIONS As above

SPONSORS/ FUNDING Ministry of Education Province of B.C. Dept. of Transport and Communications

SYSTEM OPERATOR Distance Education Planning Group

TIME FRAME July 1978 - December 1978

CONTACT Miss Pat Carney  
Ministry of Education of British Columbia  
3200 - 545 West 10th  
Vancouver, British Columbia  
V5Z 1K9  
  
Telephone number : (604) 873-3936

BIBLIOGRAPHIC REFERENCES Evaluation of the Satellite Tele-education Project (S.T.E.P.) in British Columbia. M.A. Middleton, B.C. Min. of Education, March 1978.

PROJECT NAME USC I-ITV (University of Southern California Interactive Instructional Television System)

LOCATION Los Angeles, California, USA.

SYSTEM CAPABILITIES Four educational channels in the ITFS band (2500-2690 MHz). 30 miles range, omnidirectionally. Talk-back is provided by FM radio transmitters at the remote sites also operating in the ITFS band. There are four studio classrooms and an auditorium. Each one is equipped with three television cameras with pan, tilt and zoom capability under the control of a student operator seated in a glass-walled area at the rear of the room. A daily courier service delivers and picks up class materials.

SERVICE APPLICATIONS Continuing education, degree programs, refresher courses, conferences, informational programs, seminars, and visiting speakers.

USERS Students in industry. Courses are being broadcast presently to 22 locations throughout the greater Los Angeles area with approximately 800 television registrations a year in regular USC courses with an additional 1600 in continuing education courses.

PARTICIPATING ORGANIZATIONS University of Southern California  
Business community

SPONSORS/  
FUNDING Olin Foundation (original capital grant in 1972)  
National Science Foundation (Division of Science Education Development and Research) for innovative applications

SYSTEM OPERATOR University of Southern California

TIME FRAME Operational since 1972

CONTACT Dr. Jack Manushian,  
Professor of Electrical Engineering,  
Interactive Instructional Television Program,  
Seaver Science Center, 510,  
University of Southern California,  
University Park,  
Los Angeles, California, 90002,  
USA.  
  
Telephone Number: (213) 741-7663

BIBLIOGRAPHIC REFERENCES Progress report on NSF grant.  
[ 804 ]

PROJECT NAME MSU - Rockford Two-Way Cable Project 92

LOCATION Rockford, Illinois, USA.

SYSTEM CAPABILITIES A conventional instructional video tape is used. The video tape contains a time code which is read by a minicomputer at the head end. Every two minutes the video transmission is stopped and the computer takes over. A series of questions appear on the screen which the users must answer using data terminals which are modified-Jerrold CATV channel converters. Groups without data terminals are provided with special paper sheets for their responses. At the end of each session there is a 10-question quiz. The lessons are scheduled at fixed times but they do not start until all the students have logged-in with the data terminal. A 3-letter code is used.

SERVICE APPLICATIONS Station training to improve the skills of firemen, in-service training of elementary school teachers, and medical education of nurses.

USERS Firefighters: 220 men in 6 firestations (100 of them had two-way transmission). All 10 firestations now have two-way service. School teachers: 200 teachers in 14 schools (100 of them had two-way transmission). Nurses: 6 participants plus observers

PARTICIPATING ORGANIZATIONS Michigan State University  
Rockford Fire Department  
University of Michigan  
Rockford Schools  
Rockford Hospitals

SPONSORS/FUNDING National Science Foundation (NSF) \$430,000 which covers the system design and installation and production of video tapes. Two-way CATV plant already existed.

SYSTEM OPERATOR Rockford Cablevision Inc.

TIME FRAME Operational from February 21, 1977 till June 1978 (NSF grant period). The system remained operational after June 1978 sponsored by the Rockford Fire Department, Hospitals and Schools.

CONTACT Prof. Thomas F. Baldwin,  
Department of Telecommunications,  
322 Union Building,  
Michigan State University,  
East Lansing, Michigan 48824  
USA.  
  
Telephone Number: (517) 355-6556

BIBLIOGRAPHIC REFERENCES From [65] to [69], [148], [281], [1421], [1422], and [1435].

PROJECT NAME

93

LOCATION

Spartenburg, South Carolina, USA.

SYSTEM  
CAPABILITIES

Two-way CATV plant (27 downstream channels and 4 upstream channels) with a studio and a minicomputer at the head end. Three types of interaction were compared: two-way black and white video, video downstream and data upstream (the student had an eight-button data terminal) and video downstream and telephone calls upstream which could be broadcast.

SERVICE  
APPLICATIONS

Adult education and in-service training of day-care personnel.

USERS

300 to 400 people total used the system. Three 15-week GED courses and a pre-GED course were offered using the data terminals (up to 10 students in each course). During the in-service training of day-care personnel 65 hours of two-way interactive programmes were produced.

PARTICIPATING  
ORGANIZATIONS

The RAND Corporation  
Spartanburg Technical College

SPONSORS/  
FUNDING

National Science Foundation \$1.1 Million for 20 months, distributed as follows: \$260,000 for hardware and maintenance and \$840,000 for the education experiments.

SYSTEM  
OPERATOR

Telecable Corporation

TIME FRAME

Operational from February 1976 to May 1977.

CONTACT

Dr. William A. Lucas,  
National Telecommunications  
Information Agency (NTIA)  
1800 G Street N.W.  
Washington, D.C.  
USA

Telephone Number: (202) 395-5623

BIBLIOGRAPHIC  
REFERENCES

[88], [787], [788], and [790].

PROJECT NAME Home Centred Videotape Counselling Programme for Parents of Preschool Hearing-Impaired Children in Rural Newfoundland and Labrador.

LOCATION St. John's, Newfoundland, Canada.

SYSTEM CAPABILITIES Videotaped teaching programmes; videotape playback equipment in parents' home; telephone counselling weekly by teacher of deaf.

SERVICE APPLICATIONS Counselling parents of preschool hearing impaired children in language development activities for their children. Extensive evaluation.

USERS Monthly circulation of new videotapes. Weekly telephone calls by teacher.

PARTICIPATING ORGANIZATIONS Faculty of Medicine, Memorial University of Newfoundland. Janeway Child Health Centre, St. John's, Newfoundland. Department of Health (Child Health Services), St. John's, Newfoundland. Newfoundland School for the Deaf, St. John's, Newfoundland. Atlantic Provinces Resources Centre for the Hearing Handicapped, Amherst, Nova Scotia.

SPONSORS/FUNDING The Richard and Jean Ivey Fund. The Windsor Foundation. Health and Welfare Canada, Health Research Programs Directorate, Project No. 601-1015-42.

SYSTEM OPERATOR Memorial University of Newfoundland.

TIME FRAME April 1977 to December 1978.

CONTACT Mrs. Erin Canning, Research Assistant, Telemedicine Office, Faculty of Medicine, Memorial University of Newfoundland, St. John's, Newfoundland. A1B 3V6  
Telephone Number: (709) 737-6654

BIBLIOGRAPHIC REFERENCES [1078].

PROJECT NAME STIFTUNG REHABILITATION

LOCATION Heidelberg, Germany

SYSTEM  
CAPABILITIES Computer-aided instruction system in APL (IBM 370/155, 1230 Typewriters, 40 CRT: about 500 programs for about 600 hours, Siemens 4004/151: 30 CRT) and closed circuit television system (260 TV monitors stationed at classrooms, hospital and hobby rooms. About 1800 films of 3 to 45 minutes of screen time each).

SERVICE APPLICATIONS Training of disabled people (adults, adolescents and children).

USERS CAI: 5300 users of APL  
CCTV: 1700 physically handicapped students (mainly engineering and business students)

PARTICIPATING ORGANIZATIONS Stiftung Rehabilitation Heidelberg

SPONSORS/  
FUNDING Stiftung Rehabilitation Heidelberg

TIME FRAME Operational since 1970

CONTACT Prof. Dr. Walter Augsburger  
Forschungszentrum für Rehabilitation und  
Prävention  
Postfach 101409  
6900 Heidelberg 1  
West Germany

Telephone Number: (0 62 21) 883171

BIBLIOGRAPHIC REFERENCES [ 50 ], and [ 1204 ].

PROJECT NAME

96

LOCATION

Peoria, Illinois, USA.

SYSTEM  
CAPABILITIES

Interactive television using two channels in the CATV plant. Each student has a TV camera and a TV set.

SERVICE  
APPLICATIONS

Tele Education: Students are in their own house with an instructor at the head-end.

Courses were given over a 13 week period

• Activities and daily living

• Vocational adjustment

• Course on Insurance claims

USERS

8 homebound students

PARTICIPATING  
ORGANIZATIONS

Illinois Division of Vocational Rehabilitation

SPONSORS/  
FUNDING

HEW: \$160,000 for 1 year (cable system already existed in present form).

SYSTEM  
OPERATOR

G.E. Cablevision System

TIME FRAME

Operational from July 1975 to June 1977

CONTACT

Mr. Frank E. Yandrasits,  
System Manager,  
GE Cablevision System,  
602 West Glen Avenue,  
Peoria, Illinois 61614  
USA.

Telephone Number: (309) 686-2600

BIBLIOGRAPHIC  
REFERENCES

[1003].



PROJECT NAME FEATT (Facilitating Educational Achievement Through Telecommunications)

LOCATION Lafayette, Indiana, USA.

SYSTEM CAPABILITIES Video downstream utilizing a mid-band channel on CATV systems and a channel on 2500 MHz (ITFS) systems and an interactive or talk-back mode using the telephone switched network.

SERVICE APPLICATIONS Instruct parents of severely handicapped children how to teach development skills to their children (up to age 3).

USERS 270 adults and 135 children: 85 families in the talent pool and 50 families in the demonstration group. The FEATT families came from almost the entire northwest Indiana area. (Indianapolis, Kokomo, Lafayette, West Lafayette, Gary, Hammond, and East Chicago, as well as smaller towns and rural areas).

PARTICIPATING ORGANIZATIONS Purdue University Department of Education  
Purdue University Telecommunications Centre  
Purdue Audio visual Centre

SPONSORS/  
FUNDING HEW - Bureau of Education for the Handicapped

SYSTEM OPERATOR Purdue Achievement Centre  
In Lafayette: Communications Properties, Inc.,  
In Kokomo: Telcable Corp.

TIME FRAME Operational from July 1, 1974 to June 30, 1976.

CONTACT Dr. Don Robson, Chairperson,  
Department of Special Education,  
Building E,  
South Campus Court,  
Purdue University,  
West Lafayette, Indiana,  
47907, USA.

Dr. Robert J. Currie,  
Executive Director,  
Purdue Achievement Center  
for Children,  
Purdue University,  
West Lafayette, Indiana,  
47907, USA.

Tel. No.: (317) 749-8161 Tel. No.: (317) 293-8181

BIBLIOGRAPHIC REFERENCES [704], [348], [349], and [350].

PROJECT NAME

LOCATION Lexington, Kentucky, USA.

SYSTEM CAPABILITIES Use of satellites on two occasions: ATS-6 for a tele-conference between educators at the University of Kentucky and a group of special educators in San Francisco, California. CTS for a one-shot demonstration of information dissemination to rural parents.

SERVICE APPLICATIONS Study and demonstrations on the applications of communications satellites in the education of the handicapped.

USERS Parents of handicapped children living in rural areas.

PARTICIPATING ORGANIZATIONS University of Kentucky  
Approximately 80 educators met in a conference in early June 1977 at the University of Kentucky

SPONSORS/  
FUNDING HEW - Bureau of Education for the Handicapped: \$96,000 for one year.

SYSTEM OPERATOR University of Kentucky  
National Aeronautics and Space Administration

TIME FRAME 1977

CONTACT Dr. Edward Blackhurst,  
Chairman,  
Special Education Department,  
University of Kentucky,  
Lexington, Kentucky,  
USA.  
  
Telephone Number: (606) 258-9000

BIBLIOGRAPHIC REFERENCES [1124].

PROJECT NAME      Telecommunications for the Severely Handicapped      99

LOCATION            Lexington, Kentucky, USA.

SYSTEM  
CAPABILITIES      Telephone lines used to send computer signals to  
homes with individualized teaching units. Two-way  
audio. Tactile response devices sent data to the computer.

SERVICE  
APPLICATIONS      Provide specialized individual education to homebound  
mentally retarded children.

USERS              18 homebound mentally retarded children (0-6 years old)  
with very limited behavior skills. Homes in rural and urban  
areas (6 students only during the last year of operation).

PARTICIPATING  
ORGANIZATIONS      University of Kentucky

SPONSORS/  
FUNDING            BEH - Bureau of Education for the Handicapped  
\$286,965 for 3 years.

SYSTEM  
OPERATOR           University of Kentucky

TIME FRAME        Operational from July 1, 1974 to August 31, 1977.

CONTACT            Dr. James W. Tawney,  
University of Kentucky,  
730 South Limestone Street,  
Lexington, Kentucky, 40506,  
USA.

                    Telephone Number: (606) 257-2929

BIBLIOGRAPHIC  
REFERENCES        [947, pp. II-37 and II-42], [1242], and [1243].

PROJECT NAME TEL-CATCH 100

LOCATION Amherst, New York, USA.

SYSTEM CAPABILITIES Uses adapted "TICCIT" system. CATV downstream and the switched telephone network upstream since the Amherst CATV plant does not have two-way capability. A special full keyboard is used connected through an acoustic coupler to the home telephone. The home TV receiver is tuned to one of the available mid- or super-band channels.

SERVICE APPLICATIONS Education (mathematics, language, games, etc.) for homebound handicapped children

USERS Up to ten students can use the system simultaneously. Presently, 40 children in homes in Amherst and Tonawanda (suburbs of Buffalo) and two institutional middle class family settings for the handicapped have access to the system. Potentially up to 100 handicapped children in the area could eventually use the system.

PARTICIPATING ORGANIZATIONS United Cerebral Palsy Association (UCPA) of Western New York

SPONSORS/ FUNDING HEW - Bureau of Education for the Handicapped: \$738,404 for 2 years (initial grant). Now funded by the New York State Department of Education at Albany and administered by the United Cerebral Palsy Association of Western New York.  
Operational Costs: \$200,000 to \$250,000 per year  
Video channels are given free to project by the Cable companies. Cost of terminals: \$300 each.

SYSTEM OPERATOR Tonawanda: International Cablevision Company  
Buffalo: Courier Cable Company  
The Modified TICCIT system was supplied by MITRE

TIME FRAME Operational since July 1, 1974

CONTACT Domenic Mettica,  
TEL-CATCH,  
260 Groyton Avenue,  
Tonawanda, New York,  
USA.  
  
Telephone Number: (716) 842-4315

BIBLIOGRAPHIC REFERENCES [704, p. II-30] and [947, pp. II-36 and II-42].

PROJECT NAME Telecommunications Handicapped Project 101

LOCATION New York, New York, USA.

SYSTEM Cable TV: used to transmit instructional programming, video-taped programs and computerized programs downstream. Digital response units can send signals upstream. Each response unit has four buttons with pictures of the four puppet characters featured in the video-taped lessons.

CAPABILITIES

SERVICE Provides specialized instruction for handicapped students.

APPLICATIONS

USERS Handicapped students at 5 community centres (urban market area).

PARTICIPATING City University of New York

ORGANIZATIONS BEH

SPONSORS/ BEH - Bureau of Education for the Handicapped

FUNDING \$598,240 for 2 years.

SYSTEM OPERATOR

TIME FRAME Operational 1976-1977

CONTACT Dr. Martin A. Hayott,  
Teaching Resources Centre,  
Centre for Advanced Study in Education,  
Graduate School and University Centre,  
City University of New York,  
33 West 42nd Street,  
New York, New York, 10036,  
USA.

Telephone Number: (212) 790-4408

BIBLIOGRAPHIC [947, pp. II-37 and II-43].

REFERENCES

PROJECT NAME

TELEPAC

102

LOCATION

Logan, Utah, USA.

SYSTEM  
CAPABILITIES

Interactive telephone speaker system to serve children in rural areas who are considered severely and profoundly retarded, multi-handicapped or emotionally disturbed. The telecommunications network linked the Resource Centre, homes, a local homebound instruction teacher, and the Intermountain Medical Program, a health service unit, by standard telephones (WATS) equipped with interactive speakers. The parents were sent instructional packages.

SERVICE  
APPLICATIONS

Demonstrate teaching and assessment procedures to parents of handicapped children.

USERS

Randomly selected experimental and control groups comprising 120 families with handicapped children between ages 3 and 21.

PARTICIPATING  
ORGANIZATIONS

HEW - Bureau of Education for the Handicapped  
State of Utah

SYSTEM  
OPERATOR

Exceptional Child Centre

TIME FRAME

Operational from March 1, 1974 to June 1976

CONTACT

Dr. Alan Hofmeister,  
Director,  
Outreach and Development  
Division,  
Exceptional Child Centre,  
Utah State University,  
UMC-68  
Logan, Utah, 84322,  
USA.

Dr. Charles Atkinson,  
Associate Director,  
Telepac Project,  
Exceptional Child Centre,  
Utah State University,  
Logan, Utah, 84322,  
USA.

Tel. no. (801) 752-4100

Tel. no. (801) 752-4100

BIBLIOGRAPHIC  
REFERENCES

[ 608 ], [ 1037 ], [ 1038 ], [ 1039 ].

PROJECT NAME TICCIT+10

LOCATION Washington, D.C., USA.

SYSTEM CAPABILITIES The 512 terminal TICCIT+10 System is a standard TICCIT system linked to an already available larger computer, the DEC PDP-10.  
Video downstream via CATV and data upstream via telephone. Students have an ordinary television set and a full keyboard. The 60-channel CATV plant is capable of two-way transmission and the TV-channel tuners are remote controlled. Some terminals include a TV camera and microphone which, at the option of the user, can be used as a video-phone (conference calls involving up to 25 individuals are possible). The system has capability to store and forward messages and to link terminals.

SERVICE APPLICATIONS Computer-assisted instruction for the deaf, monitoring student progress, instructional and entertainment computer games, miscellaneous computing, communications (telephone-teletype, video-phone, and message box), and administration.

USERS Deaf at the secondary school level. At present there are 150 14- to 19-year old students at MSSD. The school plans to reach maximum capacity in 1981, with 550 students.

PARTICIPATING ORGANIZATIONS Model Secondary School for the Deaf (MSSD)

SPONSORS/FUNDING Model Secondary School for the Deaf (MSSD)

SYSTEM OPERATOR Model Secondary School for the Deaf (MSSD)  
The TICCIT+10 System was produced by the MITRE Corporation. It is marketed now by the Hazeltine Corporation,

TIME FRAME Operational since 1977.

CONTACT Linda S. Zingg, Marketing Representative, Educational Systems Group, Hazeltine Corporation, 7680 Old Springhouse Road, McLean, Virginia 22101 USA.  
Leonard M. Goldberg, Coordinator for Learning Resources, Model Secondary School for the Deaf, Gallaudet College, Washington, D.C. 20002 USA.

Tel. No.: (703) 827-2320 Tel. No.: (202) 447-0314

BIBLIOGRAPHIC REFERENCES [536] and [942].

4. TELEMEDICINE



PROJECT NAME

104

LOCATION Edmonton, Alberta, Canada.

SYSTEM CAPABILITIES Transmission of ECG using dedicated lines to a time-sharing computer. No remote terminals at present but they are planned with transmission via telephone lines.

SERVICE APPLICATIONS Measurements in ECG for diagnosis.

USERS 100 cardiograms processed per day.

PARTICIPATING ORGANIZATIONS University of Alberta Hospital.

SPONSORS/FUNDING University of Alberta Hospital.

SYSTEM OPERATOR University of Alberta Hospital.

TIME FRAME Operational since January 1977.

CONTACT Dr. R.S. Fraser,  
University of Alberta Hospital,  
6119 Clinical Sciences Building,  
University of Alberta,  
Edmonton, Alberta, Canada.  
K1A 0C8  
Telephone Number: (403) 432-6292

BIBLIOGRAPHIC REFERENCES

PROJECT NAME      Memorial University Telemedicine Project

LOCATION            St. John's, Newfoundland, Canada.

SYSTEM  
CAPABILITIES      Microwave link between 2 buildings; full duplex.  
Teleconference link using Darome conferencing sets and  
telephone lines.

SERVICE  
APPLICATIONS      Undergraduate teaching and patient presentations. A  
wide variety of medical and non-medical uses still in  
the planning stages.

USERS             General Hospital and Health Science Centre; system  
potentially available 7 days per week.  
A wide range of hospitals and Memorial University;  
system available 7 days per week.

PARTICIPATING  
ORGANIZATIONS    General Hospital and Health Sciences Centre.  
16 different institutions at the outset.

SPONSORS/  
FUNDING            Communications Canada.  
Partial funding by user groups and external grants being  
sought.

SYSTEM  
OPERATOR          Memorial University of Newfoundland  
Newfoundland Telephone Company Limited

TIME FRAME        Operational since January 1977.  
Planned for September 1978.

CONTACT            Miss Judy Roberts,  
Research Associate/Coordinator,  
Telemedicine Office,  
Faculty of Medicine,  
Memorial University of Newfoundland,  
St. John's, Newfoundland, Canada.  
A1B 3V6

                    Telephone Number: (709) 737-6654

BIBLIOGRAPHIC  
REFERENCES        [228].

PROJECT NAME T.V. Cable Distribution Services of the Faculty of Medicine.

LOCATION Halifax, Nova Scotia, Canada

SYSTEM CAPABILITIES Three systems:  
1) closed circuit television system in the main health sciences building  
2) Television distribution system (RF input) in 5 adjacent university buildings  
3) Channel distributed to 40 classrooms in 10 or 12 hospitals in the Halifax area via leased broadband cable (Maritime Telephone).

SERVICE APPLICATIONS Education and Research

USERS Student and intern health professionals in training. Continuing education-health professionals. Patient education

PARTICIPATING ORGANIZATIONS University of Dalhousie's Medical Faculty  
Dentistry Faculty  
School of Nursing  
School of Pharmacy  
10 or 12 hospitals in Halifax area

SPONSORS/  
FUNDING University of Dalhousie Faculty of Medicine  
The 7 hospitals in the area

SYSTEM OPERATOR Dalhousie University

TIME FRAME Operational since 1972

CONTACT Mr. D.A. Gibson,  
Head of Audio-Visual Division,  
Faculty of Medicine,  
Dalhousie University,  
Halifax, Nova Scotia.

Telephone number : (902) 424-3477

BIBLIOGRAPHIC REFERENCES

PROJECT NAME ECG Computer Processing and Storage System

LOCATION Montreal, Quebec, Canada.

SYSTEM CAPABILITIES Analogue transmission of ECG via private telephone network to the computer centre, where ECG are digitized and processed. Computer processing of ECG generates interpretive notes which are stored on-line together with the ECG's. On-line storage disk with a capacity for 120,000 ECG.

SERVICE APPLICATIONS Solve the problem of storage and easy-retrieval of ECG and interpretive notes. Medical regulations require storing ECG'S for 5 years. With present disk they have on-line direct access to ECG's for up to two years.

USERS At present it is only used within the Institute of Cardiology. About 60,000 ECG per year.

PARTICIPATING ORGANIZATIONS Institute of Cardiology

SPONSORS/  
FUNDING Institute of Cardiology

SYSTEM OPERATOR Institute of Cardiology  
Equipment is from Televised Corp. of Chicago, Illinois, USA.

TIME FRAME Operational since June 1977

CONTACT Dr. Claude Pelletier,  
Institute of Cardiology,  
5000 East Belanger Street,  
MONTREAL, Quebec.

Telephone Number: (514) 376-3330

BIBLIOGRAPHIC REFERENCES

PROJECT NAME Dial Access and Drug Information Services

LOCATION Saskatoon, Saskatchewan, Canada.

SYSTEM CAPABILITIES 416 audio tapes of average duration 6 minutes can be requested by telephone by physicians, pharmacists and nurses. Two tape depots are housed in the TAS answering services in Regina and Saskatoon.  
Operational 24 hours per day, 7 days per week.  
In addition, a group of 14 pharmacologists and pharmacists consultants provide drug information from 9 am to 9 pm daily.

SERVICE APPLICATIONS Continuing Medical Education (tapes)  
Drug Information Service (live)

USERS Services a large area in the province of Saskatchewan with service originating from Regina and Saskatoon.

SPONSORS/  
FUNDING Installation Cost: \$6,000.  
Operational Cost: \$20,000 - per year which includes Collect calls.  
Grants Provided by:  
Saskatchewan Medical Association  
Group Medical Services of Regina  
Medical Services Incorporated of Saskatoon  
Saskatchewan Department of Health (Drug Information)  
Pharmaceutical Houses (special projects and publicity)

SYSTEM OPERATOR Department of Continuing Medical Education, University of Saskatchewan.

TIME FRAME Operational since the Spring of 1970.

CONTACT Miss Deirdre I. Johnson,  
Coordinator, Dial Access,  
Continuing Medical Education,  
Room 408,  
Ellis Hall,  
University of Saskatchewan,  
Saskatoon, Saskatchewan.  
S7N 0W8

Telephone Number: (306) 343-4571

BIBLIOGRAPHIC REFERENCES [664].

PROJECT NAME	Polar - ECG Service	109
LOCATION	Vancouver, British Columbia, Canada.	
SYSTEM CAPABILITIES	Remote preprocessing terminals for interactive entry, editing and batching of vector-ECG and verbal patient data. Digital transmission of compressed ECG (3-channel, 1000 Hz sampling, 330 Hz bandwidth) and text over dial-up telephone lines to two dedicated computers. These analyse ECG and optionally plot 12-lead derived ECG, polarcardiogram, vectorcardiogram, spherocardiogram, etc. Transmission of computer measurements and comments to remote terminals' printers. Word processing used for in-house reports.	
SERVICE APPLICATIONS	Measurements in ECG for diagnosis.	
USERS	Three preprocessing terminals installed in hospitals in British Columbia and 50-60 ECG's per day, rising to 100 by September 1978. The service is of interest to hospitals and clinics producing more than 20 ECG's per day. Successful transmissions have been made from Seattle, Washington, (230 Km) where two preprocessors are installed at University of Washington.	
PARTICIPATING ORGANIZATIONS	Vancouver General Hospital, Vancouver, B.C. Canada Shaughnessy Hospital, Vancouver B.C. Canada MSA General Hospital, Abbotsford, B.C. Canada	
SPONSORS/ FUNDING	Vancouver General Hospital Practicing Physicians Fee for Service Schedule	
SYSTEM OPERATOR	Vancouver General Hospital	
TIME FRAME	Programming of measurement began in 1970. Dual Nova Computers delivered in 1973. First preprocessor installed in October 1975.	
CONTACT	Dr. J.A. Osborne, Dept. of Diagnostic Cardiac Services, Vancouver General Hospital, Vancouver, B.C. Canada V5Z 1M9  Telephone number: (604) 876-3211 Extension 2246	
BIBLIOGRAPHIC REFERENCES	[ 406 ], [ 407 ], [ 964 ], [ 1227 ].	

PROJECT NAME Bethamy-Garfield Community Health Care Network.

LOCATION Chicago, Illinois, USA.

SYSTEM CAPABILITIES Picturephone lines (23 picturephone stations).  
Black and white video (1 mhz) with interactive capacity.

SERVICE APPLICATIONS Patient-physical consultation, remote diagnosis, in-patient care, conferences, care of ambulatory patients.

USERS Urban population 1090 patients used 42 hours/month or 812 transactions per month.

PARTICIPATING ORGANIZATIONS Bethamy-Brethren Hospital  
Garfield Park Hospital  
Bethamy Clinic  
May-Rosen Clinic  
Bethamy Drug Centre  
U.S. Department of Health, Education and Welfare

SPONSORS/  
FUNDING HEW - \$187,886  
6/29/72 to 11/28/73

SYSTEM OPERATOR Illinois Bell AT&T

TIME FRAME Operational 1972 to 1976.

CONTACT Project Director  
  
Mr. Vernon Showalter,  
Administrator,  
Bethamy/Garfield Hospital Complex,  
3821 West Washington Blvd.,  
Chicago, Illinois, 60624,  
USA.  
  
Telephone Number: (312) 265-7700.

BIBLIOGRAPHIC REFERENCES [84, pp. 314-316], [121], [858], [955, pp. 21-30], [973, pp. 69-73 and 205-210], [1053], [1170], and [1171].

PROJECT NAME Illinois Department of Medical Health Centre Complex/  
Community Mental Health Program

LOCATION Chicago, Illinois, USA.

SYSTEM CAPABILITIES Picturephone network (12 terminals black and white video).

SERVICE APPLICATIONS Consultation and patient interviews, patient intake procedures.  
Conference and team meetings.  
Administrative functions.

USERS Urban population 150 users. Potential: 135,000 patients.

PARTICIPATING ORGANIZATIONS Illinois Department of Mental Health  
Illinois State Psychiatric Institute  
Healy School  
Pilsen Mental Health Centre  
West Side Organization  
Mental Health Center  
U.S. Department of Health, Education and Welfare

SPONSORS/  
FUNDING HEW - \$72,536  
6/30/72 to 7/15/74

SYSTEM OPERATOR Illinois Bell Telephone Company

TIME FRAME Operational 1972 to 1974

CONTACT Project Coordinator  
  
Bill Lewis,  
Illinois State Psychiatric Institute,  
1601 West Taylor Street,  
Chicago, Illinois, 60612,  
USA.  
  
Telephone Number: (312) 341-4630

BIBLIOGRAPHIC REFERENCES [84, pp. 318-320], [481], [482], [483], [755, pp. 53-57],  
[973, pp. 92-100 and 218-219], [1053, p. 225], and [1128].



PROJECT NAME      Nursing Home Telemedicine Project

LOCATION            Boston, Massachusetts, USA.

SYSTEM  
CAPABILITIES      Two-way audio (dial-up) telephone and telephone coupled  
                     facsimile transceivers (Xerox telecopiers).  
                     Color Polaroid Camera used for visual data.  
                     Tone and voice paging system.  
                     Telephone coupled transmitters for the analysis of  
                     pacemakers, portable EKG machines.

SERVICE  
APPLICATIONS      Chronic Disease Follow-Up.

USERS              482 study patients  
                     475 control patients and nurses and doctors

PARTICIPATING  
ORGANIZATIONS    Boston City Hospital  
                     2 Nursing Stations

SPONSORS/  
FUNDING            Mass. Dept. of Public Health \$7,000 (1971)  
                     Thi-State Regional Program \$25,000 (1972)  
                     Medical Foundation \$10,000 (1972)  
                     NSF \$17,900/19 mo.  
                     National Science Foundation

SYSTEM  
OPERATOR          Boston City Hospital

TIME FRAME        July 1973 to July 1975.

CONTACT            Prof. Roger G. Mark,  
                     Room 36-789,  
                     MIT,  
                     Cambridge, Mass., 02139,  
                     U.S.A.

                     Telephone Number: (617) 253-7818

BIBLIOGRAPHIC  
REFERENCES        [84, pp. 324-326], [806], [807], and [808].

PROJECT NAME Massachusetts General Hospital/Bedford Veterans Hospital/Logan Airport Telemedicine Project.

LOCATION Boston, Massachusetts, USA.

SYSTEM CAPABILITIES Microwave - 2-way black and white video from Bedford, Va., and from Logan to Massachusetts General Hospital 2-way coaxial cable links, black and white video between buildings belonging to the Massachusetts General Hospital.  
Telemetry: ECG, EEG, electronic stethoscope.

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SERVICE APPLICATIONS In patient and ambulatory care, chronic patient care, consultation with patients, therapy, psychological teaching.

USERS Bedford Veterans Hospital for in-hospital care.  
Potential urban population: 950 psychiatric patients  
12,000 airport employees  
50,000 daily travellers  
3,000 local residents.

PARTICIPATING ORGANIZATIONS Logan Airport  
Bedford Veterans Hospital  
Massachusetts General Hospital, Massachusetts.  
U.S. Department of Health, Education and Welfare.

SPONSORS/FUNDING HEW (Logan) 3/1/67 - 2/28/70 - \$318,114  
Veterans Administration (Bedford) 1969-1973  
\$569,999

SYSTEM OPERATOR

TIME FRAME Operational 1968 - Logan  
Operational 1970 - Bedford

CONTACT Dr. Kenneth T. Bird,  
Medical Station,  
Logan Airport,  
Boston, Massachusetts.  
USA.  
  
Telephone Number: (617) 726-3570.

BIBLIOGRAPHIC REFERENCES [28], [29], [32], [84, pp. 89-112], [94], from [124] to [133], [419], [420], [737], [738], [905], [906], [907], [973, pp. 11-20, 25-26, 29-30, 108-119, and 223-336], [1265], and [1379].

PROJECT NAME Cambridge Telemedicine Project 114

LOCATION Cambridge, Massachusetts, USA.

SYSTEM CAPABILITIES microwave system connecting Cambridge Hospital with 3 health stations.  
Two-way audio and black and white video.  
Telephone hook up via dial-up network.  
Each community station had a camera, 2 monitors and a microphone.

SERVICE APPLICATIONS Consultation with patients and nurse-practitioners in the clinic.

USERS Urban patients 29,200 patients average 3.8 hours/month.  
(Potential use - 80 hours per month)  
23.4 transactions per month.

PARTICIPATING ORGANIZATIONS Cambridge Hospital  
Fitzgerald School Adult Health Center  
Donnelly Field Neighborhood Health Center  
Neighborhood Family Care center.  
U.S. Department of Health, Education and Welfare.

SPONSORS/  
FUNDING HEW - 6/27/72 to 3/31/74 - \$176,512.

SYSTEM OPERATOR

TIME FRAME Operational 1972 to 1974.

CONTACT Gordon T. Moore, M.D.,  
Community Medicine,  
1611 Cambridge Street,  
Cambridge, Mass., 02138,  
U.S.A.  
  
Telephone Number: (617) 661-5560.

BIBLIOGRAPHIC REFERENCES [84, pp. 326-329], [797], [887], [888], [889], [955, pp. 31-37], [973, pp. 76-80, 212 and 213], and [1053, p. 226].

PROJECT NAME University of Nebraska College of Medicine Telemedicine Project

LOCATION Omaha, Nebraska, USA.

SYSTEM CAPABILITIES Close circuit black and white television in university buildings.  
2-way microwave link between Norfolk and Omaha.

SERVICE APPLICATIONS Teaching, psychiatric therapy and counselling, consultation with patients, family visits.

USERS In hospital use.  
45/50 hour/week average use.

PARTICIPATING ORGANIZATIONS Nebraska Psychiatric Institute  
Department of Anatomy  
Norfolk State Mental Hospital

SPONSORS/  
FUNDING National Institute of Mental Health  
(1964-69)

SYSTEM OPERATOR Nebraska Psychiatric Institute (Dept. of Psychiatry)  
University of Nebraska College of Medicine

TIME FRAME 1959-1969  
Links with Norfolk State Mental Hospital started 1964.

CONTACT Reba A. Benschoter,  
Biomedical Communications,  
University of Nebraska Medical Centre,  
42nd and Dewey,  
Omaha, Nebraska 68105  
USA.

Telephone Number: (402) 541-4304

BIBLIOGRAPHIC REFERENCES

PROJECT NAME Mount Sinai Wagner Bidirectional Cable Link

LOCATION New York, New York, USA.

SYSTEM CAPABILITIES Dedicated bi-directional coaxial cable, black and white video.  
Each site had TV monitors, cameras, and VTR's.

SERVICE APPLICATIONS Patient consultation in pediatrics, orthopedics, mental health and child psychiatry.  
Used also for administration and patient-education services.

USERS Urban  
1,300 children at full potential.

PARTICIPATING ORGANIZATIONS Mt. Sinai Hospital  
Wagner Child Health Station

SPONSORS/  
FUNDING U.S. Department of Health, Education and Welfare  
\$314,000 - 6/27/72 to 6/26/75  
Teleprompter Corp. provided one cable free of charge to this project.

SYSTEM OPERATOR Teleprompter Corporation

TIME FRAME Operational 1972 to 1975

CONTACT Carter L. Marshall, M.D.,  
Office of Primary Care,  
College of Medicine and Dentistry of New Jersey,  
New Jersey Medical School,  
Newark, N.J., 07103,  
U.S.A.  
  
Telephone Number: (201) 456-5437

BIBLIOGRAPHIC REFERENCES [84, pp. 336-339], [812], [902], [931], [955, pp. 75-86], [973, pp. 119-124 and 227-228], [1053, p. 228], and from [1352] to [1356].

PROJECT NAME Case Western Reserve School of Medicine,  
Anesthesiology Project.

LOCATION Cleveland, Ohio, USA

SYSTEM CAPABILITIES Two laser links and one microwave link plus telephone  
lines.  
Two-way colour video.

SERVICE APPLICATIONS Consultations and supervision of nurse-anesthesiologists.  
Intensive patient care (terminated February 1978).

USERS In hospitals use 20 hours/month.  
10 transactions per month.

PARTICIPATING ORGANIZATIONS Case Western Reserve University.  
Veterans Administration Hospital.

SPONSORS/  
FUNDING U.S. Department of Health, Education and Welfare \$150,000/year.  
Kresge Foundation \$107,000  
Reinberger Foundation \$40,600

SYSTEM OPERATOR

TIME FRAME Operational April 1972 to May 1978

CONTACT J.S. Gravenstein, M.D.  
Department of Anesthesiology  
University Hospital  
2065 Adelbert Road  
Cleveland, Ohio 44106 USA  
  
Telephone number: (216) 444-3257

BIBLIOGRAPHIC REFERENCES [ 84, pp.339-342 ], [546 ], [547 ], [ 548 ],  
[ 955, pp.39-51 ], [ 973, pp.80-86 and 214-215 ],  
and [ 1053, pp.225-226 ].



PROJECT NAME STARPAHC  
(Space Technology Applied to Rural Papago Advanced Health Care)

LOCATION Tucson, Arizona, USA (Papago Indian Reservation)

SYSTEM CAPABILITIES

- Terrestrial microwave RF system provides two-way colour and black and white video, audio, and data communications between Sells Hospital and Santa Rosa Health Center and between Sells Hospital and a mobile clinic.
- Slow scan television link, via standard dial telephone network, between Sells Hospital and Phoenix Indian Medical Center.
- Interface with long distance telephone circuits provides real-time access to the Indian Health Service's health information data base which is maintained in a computer located in Albuquerque, New Mexico.

SERVICE APPLICATIONS Data transfer and medical record retrieval.  
Voice communications for medical consultation.  
Teleconsultation, telediagnosis, still image transfer.

USERS 8,000 to 10,000 Indians living in 75 villages.

PARTICIPATING ORGANIZATIONS Papago Indian Tribe of Arizona  
NASA/Johnson Space Centre, Houston, Texas  
Office of R&D, Indian Health Service, Tucson, Arizona  
Lockheed Missiles and Space Co., Sunnyvale, California

SPONSORS/  
FUNDING Dept. of Health and Welfare (DHEW)  
Lockheed Missiles and Space Co.  
NASA - \$3,352,000

SYSTEM OPERATOR Since April 1977, IHS has had principal responsibility for technical support and operation.

TIME FRAME Operational since April 1975  
NASA direct participation ended in April 1977.

CONTACT Peter G. Decker  
STARPHAHC Site Project Officer  
Indian Health Service  
P.O. Box 11340  
Tucson, Arizona, 85734  
  
Telephone No. (602) 792-6606

BIBLIOGRAPHIC REFERENCES [ 18 ], [ 98 ], [ 199 ], [ 567 ], [ 670 ], [ 768 ], [ 779 ],  
[ 780 ], [ 913 ], [ 914 ], [ 972 ], [ 973 pp.150-151 ],  
[ 1029 ], and [ 1030 ].



PROJECT NAME Jacksonville Florida Telemedicine System

LOCATION Jacksonville, Florida, USA.

SYSTEM CAPABILITIES 2-way microwave links, black and white video, transmission of stethoscopic sounds.

SERVICE APPLICATIONS Continuing management of persons with chronic stablized diseases (not used for acute diseases or emergencies).

USERS 2490 of Jacksonville's about 130,000 people considered medically indigent. Jacksonville total population, 580,000.

PARTICIPATING ORGANIZATIONS Duval County (Jacksonville) Health Department and three satellite clinics and the University Hospital of Jacksonville.

SPONSORS/ FUNDING U.S. Department of Health, Education and Welfare \$109,268 initial grant.  
State of Florida Division of Mental Health \$30,000.

SYSTEM OPERATOR City Communications Department

TIME FRAME Operational March 1974 to September 1977.

CONTACT

Dr. Simon Doff, Chief, Department of Community Medicine, University Hospital of Jacksonville, 655 West Eighth Street, Jacksonville, Florida 32209 USA.	Dr. Sam Rowley, Director, Duval County Health Department, (City of Jacksonville Public Health Division), 515 West Sixth Street, Jacksonville, Florida 32206 USA.
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Tel. No.: (904) 358-3272  
Ext. 2381

Tel. No.: (904) 633-2280

BIBLIOGRAPHIC REFERENCES [646] and [973, p. 143].

PROJECT NAME Cook County Hospital, Department of Urology,  
Picturephone Network.

LOCATION Chicago, Illinois, USA.

SYSTEM CAPABILITIES Picturephone network. Full motion black and white  
video-interactive.

SERVICE APPLICATIONS Used for patient care and supervision (ambulatory  
patients).  
Administrative Tasks.

USERS In hospital use - 40 hours/month, 950 transactions/month.

PARTICIPATING ORGANIZATIONS Illinois, Department of Urology.  
Cook County Hospital.

SPONSORS/  
FUNDING Self-funded by the Department of Urology.  
Cook County Hospital  
\$7,000/year annual operating budget.

SYSTEM OPERATOR AT&T

TIME FRAME Operational 1972 to 1976.

CONTACT Dr. Irving M. Bush, M.D.,  
Burlington, Illinois, 60109,  
USA.  
  
Telephone Number: (312) 697-7676  
697-8868

BIBLIOGRAPHIC REFERENCES [84, pp. 316-318], [201], and [973, pp. 87-91 and 216-217].

PROJECT NAME Blue Hill - Deer Isle Telemedicine Project

LOCATION Blue Hill, Maine, USA.

SYSTEM CAPABILITIES Broadband microwave - 2 way capabilities.  
Black and white video between the 2 sites (interactive).

SERVICE APPLICATIONS Teaching, consultation, care of ambulatory patients,  
emergencies.

USERS Rural population potential 2500-5000 patients used  
45-60 hours per month.  
70-90 transactions per month.

PARTICIPATING ORGANIZATIONS Maine,  
Blue Hill Memorial Hospital  
Island Medical Centre

SPONSORS/  
FUNDING Maine Regional Medical Program,  
U.S. Dept. of Health, Education and Welfare grant \$60,000  
Operating cost (U. of Maine), \$3,000, (estimated per  
year).

SYSTEM OPERATOR University of Maine  
Public Broadcasting System

TIME FRAME Operational April 1973 to June 1977.

CONTACT Project Director  
  
Richard Britt, M.D.,  
Administrator,  
Blue Hill Memorial Hospital,  
Blue Hill, Maine, 04614,  
U.S.A.  
  
Telephone Number: (207) 374-2836

BIBLIOGRAPHIC REFERENCES [84, pp. 320-322], [183], and [973, pp. 73-76 and 211].

PROJECT NAME Rural Health Associates: Interactive Medical Microwave Television

LOCATION Farmington, Maine, USA.

SYSTEM CAPABILITIES 2-way microwave system between Rangely, King Field, and Farrington.  
Two audio channels and one black and white video channel.

SERVICE APPLICATIONS Direct physician-patient instruction in presence of medical aide or alone in follow-up cases.  
Teleconsultation, and Continuing Medical Education.

USERS 14,000 parties on record.  
45 professionals and semi-professional personnel had access to the system.

PARTICIPATING ORGANIZATIONS Marine Rural Health Associates at:  
Farmington  
Kingfield  
Rangely

SPONSORS/FUNDING OEO, Office of Economic Opportunity, \$180,000 for equipment/maintenance for 1 year installation, in 1973.  
Operational cost \$10,000/year.

SYSTEM OPERATOR Rural Health Associates

TIME FRAME Operational July 1973 to October 1977.

CONTACT David C. Dixon, M.D.,  
Medical Director,  
Rural Health Associates,  
North Main Street,  
Farmington, Maine, 04938,  
U.S.A.  
  
Telephone Number: (207) 778-6521

BIBLIOGRAPHIC REFERENCES [84, pp. 322-324], [606], and [973 pp. 135-139 and 240-241].

PROJECT NAME Lakeview Clinic Bi-Directional Cable Television System

LOCATION Waconia, Minnesota, USA.

SYSTEM CAPABILITIES Coaxial Cable, two-way black and white video. Any location can simultaneously receive a TV image from the other two locations. Mobile video carts were used (2 black and white TV monitors, 3 microphones, VTR, sthetoscopic sound transmission).

SERVICE APPLICATIONS Patient monitoring and consultation. Emergency care and temporary patient disposition decisions.

USERS Rural population, 30 transactions/month. Potential: about 1,100 patients.

PARTICIPATING ORGANIZATIONS Minnesota  
Lakeview Clinic  
Jonathan Clinic  
Ridgeview Hospital

SPONSORS/  
FUNDING U.S. Dept. of Health, Education and Welfare  
\$195,168 - 6/29/72 to 3/29/74.  
Northlands Regional Medical Program contributed \$12,000 for an evaluation of the project.

SYSTEM OPERATOR

TIME FRAME Operational 1973 to 1974

CONTACT Project Director  
  
Jon Wempner, M.D.,  
Lakeview Clinic,  
200 West Highway No. 5,  
Waconia, Minnesota, 55387,  
USA.  
  
Telephone Number: (612) 442-4461

BIBLIOGRAPHIC REFERENCES [84, pp. 329-332], [955, p. 59-73], [959], [973, pp. 101-108 and 220-222], [1053, p. 227], [1371], and [1372].

PROJECT NAME University of Nebraska Medical Center Slow Scan Radiology Project

LOCATION Omaha, Nebraska, USA.

SYSTEM CAPABILITIES Telephone lines (basic grade) used to transmit slow-scan black and white video.  
Also to transmit 2-way audio.

SERVICE APPLICATIONS Transmission of X-rays (etc.) between M.D.'s.  
Consultation between M.D.'s on X-rays...

USERS General population in area of Broken Bow.

PARTICIPATING ORGANIZATIONS University of Nebraska.  
University of Nebraska Medical Centre, Omaha.  
Jennie M. Melbour Medical Center,  
Broken Bow.

SPONSORS/  
FUNDING U.S. Dept. of Health, Education and Welfare 6/30/73 to 6/29/75  
\$128, 654

SYSTEM OPERATOR

TIME FRAME Operational 1972 - 1974.

CONTACT Dr. William J. Wilson,  
Dept. of Radiology,  
Long Beach Memorial Hospital,  
2801 Atlantic Ave.,  
Long Beach, California, 90801,  
U.S.A.

Telephone Number: (213) 595-2191

BIBLIOGRAPHIC REFERENCES [84, pp. 332-334], [973, pp. 139-142 and 242-243],  
and [1053, p. 228].

PROJECT NAME           Memorial University Newfoundland Telemedicine Project 126

LOCATION                 St. John's, Newfoundland, Canada.

SYSTEM CAPABILITIES    Satellite links, using the communications technology satellite (Hermes). Four 2-metre terminals with receive audio and video signals, but transmit audio signals only. Audio and video broadcasting originates from a 3-metre terminal(disk) located on Memorial University.

SERVICE APPLICATIONS   Continuing education for health professionals. Consultation services and data transmission. Community Health Education.

USERS                   Broadcasting 3-5 hours each alternative day.

PARTICIPATING ORGANIZATIONS   Memorial University, St. John's. Hospitals located in: Stephenville, Goose Bay, Labrador City, and St. Anthony.

SPONSORS/ FUNDING       Communications Canada

SYSTEM OPERATOR        Communications Canada  
NASA

TIME FRAME             Operational April 7, 1977 to July 1977.

CONTACT                Miss Judy Roberts,  
Research Associate/Coordinator,  
Telemedicine Office,  
Faculty of Medicine,  
Memorial University of Newfoundland,  
St. John's, Newfoundland.  
A1B 3V6.

                          Telephone Number: (709) 737-6654

BIBLIOGRAPHIC REFERENCES   From [619] to [623], [564], [565], [1022], [1023], and [1024].

PROJECT NAME University of Western Ontario Telemedicine Project

LOCATION London, Ontario, Canada.

SYSTEM CAPABILITIES Two-way video and audio transmission over the Hermes satellite.  
Nursing station - Moose Factory audio only.

SERVICE APPLICATIONS Transmission of X-rays, ultrasound images, EKG and other visual records.

USERS 10,000 Cree and Inuit indians around James and Hudsons Bay.

PARTICIPATING ORGANIZATIONS Moose Factory General Hospital, James Bay.  
New University Hospital, London.  
Nursing Station, Kaschechewan, James Bay.

SPONSORS/  
FUNDING Communications Canada.  
Health Education and Welfare Canada.  
Department of Diagnostic Radiology and Nuclear Medicine,  
University of Western Ontario.  
University Hospital London Health Association.

SYSTEM OPERATOR Communications Canada

TIME FRAME Operational 19 Oct. 1976 to 26 Feb. 1977.  
Nursing station - Moose Factory audio link still operational.

CONTACT Dr. L. Carey,  
Chairman,  
Department of Diagnostic Radiology and Nuclear Medicine,  
University of Western Ontario,  
University Hospital,  
London, Ontario.  
N6A 5A5

Telephone Number: (519) 673-3235

BIBLIOGRAPHIC REFERENCES [100], [229], [230], [723], [1080], [1081], [1082], [1184], and [1202].



PROJECT NAME Remote Computer-Assisted Developmental Assessment of Children via Satellite

LOCATION Ottawa, Ontario, Canada.

SYSTEM CAPABILITIES CRT terminals in Dryden connected to the Sigma-9 computer at Carleton University via telephone lines and satellite (HERMES) link.

SERVICE APPLICATIONS Automated pediatric history-taking interview for parents. Automated battery of achievement tests, including Reading, Arithmetic and Spelling for children.

USERS 24 mothers and 27 children in Dryden, out of a population of 7000 people. Used 8 hours per week for two months.

PARTICIPATING ORGANIZATIONS Carleton University, Ottawa, Ontario. Dryden High School, Dryden Board of Education, Dryden, Ontario.

SPONSORS/FUNDING Ontario Ministry of Health.

SYSTEM OPERATOR

TIME FRAME June-July 1977.

CONTACT Prof. Robert M. Knights,  
Department of Psychology,  
Carleton University,  
Ottawa, Ontario, Canada.  
K1S 5B6

Telephone Number: (613) 231-5587

BIBLIOGRAPHIC REFERENCES [722].

PROJECT NAME	Telemedicine Project	129
LOCATION	Toronto, Ontario, Canada.	
SYSTEM CAPABILITIES	Slow-scan television via telephone lines and telephone (Companion III - hands-free telephone). Two-way black and white picture update in 79 seconds.	
SERVICE APPLICATIONS	Remote Health Care Delivery (trauma, dermatology, X-rays and EKG's).	
USERS	25,000 patient contacts already made out of 120,000 planned.	
PARTICIPATING ORGANIZATIONS	Telemedicine units in: Toronto (2) Sioux Lookout New Osnabourgh Big Trout Lake Kasabonika Sandy Lake Deer Lake	
SPONSORS/ FUNDING	PSI Foundation for 2½ years evaluation.	
SYSTEM OPERATOR	Mostly the usual health personnel (nurses, doctors, etc.). One nurse research coordinator.	
TIME FRAME	Operational since August 1977.	
CONTACT	Earl V. Dunn, M.D., Sunnybrook Medical Centre, Room E4647, University of Toronto, 2075 Bayview Avenue, Toronto, Ontario, Canada. M4N 3M5  Telephone Number: (416) 486-3161	
BIBLIOGRAPHIC REFERENCES	[320], [322], [323], [415], [416], and [417].	

PROJECT NAME "La Grande-Montréal Telemedicine Project" 130

LOCATION Montreal, Quebec, Canada.  
La Grande, Quebec, Canada.

SYSTEM ANIK-B satellite to be used for video and audio  
CAPABILITIES communication.

SERVICE Transmission of patient data: X-ray, ECG, physical  
APPLICATIONS examination, answers to questions. Verbal exchanges  
between medical and para-medical personnel.

USERS Patients, medical and para-medical personnel.

PARTICIPATING Hôpital Sacré-Coeur, Montreal.  
ORGANIZATIONS Hôpital LG-2, La Grande.

SPONSORS/ Department of Communications, Ottawa.  
FUNDING Ministère de l'Education du Québec.  
Université de Montréal.

SYSTEM Communications Canada  
OPERATOR

TIME FRAME Pilot project for use of ANIK-B submitted to DOC for  
approval in 1977.  
Project started April 1979.

CONTACT Dr. Fernand A. Roberge,  
Director,  
Biomedical Engineering Program,  
Ecole Polytechnique and Faculty of Medicine,  
Université de Montréal,  
C.P. 6208, Succ. A,  
Montreal, Quebec,  
H3C 3T8

BIBLIOGRAPHIC  
REFERENCES

PROJECT NAME Teleclinique Montreal-Lyons

LOCATION Montreal, Quebec, Canada.

SYSTEM CAPABILITIES Bidirectional black and white video.  
Microwave links: from Montreal to Nova Scotia and  
from Lyons to Peumeur-Bodou  
(Brittany) to Mill Village, Nova Scotia.

SERVICE APPLICATIONS Tele-consultation.

USERS Specialists in heart diseases from the two hospitals  
(✓100-150 participants).

PARTICIPATING ORGANIZATIONS 1'Institut de cardiologie de Montréal  
1'Hôpital cardiovasculaire et pneumologique de Lyon  
Université du Québec

SPONSORS/  
FUNDING Ministère des Communications du Québec (MCQ)

SYSTEM OPERATOR MCQ (Service de développement des médias)  
Bell Canada  
New Brunswick Telephone  
Maritime Telephone  
Teleglobe  
O.R.T.F.

TIME FRAME Operational during 14th June 1973 (2½ hours)

CONTACT Pierre Patry  
Directeur de la coordination  
Université du Québec  
Ste. Foy, Québec

Telephone number: (418) 657-2307

BIBLIOGRAPHIC REFERENCES [1247].

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PROJECT NAME      ATS-1, ATS-6.

LOCATION            Alaska, USA.

SYSTEM CAPABILITIES      ATS-1 satellite used for background audio communications among 15 to 20 villages (still operational). ATS-6 satellite used for black and white video communications (half-duplex) among five hospitals.

SERVICE APPLICATIONS      Tele-diagnosis and consultation  
Monitoring of chronic diseases  
Transmission of medical data

USERS              300 video cases in 10 months

PARTICIPATING ORGANIZATIONS      Tanana Service Unit (field hospital which provided consultations)  
Anchorage Native Medical Centre (referral hospital, receive-only video)  
Fort Yukon Rural Clinic  
Galena Rural Clinic  
Fairbanks Urban Clinic (did not participate because of personnel shortages)

SPONSORS/FUNDING      Indian Health Service Branch of the Public Health Service  
Cister Hill National Centre for Biomedical Telecommunications  
National Aeronautics and Space Administration (NASA)

SYSTEM OPERATOR      NASA (satellite)

TIME FRAME         ATS-1 satellite has been operational since 1971  
ATS-6 was operational from May 1974 until February 1975

CONTACT            Dr. Dennis Foote,  
Institute for Communications  
Research  
Stanford University  
Stanford, California 94305  
USA.

Tel. No.: (415) 497-2300

BIBLIOGRAPHIC REFERENCES

PROJECT NAME WAMI Program

LOCATION Seattle, Washington; Fairbanks, Alaska; Omak, Washington; Bozeman, Montana.

SYSTEM CAPABILITIES ATS-6 system included full-duplex color video and audio transmission to Fairbanks and simplex black and white to Omak. CTS (Hermes) features color video and audio to all sites.

SERVICE APPLICATIONS Telemedicine and telepsychiatry consultations, plus first year medical courses at the universities of Alaska and Montana. Conferences of state governors and legislators with WAMI administrators. Improving the quality of minority counseling in careers and health.

USERS Medical faculty and administrators at the University of Washington, Montana State University and the University of Alaska; physicians in Washington, Alaska, Montana and Idaho; first year medical students at Montana State University and University of Alaska.  
Hermes is used on an average of 4½ hours per week for 4 broadcasts (does not include satellite access time prior to program) by 35 users per week in Seattle, Fairbanks and Bozeman. Average program length is 1½ hours. User averages per broadcast by individual experiment are as follows: Admissions and Minority Recruitment = 5/program; Consultation Process = 5/program in Bozeman, 10/program in Fairbanks; Independent Learning Program = 5/program in Bozeman, 10/program in Fairbanks; Legislative Process = 10/program; Faculty Sharing = 15/program.

PARTICIPATING ORGANIZATIONS Okanogan Community Mental Health Center, Omak, Washington; Family Medicine Clinic, Omak, Washington; University of Washington Medical, Seattle, Washington; The Montana State Medical Association; Alaska State Medical Society; Idaho State Medical Association; Washington State Medical Association. Montana State University at Bozeman  
Alaska State Native Association, Anchorage, Alaska.

SPONSORS/FUNDING U.S. Department of Health, Education and Welfare

SYSTEM OPERATOR Communications Canada  
NASA

TIME FRAME

ATS-6 - Planning July 1973 to September, 1974;  
Operational September 1974 to May, 1975

CTS - Planning April, 1976 through August, 1977;  
Operational August, 1977 to May, 1978

CONTACT

Marion H. Johnson  
Associate Director  
WAMI Program  
Room E-312  
Mail Stop SC-45  
Health Sciences Bldg.  
University of Washington  
School of Medicine  
Seattle, Washington 98102  
U.S.A.

BIBLIOGRAPHIC  
REFERENCES

"Role of Satellite Broadcast in Regional Medical Education and Health care Delivery", by M. Roy Schwarz and Marion H. Johnson. Presented at the AIAA Conference on Communication Satellites for Health/Education Applications, Denver, Colorado, July 21-23, 1975.

"Communication Satellites in Medical Education", by Marion H. Johnson. The Journal/Technical Horizons in Education, Volume 3, No. 7, October 1976.

"In the Northwest, It's WAMI", by M. Roy Schwarz, American Education, May, 1976.

"Satellite Telecommunications Experiments Include Health Education Delivery". Commitment, Vol. 1, No.2, Fall 1976.

"Satellite Telecommunication in Medical Education and Health Care", by Marion H. Johnson. Presented at the 30th Annual Rural Conference, Washington Plaza Hotel, Seattle, Washington, March 30 - April 1, 1977.

"Impact of Satellite Telecommunication on Health Education and Health Care Delivery", by Marion H. Johnson. Presented at the International Communications Conference, West Berlin, Germany, May 28 - June 3, 1977.

"Communications Support for Decentralized Education in Washington, Alaska, Montana and Idaho", by M. Roy Schwarz, M.D. and Marion H. Johnson. Presented at the Hermes Satellite Symposium of the Royal Society of Canada, Ottawa, Canada, November 29 - December 1, 1977.

"Role of the Medical School in Health Care Delivery: The WAMI Program", by M. Roy Schwarz, M.D. Presented at the U.S./Polish Symposium on Medical Education, Duke University, North Carolina, November 1 - 3, 1977.

PROJECT NAME IEPC 135

LOCATION Halifax, Nova Scotia, Canada.

SYSTEM CAPABILITIES Transmission of ECG to a time-sharing computer using dial-up telephone lines and FM modulation. The resultant diagnosis report are sent back to the remote sites by teletype.

SERVICE APPLICATIONS Tele-diagnosis.

USERS During pilot phase (1974-76) 12000 transactions per year. During the present operational phase 40,000 transactions per year.

PARTICIPATING ORGANIZATIONS Dalhousie University  
Other hospitals in Nova Scotia and across Canada.

SPONSORS/  
FUNDING Department of Physiology, Medical School  
Provincial Government.

SYSTEM OPERATOR Dalhousie University

TIME FRAME Operational Since 1972.

CONTACT Dr. Herman Wolfe,  
Dept. of Physiology and Biophysics,  
Dalhousie University,  
Halifax, Nova Scotia, Canada.  
Bh4 4H7

Telephone Number: (902) 424-3303

BIBLIOGRAPHIC REFERENCES [442, pp. 35-37].



PROJECT NAME

136

LOCATION

Quebec City, Quebec, Canada.

SYSTEM  
CAPABILITIES

Multi-site configuration: Facsimile transmission by regular phone lines (2 way); this system runs on a UNIVAC V75 series computer using as interface a model 1000 data coupler between the computer and the phone lines.

SERVICE  
APPLICATIONS

Electro-Cardiogram Transmission

USERS:

Hospital personnel of the 13 hospitals

PARTICIPATING  
ORGANIZATIONS

Institute of Cardiology of Quebec, Laval Hospital

SPONSORS/  
FUNDING

SYSTEM  
OPERATOR

Laval Hospital

TIME FRAME

Operational

CONTACT

Mr. Gaston Leblond,  
Hopital Laval,  
2725 Chemin Ste.Foy,  
Quebec City, Quebec.

Telephone No.: (418) 656-8711

BIBLIOGRAPHIC  
REFERENCES

PROJECT NAME Puerto Rico Telemedicine Project

LOCATION Ponce, Puerto Rico.

SYSTEM CAPABILITIES Microwave Links:

1. Guayama to Ponce
  - 1 video channel (10 mhz) superior resolution (750 horizontal lines)
  - 1 broadcast black and white video channel (6 mhz)
  - 13 channels for voice transmission, graphics, and data
2. Ponce to Guayama
  - 1 broadcast, black and white video channel
  - 7 channels for voice, graphics, and data
3. System can be upgraded to color transmission
  - special effects generator, zoom lenses on cameras, and camera-monitor carts

SERVICE APPLICATIONS Consultation for emergency services.  
Primary health care delivery.  
Inter-staff consultation.  
Education and in-service training of physicians and para-medical personnel.  
Inter hospitals conferences.  
Analysis and transmission of X-rays, ECG, etc.

USERS Guayama Area Hospital serves a population of 90,000 people.  
Ponce Regional Hospital serves 500,000 people.

PARTICIPATING ORGANIZATIONS Puerto Rico Department of Health

SPONSORS/FUNDING Institute of Social Technology (Department of Health)  
Government of the Common-Wealth of Puerto Rico  
\$550,000.

SYSTEM OPERATOR

TIME FRAME Operational since 1972.

CONTACT Dr. Hector Rodriguez,  
Apartado Postal 1306,  
Ponce, Puerto Rico.

Telephone Number: (809) 844-2080  
844-0040

BIBLIOGRAPHIC REFERENCES [84, pp. 342-344], [422], and [973, pp. 146-149].

PROJECT NAME            Rehabilitation Video Link

LOCATION                 Santa Barbara, California, USA.

SYSTEM  
CAPABILITIES            Upstream  
                          Audio and video (scrambled) via two-way cable TV and  
                          microwave link from St. Francis Hospital to Memorial  
                          Rehabilitation Centre.  
                          Downstream  
                          Audio via telephone lines.

SERVICE  
APPLICATIONS            Providing specialized medical services from the  
                          Rehabilitation Medical Centre to severely physically  
                          disabled people.

USERS                    Used 2 hours/day, once a week.

PARTICIPATING  
ORGANIZATIONS           Rehabilitation Medical Centre.  
                          St. Francis Hospital.

SPONSORS/  
FUNDING                 Local Private Foundation, \$18,000.  
                          \$150 per month CATV Channel Rental Fee.

SYSTEM  
OPERATOR                Santa Barbara Cable TV, and  
                          Memorial Rehabilitation Centre.

TIME FRAME             Operational since April 1977.

CONTACT                 Mr. Roy Glenn,  
                          Administrator,  
                          Memorial Rehabilitation Foundation,  
                          Santa Barbara General Hospital Pavilion,  
                          P.O. Box 3650,  
                          Santa Barbara, California 93105  
                          USA.

                          Telephone Number: (805) 964-4318

BIBLIOGRAPHIC  
REFERENCES             [642] and [1052].

PROJECT NAME An Evaluation of the Impact of Communications Technology and Improved Medical Protocol on Health Care Delivery in Penal Institutions.

LOCATION Miami, Florida, USA.

SYSTEM CAPABILITIES Colour video, black and white video, and slow-scan video, microwave transmission (Stockade-telephone only). Mobile video console, remote controls, EKG, stethoscope, and facsimile transmission capabilities. It was determined that wide-band black and white video was the most desirable overall selection for this project.

SERVICE APPLICATIONS Remote medicine consultation/diagnosis. Continuing education of nurse practitioners.

USERS Physicians located in Jackson Memorial Hospital and nurse practitioners located in any of the three correctional facilities. Inmates of the correctional facilities about 1,550 maximum at any one time.

PARTICIPATING ORGANIZATIONS Jackson Memorial Hospital (Miami, Florida). University of Miami, School of Medicine. Dade County Penal Institutions' three correctional facilities including the "Main Jail", the "Women's Detention Center" and the "Stockade".

SPONSORS/FUNDING National Science Foundation - \$906,000  
Dade County Correctional Institutions contributed - \$299,000.

SYSTEM OPERATOR University of Miami School of Medicine.  
Dade County, Florida Prison Medical Service.  
Westinghouse Electric Corporation, Health Systems  
(responsible for design/installation and maintenance).

TIME FRAME Total project July 1, 1973 - December, 1976.  
The Telemedicine System Phase - June 1, 1975 to December 31, 1975.

CONTACT Jay H. Sanders, M.D., Professor of Medicine, University of Miami, School of Medicine, P.O. Box 520875, Miami, Florida 33152 USA.  
Mr. Michael J. Reardon, Westinghouse Health Systems, P.O. Box 866, Columbia, Maryland 21044 USA.

Tel. No.: (305) 325-6338 Tel. No.: (301) 992-3160

BIBLIOGRAPHIC REFERENCES [84, pp. 311-314], [486], [580], [645], [973, pp. 144-145], [1117], and [1118].

PROJECT NAME      ATS-6 Satellite Advanced Health Care and Education Experiments

LOCATION            Atlanta, Georgia, and V.A. Hospitals

SYSTEM CAPABILITIES      Uni-directional (black and white) video with telephone answer-back microwave links from the originating studio in Atlanta, Georgia to Rosman North Carolina where the ATS-6 transmitter is located.  
ATS-6 satellite links from Rosman to locations throughout the east coast - return slow scan via land-lines to Atlanta from V.A. hospitals  
- ATS-3 satellites links used for switched audio between sites.

SERVICE APPLICATIONS      Video Seminars, Grand Rounds, Out-Patient Clinics, Teleconsultations, Computer-Assisted Training and Computerized Patient Self-assessment Program.

USERS

PARTICIPATING ORGANIZATIONS      V.A. Hospitals Located in:  
Altoona Pa.  
Beckley, W., Va.  
Clarksbey, W. Va.  
Dublin, Ga.  
Fayetteville, N.C.  
Joynson City, Tenn.  
Oteen, N.C.  
Salem, Va.  
Salesbury, N.C.  
Wilkes-Barre, Pa.

SPONSORS/ FUNDING      Veteran's Administration.

SYSTEM OPERATOR      NASA

TIME FRAME          Operational May 1974 to May 1975.

CONTACT            Robert B. Shamaskin,  
Deputy Director,  
Learning Resources Service,  
Office of Academic Affairs,  
Department of Medicine and Surgery,  
Verterans Administration Central Office,  
Washington, D.C., 20420,  
USA.

Telephone Number: (202) 393-4120 Ext. 3811

BIBLIOGRAPHIC REFERENCES      [220], [336, pp. 24-25], and [973, pp. 152-153].

PROJECT NAME Central Maine Interactive Telecommunications System

LOCATION Augusta, Maine, USA.

SYSTEM CAPABILITIES Multisite interactive video. Duplex microwave lengths from each participating location converging at a central unmanned automated switching center in Augusta. Each location completely controls who sees and hears their transmissions. The system is fully color capable but system cameras are all black and white in an attempt to contain costs. Each facility has identical reception and origination capabilities. The system features both remote control and manually operated cameras with users able to remotely control cameras anywhere else in the system.

SERVICE APPLICATIONS Medical education, teleconferencing, teleconsultation.

USERS The system currently operates (following six months of operation) between 25 and 35 hours per week of unduplicated, live programming developed and produced by the users themselves. The number of viewers of educational programs is in excess of 1200 per month, not counting conference participants.

PARTICIPATING ORGANIZATIONS Medical Care Development, Augusta.  
Mid-Maine Medical Center (Thayer and Seton Units), Waterville.  
Augusta General Hospital, Augusta.  
Central Maine Family Practice Residency's, Family Medicine Institute, Augusta.  
University of Maine at Augusta.  
Veterans Administration Center, Togus.  
St. Mary's General Hospital, Lewiston.  
Central Maine Medical Center, Lewiston.

SPONSORS/FUNDING Veterans Administration: \$895,000 for a three-year period plus \$104,000 in continuation movies for additional experimentation.

SYSTEM OPERATOR Medical Care Development, Inc.

TIME FRAME Operational since August 1977.

CONTACT Robert A. Cowan, Project Director, Interactive Telecommunications System, C/O Medical Care Development, Inc., 295 Water Street, Augusta, Maine 04330 USA.  
Donald D. Wisch, Project Engineer, Interactive Telecommunications System, C/O Medical Care Development, Inc., 295 Water Street, Augusta, Maine 04330 USA.

Tel. No.: (207) 622-7566 Tel. No.: (207) 622-7566

BIBLIOGRAPHIC REFERENCES [333], [334], [335], and from [842] to [845].

PROJECT NAME VETERAN (Veterans Educational Training Extramural Regional Audiovisual Network)

LOCATION St. Louis, Missouri, USA.

SYSTEM CAPABILITIES 3 studios with large, colour programming production facilities.  
3-channel closed-circuit distribution system.  
18 mile 2-way microwave system connecting the 3 studios.

SERVICE APPLICATIONS Education and training for medical administration personnel.  
Future expansion to include access to resources of medical schools and other health care facilities in St. Louis.

USERS Potential 4514 persons.

PARTICIPATING ORGANIZATIONS The following Veteran's Administration Hospitals:  
John Cochran V.A. Hospital, St. Louis  
Jefferson Barracks V.A. Hospital, St. Louis  
St. Louis University Medical School  
  
Future Expansion: Marion, Illinois  
Poplar Bluff, Mo.

SPONSORS/FUNDING Veterans Administration  
Installation cost of 2 studios \$1.4 Million.  
Installation cost of microwave links \$170 Thousand.

SYSTEM OPERATOR Veterans Administration

TIME FRAME The studios at both locations in St. Louis have been operational since July 1974.  
The microwave system is tentatively scheduled to be operational as of May 1978.

CONTACT H. David Spikes,  
Audio-Visual Production Specialist,  
Learning Resources Centre,  
142-JB,  
St. Louis Veterans Administration Hospital,  
St. Louis, Missouri 63125  
USA.  
  
Telephone Number: (314) 652-4100 Extension 1484

BIBLIOGRAPHIC REFERENCES

PROJECT NAME Nebraska Veterans Administration Network,

LOCATION Omaha, Nebraska, USA.

SYSTEM CAPABILITIES Microwave 2-way for colour video outside the city (telephone lines for audio). (Omaha V.A. Hospital acts as the Switching Center).

SERVICE APPLICATIONS Therapy and consultation, vocational rehabilitation, patient supervision, conferences and lecture for staff, administration.

USERS Peak 30 hours/week.  
Average number of participant = 3,750/mo.

PARTICIPATING ORGANIZATIONS University of Nebraska Medical Center (UNMC).  
Nebraska Psychiatric Institute.  
Grand Island Veterans Administration Hospital.  
Lincoln Veterans Administration Hospital.  
Creighton Health Science, St. Joseph's Hospital.  
Omaha Veterans Administrative Hospital.  
University of Nebraska College of Dentistry, Lincoln.  
Clarkson Hospital.

SPONSORS/FUNDING Internal funding by the Veterans Administration  
Approximately \$100,000/year annual operational budget for the V.A. Hospital in the project.  
Some funding by:  
University of Nebraska Medical Center, and  
Creighton University Health Sciences.

SYSTEM OPERATOR Veterans Administration

TIME FRAME Operational since 1969.

CONTACT Reba A. Benschoter,  
Biomedical Communications,  
University of Nebraska Medical Center,  
42nd and Dewey,  
Omaha, Nebraska 68105  
USA.  
  
Telephone Number: (402) 541-4304

BIBLIOGRAPHIC REFERENCES [106], [108], [110], and [973, pp. 29, 124-128, and 229-233].



PROJECT NAME Playas Lake Telemedicine Project

LOCATION Playas, New Mexico, USA

SYSTEM CAPABILITIES Black and white interactive TV, capability for transmitting medical records, stethoscopic sound, microscopic slides, EKG, and radiographs, microwave transmission to Silver City, N. Mexico, 110 miles away.

SERVICE APPLICATIONS The primary care clinic is run by physician assistants who may contact physicians at Silver City using the telemedicine system any time. Also used for medical education at least once per week.

USERS 1200 local residents plus 800 in surrounding area. Ave. no. of transactions 4 or 5 per day.

PARTICIPATING ORGANIZATIONS Phelps-Dodge Co.  
Med-Square Clinic, Silver City

SPONSORS/  
FUNDING Phelps-Dodge Co. (Installation costs about \$280,000).

SYSTEM OPERATOR

TIME FRAME Operational since December 1975.

CONTACT Mr. G.H. Nelson,  
Administrator,  
Med-Square Clinic,  
Drawn-N,  
Playas, New Mexico, 88009,  
USA.  
  
Telephone number : (505) 436-2242

BIBLIOGRAPHIC REFERENCES [18], and [1036].

PROJECT NAME Ohio Valley Medical Microwave Television System 145

LOCATION Athens, Ohio, USA.

SYSTEM CAPABILITIES Colour television, one studio in each one of four sites.  
2-way microwave links.

SERVICE APPLICATIONS Consultation with specialists.  
Continuing education and in-service training for physicians, nurses and allied health personnel.  
Evaluation and therapy in mental health and speech problems.  
Training of undergraduate medical students.

USERS 30,000 user-contact hours in 3 years.

PARTICIPATING ORGANIZATIONS Ohio State University Hospital, Columbus.  
O'Bleness Memorial Hospital, Athens.  
The Athens Mental Health Center, Athens.  
Holzer Medical Center, Gallipolis.  
In Preparation:  
Doctor's Hospital, Columbus.  
Ohio University College of Osteopathic Medicine, Athens.

SPONSORS/  
FUNDING Original Grants:  
Appalachian Regional Commission - \$669,000 and \$30,471.  
Ohio ETV Network Commission \$135,000.  
Ohio Department of Mental Health and Mental Retardation \$107,000.  
Operational Grants:  
Appalachian Regional Commission - \$713,053 through June 30, 1978.  
System Expansion Grants:  
State of Ohio - \$150,000.

SYSTEM OPERATOR Ohio University College of Osteopathic Medicine and the Ohio ETV Network Commission.

TIME FRAME Operational since December 1974.

CONTACT Mr. Ronald Black,  
Project Director,  
Ohio Valley Medical Microwave Television System,  
Room 353,  
Grosvenor Hall,  
Ohio University,  
Athens, Ohio 45701  
USA.  
  
Telephone Number: (614) 594-6401

BIBLIOGRAPHIC REFERENCES [949] and [973, pp. 145-146].

PROJECT NAME Interactive Closed Circuit Television System 146

LOCATION Waco, Texas, USA.

SYSTEM CAPABILITIES Closed circuit microwave system.

SERVICE APPLICATIONS Rapid exchange of medical information.

USERS

PARTICIPATING ORGANIZATIONS The Veteran's Administration Hospitals at:  
Temple,  
Marlin,  
Waco.

SPONSORS/  
FUNDING Veterans Administration

SYSTEM OPERATOR

TIME FRAME

CONTACT Robert B. Shamaskin,  
Deputy Director,  
Learning Resources Service,  
Office of Academic Affairs,  
Department of Medicine and Surgery,  
Veterans Administration Central Office,  
Washington, D.C. 20420  
USA.

Telephone Number: (202) 393-4120 Extension: 3811

BIBLIOGRAPHIC REFERENCES

PROJECT NAME            The Interactive Television Network (ITN)

LOCATION                 Seven (7) stations located in Vermont/New Hampshire with administrative and operational headquarters at Dartmouth College, Hanover, New Hampshire, USA

SYSTEM CAPABILITIES    Full duplex (audio and video) microwave system used primarily on an interactive, two-way basis. The frequency is capable of video (black & white or color) and three (3) audio channels.

SERVICE APPLICATIONS    Medical Education (physician and allied health professionals)  
Specialty conferences  
General Education and Service to non-health-related personnel  
Patient Consultations  
Patient Education

USERS                    Physicians at all subscribing hospitals  
Other health professionals at all subscribing hospitals  
General Public  
Weekly Program Hours (Average) = 30  
Weekly Users (Average) = 200

PARTICIPATING ORGANIZATIONS    University of Vermont and Medical School (Vermont)  
Medical Center Hospital of Vermont (Vermont)  
Central Vermont Medical Center (Vermont)  
Dartmouth-Hitchcock Medical Center (New Hampshire)  
Claremont General Hospital (New Hampshire)  
Rockingham Memorial Hospital (Vermont)  
Vermont Department of Corrections (Vermont)  
V.A. Hospital (White River Junction, Vermont)

SPONSORS/FUNDING        Original capitalization and operational costs were borne by the National Library of Medicine. Estimated Fiscal Year 1979 Operational Budget - \$200,000 (excluding equipment depreciation)  
Sources of Revenue: a) Institutional Subscribers - 50% of budget; b) sale of airtime on ad hoc basis - 15%; c) Videotape Productions - 20%; and d) Engineering Services - 15%.

SYSTEM OPERATIONS      Interact's FCC licenses are held by Dartmouth College. The administrative and operational control is presently via Dartmouth Medical School in the form of a non-academic department. Interact's transition to a regional consortium is under evaluation.

TIME FRAME              Operational since 1968.

## CONTACT

Mr. Marshall Krumpe, Network Manager  
INTERACT Television Network  
Dartmouth-Hitchcock Medical Center  
Hanover, New Hampshire, USA

Telephone number: (603) 646-3565

BIBLIOGRAPHIC  
REFERENCES

[ 84, pp.334-336 ], [ 641 ], [ 955, pp.87-97 ],  
[ 973, pp.26-31, 129-135, and 234-239 ], [ 1053, p.227 ],  
[ 1115 ], [ 1116 ], and [ 1145 ].

5. SERVICES TO THE PUBLIC

PROJECT NAME GRAND RIVER

LOCATION Kitchener, Ontario, Canada

SYSTEM CAPABILITIES Teletext system for on-demand access to visual material.  
Uses home TV set.  
Telidon and Micro TV control units.  
Coaxial cable.

SERVICE APPLICATIONS Pilot trials  
Information retrieval

USERS Grand River Cable Co. subscribers  
25 households with Micro TV units  
50 households with Telidon units  
Service may be expanded to all subscribers

PARTICIPATING ORGANIZATIONS Grand River Cable Company  
Canadian Cable Systems (parent company)

SPONSORS/  
FUNDING Canadian Cable System  
Canadian Department of Communications (equipment loan)

SYSTEM OPERATOR Grand River Cable Company  
(owned by Canadian Cable Systems)

TIME FRAME Micro TV pilot under way  
Telidon pilot phase to start September 1979

CONTACT Frank L. Eberdt  
General Manager  
Grand River Cable TV  
Kitchener, Ontario

Telephone number : (519) 893-2101

BIBLIOGRAPHIC REFERENCES

PROJECT NAME PHONE-INFO

LOCATION Ottawa, Ontario, Canada

SYSTEM CAPABILITIES Interactive system using commonly available technology.

- Cable TV downstream (one channel to everybody)
- Touch-tone telephone upstream
- Computer control of the interactive system
- Computer compiling of data on use of the system.

SERVICE APPLICATIONS Information retrieval in the home.  
Demonstration and evaluation of a system.

USERS 400 homes at March 31, 1977

PARTICIPATING ORGANIZATIONS Carleton University  
Department of Communications (DOC) Canada

SPONSORS/  
FUNDING Carleton University  
DOC contract for \$29,000

SYSTEM OPERATOR Carleton University  
Ottawa Cablevision Ltd.  
Skyline Cablevision Ltd.

TIME FRAME DOC contract September 1976  
System Operational February and March 1977

CONTACT Dr. Don George  
Wired City Laboratory  
Department of Systems (Engineering & Computing Science)  
Carleton University  
Ottawa, Ontario K1S 5B6  
Canada  
Telephone Number: (613) 231-2601  
(613) 231-6342

BIBLIOGRAPHIC REFERENCES [ 524 ]



PROJECT NAME TV ONTARIO

LOCATION Toronto, Ontario, Canada

SYSTEM CAPABILITIES Broadcast teletext system using Telidon control units to display information on the home TV. Later phases may be interactive (broadcast/phone or phone/phone) for visual information retrieval and production of learning information on-demand.

SERVICE APPLICATIONS Telidon trial on an educational TV network. Retrieval of educational material and OECA administrative information.

USERS 55 Telidon units in homes, educational institutions and secondary schools.

PARTICIPATING ORGANIZATIONS TV Ontario ( part of the Ontario Communications Authority, OECA)  
Canadian Department of Communications (DOC)

SPONSORS/  
FUNDING OECA internal funds  
DOC (hardware and software)

SYSTEM OPERATOR TV Ontario/OECA

TIME FRAME Pilot phase to start September 1979

CONTACT John Syrett  
The Ontario Educational Communications Authority  
P.O. Box 200. Station Q.  
Toronto, Ontario  
M4T 2T1  
  
Telephone number: (416) 484-2621

BIBLIOGRAPHIC REFERENCES



PROJECT NAME CEEFAX, ORACLE

LOCATION London, England

SYSTEM CAPABILITIES Teletext system. CEEFAX is the BBC name and ORACLE is the ITV name.

- Digital information transmitted vertical blanking TV intervals selected by home viewers using a decoder
- Viewer selects information pages from an index on the home screen.
- 625 line TV system has capacity for 800 pages/channel
- Alphanumerics, graphics, black and white or 7 colors

SERVICE APPLICATIONS Information retrieval in the home and office  
News flashes, sports results, price indices, entertainment guide, etc.

USERS 10,000 homes and offices in 1979

PARTICIPATING ORGANIZATIONS British Broadcasting Corporation  
Independent Broadcasting Authority

SPONSORS/  
FUNDING BBC and ITV funds  
Converters and key pads cost about \$500 additional for a color TV. Price could drop with mass production. Service is "virtually free".

SYSTEM OPERATOR BBC & ITV

TIME FRAME CEEFAX announced in October 1972  
Transmission tests began in March 1973  
Two year trial of CEEFAX and ORACLE started in September 1974.  
Go-ahead to continue in November 1976.

CONTACT BBC Television Centre  
Wood Lane  
London W12 7RJ,  
England  
  
Telephone: 01-743-8000 Ext. 3701 or 3703

BIBLIOGRAPHIC REFERENCES [184], [270].

PROJECT NAME Antiope

LOCATION Rennes, France

SYSTEM CAPABILITIES Teletext system that uses an augmented home TV receiver to display data that is broadcast or transmitted over a wired network.

- Adaptable to all television standards and transmission networks.
- Compatible with other text transmission systems.
- Multialphabetic possibilities can accomodate alphabets from different countries

SERVICE APPLICATIONS Information services to the public in the form of pages of text on a color TV screen.

USERS Experimentally tried out on the network of Télédiffusion de France (T.D.F.)

PARTICIPATING ORGANIZATIONS Centre commun d'études de télévision et télécommunications (CCETT).

SPONSORS/ FUNDING CCETT funds

SYSTEM OPERATOR

TIME FRAME Studies initiated in late 1973  
Estimated to be on the market in 1980

CONTACT Dr. Y. Guinet  
Directeur adjoint du CCETT  
2, rue de la Mabilais  
B.P. 1266 - 35013 Rennes Cedex  
France  
Tel. no.

BIBLIOGRAPHIC REFERENCES [ 561 ], [ 562 ], [ 813 ], [ 814 ], [ 933 ], [ 1135 ].

PROJECT NAME Character Information Broadcasting Station (CIBS)

155

LOCATION Japan

SYSTEM CAPABILITIES Teletext system using characters written in the Japanese alphabet. The dot elements of a complete black and white picture consisting of 200 lines are carried, one line at a time, in one spare scan line in the vertical blanking interval of a TV channel. The resulting built-up display has a sufficiently fine resolution to show Japanese text and video pictures.

SYSTEM APPLICATIONS Information retrieval ( news, weather, traffic information)

USERS Limited number of users for terminal trial

PARTICIPATING ORGANIZATIONS N.H.K. (Japanese Broadcasting Corporation)

SPONSORS/ FUNDING Internal funds - N.H.K.

SYSTEM OPERATOR NHK (Japanese Broadcasting Corporation)

TIME FRAME Project announced April 1978

CONTACT Mr. Yasutaka Numaguchi  
Deputy Director - Technical Research Laboratory  
NHK  
Kenuta 1-10-11  
Setagaya-Ku  
Tokyo 157, Japan  
Tel.no.: (Tokyo) 465-1111

BIBLIOGRAPHIC REFERENCES

PROJECT NAME

CableText, Inc.

156

LOCATION

USA

SYSTEM  
CAPABILITIES

Teletext system transmitted via a TV vertical blanking interval. Service to be offered over a Satcom 1 Transponder G satellite. CATV stations will receive information via a Micro TV decoder. Eventually home decoders will be developed. Computer can hold 2000 pages. Any page can be accessed within 10 seconds.

SERVICE  
APPLICATIONS

Information retrieval - electronic newspaper

USERS

Subscribers of the CATV Systems receiving CableText

PARTICIPATING  
ORGANIZATIONS

Micro TV  
Satellite Syndicated Systems  
WTCG Atlanta, Channel 17  
CATV Stations  
Reuters, United Press International

SPONSORS/  
FUNDING

Internal funds - Micro TV, Satellite Syndicated Systems  
CATV Systems will pay \$50.00 for the decoder

SYSTEM  
OPERATOR

CableText uses the vertical blanking interval of superstation WTCG, Atlanta, Channel 17 aboard RCA American Satcom 1 Transponder G

TIME FRAME

System tests in 1979

CONTACT

Mr. Bill Gross  
Micro TV  
River Park House  
3600 Conshohocken Ave  
Philadelphia, Pennsylvania  
19131 U.S.A.

Satellite Syndicated  
Systems  
P.O. Box 45684  
Tulsa, Oklahoma  
74145 U.S.A.

Tel.no.: (215) 879-0900

Tel.no.: (918) 664-4812

BIBLIOGRAPHIC  
REFERENCES

PROJECT NAME Inteltext

LOCATION U.S.A.

SYSTEM CAPABILITIES Teletext system using Antiope decoders. System will be piggybacked onto Pay TV programming using both the TV vertical blanking interval or full channel for transmission. Peripherals can convert system into remote terminal with upstream capability via telephone lines.

SERVICE APPLICATIONS Information retrieval

USERS Hotels, apartment buildings (etc.) subscribing to Microband services

PARTICIPATING ORGANIZATIONS Microband  
Sofratev via U.S. subsidiary, Antiope Videotex Systems

SPONSORS/  
FUNDING Internal funds - Microband, Sofratev

SYSTEM OPERATOR Microband

TIME FRAME Tests in 1979

CONTACT  
Microband  
655 Third Avenue  
New York, N.Y. 10017  
U.S.A.  
Tel.no.: (212) 867-9590

Mr. David Taylor  
Antiope Videotex Systems  
1150 Connecticut Avenue  
N.W. Washington D.C. 20036  
U.S.A.  
Tel.no.: (202) 457-1020

BIBLIOGRAPHIC REFERENCES

PROJECT NAME IDR System

PROJECT LOCATION Reuters, New York, N.Y., U.S.A.

SYSTEM CAPABILITIES Computer controlled information retrieval system via cable TV. Sends packages of information at a time from a computer disk at 4 million words a minute. Data recycled every 3 to 5 seconds. Subscriber's equipment uses "row-grabber" technology. Alphanumeric display but graphics and picture capability. Screen capability 16 x 64 characters. In cycling mode screen changes every 15 seconds. In fixed mode page turning controlled by viewer.

SERVICE APPLICATIONS Information from Reuters news file, stock and commodity exchanges, money market, racing service, etc., depending on customers code.

USERS Bankers, brokers, commodity traders.

PARTICIPATING ORGANIZATIONS Reuters North America

SPONSORS/FUNDING \$300 to \$1500 per month depending on type of service

SYSTEM OPERATOR Reuters North America

TIME FRAME News-View teletext service via cable TV in April 1971.  
IDR development started in 1972.  
Field test in 1974 on Manhattan cable.  
Operation in 1975 in New York, N.Y.  
Being installed in other cities in U.S. and Canada.

CONTACT Manager Cable Services,  
Reuters,  
1700 Broadway,  
New York, N.Y. 10019.  
U.S.A.  
  
Telephone Number (212) 582-4030

BIBLIOGRAPHIC REFERENCES [ 162 ], [ 1068 ], [ 1069 ].



PROJECT NAME Info-text

LOCATION Philadelphia, Pennsylvania, U.S.A.

SYSTEM CAPABILITIES Teletext system similar to Ceefax designed for both cable broadcasting and transmission through four spare scan lines in the vertical blanking interval. Information pages are stored digitally in a computer data base and continuously cycled through the transmission medium. With the keypad users access a page by keying in a number corresponding to that page. Display format is 40 characters per row and 20 rows per page.

SERVICE APPLICATIONS Information distribution for businesses  
Electronic newspaper

USERS Business subscribers in the Philadelphia area

PARTICIPATING ORGANIZATIONS Micro TV  
Mullard (components for the decoders)

SPONSORS/  
FUNDING Internal funds - Micro TV

SYSTEM OPERATOR Micro TV

TIME FRAME Fall 1979

CONTACT Mr. Bill Gross  
Micro TV  
River Park House  
3600 Conshohoken Ave  
Philadelphia, Pennsylvania 19131  
USA  
Tel.no.: (215) 879-0900

BIBLIOGRAPHIC REFERENCES

PROJECT NAME        Teledata

LOCATION             Salt Lake City, Utah, U.S.A.

SYSTEM  
CAPABILITIES        Teletext system using two scan lines in the TV vertical  
                     blanking interval. Display is 32 characters per row  
                     and 20 rows per page. The database contains about  
                     100 pages and could accomodate up to 800 pages.  
                     TIFAX decoders are used in the TV sets to receive the  
                     service

SERVICE  
APPLICATIONS        Information retrieval  
                     Electronic newspaper

USERS

PARTICIPATING  
ORGANIZATIONS       Bonneville International Corporation (owners of KLS TV)  
                     British Broadcasting Corporation  
                     Texas Instruments

SPONSORS/  
FUNDING             Internal funding by the participating organizations

SYSTEM  
OPERATOR            KLS TV

TIME FRAME         Operational June 1978

CONTACT             Mr. Bill Loveless  
                     KLS-TV  
                     Broadcast House  
                     Salt Lake City, Utah 84111  
                     USA  
                     Tel.no.: (801) 524-2660

BIBLIOGRAPHIC  
REFERENCES

PROJECT NAME Line 21 System

LOCATION U.S.A.

SYSTEM CAPABILITIES Teletext system offered over one spare scan line (line 21) in the TV vertical blanking interval. System can be accessed using TIFAX decoders.

SERVICE APPLICATIONS Program captions and additional information for the deaf community

USERS Deaf community in U.S.

PARTICIPATING ORGANIZATIONS The Public Broadcasting Service  
The Corporation for Public Broadcasting

SPONSORS/  
FUNDING

- US Department of Health, Education and Welfare (HEW), Office of Education, Bureau of Education for the Handicapped
- The Corporation for Public Broadcasting

SYSTEM OPERATOR The Public Broadcasting Service (PBS)

TIME FRAME Operational on an experimental basis since 1974  
Public trial in 1979

CONTACT Mr. John Blamphin  
The Public Broadcasting Service  
200 Independence - Room 638E  
Washington, D.C., 20201  
USA  
Tel.no.: (202) 245-6343

BIBLIOGRAPHIC REFERENCES

PROJECT NAME Natrona County Public Library Video Reference Service

LOCATION Casper, Wyoming, U.S.A.

SYSTEM CAPABILITIES Downstream: Co-axial cable, full motion video,  
One channel is used for this service  
Upstream: Switched telephone network to operator -  
voice calls

SERVICE APPLICATIONS Video reference service (recipes, auto mechanic diagrams),  
dial-a-story service and some regular programming.

USERS Potential of 35,000 cable subscribers. System was used  
about 5 times/month.

PARTICIPATING ORGANIZATIONS Natrona County Public Library

SPONSORS/  
FUNDING Natrona County Public Library  
Rent from the cable company is \$1.00/year (United Cable)

SYSTEM OPERATOR United Cable Co.

TIME FRAME Operational

CONTACT Mr. Christopher Jones  
Natrona County Public Library  
3070 East Second St.  
Casper, Wyoming  
U.S.A. 82701

BIBLIOGRAPHIC REFERENCES [ 408 ]

PROJECT NAME Automatic Meter Reading (A.M.R.)  
Verification Trial

LOCATION Edmonton, Alberta, Canada

SYSTEM CAPABILITIES Transmission by regular telephone lines. Utility meter reading by a transponder connected to the telephone lines and encoders connected to the transponder.

SERVICE APPLICATIONS Meter reading of water, gas, power. Peak demand reading for power. Four on-off control functions. Eight alarm inputs.

USERS Six hundred home dwellers.

PARTICIPATING ORGANIZATIONS 'edmonton telephones', Edmonton Power, & Edmonton Water, which are City owned utilities. Northwestern Utilities, which is a shareholder owned utility.

SPONSORS/  
FUNDING 'edmonton telephones'  
Cost \$450,000, plus operating costs.

SYSTEM OPERATOR 'edmonton telephones'

TIME FRAME Due to late transponder delivery, installation of the system is scheduled to begin September 1, 1978. This will be a trial system for evaluation purposes. Evaluation will take place from November 1978 to December 1979.

CONTACT Mr. R.W. Sollanych  
Plant Extension Engineer  
'edmonton telephones'  
10405 - 104 Avenue  
Edmonton, Alberta  
T5J 0K7

BIBLIOGRAPHIC REFERENCES

PROJECT NAME North York Metering Trial

LOCATION Metropolitan Toronto, Canada

SYSTEM CAPABILITIES Automatic meter reading (AMR) for electricity, gas and water using telephone lines and telephone test circuits. Interactive control and real time processing of meter data. Automatic polling in off-peak hours and direct entry from data terminals in utility offices. Minicomputer based central controller supplemented by microprocessor based remote controllers.

SERVICE APPLICATIONS Automatic remote meter reading service supplied by the telephone system.

USERS Trial involving 100 volunteer homes in the Borough of North York.

PARTICIPATING ORGANIZATIONS Bell Canada  
Metropolitan Toronto Public Utilities Coordinating Committee  
Consumer's Gas Company  
North York Hydro  
North York Water

SPONSORS/  
FUNDING Bell Canada funding  
Cost estimates based on 500,000 homes averaging 2 utility meters:  
Bell capital costs about \$450,000  
Utility owned components  
Encoders average about \$17.00 per meter  
Water Meter adapter about \$9.24  
Cable and connectors about \$5.00  
Once a month reading of each meter about \$0.30

SYSTEM OPERATOR Bell Canada

TIME FRAME November 1974 to November 1975

CONTACT Bell Canada  
Ontario Region Operations  
Customer Services Planning  
393 University Ave., F-13  
Toronto, Ontario  
Canada, M5G 1W9

BIBLIOGRAPHIC REFERENCES

PROJECT NAME

ERDA/EPRI

165

LOCATION

Electric Power Research Institute  
Palo Alto, California (EPRI)  
U.S.A.

U.S. Department of Energy (DOE)  
Washington D.C.  
U.S.A. (formerly ERDA)

SYSTEM  
CAPABILITIES

Two-way communication by:  
regular phone lines on one project  
power line carrier on three projects  
radio on one project

SERVICE  
APPLICATIONS

Field demonstration of communication systems for  
distribution automation.  
Time-of-use metering, remote meter reading, load control  
for residential electric, gas, water meters; control  
and status monitoring of electric distribution equipment.

USERS

About 700 homes and 50 control points, per project.

PARTICIPATING  
ORGANIZATIONS

Compuguard Corp. and Carolina Power & Light Co.  
Westinghouse Electric Corp. and Detroit Edison Co.  
American Science & Engineering and San Diego Gas &  
Electric Co.  
Darco Inc. with Omaha Public Power District  
Municipal Utilities District  
Northwestern Bell

SPONSORS/  
FUNDING

EPRI funded three projects at \$1.2M to \$1.7M each.  
DOE funded two projects also at \$1.2M to 1.7M each.

SYSTEM  
OPERATOR

Carolina Power & Light Co.  
Detroit Edison Co.  
Long Island Lighting Co.

San Diego Gas & Electric Co.  
Omaha Public Power District  
Municipal Utilities District  
Northwestern Bell

TIME FRAME

1978 Equipment development, manufacturing and installation  
1978 System test and evaluation

CONTACT

Dr. W.E. Blair  
Electrical Systems Division  
3412 Hillview Avenue  
P.O. Box 10412  
Palo Alto, CA 94303

BIBLIOGRAPHIC  
REFERENCES

Blair, Dr. W.E. "Field Demonstration of Communications  
Systems for Distribution Automation" (1977)

PROJECT NAME

LOCATION Munroe, Georgia, U.S.A.

SYSTEM  
CAPABILITIES Remote monitoring via CATV  
CATV system has 21 channels downstream  
5 MHz return signal  
Scientific Atlanta equipment

SERVICE  
APPLICATIONS Experiments with a number of security  
monitoring systems including fire, burglar,  
low pressure tanks tests. CATV system also  
used for school-originated programs.

USERS CATV subscribers

PARTICIPATING  
ORGANIZATIONS Munroe Water, Light and Gas Commission  
CATV municipally owned

SPONSORS/  
FUNDING Surveillance estimated to cost an additional  
\$30,000.  
Operating cost about \$50 per house additional  
for 5,000 to 10,000 subscribers.

SYSTEM  
OPERATOR Munroe Water, Light and Gas Commission

TIME FRAME Cable system completed in September 1972.  
Original remote monitoring project abandoned  
because of high error rate.

CONTACT Mr. Briscow or Mr. Gear,  
Munroe Water, Light and Gas Commission,  
Munroe, Georgia, U.S.A.

Telephone number: (404) 267-5756

BIBLIOGRAPHIC  
REFERENCES



PROJECT NAME           Carpentersville Interactive Security System

LOCATION                 Crystal Lake, Illinois, U.S.A.

SYSTEM CAPABILITIES    Transmission by co-axial cable;  
two-way data using existing CATV channel

SERVICE APPLICATIONS   Security monitoring, fire and burglary service

USERS                   6 subscribers, cost: \$270.00 for installation;  
\$9.95 per month for the service for each subscriber

PARTICIPATING ORGANIZATIONS   Oak Security Co.  
L.V.O. Cable, North Illinois

SPONSORS/  
FUNDING                 L.V.O. Cable Co.  
Oak Security Co.

SYSTEM OPERATOR        L.V.O. Cable Co.

TIME FRAME             Not operational since 1973

CONTACT                 Oak Security  
Divison of Oak Industries  
dissolved in 1973

BIBLIOGRAPHIC REFERENCES   [ 244 ], [ 794 ].

PROJECT NAME

TOCOM II

168

LOCATION

DALLAS, TEXAS, U.S.A.

SYSTEM  
CAPABILITIES

Mini-computer based security and monitoring system over CATV.

- Bi-directional cable distribution allowing 26 T.V. channels downstream and 5 to 25 MHZ for return data.
- Computer-controlled central data terminal can poll 60,000 remote units every 6 seconds.
- Remote subscriber units include a 26 channel converter, RF receiver, crystal-controlled digital transmitter and digital control system. Remote unit sends 16-bit data word when interrogated. Also has a medical alert button.

SERVICE  
APPLICATIONS

Cable TV channels and security service (fire, police, medical alarms) to subscribers.

USERS

TOCOM II system installed in Woodlands, a satellite city 30 miles north of Houston. Six TOCOM II systems installed usually in new towns.

PARTICIPATING  
ORGANIZATIONS

TOCOM, Inc.  
Woodlands fire and police services.

SPONSORS/  
FUNDING

TOCOM home terminal costs about \$300.  
Woodlands TV service costs \$7 per month. The security service costs \$5 per month. Both cost \$12 a month.

SYSTEM  
OPERATOR

TOCOM, INC

TIME FRAME

In 1972 test bed for TOCOM system completed in Irving Texas.  
6 systems installed since.  
In 1978 microprocessor TOCOM III system being tested.

CONTACT

WCATV

TOCOM

Ben Rozac  
General Manager  
Woodlands CATV, Inc.  
2407 Timberlock Pl.,  
The Woodlands, Texas 77380,  
U.S.A.

John Campbell  
Chairman of the Board  
Michael Corboy,  
President  
TOCOM Inc.,  
P.O. Box 47066  
Dallas, Texas 75247,  
U.S.A.

Tel. No. (713) 367-2288

Tel. No. (214)253-3661

BIBLIOGRAPHIC  
REFERENCES

[ 163 ], [ 316 ], [ 1174 ].

PROJECT NAME Project Iron Star

LOCATION Edmonton, Alberta, Canada

SYSTEM CAPABILITIES Transmission by Satellite (Hermes);  
Two-way audio and one way black and white video

SERVICE APPLICATIONS Used for daily satellite broadcasts of radio and television programs to three remote communities in an experimental program.

USERS Alberta Native Communities

PARTICIPATING ORGANIZATIONS Alberta Native Communications Society

SPONSORS/  
FUNDING Canadian Dept. of Supply and Services

SYSTEM OPERATOR NASA and Department of Communications Canada

TIME FRAME Experimental operations from mid-1977 to end of 1977

CONTACT Mr. Larry Desmeules  
Alberta Native Communications Society  
9311 60th Ave.  
Edmonton, Alberta  
T6E 0C2

BIBLIOGRAPHIC REFERENCES A.D. Fisher, "Evaluation of Ironstar: Thoughts From Mid-Stream". Proc. 20th Symposium of the Royal Society of Canada 1977.

PROJECT NAME Kablevision Kiruna

PROJECT LOCATION Kiruna, Sweden

SYSTEM CAPABILITIES Four channel CATV system  
One channel used for a local programming experiment.  
Black and white video transmitted  
Simple equipment with limited economic and personnel resources.  
One way only.

SERVICE APPLICATIONS Experiment involving locally produced programs in a northern community. Material of local interest with local participation.

USERS Subscribers to the local cable system (1700 households). Institutions and schools linked in.

PARTICIPATING ORGANIZATIONS Commission for TV and Radio Education (TRU)  
Swedish Broadcasting Corporation  
Kiruna Local Authorities

SPONSORS/  
FUNDING Participating organizations  
Cost in fiscal year 1973/74 S kv 1 million  
Cost for fiscal year 1974/75 about S kv 400,000

SYSTEM OPERATOR Kablevision Kiruna

TIME FRAME Production plan approved September 1973  
Initial trial was January to May 1974  
Continuing trial terminated February 23, 1975.

CONTACT TRU  
Skötoverstyrelsen  
Karlavagen 108  
PA  
S-10642  
Stockholm, Sweden

BIBLIOGRAPHIC REFERENCES

PROJECT NAME Channel 40 171

LOCATION Milton Keynes, U.K.

SYSTEM CAPABILITIES Transmission by co-axial cable;  
12 downstream channels  
Two upstream channels  
One downstream channel used for Channel 40 distribution, with upstream link studio to head end. Channel 40 black and white video and audio, plus Ceefax (sequentially programmed). System re-distributes five national and/or regional TV channels.

SERVICE APPLICATIONS Community Programming

USERS Subscribers to the cable system (10,000 homes)

PARTICIPATING ORGANIZATIONS British Post Office  
Milton Keynes Development Corporation

SPONSORS/  
FUNDING Milton Keynes Development Corp: £ 50,000 a year during the experimental period for operating costs. £ 50,000 by the British Post Office, used to purchase production equipment.

SYSTEM OPERATOR British Post Office

TIME FRAME Operational since December '76, scheduled to terminate July 1979.

CONTACT Mr. Mike Barrett  
Channel 40  
161 Fishermead Boulevard  
Fishermead  
Milton Keynes  
England MK6 - 2AB

BIBLIOGRAPHIC REFERENCES Barrett, Michael, "Channel 40, Community Access CATV in Milton Keynes".  
Barrett, Michael, "Progress Reports No. 1 - 11 - 111 - 1V".

PROJECT NAME Manhattan Cable Access

LOCATION New York, N.Y., U.S.A.

SYSTEM CAPABILITIES Public access CATV in a large urban centre

- One way system publicity oriented
- 26 channels and Home Box Office (HBO) pay TV
- 4 channels for public use, for live programs and taped features
- 1 public channel is the program guide
- 4 channels for government use
- 2 channels leased for commercial purposes

SERVICE APPLICATIONS Locally produced programs. Free public access for all kinds of presentations. Community-oriented programming by local government authorities. Public access tapes.

USERS Total subscribers is 91,000 of which 37,000 subscribe to pay TV. 20 hours of pre-recorded programming shown on the public access channels per day. 15 to 20 organizations produce more sophisticated programming. About 30 phone-in shows per week. No statistics of number of watchers.

PARTICIPATING ORGANIZATIONS Manhattan Cable TV (owned by Time-Life Inc.)  
Office of Telecommunications of the City of New York  
Two non-profit production centres (E.T.C. and Automation House).

SPONSORS/  
FUNDING Time-Life has invested \$1 million in public access activities in 3 years. Two public access channels free for 1 hour/week usage. One channel leased for \$25 per half-hour. More sophisticated programs cost \$1000 to \$1500 to produce.

SYSTEM OPERATOR Manhattan Cable TV

TIME FRAME Time-Life ownership since 1975. Continuing

CONTACT Bobby Marino  
Assistant for Program Development  
Manhattan Cable TV  
120 East 23rd Street  
New York, N.Y. 10010  
U.S.A.

Telephone number: (212) 260-1200

BIBLIOGRAPHIC REFERENCES [ 471 ], [ 1132 ], [ 1218 ].

PROJECT NAME

MRC - TV

173

LOCATION

New York, N.Y., U.S.A.

SYSTEM  
CAPABILITIES

MRC-TV is a black and white television system providing two-way audio-visual interaction among officials at a central facility in downtown Manhattan and 13 outlying locations (10 two-way and 3 receive only). Planning anticipates 17 locations, each equipped to reach one-way subsites in their vicinities.

The main transmitter, located at the World Trade Centre broadcasts omnidirectionally at 2,491 MHZ. Parabolic antennas receive and transmit at the two-way sites and low-power omnidirectional antennas relay received programs to other receive - only locations within a 10 to 15 mile range.

SERVICE  
APPLICATIONS

Governmental communications, administration and employee training by live training productions. Local government seminars.

USERS

Government officials and employees for work. Employees for college credit, secretarial development, improvement of supervisory skills and specialized training.

PARTICIPATING  
ORGANIZATIONS

Metropolitan Regional Council (MRC), Inc.  
Participating municipalities  
U.S. Civil Preparedness Agency  
National Science Foundation  
Columbia Bureau of Applied Research

SPONSORS/  
FUNDING

Annual Operating Cost \$150,000

SYSTEM  
OPERATOR

Metropolitan Region Council

TIME FRAME

Feasibility studies and evaluation 1969 to 1973  
Operational July 1973

CONTACT

David Smith Director of Technical Operations  
Metropolitan Regional Council Inc.,  
Suite 2437, One World Trade Centre,  
New York, N.Y. 10048  
U.S.A.

Telephone Number: (212) 466-3850

BIBLIOGRAPHIC  
REFERENCES

[ 176 ]

PROJECT NAME

174

LOCATION

Reading, Pennsylvania, U.S.A.

SYSTEM  
CAPABILITIES

Two-way cable system for senior citizens programming and school applications.  
- Bi-directional, dual-trunk delivery  
- 5 low-band, 40FM, 7 high-band, 2 mid-band channels downstream.  
- up-stream trunk cable accommodates 8 TV channels.  
- 2-way video and one-way video open-audio.

SERVICE  
APPLICATIONS

Interactive programs using neighborhood communication centres for delivery of public services

USERS

Senior citizen programs, school programs, medical programs.

PARTICIPATING  
ORGANIZATIONS

Alternate Media Centre of New York University  
City of Reading  
Berks TV Cable Co.  
Berks County Senior Citizens Council  
Reading Housing Authority

SPONSORS/  
FUNDING

Natural Science Foundation (NSF) grant of \$875,000  
Operating budget for Berks Community Television (BCTV) for 1977/78 is about \$100,000 (minimum budget)  
Follow up grant from NSF of \$40,000 to BCTV

SYSTEM  
OPERATOR

Berks T.V. Cable

TIME FRAME

NSF funding in May 1975 for 30 months.  
NSF funded programming from January 1976 to February 1977.  
NSF funding expired December 1977. Activity continuing at reduced level.

CONTACT

Earl Hayat,  
Jerry Rehtir,  
Don Odeon,  
Paul Braun,  
Carole Epler,  
Berks T.V. Cable,  
112 Muhlenberg Street,  
Reading, Pennsylvania  
U.S.A.

Telephone Number: (215) 374-3065



PROJECT NAME COMP-U-SHOP

LOCATION Toronto, Ontario, Canada

SYSTEM CAPABILITIES Uses the switched telephone network.  
Signal entry is by touch-tone telephone.  
Computer voice response and controlled interaction.  
Also ordinary telephone to operate with touch-tone to the computer.

SERVICE APPLICATIONS Remote catalogue shopping

USERS Simpsons-Sears registered catalogue customers.  
3000 customers are registered with 20 to 30 inquiries per week.  
600 to 700 people use system regularly in 1977.  
Average of 50 calls per day (.04 to .05% of catalogue orders).

PARTICIPATING ORGANIZATIONS Simpsons-Sears

SPONSORS/  
FUNDING Funded internally by Simpsons-Sears.  
Investment in trials not known- probably not over \$50,000.

SYSTEM OPERATOR Simpsons-Sears  
Bell Canada

TIME FRAME Touch-tone entry trial started in 1972 and lasted 3 months.  
Additional trial using ordinary telephone entry took place in the spring 1977 for three months.

CONTACT Duncan McAllyster, Systems Development Group,  
Lloyd Chiotte, Program Manager,  
Simpsons-Sears,  
222 Jarvis Street,  
Toronto, Ontario.

Telephone Number: (416) 861-9111

PROJECT NAME CALGARY 176

LOCATION Calgary, Alberta, Canada

SYSTEM CAPABILITIES Two-way system for integrated services to the home.  
Videotex for on-demand access to visual material.  
Uses the home TV.  
Telidon and adapted Prestel control units,  
Display: 32 characters by 16 lines.  
Microprocessor in each household for metering, etc.  
Uses standard telephone lines.

SERVICE APPLICATIONS Pilot trials  
Information retrieval integrated with security  
and metering applications.

USERS Target market: new housing developments  
120 households in the pilot phase.

PARTICIPATING ORGANIZATIONS Alberta Government Telephones (A.G.T.)

SPONSORS/  
FUNDING A.G.T. internal funds  
Housing developers contribute to cost of microprocessor  
unit and wiring of house  
Canadian Department of Communications (equipment loan)

SYSTEM OPERATOR Alberta Government Telephone

TIME FRAME Pilot phase to start October 1979  
Market trial in 1980-81

CONTACT Robert Sutcliffe  
Alberta Government Telephones  
30F  
10020-100 St.  
Edmonton, Alberta  
T5J 0N4  
  
Telephone number: (403) 425- 4336

BIBLIOGRAPHIC REFERENCES

PROJECT NAME

177

LOCATION

Vancouver, British Columbia, Canada

SYSTEM  
CAPABILITIES

Videotex system for on-demand access to visual material from data banks.  
Uses home TV set for display.  
Telidon and B.C.T. control units.  
Copper pair wires for transmission.

SERVICE  
APPLICATIONS

Pilot trials  
Information retrieval  
integrated with meter reading, power shedding systems

USERS

300 Telidon units in trials.

PARTICIPATING  
ORGANIZATIONS

British Columbia Telephone Co. (B.C.T.)

SPONSORS/  
FUNDING

B.C.T. internal funds  
Canadian Department of Communications (DOC)  
(equipment)

SYSTEM  
OPERATOR

British Columbia Telephones

TIME FRAME

Pilot phase to start in 1980

CONTACT

William D. Bird  
Project Manager  
Videotex  
British Columbia Telephone Co.  
3777 Kingsway  
Burnaby, B.C.

BIBLIOGRAPHIC  
REFERENCES

PROJECT LOCATION ELIE

LOCATION Elie, Manitoba, Canada

SYSTEM CAPABILITIES

- Fibre optic local loops
- Videotex interactive system using Telidon control units and the home TV set with a 40 character by 24 line display.
- Telephone services
- CATV services
- Other "new" services

SERVICE APPLICATIONS

- Field trial of fibre optics technology and an integrated fibre optic communications system in a rural area.
- Information retrieval and integrated telecommunications and broadcast services.

USERS 150 households

PARTICIPATING ORGANIZATIONS

Canadian Department of Communications (DOC)  
Canadian Telecommunications Carriers Association (CTCA)  
Manitoba Telephone System (MTS)  
Northern Telecom Canada  
Elie Municipal Council

SPONSORS/  
FUNDING \$6.1 million from DOC, CTCA, MTS.

SYSTEM OPERATOR Manitoba Telephone System

TIME FRAME

Program announced June 1978  
Agreement February 1979  
Pilot start mid-1981

CONTACT

Brian McCallum,  
C.T.C.A.  
1 Nicholas Street,  
Suite 700  
Ottawa, Ontario

Telephone number: (613) 238-3038

BIBLIOGRAPHIC REFERENCES

PROJECT NAME IDA 179

LOCATION Winnipeg, Manitoba, Canada

SYSTEM CAPABILITIES Interactive videotex system for on-demand access to visual material using the home T.V.  
Interdiscom control unit in the network.  
Two-way cable  
Interface to the telephone network  
Display: 32 characters by 16 lines

SERVICE APPLICATIONS Pilot trial  
Information retrieval  
Videotex integrated with other services i.e. security, metering.  
Networking with data bases anticipated

USERS 100 households of which 50 will have the videotex service

PARTICIPATING ORGANIZATIONS Manitoba Telephone System (MTS)

SPONSORS/FUNDING Internal funds (MTS)

SYSTEM OPERATOR MTS

TIME FRAME Pilot start April 1980  
Market test of possible networking for data bases in 1980

CONTACT Dennis McCaffrey  
Manitoba Telephone  
BE301A  
P.O. Box 6666  
Winnipeg, Manitoba  
R3C 3V6  
Tel. No.: (204) 947-8418

BIBLIOGRAPHIC REFERENCES

PROJECT NAME

TELIDON

180

LOCATION

Ottawa, Ontario, Canada

SYSTEM  
CAPABILITIES

- Videotex terminal with local computer power
- Data signals on phone line, cable, broadcast, fibre optics
- TV or CRT display
- Micro-computer expansion of coded signals for display.
- Message sending capability
- Electronic blackboard capability

SERVICE  
APPLICATIONS

High resolution, low capacity network, two-way interactive video technology for home and other uses.

USERS

Field trials for on-demand information retrieval and interactive uses in Ontario, Quebec, Manitoba Alberta, British Columbia, Canada.

PARTICIPATING  
ORGANIZATIONS

Federal Department of Communications, Canada (DOC)  
Various telecommunications carriers, CATV, companies and other authorities in Canada (trials)  
Norpak Ltd (development)

SPONSORS/  
FUNDING

DOC funding for R and D  
Fourth generation technology estimated cost, \$200 - \$250/user terminal.

SYSTEM  
OPERATOR

Communications Research Centre (CRC/DOC)

TIME FRAME

Announced, August 1978.  
2nd generation technology, March 1979.  
3rd generation technology, fall 1979.  
Trials commence late 1979.

CONTACT

Dr. J.C. Madden  
Department of Communications,  
300 Slater Street,  
Ottawa, Ontario, K1A 0C8

Telephone number: (613) 996-4243

BIBLIOGRAPHIC  
REFERENCES

In Search, The Canadian Communications Quarterly,  
Winter 1979.

PROJECT NAME VISTA 181

LOCATION Demonstration centers in - Ottawa, Ontario, Canada  
Toronto, Ontario, Canada

SYSTEM CAPACITIES Two-way interactive videotex system for on-demand access to visual information.

- uses home TV, standard telephone line, Vista control unit and keypad
- computer/based (PDP 11/34) information source 10,000 pages
- display is 20 lines of 32 characters, 24 lines of 40 characters
- uses both BNR developed control units and Telidon control units

SERVICE APPLICATIONS Pilot demonstrations include information retrieval and interactive calculations and games.  
Enhancements for field tests to include transactions, messaging, data processing and connection to third party data bases.

USERS Demonstration project in Ottawa-Hull with 35 user terminals and 3000 pages of information.  
Intended for the residential market and the business community.

PARTICIPATING ORGANIZATIONS Bell Canada  
Bell - Northern Research  
Videotex Information Service Providers Association of Canada

SPONSORS/ FUNDING Internal funds

SYSTEM OPERATOR Bell Canada

TIME FRAME Pilot demonstration phase started February 14, 1979.  
Field trial phase to start mid-1980.

CONTACT G.A. Johnson  
Assistant Director  
Business Development  
Bell Canada  
25 Eddy St., 5th floor  
Hull, Quebec, Canada  
J8X 2V7

Telephone number : (819) 776-7647

BIBLIOGRAPHIC REFERENCES G.A. Johnson, "Vista and the New Information Marketplace",  
Canadian Futures Magazine, Mississauga, Ontario, Feb. 1979.

PROJECT NAME

PRESTEL (Viewdata)

182

LOCATION

London, England

SYSTEM  
CAPABILITIES

Information retrieval (videotex) system

- Telephone line up and downstream
- Display on home TV set
- Interactive system using keypad
- Uses same decoders, page format, character set as the U.K. teletext system (Oracle, Ceefax)
- Theoretically unlimited pages of information from the central computer

SERVICE  
APPLICATIONS

Use of the telephone network to transmit information to the television screen. Organizations supply the data base.

USERS

Public information on a wide range of subjects  
closed user groups for private applications  
1,197 subscribers, 164 information providers with  
122,000 pages of information ( July 1979 )  
market trials in London, Birmingham and Norwich.

PARTICIPATING  
ORGANIZATIONS

British Post Office  
Organizations supplying data

SPONSORS/  
FUNDING

British Post Office funding - \$50 million  
Home Converter costs about \$50 additional  
Information providers pay \$575 per year and  
rent frames at \$2.30 each.  
Information pages average less than 10¢

SYSTEM  
OPERATOR

British Post Office

TIME FRAME

Full public service and marketing tests in  
1979-80. Test service started in June 1978 with  
141 information providers and 50 converted sets.

CONTACT

Roy Bright  
Director International Marketing  
Post Office Telecommunications  
Systems House  
1 - 6 Finsbury Circus  
London, England  
EC2M 7LY  
Tel. no.: 01-628-7733

BIBLIOGRAPHIC  
REFERENCES

[ 455 ]





PROJECT NAME

Telset

184

LOCATION

Helsinki, Finland

SYSTEM  
CAPABILITIES

Interactive videotex system compatible with Prestel, accessed through telephone lines. Home terminal is a color TV set with built in decoder produced by Salova. Business terminal is a video display unit modified to be compatible with a home terminal and is produced by Nokia Electronics. The database contains 1000 pages of information.

SERVICE  
APPLICATIONS

Information retrieval (both business and consumer information)

USERS

30 test users in 1978

PARTICIPATING  
ORGANIZATIONS

Sanoma Publishing  
Nokia Electronics  
Helsinki Telephone  
Information Providers (banks, government, etc.)

SPONSORS/  
FUNDING

Internal funds - Sanoma Publishing  
Nokia Electronics  
Helsinki Telephone

SYSTEM  
OPERATOR

Helsinki Telephone

TIME FRAME

Project established in 1977  
trial system operational August 1978 - April 1979

CONTACT

Mr. Jaakko Hannuksela  
Vice-President Planning  
Sanoma Publishing Co.  
P.O. Box 240  
SF - 00101, Helsinki 10  
Finland  
Tel. no.: (Helsinki) 609-41

BIBLIOGRAPHIC  
REFERENCES

PROJECT NAME Télétel 185

LOCATION Vélizy (suburb of Paris), France  
Ille & Villaine, France

SYSTEM CAPABILITIES Interactive videotext system for on-demand access to visual information. Compatible with the Antiope teletext system.  
Two versions: 1<sup>o</sup> small black and white CRT display integrated with a telephone and full keyboard.  
2<sup>o</sup> home TV set and standard telephone line (display 24 lines by 40 characters) with keypad.  
Both versions have 16K local memory.  
Prototypes of both systems are up and running.

SERVICE APPLICATIONS General Videotex trial (Vélizy) to include information retrieval, transactions and message services.  
Ille & Villaine is a telephone directory trial.

USERS Vélizy trial - 3000 users, 1000-2000 Information Providers  
Ille & Villaine - 1000 users.

PARTICIPATING ORGANIZATIONS Direction Générale des Télécommunications  
Information Providers

SPONSORS/ FUNDING Internal Funds (D.G.T.)

SYSTEM OPERATOR French P.T.T.

TIME FRAME Vélizy trial to start in 1980  
Ille & Villaine trial to start in 1981-82  
Public service forecasted for 1982/83 with 13 million users predicted for 1991.

CONTACT Vélizy: Ille & Villaine:  
M. Philippe Leclercq M. Fradin  
Ingénieur des Télécommunications Direction Générale des  
Chef de Projet Télécommunications -  
Direction Générale des Direction des Affaires Commerciales  
Télécommunications - Télétel Téléinformatique et Réseaux  
9111 Avenue Louis Bréguet Spécialisés  
78140 Vélizy, Villacoublay 107, Avenue de Crimée  
France B.P. 2276, 35022 Rennes  
France  
Tel.no.: (1) 635.12.34 Tel.no.: (99) 01-11-11  
01-40-36

BIBLIOGRAPHIC REFERENCES

PROJECT NAME TIC TAC

LOCATION Issy les Moulineaux, France

SYSTEM CAPABILITIES Two-way interactive data transmission uses existing telephone lines (300 baud). Information requests via push-button telephone. Receiving terminals can be CRT or adapter unit on a normal TV set. Central processing and storage of information.

SERVICE APPLICATIONS Similar to the Viewdata system. Service to be offered to business users.

USERS Experimental system being developed by the Secrétariat d'Etat aux Postes et Télécommunications (PTT) First use is planned for credit transaction in French post office.

PARTICIPATING ORGANIZATIONS P.T.T.  
C.N.E.T.

SPONSORS FUNDING P.T.T.

SYSTEM OPERATOR P.T.T.

TIME FRAME Experimentally operational since 1975. First service considered for 1978. Now part of Antiope.

CONTACT Director  
CNET  
92  
Issy les Moulineaux  
France

Telephone number : 638. 46.51

BIBLIOGRAPHIC REFERENCES



PROJECT NAME Viewdata 188

LOCATION Holland

SYSTEM CAPABILITIES Interactive Videotex system based on Prestel/GEC hardware with 200 ports on a GEC 4082. The database can store 100,000 pages of information

SERVICE APPLICATIONS Information retrieval  
Closed user groups

USERS Closed user groups (1979):  
- hospital services (health regulations and tariff)  
- Jobdata (available jobs in the Government)  
- tour operator (travel information)  
- teachers information group (secondary school course information)  
Public: about 5000 users in 1980 for market trial

PARTICIPATING ORGANIZATIONS Dutch P.T.T.  
Information Providers (112 in 1979)  
Closed user groups

SPONSORS/ FUNDING Dutch P.T.T. - internal funds

SYSTEM OPERATOR Dutch P.T.T.

TIME FRAME Closed user groups - July 1979  
Market trial for public viewdata - August 1980 - July 1981

CONTACT Mr. Van Ruiten  
Dutch P.T.T. Headquarters  
12 Kortenaerkade  
2518AX, The Hague  
Holland

BIBLIOGRAPHIC REFERENCES

PROJECT NAME Hi-OVIS

LOCATION Higashi-Ikoma City, Nara Prefecture, Japan

SYSTEM CAPABILITIES Full audio-visual two-way interactive information system using optical fiber transmission line.  
Audio visual information (video cassettes) still pictures, (microfiche), character information, graphic information etc. stored at the center to be retrieved by home terminal (keyboard) controlled by computer.

SERVICE APPLICATIONS TV programs on demand, still picture, computer-assisted instruction (school age children and adults), shopping, reservations FM audio programs on demand, local origination service.

USERS 168 homes.

PARTICIPATING ORGANIZATIONS VISDA (Visual Information System Development Association), Ministry of International Trade & Industry.

SPONSORS/FUNDING Visual Information System Development Association, Ministry of International Trade & Industry, \$ 23M/3-Year

SYSTEM OPERATOR VISDA

TIME FRAME Service implemented July, 1978.

CONTACT Dr. Masahiro Kawahata  
Re: Hi-OVIS  
Visual Information System Development Association  
Sanko Building 10-5  
4-Chome Ginza Chuo-Ku  
Tokyo 104, Japan

BIBLIOGRAPHIC REFERENCES Visual Information System Development Association, "Higashi-Ikoma Optical Visual Information System (Hi-OVIS)".

PROJECT NAME	Tama CCIS Experimental Project	190
LOCATION	Tama NewTown, Tokyo, Japan	
SYSTEM CAPABILITIES	Transmission by co-axial cable; Downstream: Co-axial cable (15 TV channels, 2 facsimiles) TV sets, facsimile equipment. Upstream : Twisted pair cables; opinion polling and voice response system by telephone type units with five keys (buttons).	
USERS	500 homes - retransmission of off-the-air TV, original program, interactive TV program, flash information service, memo service, facsimile newspaper, still retrieval, pay TV, automatic repetition telecasting auxiliary TV.	
PARTICIPATING ORGANIZATIONS	<ul style="list-style-type: none"> <li>- Ministry of Posts &amp; Telecommunications (Kasumigaseki, Chiyoda-Ku, Tokyo)</li> <li>- Nippon Telephone &amp; Telegraph Corp. (Uchisaiwaicho, Chiyoda-Ku, Tokyo)</li> <li>- Living-Visual Information System Development Association (1-4, Nagayama, Tama-Shi, Tokyo)</li> </ul>	
SPONSORS/ FUNDING	Ministry of Posts & Telecommunications Nippon Telephone & Telegraph Corp. Living-Visual Information System Development Association	
SYSTEM OPERATOR	Living Information System Development Division; Living-Visual Information System Development Association	
TIME FRAME	Jan. '76 to Dec. '77 (Experiment Phase I) Will be reopened in June '78 (Experiment Phase II)	
CONTACT	K. Yamaguchi Representative Director Living-Visual Information System Development Association Gurinado Nagayama, 1-4 Nagayama Tama-Shi, Tokyo 192-02 Japan	
BIBLIOGRAPHIC REFERENCES	Living-Visual Information System Development Association 1) Tama CCIS Experiment Project Plan for the Living Information System Development 2) Outline of Tama CCIS Experiment Project 3) Tama CCIS, Technical Notes for Experimental Project	



PROJECT NAME Captains (character and pattern telephone access information network system)

LOCATION Tokyo, Japan

SYSTEM CAPABILITIES Interactive videotex system accessed through telephone lines by TV sets equipped with decoders and keypads. A seven color display will contain a maximum of eight lines of 15 Japanese characters each (total of 120 characters) or silhouette pictures and graphs but not still video pictures. Audio will be available. Maximum response time is about 15 seconds. Database can accommodate 100,000 pages of information.

SERVICE APPLICATIONS Information retrieval

USERS 1000 households in Tokyo

PARTICIPATING ORGANIZATIONS Ministry of Postal Services  
Nippon Electric Company  
Hitachi Limited  
Matsushita Electric Industry Company

SPONSORS/  
FUNDING Internal funds of participating organizations. Users will pay telephone charges for connection, access charge/page of information and terminal charges.

SYSTEM OPERATOR Jikura Annexe of the Post and Telecommunications Ministry.

TIME FRAME Experimental public trial - August 1978

CONTACT Mr. Kashiyagi  
President, Captains System  
1-6-19 Azabudai  
Minato-Ku  
Tokyo, Japan  
Tel. no.: 01-11-81 - 358-62311

BIBLIOGRAPHIC REFERENCES:



PROJECT NAME LOS GATOS

LOCATION Los Gatos, California, U.S.A.

SYSTEM CAPABILITIES Two-way systems called Subscriber Response System (SRS).

- Video and digital signals downstream and digital upstream signals using a single cable.
- Three video channels and P.C.M. at 1 M b/s downstream and 1 M b/s data upstream.
- Local Processing Centre (LPC) at the head end.

SERVICE APPLICATIONS Home services (shopping at home, etc.). Teleprompter's original test bed for two-way equipment. Data collected formed the basis for the decision to use a second cable for two-way applications.

USERS Teleprompter Corporation

PARTICIPATING ORGANIZATIONS Teleprompter Corporation  
Theta-Com (Hughes Aircraft Co.) designed prototype equipment.

SPONSORS/  
FUNDING Teleprompter funding

SYSTEM OPERATOR Teleprompter Corporation

TIME FRAME Single cable system tested in June 1971. The test discontinued later in 1971. Research in two-way cable then transferred to the Teleprompter system in El Segundo, California.

CONTACT

BIBLIOGRAPHIC REFERENCES [ 686 ], [ 1297 ], [ 1418 ].

PROJECT NAME SRS 194

LOCATION El Segundo, California, USA

SYSTEM CAPABILITIES Coaxial cable transmission;  
5 channels were assigned to the experiment out of  
20 possible.

SERVICE APPLICATIONS (Potential) Information services: city news and  
services, information calendar. Shopping, audience  
surveys and polling, credit card identification.  
Request scheduling by telephone/mail of program.

USERS System never implemented

PARTICIPATING ORGANIZATIONS Theta Cable  
Hughes Aircraft

SPONSORS/  
FUNDING Theta Cable, Hughes Aircraft, National Science  
Foundation \$100K in 1974. National Science  
Foundation \$0.0 in 1975 out of \$1.1M requested  
for implementation.

SYSTEM OPERATOR Theta Cable, Hughes Aircraft, Phase Com Corp.  
K.E.C.T. (Los Angeles Public Broadcasting Station)  
City of El Segundo.

TIME FRAME Operational in a test mode from 1974 - January 1975  
Never implemented on a wide scale

CONTACT Paul Bortz  
National Telecommunications Information Agency (NTIA)  
1800 G Street N.W.  
Washington, D.C.  
U.S.A.

BIBLIOGRAPHIC REFERENCES [ 222 ], [ 223 ], [ 224 ], [ 237 ], [ 1235 ], [ 853 ].

PROJECT NAME Viewtron 195

LOCATION Miami, Florida, USA

SYSTEM CAPABILITIES Interactive videotex system accessed via telephone lines by color TV sets with decoders.

SERVICE APPLICATIONS Information retrieval

USERS 150 to 200 households in Miami

PARTICIPATING ORGANIZATIONS Knight-Ridder Newspapers, Inc. through its subsidiary "Viewdata Corporation of America".

SPONSORS/ FUNDING Internal funds - approximately \$1.3 million for 1979-80-81

SYSTEM OPERATOR AT&T

TIME FRAME Operational mid-1980

CONTACT Dr. Norman Morrison  
Vice-president, Viewdata Corporation of America Inc.  
Knight-Ridder Newspapers, Inc.  
One Herald Plaza  
Miami, Florida 33101  
USA  
Tel.no.: (305) 350-2244

BIBLIOGRAPHIC REFERENCES

PROJECT NAME Poly-Com 196

LOCATION Orlando, Florida, U.S.A.

SYSTEM CAPABILITIES Transmission by co-axial cable  
Downstream : Ten channels at a time can be monitored,  
Full motion video  
Black and white or color  
Upstream : E.I.E. terminals are used to interface  
with the cable system

SERVICE APPLICATIONS Security monitoring (fire and burglary);  
Highway Surveillance; some Telemedicine Experiments;  
Polling, Monitoring Channels and hours viewed;  
Remote Shopping.

USERS 23 terminals

PARTICIPATING ORGANIZATIONS Orange Cablevision Inc.  
American Television and Communications  
E.I.E.

SPONSORS/  
FUNDING Orange Cablevision Inc.  
American Television and Communications  
E.I.E.

SYSTEM OPERATOR Orange Cablevision  
E.I.E.

TIME FRAME Operational from May 1972 - May 1973

CONTACT Sandra Booton  
Orange Cablevision Inc.  
1111 Virginia Drive  
Orlando, Florida  
U.S.A. 32803

BIBLIOGRAPHIC REFERENCES [ 1195 ], [ 1346 ].

PROJECT NAME VICOM

LOCATION Overland Park, Kansas, U.S.A.

SYSTEM CAPABILITIES Coaxial Cable transmission;  
Downstream : 12 channels  
Upstream : 3 channels (data, voice, video)

SERVICE APPLICATIONS Education (handicapped children)  
Merchandising (Sears)  
Polls

USERS 700 subscribers

PARTICIPATING ORGANIZATIONS Telecable Corporation  
Vicom Manufacturing

SPONSORS/  
FUNDING Telecable Corporation  
Electronic Industrial Engineering  
Vicom Manufacturing

SYSTEM OPERATOR Overland Telecable Co.

TIME FRAME Not operational, moved to Spartanburg

CONTACT see Spartanburg Project (Specialized Training)

BIBLIOGRAPHIC REFERENCES [ 286 ], [ 1067 ], [ 1296 ].

PROJECT NAME Mitrix 198

LOCATION Bedford, Massachusetts, U.S.A.

SYSTEM CAPABILITIES Transmission by co-axial cable (2 miles long)  
16 video channels  
Some channels also used for data and telephone transmission

SERVICE APPLICATIONS Multi-media and multi-mode information transfer.  
This includes: high speed data, closed circuit, full motion video, voice telephone, computer-based information retrieval, word processing.

USERS Used as a test-bed internally at Mitre

PARTICIPATING ORGANIZATIONS Mitre Corporation

SPONSORS/FUNDING Mitre Corporation (Internal Funds)

SYSTEM OPERATOR Mitre Corporation

TIME FRAME Operational in 1972

CONTACT Mr. Charles Dolberg  
Mitre Corporation  
P.O. Box 208  
Bedford, Massachusetts  
U.S.A. 01730

BIBLIOGRAPHIC REFERENCES



PROJECT NAME SRU

LOCATION Chaska, Minnesota, U.S.A.

SYSTEM CAPABILITIES Transmission by two-way co-axial cable;  
Downstream: Full-motion color video  
Upstream : Data stream

SERVICE APPLICATIONS Educational, medical and community services  
Several schools/clinics and a community hospital are connected.

USERS CATV system

PARTICIPATING ORGANIZATIONS Community Information Systems Inc.  
Dept. of Housing and Urban Development

SPONSORS/  
FUNDING Dept. of Housing and Urban Development

SYSTEM OPERATOR Community Information Systems Inc.

TIME FRAME Operational from 1972-1973

CONTACT Mr. Gene Furstinou  
Chaska High School  
1700 Chestnut St.  
Chaska, Minnesota  
U.S.A. 55318

BIBLIOGRAPHIC REFERENCES [ 310 ], [ 311 ].

PROJECT NAME R.C.A. Laboratories Test Bed

LOCATION Princeton, New Jersey, U.S.A.

SYSTEM CAPABILITIES Transmission by co-axial cable;  
Downstream: Video and data 110-116 MHz (1.25 Mbit/sec.)  
Upstream : Data 10-16 MHz

SERVICE APPLICATIONS Monitoring, interactive shopping, opinion polling,  
interactive education, remote banking and electronic  
mail

USERS R.C.A. Laboratories

PARTICIPATING ORGANIZATIONS R.C.A. Laboratories

SPONSORS/  
FUNDING R.C.A. Laboratories, Internal funds

SYSTEM OPERATOR R.C.A. Laboratories

TIME FRAME Operational since 1974

CONTACT Mr. B.J. Lechner  
R.C.A. Laboratories  
P.O. Box 432  
Princeton, New Jersey  
U.S.A. 08540

BIBLIOGRAPHIC REFERENCES

PROJECT NAME

QUBE

201

LOCATION

Columbus, Ohio, U.S.A.

SYSTEM  
CAPABILITIES

Computerized two-way multiple service interactive system for entertainment and consumer services.  
Transmission by coaxial cable (30 channels)  
- 10 commercial and public T.V.  
- 10 premium selections (pay T.V.)  
- 10 for viewer interaction

Upstream: Data ( 5 button keyboard attached to TV set)  
Data general computer at the head end.  
Home microprocessor for security services.  
Subscribers scanned for interaction every 6 seconds.

SERVICE  
APPLICATIONS

Pay TV (automatic billing on a per program basis), participation in TV shows, security monitoring, courses, games, polling, ordering of merchandise. Electronic Fund Transfer (EFT) is planned.

USERS

29,000 subscribers in QUBE's franchised area.  
32,000 additional subscribers to be added.

PARTICIPATING  
ORGANIZATIONS

Warner Cable Corporation  
Warner Communications Inc.

SPONSORS/  
FUNDING

Warner Cable Corp.  
Basic services charge is \$10.95 per month.  
Pay TV charges are from .75¢ to \$9.00 per program.  
Security service costs about \$100 per installation and \$12 per month for monitoring.

SYSTEM  
OPERATOR

Warner Cable Corporation

TIME FRAME

Operational since December 1977

CONTACT

Gustave M. Hauser, President  
Warner Cable Corporation  
75 Rockefeller Plaza  
New York, N.Y.  
U.S.A. 10019

Nichlos Korodi, General Manager  
QUBE  
Olentangy River Road  
Columbus, Ohio  
U.S.A.

BIBLIOGRAPHIC  
REFERENCES

QUBE, A Warner Communications Company,  
Warner Cable Corporation, 1977.

Wired City, U.S.A. by John Wicklein,  
Atlantic Monthly, January 1979.

PROJECT NAME Area Multiplexing System

LOCATION Columbus, Ohio, USA

SYSTEM CAPABILITIES Two-way, single cable pay-TV overlaid on a CATV system. Downstream - video and digital for control and polling.  
Upstream - 16 bit data word from subscribers (by FSK)  
- feeder line carriers for balancing  
FDM/TDM area multiplexing in 100 subscriber groups  
SPC 16 Minicomputer

SERVICE CAPABILITIES Inexpensive interrogation-response home terminal and minimized interference in two-way systems.  
Capability of monitoring viewing time. Commercial services.

USERS Coaxial Communications Inc., for 5000 subscribers to two-way pay services.

PARTICIPATING ORGANIZATIONS Coaxial Scientific Corporation (Sarasota, Florida)  
Coaxial Communications Inc. (Columbus, Ohio)  
A second generation system involving interactive response installed by Rockford Cablevision in cooperation with the University of Michigan.

SPONSORS/ FUNDING Coaxial Communications Inc., funding  
Cost of terminals (modified converters) to the cable operator about \$80.00  
Representative revenues are \$1 a day additional per CATV subscriber.

SYSTEM OPERATORS Coaxial Communications of Columbus, Ohio.

TIME FRAME Telecinema system developed by Coaxial Scientific Corporation has been operating in Columbus since June 1973. In May 1974 there were 718 terminals operating. In March 1978 about 5000 subscribers to two-way out of 26,000 total subscribers.

CONTACT D. Stevens McVoy  
Coaxial Communications Inc.  
Columbus, Ohio  
USA  
Telephone No:

BIBLIOGRAPHIC REFERENCES

PROJECT NAME            Communicon

LOCATION                 Horsham, Pennsylvania, U.S.A.

SYSTEM  
CAPABILITIES            Transmission by co-axial cable  
                          Downstream: Video and Data  
  
                          Upstream : Data (polling, computer-controlled)  
  
                          Number of channels:  
                          Downstream - 35  
                          Upstream    - 5-30 mkg 4 TV or any other mix

SERVICE  
APPLICATIONS            Pay TV, monitoring, ticket reservations,  
                          information retrieval, etc.

USERS                    25 terminals in a laboratory test bed

PARTICIPATING  
ORGANIZATIONS            Jerrold Electronics

SPONSORS/  
FUNDING                 Jerrold Electronics (Internal funds)

SYSTEM  
OPERATOR                Jerrold Electronics

TIME FRAME             Not operational since 1972

CONTACT                 Mr. William H. Lambert  
                          Jerrold Electronics  
                          87 Wingold Ave.  
                          Toronto, Ontario    MGB-1P8

BIBLIOGRAPHIC  
REFERENCES

PROJECT NAME Dow Jones News / Retrieval Service (DJS)

LOCATION Major cities in the U.S. and Canada.

SYSTEM CAPABILITIES DJS is a structural database accessed via Tymnet by Apple II computers with special equipment: a communication card, a modem, an ordinary telephone and the Dow Jones Series which is the Apple software needed to access the DJS. DJS is also available through other online systems as well as directly to Tymnet users with ordinary terminals

SERVICE APPLICATIONS The Apple software: The Dow Jones Services offers two programs called Stock Quote Reporter and the Portfolio Evaluator. DJS offers a more complete online service including a financial news service and a quotation service

USERS Owners of the Apple II personal computers

PARTICIPATING ORGANIZATIONS Apple  
Dow Jones Company

SPONSORS/  
FUNDING Cost of the Dow Jones/Apple service is a one-time contract fee of \$25.00 to obtain a password and a user charge of \$3.00/1st 3 minutes and .50¢/minute thereafter. Apple computers cost between \$1195.00 and \$3500.00 depending on the peripheral equipment included.

SYSTEM OPERATOR Tymnet

TIME FRAME Operational June 1977 over Tymnet

CONTACT Mr. Bill Clabby  
Dow Jones News / Retrieval Service  
22 Cortlandt Street  
New York, N.Y., 10007  
USA  
Tel. no.: (212) 285-5225

BIBLIOGRAPHIC REFERENCES

PROJECT NAME Greenthumb 205

LOCATION Farming communities in the USA

SYSTEM CAPABILITIES Interactive videotex system using home TV set and telephone lines and an external interface box containing an integral keypad for information selection. An information category is accessed and the contents are transmitted and stored locally in the 4K memory box. Display is 32 characters per line and 16 lines per page.

SERVICE APPLICATION Information of interest to farmers: weather, agricultural recommendations, market prices, home economics.

USERS Test service in two counties

PARTICIPATING ORGANIZATIONS National Weather Service  
US Department of Agriculture  
University of Kentucky - Cooperative Extension Service

SPONSORS/FUNDING Dept. of Agriculture  
N.T.I.A.

SYSTEM OPERATOR National Weather Headquarters (Silver Spring)

TIME FRAME Operational 1980

CONTACT Ms. Kathleen Criner  
Program Manager, Home Information Systems  
N.T.I.A.  
Room 296, 1325 G Street N.W.  
Washington, D.C., 20005, USA  
Tel.no.: (202) 724-3464

BIBLIOGRAPHIC REFERENCES

PROJECT NAME PlayCable

LOCATION Moline, Illinois, USA  
Boise, Idaho, USA  
Jackson, Missouri, USA

SYSTEM CAPABILITIES Two-way interactive Intellivision home computer which can be used in a stand-alone configuration or tied into a CATV converter for interactive information retrieval and video games over cable. The data base is stored on floppy disks on a Jerrold mini-computer at the CATV head end.

SERVICE APPLICATIONS Information retrieval, information processing and video games.

USERS Subscribers of Cox Cable, United Cable, American TV and Communications and Teleprompter at test locations.

PARTICIPATING ORGANIZATIONS Jerrold Electronics  
Mattel Electronics

SPONSORS/  
FUNDING Internal funds - Jerrold Electronics and Mattel Electronics. Basic Intellivision unit is \$250.00 and companion unit with mini-computer facilities is also \$250.00.

SYSTEM OPERATOR Cox Cable (Moline, Illinois)  
United Cable (Boise, Idaho)  
American TV and Communications (Jackson, Missouri)  
Teleprompter

TIME FRAME Tests to begin Fall 1979

CONTACT Jerrold Electronics Byberry Rd. & Pennsylvania Turnpike  
Huntboro, Pa. 19040  
USA  
Tel.no.: (215) 674-4800

Mattel Electronics 5150 Rosecrans Ave  
Hawthorne, Ca. 90250  
USA  
Tel.no.: (213) 641-0411

BIBLIOGRAPHIC REFERENCES



PROJECT NAME The Source

LOCATION U.S.A.

SYSTEM CAPABILITIES Computer time-sharing information system accessed through telephone lines by a range of home computers

SERVICE APPLICATIONS Information retrieval, games, data processing, messaging

USERS Any subscriber in the U.S. and Canada living in a major city

PARTICIPATING ORGANIZATIONS Telecomputing Corporation of America (TCA)  
United Press International (UPI)

SPONSORS/  
FUNDING Internal funds - TCA, UPI  
subscribers pay: \$15.00/hour during the day,  
\$ 2.75/hour, nights and weekends  
one time \$100.00 hookup fee is also required

SYSTEM OPERATOR Telenet

TIME FRAME Available 1979

CONTACT Mr. Marshall Graham  
Vice President, Marketing  
Telecomputing Corporation of America  
1616 Anderson Road,  
McLean, Virginia 22102  
USA  
Tel.no.: (703) 821-6660

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 [838], [839], [1103], [1368], and [1369].

#### Business

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#### Cable TV

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 [316], [331], [337], [340], [341], [342], [344], [371],  
 [389], [390], [392], [405], [408], [418], [428], [433],

[444], [445], [470], [471], [477], [480], from [495] to [498], [501], [503], [504], [505], from [508] to [511], [524], [530], [538], [544], [554], [558], [559], [563], [573], [574], [575], [582], [591], [594], from [602] to [605], [610], [612], [624], [625], [630], [634], [642], [650], [663], [666], [672], [673], [674], [676], [682], [686], [689], [690], [691], [693], [696], [697], [700], [702], [703], [704], [710], [713], [715], [716], [720], [739], from [753] to [756], [758], [762], [763], [764], [767], from [787] to [792], [794], [795], [799], [800], [801], [803], [805], [809], [824], [825], [826], [830], [835], [848], [853], [858], [865], [870], [874], from [876] to [879], from [881] to [885], [892], [898], [900], [901], [911], [915], [916], [917], [919], [926], [940], [945], [948], [951], [960], [962], [963], [965], [967], [968], [969], [974], [975], [996], [1001], [1003], [1006], [1011], [1014], [1015], [1021], [1025], [1026], [1031], [1050], [1051], [1066], [1067], [1071], [1072], [1074], [1075], [1085], [1091], [1092], [1095], [1096], [1097], [1102], [1127], [1129], [1130], [1132], [1133], [1141], [1146], [1151], [1152], [1172], [1174], from [1186] to [1189], [1197], [1206], [1214], [1216], from [1218] to [1224], [1226], [1229], [1230], [1234], [1235], [1237], [1238], [1240], [1241], [1244], [1245], from [1257] to [1260], from [1294] to [1297], from [1311] to [1314], [1318], [1335], [1337], [1341], [1342], [1343], [1346], [1347], [1353], [1356], [1359], [1360], [1361], [1369], [1380], [1383], [1384], [1404], [1417], [1418], [1419], [1421], [1422], from [1425] to [1429], [1434], [1435], and [1442].

#### Child development

[68], [69], [102], [148], [216], [391], [722], and [1125].

#### Closed circuit TV

[106], [110], [112], [116], [189], [193], [288], [289], [502], [514], [515], [516], [584], [1007], [1008], [1072], [1145], [1215], [1217], [1271], and [1362].

#### Communications Canada

[164], [165], [309], [677], [678], [679], [855], [943], [944], [1106], [1108], [1376], and [1377].

#### Communications Studies Group

[113], from [247] to [251], from [253] to [256], [269], [272], [274], [275], [277], from [303] to [306], [362], [363], [535], [571], [997], [1044], [1045], [1046], [1055], from [1057] to [1062], [1159], [1161], [1163], [1164], [1166], [1210], [1211], [1389], [1392], [1394], [1396], [1397], [1402], [1430], and [1431].

#### Community information systems

[2], [3], [46], [69], [78], [150], [158], [192], [311], [352], [490], [538], [593], [613], [614], [615], [689], [853], [892], [974], [980], [1086], [1172], [1315], and

[1428].

Computer aided instruction

[19], [26], [50], from [134] to [140], [219], [313], [421], [536], [570], [631], [640], [671], from [706] to [709], [796], [831], [893], [942], [1178], [1179], [1195], [1204], [1221], and [1228].

Computer conferencing

[21], [22], [105], [164], [165], [166], [224], [231], [238], [312], [314], [319], [324], [375], [376], [378], [379], [385], [425], [443], [449], [525], [572], [585], from [595] to [600], [643], [651], [652], from [655] to [659], [661], [662], [675], [748], [772], [773], [775], [810], [811], [819], [866], [867], [943], [944], [950], [970], [1034], [1125], [1126], [1134], [1149], [1150], from [1273] to [1276], from [1278] to [1293], [1304], from [1319] to [1333], and [1405].

Conferencing

[10], [15], [16], [21], [22], [33], [34], [35], [40], [60], [63], [81], [82], [86], [87], [95], [99], [104], [113], [120], [123], [164], [165], [166], [171], [172], [173], [176], [178], [182], [187], [188], [193], [194], [228], [231], [232], [238], [239], [242], from [246] to [252], from [254] to [258], from [260] to [263], from [269] to [277], [279], [291], [295], [296], [297], from [303] to [308], [312], [314], [315], [317], [318], [319], [321], [324], [338], [353], [359], [362], [363], [393], [395], [396], [397], [404], [412], [413], [436], [439], [441], [448], [449], [455], [469], [487], [488], [491], [522], [528], from [532] to [535], [539], [540], [542], [550], [568], [571], [572], [576], [577], [583], [585], [586], [597], [598], [600], [601], [609], [617], [618], [636], [643], [648], from [651] to [656], [658], [659], [660], [677], [678], [679], [688], [698], [699], [700], [712], [717], [719], from [725] to [733], [742], [749], [757], [759], [772], [774], [775], [783], [786], [802], [817], [855], from [860] to [864], [866], [872], [875], [886], [894], [895], [899], [928], [929], from [935] to [938], [943], [944], [950], [961], [970], [971], [986], [990], [995], [997], [1002], [1007], [1008], [1013], [1018], [1019], [1020], [1034], from [1042] to [1047], from [1054] to [1057], from [1059] to [1063], from [1105] to [1108], [1125], [1126], [1134], [1147], [1150], [1158], [1159], from [1161] to [1166], [1177], [1180], [1196], [1205], [1210], [1211], [1212], [1233], [1239], [1248], from [1252] to [1255], [1262], [1266], [1270], from [1273] to [1281], from [1283] to [1286], [1288], [1289], [1290], [1293], [1298], [1299], [1300], [1304], [1308], from [1319] to [1324], from [1326] to [1330], [1332], [1333], [1334], [1350], [1351], [1357], [1358], [1365], [1376], [1377], [1378], [1381], from [1389] to [1395], [1397], [1399], [1400], [1402], [1405], [1406], [1420], [1430], [1431], [1440], and [1441].

## Cost-effectiveness

[251], [252], [506], [507], [612], [663], [873], [1034],  
[1042], [1059], and [1061].

## Criminal justice

[69], [96], [145], [197], [292], [434], [472], [529],  
[736], [790], [987], [1006], [1007], [1008], [1118],  
[1230], [1239], [1388], and [1438].

## Delphi method

[374], [659], [773], [823], [1084], [1275], [1278],  
[1281], and [1282].

## Education

[6], [9], [11], [12], [19], [24], [25], [26], [36], [37],  
[49], [50], from [61] to [69], [79], [82], [88], [91],  
[102], [109], [111], [116], [122], from [134] to [140],  
[172], [174], [175], [177], [204], [207], [210], [211],  
[212], from [214] to [217], [219], [221], [226], [228],  
from [233] to [237], [268], [278], [281], [286], [299],  
[313], [327], [330], from [333] to [336], [339], [340],  
[348], [350], [351], from [354] to [361], [365], [391],  
[401], [410], [421], [435], [445], [450], [469], [476],  
[478], [479], [493], [502], [506], from [517] to [521],  
[523], [526], [527], [529], [536], [543], [551], [552],  
[555], [556], [557], [566], [570], [579], [581], [592],  
[603], [608], [620], [627], [630], [631], [637], [638],  
[640], [659], [664], [665], [667], [668], [669], [671],  
[672], [692], [695], [700], [702], [703], from [706] to  
[709], [724], [735], [741], [745], [750], [760], [761],  
[765], [782], [784], [785], [787], [790], [796], [804],  
[805], [821], [822], [826], [829], [831], [832], from  
[837] to [840], [854], [857], [860], [861], [862], [868],  
[871], [878], [881], [884], [885], [890], [896], [915],  
from [919] to [923], [927], [930], [941], [942], [962],  
[966], from [980] to [985], from [987] to [996], [998],  
[999], [1000], [1004], [1005], [1016], [1017], [1022],  
[1023], [1024], [1032], [1037], [1038], [1049], [1064],  
[1065], [1067], [1072], [1083], [1086], [1096], [1100],  
[1109], [1110], [1119], [1122], [1123], [1124], [1130],  
from [1136] to [1139], [1142], [1143], [1147], [1173],  
[1175], [1178], [1179], [1190], [1194], [1195], [1204],  
[1213], [1217], [1221], [1222], [1223], [1228], [1229],  
[1236], [1240], [1242], [1243], [1250], [1267], [1268],  
[1269], [1302], [1303], [1305], [1306], [1307], [1309],  
[1312], [1313], [1315], [1316], [1341], [1349], [1362],  
[1367], [1375], [1382], [1383], [1403], [1407], [1408],  
[1412], [1413], [1415], [1436], [1437], [1441], and  
[1443].

## Elderly people

[352], [366], [367], [633], [963], [974], [1353], and  
[1356].

## Electronic fund transfer systems

[147], [424], [473], [616], [683], [816], [897], [1035], [1098], and [1272].

## Electronic mail

[187], [280], [377], [558], and [970].

## Energy conservation

[537], [576], [698], [699], [726], [730], [731], [733], [759], [928], [1018], [1020], [1298], and [1299].

## Europe

[96], [141], [142], [301], [710], [1051], [1176], [1200], [1201], [1262], [1438], and [1439].

## Government communications

[15], [16], [55], [176], [192], [211], [275], [284], [305], [393], [491], [563], [663], [1057], [1058], [1404], [1426], and [1434].

## Graphics conferencing mechanisms

[164], [165], [166], [943], [944], [1125], [1126], and [1358].

## Handicapped

[348], [349], [350], [490], [492], [514], [515], [516], [536], [592], [608], [713], [735], [942], [1037], [1038], [1039], [1100], [1125], [1127], [1204], [1206], [1242], [1243], [1279], and [1379].

## Home

[13], [72], [73], [74], [163], [196], [198], [286], [687], [924], [1048], [1144], [1149], [1150], [1172], [1188], [1223], and [1317].

## HERMES Satellite (CTS)

[79], [100], [229], [230], [240], [241], [309], [330], from [354] to [358], [493], from [517] to [520], [523], from [619] to [623], [627], [667], [668], [669], [723], [769], [785], [854], [868], [1010], from [1078] to [1083], [1109], [1110], [1123], from [1136] to [1139], [1184], [1202], and [1381].

## Impacts

[75], [159], [232], [251], [346], [438], [597], [719], [1019], [1027], [1148], [1396], and [1405].

## Information retrieval

[59], [162], [184], [270], from [452] to [464], [506], [507], [524], [541], [543], [553], [555], [561], [562], [585], [587], [590], [593], [602], [633], [638], [664], [744], [813], [814], [933], [1068], [1069], [1086], [1091], [1101], [1112], [1113], [1114], [1135], [1150], [1156], [1206], [1238], [1264], [1368], [1374], and

[1401].

#### Interactive systems

[21], [33], [34], [35], [41], [56], [70], [72], [73],  
 [83], [131], [148], [151], [165], [166], [183], [193],  
 [198], [263], [281], [284], [315], [335], [358], [380],  
 [419], [420], [435], [437], [516], [568], [583], [584],  
 [604], [605], [674], [702], [703], [775], [824], [865],  
 [875], [877], [886], [1097], [1110], [1126], [1130],  
 [1149], [1150], [1220], [1222], [1223], [1308], [1332],  
 [1342], [1351], [1358], [1405], and [1442].

#### Libraries

[186], [203], [408], and [771].

#### Mass media communications

[57], [184], [270], [283], [285], [332], [361], [372],  
 [531], [553], [681], [692], [695], [701], [718], [745],  
 [833], from [848] to [852], [927], [1148], [1206], [1263],  
 [1340], [1370], and [1433].

#### Medicine

[4], [5], [12], [18], [20], [23], from [28] to [32], [39],  
 [45], [47], [84], [85], [94], [97], [98], [100], [103],  
 from [105] to [112], [115], [117], [118], [121], from  
 [124] to [133], [167], [170], [171], [183], [189], [191],  
 [199], [201], [218], [220], [221], [225], [228], [229],  
 [230], [240], [259], [264], [265], [287], [293], [294],  
 [298], [302], [309], from [320] to [323], [325], [328],  
 from [333] to [336], [343], [345], [352], [364], [368],  
 [369], [370], [398], [400], [401], [406], [407], [409],  
 [411], [415], [416], [417], [419], [420], [422], [426],  
 [440], [442], [446], from [481] to [486], [489], [499],  
 [500], [513], from [545] to [548], [564], [565], [567],  
 [569], [580], [584], [585], [589], [606], [607], [611],  
 from [619] to [623], [626], [628], [629], [632], [639],  
 [641], [642], from [644] to [648], [664], from [667] to  
 [670], [684], [685], [690], [700], [722], [723], [737],  
 [738], [740], [751], [752], [766], [768], [776], from  
 [778] to [781], [797], [798], [806], [807], [808], [812],  
 [823], [827], [834], [836], from [842] to [847], [856],  
 [858], [859], from [887] to [891], from [902] to [909],  
 [912], [913], [914], [918], [931], [932], [934], [949],  
 [952], from [954] to [959], [972], [973], [977], [978],  
 [979], [1000], [1009], [1022], [1023], [1024], [1027],  
 [1029], [1030], [1033], [1036], [1040], [1052], [1053],  
 [1076], from [1078] to [1082], [1084], from [1087] to  
 [1090], [1104], [1111], from [1115] to [1118], [1120],  
 [1121], [1123], [1128], [1131], from [1136] to [1140],  
 [1145], [1155], [1156], [1160], [1167], [1169], [1170],  
 [1171], from [1181] to [1185], [1191], [1193], [1198],  
 [1199], [1202], [1207], [1208], [1209], [1215], [1217],  
 [1227], [1231], [1232], [1247], [1249], [1250], [1261],  
 [1265], [1310], [1338], [1345], [1352], [1354], [1355],  
 [1363], [1364], [1366], [1371], [1372], [1379], [1385].



[1386], [1387], [1396], [1398], from [1409] to [1414], and [1423].

#### Metering and load management

[144], [387], [427], from [429] to [432], [494], [694], [746], [747], and [869].

#### Mitre Corporation

[292], [427], [429], [434], [435], [736], [824], from [875] to [880], [883], [884], [885], [932], [1006], [1220], [1222], [1223], [1230], [1341], [1342], and [1384].

#### Networks

[95], [464], [511], [531], [555], [559], [588], [649], [714], [743], [818], [828], [841], [1050], [1077], [1114], [1219], [1225], [1237], [1251], [1301], [1348], [1373], and [1432].

#### On-demand

[122], [337], [408], [503], [509], [510], [832], [966], [969], [1025], and [1246].

#### Pay-TV

[7], [512], [693], [1245], and [1246].

#### Policy and regulation

[180], [300], [828], [874], [940], [967], [1075], [1099], [1146], [1151], [1152], [1153], [1157], [1187], [1234], [1248], [1312], and [1344].

#### Public safety

[69], [143], [288], [289], [341], [399], [1073], and [1271].

#### Rand Corporation

[15], [16], and [56].

#### Remote communications

[98], [100], [199], [229], [230], [323], [401], [484], [567], from [667] to [670], [722], [723], [778], [779], [780], [914], [941], [1009], [1030], [1080], [1081], [1082], [1123], from [1136] to [1139], and [1184].

#### Rural communications

[153], [158], [160], [161], [335], [401], [447], [484], [537], [565], [667], [668], [669], [692], [695], [705], [721], [766], [768], [770], [934], [941], [947], [972], [1029], [1048], [1078], [1123], [1131], from [1136] to [1139], and [1372].

#### Satellite communications

[1], [5], [79], [97], [100], [154], [170], [181], [220], [226], [229], [230], [240], [241], [302], [309], [325], [330], [336], [351], from [354] to [358], [401], [423],

[474], [475], [484], [485], [493], from [517] to [520],  
 [523], [549], [552], from [619] to [623], from [626] to  
 [629], [637], [667], [668], [669], [688], [692], [695],  
 [711], [722], [723], [740], [750], [761], [769], [785],  
 [854], [868], [977], [978], [979], [996], [1000], [1009],  
 [1010], [1017], [1032], [1041], [1064], from [1078] to  
 [1083], [1109], [1110], [1120], [1122], [1123], [1124],  
 [1131], from [1136] to [1139], [1184], [1202], [1247],  
 [1268], [1306], [1307], [1381], and [1416].

#### Security

[245], [288], [329], [341], [399], [1102], and [1271].

#### Shopping

[13], [27], [405], [444], [809], [816], and [816].

#### Social services

[33], [34], [40], [169], [241], [449], [465], [475],  
 [502], [540], [588], [653], [654], [702], [703], [704],  
 [757], [777], [833], [880], [897], [901], [945], [976],  
 [1010], [1027], [1028], [1070], [1088], [1112], [1113],  
 [1168], [1222], [1223], [1315], [1340], and [1378].

#### SITE project (India)

[9], [11], [268], [637], [692], [695], [1049], [1119], and  
 [1122].

#### Telephone

[38], [40], [77], [101], [103], [155], [243], [256],  
 [359], [440], [451], [455], [522], [589], [609], [648],  
 [664], [734], [793], [818], [820], [827], [889], [910],  
 [926], [953], from [981] to [986], [990], [992], [993],  
 [994], [997], [998], [1028], [1035], [1056], [1105],  
 [1177], [1203], [1336], [1363], [1367], and [1439].

#### Teletext

[162], [184], [200], [562], [814], [933], [1068], and  
 [1069].

#### Travel substitutes

[274], [395], [550], [636], [698], [699], [726], [727],  
 from [729] to [733], [929], [935], [1018], [1019], [1047],  
 [1060], [1061], and [1196].

#### Two-way systems

[65], [66], [67], [227], [418], [471], [503], [508],  
 [509], [560], [642], [650], [686], [762], [794], [948],  
 [1067], [1095], [1129], [1132], [1174], [1188], [1214],  
 [1218], [1245], [1295], [1296], [1297], [1335], [1347],  
 [1421], and [1435].

#### TICCIT system

[202], [313], [536], [875], [877], [878], [882], [942],  
 from [1220] to [1223], [1341], [1342], and [1343].

## Urban communications

[44], [192], [402], [403], [539], [876], [902], [911],  
[1073], [1141], and [1232].

## Video tapes

From [61] to [64], [109], [110], [115], [143], [287],  
[299], [410], [527], [647], [784], [829], [885], [930],  
[1128], [1190], [1267], [1310], and [1436].

## Video telephone

[145], [201], [292], [396], [397], [434], [448], [481],  
[482], [483], [680], [712], [736], [939], [1006], [1012],  
[1170], [1230], [1231], [1239], [1406], and [1420].

## Viewdata

[38], [179], from [452] to [463], and [1401].

## Welfare and employment

[185], [403], [680], [756], and [790].

## Wired city

[24], [38], [42], [80], [297], [347], [473], [521], [544],  
[566], [754], [1192], [1193], [1254], [1346], and [1347].

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