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ABSTRACT

The Aroostook County Telecommunications System is a slow-scan television network connecting five health institutions in the county with the Central Maine Interactive Telecommunications System (CMITS). The Aroostook system allows both audio conferencing and still-image videoconferencing among the Aroostook participants, and provides for an interface with the CMITS, which is a two-way broadband microwave television system connecting participating health institutions in four towns. The entire system is connected using dedicated voice-grade telephone circuits and a telephone company bridging device. Merging the slow-scan and broadband systems demonstrates an economical method for improving educational offerings and medical care, while saving travel and energy in remote areas. This report on the system describes the efforts of Medical Care Development, a non-profit health systems development and implementation organization, in initiating the project. The narrative section of the report covers the project start-up, trial operation, demonstration, and operation phases. Additional sections address project benefits, demonstrable gains, expected benefits, barriers to implementation and utilization, and strategies for institutionalization and dissemination. An extensive collection of study-related materials is appended. (LMM)

FINAL REPORT

Grant No. 039A-7901

AROOSTOOK COUNTY TELECOMMUNICATIONS DEMONSTRATION

Project Period:
December 15, 1978 – June 15, 1981

July 15, 1981

MEDICAL CARE DEVELOPMENT, INC.
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NARRATIVE SECTION

ABSTRACT

The Aroostook County Telecommunications System is a slow scan television network which connects five health institutions in Aroostook County and provides for an interconnect with the Central Maine Interactive Telecommunications System (CMITS). The Aroostook County participants are Aroostook Medical Center, A.R. Gould Memorial Hospital Division, Presque Isle; Aroostook Mental Health Center, Caribou; Cary Medical Center, Caribou; Houlton Regional Hospital, Houlton; and Northern Maine Medical Center, Fort Kent. The system allows both audio conferencing and still-image video conferencing among the Aroostook participants and provides for an interface with the CMITS. The CMITS is a two-way broadband microwave television system which connects participating health institutions in Lewiston, Augusta, Togus, and Waterville. Merging the slow scan system with the broadband television system in central Maine demonstrates an economical method for improving educational offerings and medical care as well as saving travel and energy in remote areas.

The Department of Education's (formerly the Department of Health, Education and Welfare) Telecommunication Office granted Medical Care Development (MCD), a nonprofit health systems development and implementation organization, monies to initiate the slow scan telecommunications project in Aroostook County. The equipment was assembled by Lake Systems Corporation of Newton, Massachusetts, using the specifications provided by MCD. The audio equipment consists of a Darome miniconvenor, and the slow scan equipment utilizes slightly modified Robot slow scan transceivers. The entire system is connected using dedicated voice-grade telephone circuits and a telephone company bridging device.

A delay in system construction of approximately one year resulted from belated FCC disapproval of Medical Care Development's planned use of the Maine Public Broadcasting Network's microwave system for the central Maine/Aroostook interconnect. The plan of transmission was then changed to telephone communications, and this shift was approved by the Project Officer in November 1979. An extensive review of bridging options was conducted and the most cost-effective method chosen.

This option required a specially assembled bridge with which the New England Telephone Company had had no experience. Technical problems occurred when the equipment was connected to the bridging device as initially designed, and the system had to be taken off line for two and one-half months to correct these problems, which were overcome when the telephone company converted the phone lines for the video circuit from a two-wire to four-wire system. The system actually began operation without major technical problems

in March 1981--one year and three months from the date the grant was awarded. The delays and problems understandably curbed some of the initial enthusiasm, but user groups are now expanding use of the system. More detailed training for selected individuals is being conducted, and a detailed troubleshooting manual is being prepared to assure that users make effective use of the equipment.

The system builds on cooperation which exists between institutions in Aroostook County. The project works closely with Northern Maine RAISE (Regional Approach to Improved Health Services Through Education), a consortium which is an example of this cooperation. To ensure the responsiveness of the system, user groups have been and are being formed to develop, design, implement, and evaluate programs. The user groups consist of representatives in a number of specialty areas from each institution, and success of individual programs depends upon the involvement of these groups. Involvement of all of these professionals in educational programs that meet their needs for information and peer contact will greatly reduce the isolation factor that is a major contributing factor to the manpower shortage conditions which now exist in this poor and rural area of Maine.

The potential benefits from this project are significant for rural Aroostook County. Several state agencies in Augusta have sought use of the system as a means to meet with their staff representatives in Aroostook and improve service availability for Aroostook people. The unmet needs for educational programs are extensive, and the system is addressing these needs.

The Aroostook County Telecommunications System needs a complete demonstration period to prove its worth to its users and potential financial supporters. Second-year funding was not received due to Department of Education cutbacks. An application has been made to the Farmers Home Administration for funds to plan for uses of this system to promote community development. This support would help assure that local facilities and agencies will support the system's operation in the future.

The concerns of the rural participants with educational access, their belief that an appropriate cost-effective telecommunications system will substantially benefit the region, and a history of ongoing economic support of past cooperative efforts are positive factors in favor of long-term viability.

START-UP PHASE

On November 2, 1979, Medical Care Development was notified that it could proceed to implement the Aroostook County Telecommunications Demonstration project under the revised transmission format which had been approved by the Office of Telecommunications Policy, U.S. Department of Health, Education, and Welfare. Following that, MCD moved rapidly to implement the program. A meeting was held with representatives from each of the participating hospitals in Aroostook County. At that time the administrators (1) agreed to a plan for serving as a policy board to the project, (2) discussed in a preliminary way the criteria for evaluation of the system that would permit them to justify assuming financial and programmatic responsibility after the demonstration phase, (3) agreed to a methodology for evaluation of the bids for providing the slow scan and terminal equipment, and (4) evaluated the options for telephone linkage configurations among the Aroostook hospitals and between Aroostook County and the Central Maine Interactive Telecommunications System (CMITS). The session was marked by unrestrained enthusiasm on the part of the hospital representatives for the implementation of this project.

EQUIPMENT:

Specifications for the equipment at each terminal location were developed and sent to 19 possible bidders on the project. Bids were to be received at Medical Care Development by 11:00 A.M., January 29, 1980. The features of each bid were summarized for evaluation by the Policy Board prior to awarding a contract for provision of the equipment.

Bids for the slow scan equipment were received from three companies following which a bidder's conference was held. Lake Systems Corporation was the lowest bidder and satisfactorily addressed the requested aspects of the console configuration and operation. Aroostook participants were consulted, and subsequently a contract was signed with Lake Systems Corporation for the provision of the slow scan system at each terminal location. Modifications were discussed and agreed upon at a postaward conference with Lake Systems Corporation. The equipment arrived the middle of May 1980.

It was necessary to change the plan of transmission between the central Maine area and the Aroostook County area from that proposed in the original application in 1978. This was because the Federal Communications Commission refused to permit Medical Care Development to utilize the Maine Public Broadcasting Network's microwave transmission system as originally proposed. The shift to use telephone communications was approved by the Project Officer on November 7, 1979, and negotiations progressed with the New England Telephone Company.

Several options existed for bridging of phone lines in Aroostook County to assemble the system. Review of these was extensive, and it was determined that the most cost-effective plan was to use equipment supplied by the New England Telephone Company at their Presque Isle office. See MAP 1 for system sites.

The telephone company has provided a specially assembled dial-in capability to the conferencing bridge which connects the Aroostook participants' audio and slow scan video. This dial-in capability allows participation in an Aroostook conference by non-Aroostook participants who have Robot slow scan equipment. The primary use for this interconnect is to join the Central Maine Interactive Telecommunications System and Aroostook County Interactive Telecommunications System; however, participants from anywhere in the country or world need only access to two phone lines, a Robot slow scan transceiver, and other basic video components and they could connect to an Aroostook program. Only one phone line is necessary if people are willing to alternate the audio and video.

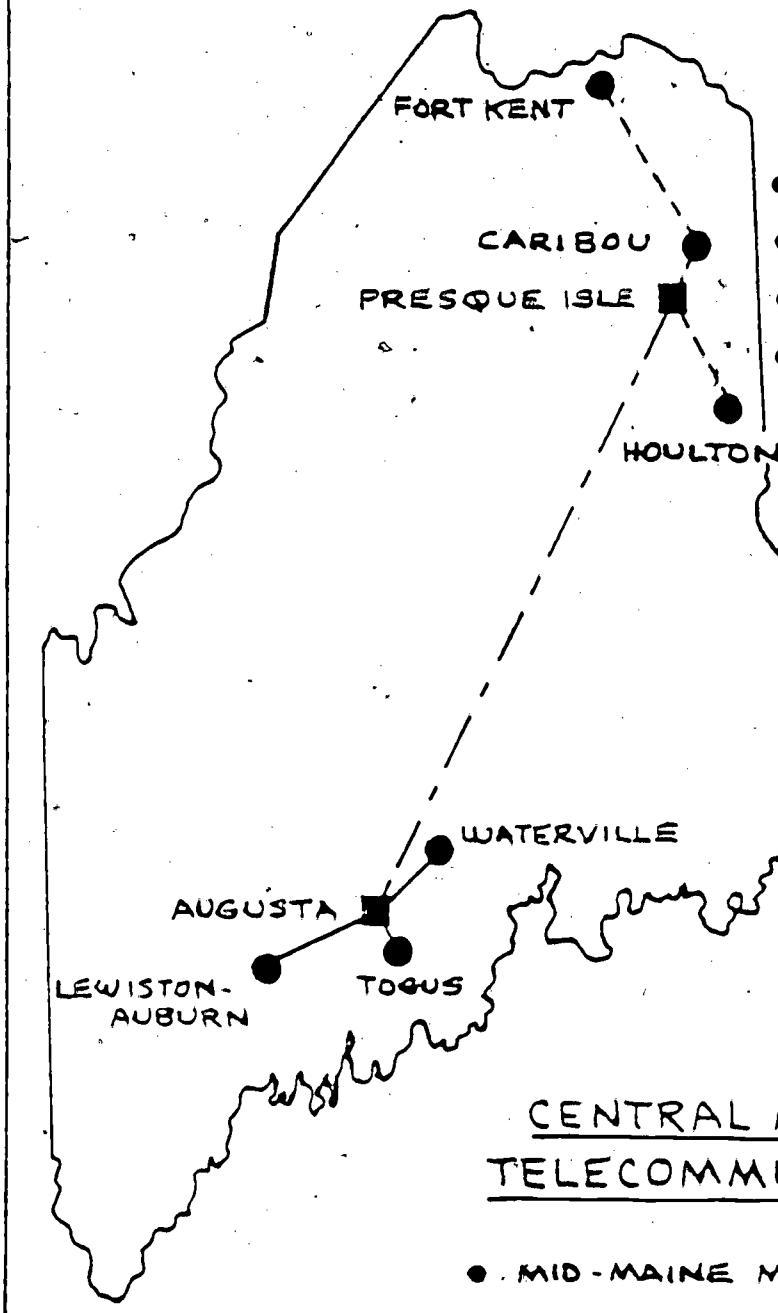
STAFFING:

It was proposed that the Aroostook demonstration would be implemented with minimum addition of new personnel at MCD. An experienced and capable telecommunications staff was in place for the existing CMITS, and their talents would be applied to this project.

Robert Cowan, the project director who had directed planning for the project, resigned in February 1980. A search committee composed of members from the Central Maine Interactive Telecommunications System's Policy Board and the Aroostook County system's Policy Board was formed to seek a replacement for Mr. Cowan. John LaCasse, Deputy Director of Medical Care Development, who has built and operated several telecommunications experiments in Maine, assumed responsibility for the project on an interim basis. Anne Niemiec, who has been the educational specialist for the Central Maine Interactive Telecommunications System project since its inception, committed part of her time to the development of the Aroostook system. Sterling Haskell, the engineer with the Central Maine Interactive Telecommunications System, directed the purchase and installation of the equipment for the Aroostook project and negotiated the interface with telephone facilities for that system. Robert Ellis, who has been involved with the Central Maine Interactive Telecommunications System since its inception as a program developer at Mid-Maine Medical Center, joined MCD as assistant director of the Aroostook project, with a special responsibility for developing user groups and coordinating educational activities. He joined the MCD staff on January 14, 1980.

Anne Niemiec was selected and accepted the position of project director, and this change was approved by DHHS in April 1980.

INTERACTIVE TELECOMMUNICATIONS



AROOSTOOK SLOW SCAN SYSTEM

- NORTHERN MAINE MEDICAL CTR.
- AROOSTOOK MENTAL HEALTH CTR.
- CARY MEDICAL CENTER
- AROOSTOOK MEDICAL CENTER
- HOULTON REGIONAL HOSPITAL

CENTRAL MAINE INTERACTIVE TELECOMMUNICATIONS SYSTEM

- MID-MAINE MEDICAL CENTER
- KENNEBEC VALLEY MEDICAL CENTER
- MAINE-DARTMOUTH FAMILY PRACTICE RESIDENCY
- UNIVERSITY OF MAINE AT AUGUSTA
- VETERANS ADMINISTRATION AT TOGUS
- CENTRAL MAINE MEDICAL CENTER
- ST. MARY'S GENERAL HOSPITAL

——— MICROWAVE
- - - - SLOW SCAN
——·—· DIAL-IN CONNECTION

MCD 3-81

THE NEED FOR THE SYSTEM:

The problems facing rural health care delivery are complex and varied. Manpower shortages are a central concern, and isolation from peers and other professionals and lack of educational opportunities are major impediments to recruitment and retention of needed providers. In addition, there are problems in meeting continuing education requirements for continued membership in both state and national organizations such as the Maine Medical Association, the Maine State Nurses' Association, the Joint Commission for the Accreditation of Hospitals, and the Occupational Safety and Health Administration. Appropriate educational experiences are much more accessible in urban areas, and people in rural sectors of Maine have found it difficult to keep pace with the increasing requirements.

Maine is a very rural state, as described in EXHIBIT 1. With the shortage of health care professionals in rural areas, demands for time are severe, and it is difficult for those few professionals to obtain coverage so that they can attend distant educational events. As an example of the severity of the problem, according to statistics compiled by the Health Resources Administration in a 1977 publication entitled "Critical Medical Manpower Shortage Areas," out of 160 designated critical manpower shortage areas in New England, Maine has 12[illegible], including most communities in Aroostook County. The shortage of health professionals is apparent in other allied health areas as well.

Maine's most northern county, Aroostook, is extremely rural and isolated with the attendant problems. The county has a population of less than 100,000 people in an area greater than the size of Connecticut and Rhode Island combined. It is isolated from the nearest urban center in the state by a 150 mile stretch of woods. Aroostook County's average of 14.7 people per square mile is considerably less than the Maine average of 32 and the national average of 56 people per square mile. See EXHIBIT 2 for a more complete description of Aroostook County. Due to the remoteness of the area, the majority of the educational events in Maine which provide accredited continuing education exist outside the county. At a minimum, travel to the nearest area of educational offerings, Bangor, is three hours. For the professional in Aroostook County, attending a one- or two-hour educational meeting in Bangor means loss of an entire day, placing an even greater stress on the understaffed health care system.

In addition to the need for educational access to simply keep current with various accrediting agencies, there is a need to overcome the isolation that affects geographically separated health care professionals. A survey done by Medical Care Development in 1978 indicated that a lack of peer contact to allay professional isolation experienced in the rural area was the most frequently cited problem by rural providers.

There have been a number of efforts in Aroostook County to combine resources to meet the ever increasing demands for health care. A prime example is Northern Maine RAISE, described in EXHIBIT 3, which was established eight years ago with support and guidance from Medical Care Development. RAISE has been successful due to its orientation toward the cooperative sharing of available resources and is now totally sponsored by the participating hospitals in Aroostook County.

Through regular meetings with administrators and in-service education directors, the following have been designated as high priority continuing education areas: Continuing medical education for physicians, nursing education, radiology, laboratory, pharmacy, housekeeping, business office, central services, maintenance, laundry, and switchboard.

The educational needs of Aroostook County are similar to those in the central Maine area which were identified in an extensive needs assessment survey of over 750 physicians, nurses, and hospital staff personnel in May of 1977. The survey, conducted by Medical Care Development, was the basis for programming efforts for the Central Maine Interactive Telecommunications System. As a consequence, much of the educational activity conducted over the central Maine system is appropriate to meet the needs of the professionals in Aroostook County through the new system.

COOPERATIVE ARRANGEMENTS:

The Aroostook area members have agreed to develop a written affiliation agreement among the participants in the system to include hospitals at Fort Kent, Caribou, Presque Isle, and Houlton; the Aroostook Mental Health Center in Caribou; and Medical Care Development. The affiliation agreement is modeled after the agreement now in effect among the members of the Central Maine Interactive Telecommunications System. EXHIBIT 4 is a copy of that agreement. It is felt that such an agreement will help to avoid misunderstandings about the respective responsibilities of the participants as the system develops and moves toward local support.

A liaison committee composed of members of the Policy Control Boards of the Aroostook County and central Maine systems was formed to discuss cooperative efforts between the two systems. A chairman was elected, and the committee now meets at least monthly to discuss common activities and resolve problems associated with the interface.

As mentioned, the project works closely with RAISE, a consortium which is indicative of a history of cooperation among the Aroostook facilities. For the past eight years, through the RAISE project, the Aroostook health facilities have collaborated to improve the level of educational activity that none of the relatively small institutions would be able to reach alone.

Representatives from the various institutions are accustomed to working together to meet local needs using available resources in this very isolated area. The implementation of this project has been facilitated because of this network of strong, cooperative relationships among hospitals and health and educational institutions that are participating or providing resources. This includes sharing of facilities for communications, sharing of educational resources, and joint participation in educational and patient care activities, as well as linking of separate groupings of institutions that have previously been involved in cooperative programs.

Past experience with the CMITS and other telecommunications systems has shown that the prior existence of a cooperative atmosphere creates a more "threat-free" environment for the infusion of new telecommunications technology. The demonstration is utilizing the CMITS model of cooperative program development in an attempt to maximize user involvement in meeting actual needs. This is based on the following assumptions:

A. That health care professionals are capable of operating their own telecommunications equipment if reasonable efforts are made to keep instrumentation simple and straightforward. The state of the art is such that automated circuitry can perform the majority of the functions necessary to send or receive acceptable information that formerly required a technician. This is important since rural health care facilities cannot afford hiring technical personnel to manipulate equipment.

B. That health care professionals are capable of designing and implementing their own educational programs to meet their specific needs. Common sense guidelines for the development of sound educational programs and media manipulation can be taught to rural telecommunications users in a minimum of time using a group problem-solving approach.

C. That the primary emphasis of project personnel be development of user self-sufficiency and self-determination. Past telecommunications demonstrations that did not become viable often failed due to high personnel costs, a highly inflationary operating expense for any program in the health field. By establishing at the outset that existing personnel in the region will be used whenever possible to operate the telecommunications system and by training users in the operation of their own system, the likelihood of success is enhanced.

The philosophy of user-sharing is based on the same one used to develop the Central Maine Interactive Telecommunications System which links five collaborating hospitals and the University of Maine at Augusta and is managed by Medical Care Development. Central Maine institutions have now been cooperatively sharing resources via the CMITS for four years.

An essential ingredient in the success of this telecommunications system is the total involvement of the user. If the user does not find the program content relevant using his or her own standards, no educational program--regardless of how up-to-date and current it might be--will enhance the success of the system. It is important that the users share responsibility for the success or failure of an educational presentation designed to meet their needs. If the user is not involved in the development and implementation of the program content, then a failure of that content to meet perceived needs is seen as a failure of the entire telecommunications system, thereby biasing future encounters. The greater the involvement of the user and the greater the focus on participatory education, the more transparent the communications system becomes.

It is important that the early telecommunications efforts concentrated on the interrelationships between people and the establishment of dialogues between the various sites. In order to establish a continuing communications bond between participating sites, it is very important that the individual users get to know one another on both a professional and personal level. Experience with the CMITS has shown that future telecommunications events will be enhanced if face-to-face contact has been established prior to the use of the medium. Early planning meetings are an excellent method of allowing people to meet one another in person and establish the necessary rapport. CMITS experience has indicated that users who have met personally prior to the mediated encounter feel more comfortable and are inclined to interact more than those who have not had face-to-face contact.

It should also be noted that the telecommunications system does not attempt to totally replace personal contact. Experience has shown that there is a strong need for personal contact, especially in rural areas where face-to-face communication is highly valued and particularly for topics such as those concerning finances or certain discussions that have long-term effects upon institutional relations.

As a telecommunications system dedicated to the cooperative utilization of resources, the CMITS has provided much information concerning the implementation problems associated with the sharing of educational materials and resources via interactive telecommunications. It is based on this experience that the Aroostook County Telecommunications Demonstration was proposed as an extension of both technology and program philosophy to small remote hospitals.

TRIAL OPERATION PHASE

As soon as the equipment arrived, but before the bridging was in, demonstrations were held at each Aroostook site between the site and the Lake Systems Corporation headquarters in Newton, Massachusetts.

Discussions regarding utilization of the Aroostook County slow scan system were held with potential user groups who have shown a great deal of interest in the system. Some have already used the system on a trial basis and others have set up demonstration times. The following is a sample listing of these groups.

--Directors of Social Services
--Maine State Pharmacists Association
--Physical Therapists
--Diabetes Educators
--Regional Administrators
--Clergy Association in Caribou
--Advisory Council for Project LEARN
--Medical Grand Rounds
--Dietary Personnel
--Infection Control Nurses
--Plant Engineers
--Recovery Room Nurses
--Family and Children's Services Council, Department of Human Services

Some of these groups meet only on the Aroostook system, and others meet using the slow scan system and the Central Maine Interactive Telecommunications System.

Training guidelines were developed which include instructions (both complete and abbreviated versions) and examples for preparations of visuals for use in slow scan presentations. See EXHIBIT 5 for guidelines. The contact persons at each facility were trained and in turn help others.

Current meeting and travel patterns for Aroostook County health personnel were analyzed. Statistics have been compiled to illustrate potential cost savings in connection with two types of meetings which currently take place. One example is a meeting held in Augusta which involves persons in Aroostook traveling to Augusta; the other involves a rotation of locations so that every site takes its turn hosting a meeting. TABLE 1 shows travel savings which can occur from reduced travel within Aroostook County. In the past, persons from each site had to travel to four out of five meetings. Plans are being made to utilize the slow scan for many of these types of meetings. There is interest also in the increased access of these meetings to others in the institutions who would not otherwise be able to attend. Thus, administrators can get input from appropriate department heads during pertinent portions of a meeting without having to ask them to travel.

TABLE 1: TRAVEL SAVINGS

MEETING LOCATION	*TOTAL MILEAGE FROM OTHER FOUR SITES	*TOTAL TRAVEL TIME FROM OTHER FOUR SITES
Fort Kent (NMMC)	482 miles	12 hrs., 3 min.
Caribou (CMC)	222 "	5 " 33 "
Caribou (AMHC)	222 "	5 " 33 "
Presque Isle (AMC)	248 "	6 " 12 "
Houlton (HRH)	502 "	12 " 33 "
TOTALS	1,676 miles	41 hrs., 54 min.
Average savings per institution per meeting by using slow scan ITS	84 miles	Over 2 hours

*Based on five meetings--one meeting at each site. For each of the five meetings participants travel from the four other sites--totaling 20 trips.

Data from the presystem questionnaires were compiled. See EXHIBIT 6 for summary. Highlights include: Eighty-two percent of the nurses cited high or moderate interest in having access via slow scan television to continuing education--accredited educational programs. All but three physicians indicated they would like to be contacted to explore possible interest in using slow scan television. Data from the questionnaires were coded and computer tabulations done.

A procedure for delivery of scheduling and programming information among the five Aroostook sites, project RAISE, and the MCD telecommunications office was agreed upon and implemented.

It was found that the Robot equipment is more sensitive than had been anticipated and is able to detect echoes that are produced in the telephone bridging system. Solutions are being evaluated to remedy this problem, but some minor transmission problems remain. In addition, modifications were made in the Darome equipment to remove oscillation from the network when all the stations are turned off. Despite these problems, enthusiasm continues to be high among the trial users.

DEMONSTRATION PHASE

The project remains in the demonstration phase. Additional user groups are being formed, hours of usage are increasing, and demonstrations for various potential users are being planned and implemented. Evaluation forms have been in use since the initial program on the system. The results from these ongoing evaluations allow for a constant update on the users and are used for troubleshooting. RAISE is acting as scheduling liaison between the Aroostook participants and the MCD telecommunications office. In addition, the RAISE Associates, a group of in-service educators from the participant organizations, and the director of RAISE provide programming support for a variety of users. See EXHIBIT 7 for programs that have been scheduled in Aroostook County.

As the system's reputation spreads through each of the institutions, more persons are looking to the Aroostook County Telecommunications Demonstration to aid them in solving a particular problem or satisfy a need. Examples are the operating room personnel user group and the Family and Children's Services user group. In the case of the operating room users, the system was the impetus for the initiation of the group. A statewide chapter of the Association of Operating Room Nurses had been using the CMITS to meet for almost a year. The reason for using the CMITS was to cut down on the travel by the members to their monthly business and in-service meetings. Even with the use of the CMITS, the closest Aroostook participant would have to drive three hours, one way, to attend. These meetings are all in the evening, usually on Wednesdays. Six hours of travel and two hours of meeting meant that no one from Aroostook County was able to attend. Because of the inability to easily participate in the statewide meeting, the operating room personnel in Aroostook wanted to start their own subchapter. Even within the county, there is still 100 miles of mediocre roads that must be traveled to get between Fort Kent and Houlton, the two ends of the slow scan television network. Before the network was available, the realization of an Aroostook subchapter of the Association of Operating Room Nurses had not been fulfilled. With the system, the operating room group meets once a month within Aroostook County and has the ability to attend the CMITS's Association of Operating Room Nurses group for its monthly meetings.

The Family and Children's Services group, which is sponsored by the Maine State Department of Human Services and the various Aroostook hospitals, had been meeting prior to the availability of the Aroostook slow scan system. Because travel was a problem for many who were on the steering committee, average attendance was about one-third of the total membership. The use of the slow scan system has made it easier for the various members to attend meetings and has increased attendance markedly.

In addition to the Aroostook programs, CMITS programs are now available to and participated in by Aroostook health personnel. One indication of the interest is that programs involving both systems are already being scheduled for two months in advance.

Additional training is needed for CMITS participants as some modifications in presentations are needed when the CMITS is interconnected with the Aroostook County Telecommunications Demonstration system. For instance, when using slow scan with a 60-second frame rate, slides cannot be changed as rapidly as when using only the fast scan television. More attention needs to be paid to the audio component, such as making sure that the person speaking is close enough to the microphone at all times or is wearing a lavaliere mike. Adjustments are being made by participants.

OPERATION PHASE

Second year funding for the project was not received due to budget recisions of the sponsoring program. A grant application was written to the Farmers Home Administration. The system is proceeding with the demonstration phase in the hope that this proposal will be funded.

The evaluation process has been ongoing but the full evaluation results for the demonstration will not be ready until the end of April 1982. It is believed that the evaluation period should include an entire year of activity due to variation in the level and types of activities which occur at different times of the year.

The population of users is growing and is expected to continue to grow throughout the demonstration period if the system can find continued financial support for a true test period. There is little doubt that local support will be available when a user constituency has been established.

ASSESSMENT OF BENEFITS OF PROJECT

The intended beneficiaries for this system include persons in all areas of the health care field. The institutions, as a whole, benefit from increased awareness and sharing of programming. Administrators are able to attend meetings without leaving their institutions thereby reducing time away from possible problems that may need immediate attention. Physicians can now receive Category I educational credits without leaving their hospital and also may provide and receive valuable consultative input regarding difficult medical problems without a need for travel. Nursing personnel can provide some of their own in-service education by sharing the various resources throughout the system as well as accessing expertise previously available only by traveling great distances. All areas of the health care facilities family--housekeepers, lab technicians, maintenance engineers, etc.--now have the ability to communicate with others in their fields without the need to travel. As a result, some of the isolation felt by rural institutions and their employees can be reduced by utilization of this telecommunications system.

In the past some needs were left unmet and other needs were met by driving to education programs at individual hospitals in Aroostook as well as to other parts of the state. Because of the distance and time away from work, the number of members able to do this has been limited. Day-long workshops will still be held, but more options will be available. Also, portions of these workshops can be presented on the system and made available to a larger number of participants. The videotaping capability will extend the educational programs even further, making them available to personnel on all hospital shifts.

The slow scan system will also help improve the information exchange process and allow, for example, administrators to be more proactive in state health issues. Because of the distance and time problem, it has been difficult for them to attend subcommittee meetings such as those of the Maine Hospital Association which are held in Augusta. Use of the portable unit will allow them to interconnect with these meetings in Augusta. Aroostook County hospital staffs are able to have more input into the planning process for statewide projects such as Diabetes and Hypertension Control.

DEMONSTRABLE GAINS

There are several areas where it is felt there will be demonstrable gains. Unfortunately, it will be difficult to evaluate these areas until after the system has been in operation for at least six months. The areas which may be affected by this system include a reduction in isolation, greater numbers of persons able to avail themselves of educational and informational exchange opportunities, a greater sharing of existing resources with a possible reduction in a duplication of efforts among the participants, and a reduction of travel and the ability to include more personnel in educational activities.

Because the equipment is designed to allow for simplicity of operation, thereby allowing user operation, the potential target population is the entire health care personnel population as well as patients in Aroostook County. Each group must assess their own needs and then decide for themselves whether the Aroostook County Telecommunications System can be used to help satisfy their needs. The project staff will assist in this process.

As the system develops and user patterns are established, some operating costs can potentially be offset by outside users in state, federal, or private nonprofit businesses that could utilize the network. If this is taken into account, the potential target population includes most people in and around the cities and towns where the equipment is located in either Aroostook County or central Maine. Reported attendance for the first two and one-half months of operation was 234. As the number of users increases, there will be increased utilization of resources of participant institutions. Primarily this will be in the form of meeeting room use and support personnel time and effort spent in scheduling and programming assistance.

EXPECTED BENEFITS

This project establishes an innovative telecommunications system to serve health and educational needs of Maine's most isolated rural county. The slow scan system is connected to an existing broadband system through use of dial-up telephone lines located at Kennebec Valley Medical Center in Augusta. This linking of the slow scan and existing broadband television systems will demonstrate a long-term, economically viable method for improving educational offerings and enhancing the quality of medical care through professional communication and interaction in a remote sector of this large, rural state.

The project will involve a broad cross section of users to assure high usage levels and resultant low unit costs for operation of the system. The site of the demonstration, Aroostook County, is poor, rural, and has severe manpower shortages in several medical, nursing, and allied health categories. It is believed that involvement of all these professionals in educational programs that meet their needs for information and peer contact will greatly reduce the isolation factor that is a major contributing factor to the manpower shortage conditions that now prevail.

The potential impact of reasonable cost telecommunications in the Aroostook area is great. Discussions have been under way with health care facilities in Aroostook County since 1977 to develop an appropriate telecommunications system that would provide for intraregional communications so that existing resources might be shared and permit interaction with other major health care facilities in the state to meet educational requirements.

As an example, the system provides physicians in Aroostook County with access on a regular basis to American Medical Association Category I medical education programs that are conducted over the CMITS. In addition, other health care professionals have access to the hospital-wide programs developed and now transmitted by the CMITS. See EXHIBIT 8 for a sample program guide. These programs are prepared by the community hospitals that are a part of the CMITS and will now include Aroostook County professionals in both presentation and participation through this project.

Because the system has been on line for just a short period of time, it is very difficult to specify actual, broad-based benefits from the system. As the new and existing user groups experience the slow scan technology, it becomes very apparent that the ability to meet and exchange ideas over the system and the resulting reduction of necessary travel time are very important reasons for utilizing the slow scan network.

The institutions that are connected to the dedicated telephone network, which carries the slow scan video and audio, are relatively small in size compared to the institutions that are participants in the CMITS. See EXHIBIT 9 for descriptions of Aroostook participants. Their small size does not necessarily mean that specific job functions can be eliminated. It does mean that these specific jobs may require less time than in larger institutions. Consequently, many individuals may have the same variety of responsibilities of two, three, or four specialty positions in a larger institution. The ability to meet with counterparts throughout Aroostook County and central Maine without traveling allows these persons to increase their awareness and knowledge in areas where they are normally not able to keep current.

Travel may decrease, but experience in some instances has shown that it possibly will not. Usually travel monies are budgeted for a year in advance. Supervisors and department heads know what the total budget will allow for travel and therefore will plan for the use of the money until it is gone. If the slow scan television network reduces travel costs in specific areas, then that money will probably be used for other travel that might not have been possible prior to installation of the system. The actual benefit in this case is not necessarily lower travel cost but instead a greater return for the same amount of travel budget. Discussions are being held with the hospital finance officers to work further on cost effectiveness.

BARRIERS TO IMPLEMENTATION AND UTILIZATION

The major technical problems with implementation of the demonstration project occurred in the creation of the bridged, dedicated telephone network. It was found that the Robot slow scan equipment and the Darome audio conferencing equipment functioned very well using point-to-point dial-up telephone connections. Problems arose once the equipment was connected to the bridging device located in the Presque Isle central telephone office. Although MCD had worked with New England Telephone in design needs and although the audio conferencer and slow scan transceiver were designed for telephone line connection, a slight difference between the phone specifications and the slow scan conferencing equipment existed. The bridged, dedicated phone circuit amplified this difference and caused problems with "echoes" in the pictures and other interferences. It was also found that the equipment at all five sites had to remain connected to the dedicated network or else the phone system would start to oscillate, thereby causing a feedback situation that would interfere with audio and/or video communications throughout the system.

One of the solutions to the echoing problem called for an increase in the return line loss, thereby decreasing the chance that an "echo" signal might be seen by the slow scan equipment. This caused a problem in recording the slow scan programs when the signals were not originated at the taping site. It was a case of the taping site's slow scan video being at a good level but another site's slow scan video being received at about an eight times lower signal. This level was not adequate for taping a program from another site. A relay was designed by telecommunications engineering personnel to amplify the incoming signal without amplifying a locally produced signal.

The location of the interface into the CMITS caused some problems but they were overcome by the time an interface into the Aroostook dedicated telephone network was available from the phone company.

There was a definite linguistic barrier which existed. Telephone personnel who were responsible for ordering the bridged network had little or no experience in areas which concerned the needs of the Aroostook County Telecommunications Demonstration system. MCD telecommunications personnel spoke a language different from the "telephonese" which seems to be the standard language for all telephone companies. Once a translator was found, the system was described, priced, and ordered. Unfortunately almost four months had passed, wasting valuable demonstration time. As it was, the entire network from the bridging device to the drops into the institutions were all tariffed and waiting for the correct order numbers. The only portion of the telephone network that had to be specifically engineered was the dial-in capability for the bridges in the Presque Isle office of the telephone company. This capability

allows persons outside the dedicated circuit in Aroostook County to participate in conferences by calling two phone numbers. One number connects with the audio conferencing bridge, and the other number connects with the slow scan video conferencing bridge.

The problems that project personnel faced in trying to order an appropriate telephone service were offset by the courteous manner in which telephone company personnel handled themselves. Once the appropriate equipment and circuitry were ordered, no delays in scheduled installation occurred. Cooperation between telephone personnel in Presque Isle and the project engineer was extremely good, and the problems encountered have been solved. Future networks wishing to use similar techniques and equipment will have a source of information to help prevent these problems before they occur.

Few problems were encountered in dealing with the participating institutions during installation of the equipment. Those involved were willing to assist as well as they could but also made very clear their dependence on the expertise provided by the engineers and project personnel. Enthusiasm was high when these persons were first approached and still remains high. Expressions of disappointment were occasionally forthcoming during setback periods when technical problems were encountered. A contributing factor to the disappointment and frustration, expressed by the in-service educators who are responsible for coordination of the slow scan activities at each of the participating institutions, was the fact that four out of the six educational representatives were newly hired after the equipment was delivered. Three of these people are in-service coordinators for their institutions, and one is the director of RAISE. They were coming into their jobs without the gradual buildup to slow scan that their predecessors had and therefore had different expectations. Once the uniqueness of the system was explained along with the nature of the problems, most accepted the delays but were still anxious to get started.

More delays occurred. The system was taken off line the first week in December 1980 to correct problems which appeared to be caused by the telephone bridging system. The telephone company converted the phone lines for the video circuit from a two-wire to a four-wire system during the first week in February. This allowed all Aroostook participants to transmit and receive pictures among themselves, but a problem remained when the dial interconnect was used. A regular business line was substituted for the video WATS line and has been satisfactory. When the Presque Isle phone office is converted to electronic switching this summer, the plan is to switch back to a WATS line. The audio circuit remains in a two-wire configuration with a dial-in WATS line. The system has thus been in operation since March. Problems since then have been mostly people problems. Training solves some of these problems, and a detailed trouble-shooting manual will solve more. A technical committee composed of one person from each site is also being trained and will meet regularly.

The slow scan television equipment is designed to be operated by the user. The consoles are straightforward in design. Most of the controls are located in a handholdable box. See EXHIBIT 10 for photograph of the equipment. With very simple instructions, anyone can use the equipment and master its technique in a very short time. A user guide was developed to provide assistance in the preparation of programs. See EXHIBIT 11 for a sample of the user guide.

The philosophy of both the Aroostook County Telecommunications Demonstration system and the Central Maine Interactive Telecommunications System has been to provide a tool by which people can communicate, thereby satisfying some educational or health care needs. It is the primary responsibility of the user to identify his or her needs and then participate directly in the development of programming to help satisfy those needs. In the cases where more assistance is required to develop courses or programs, attempts are made to identify and collaborate with other institutions or organizations that provide services in the same areas as the expressed needs. Cooperative efforts have been launched with other education distribution systems to assist participants in satisfying their needs. This placement of responsibility on the participant has helped to avoid the frustrations that are often found in nonuser-based systems where participants are not expected to be as self-sufficient.

An extremely cooperative effort has existed for many years among health care facilities to assist each other in preparation of health education through the RAISE office in Aroostook County. The RAISE Associates identify needs for cooperative health education and assist RAISE personnel in providing such educational activities. Because most of the RAISE Associates represent Aroostook County Telecommunications Demonstration system participants, it is logical that RAISE be strongly involved in the efforts to program the system. RAISE personnel have been very cooperative in assisting in the coordination of the implementation and utilization of the system. The system is also one tool by which RAISE can make available its programs and courses to its constituents.

Each of the participating institutions has its own strengths. These areas provide resources for sharing of programming, thereby reducing unnecessary and costly duplication of efforts. Various user groups have been and are being established to capitalize on specific areas within each institution. Because these institutions are of relatively equal size, each participant is providing programming for all of the others.

The teaching facilities in the State of Maine are coming to realize the potential for course distribution beyond the facilities' physical walls. The CMITS has been providing courses from the University of Maine at Augusta campus and vocational technical schools in Waterville and Lewiston since its initiation four years ago. Presently three campuses of the University of Maine system (Augusta, Presque Isle, and Fort Kent), three vocational

technical schools, and two private colleges are located in the municipalities with telecommunications terminals. Other teaching facilities outside of these areas have also expressed interest in the telecommunications system.

The advantages to identifying and collaborating with institutions that can provide services in areas where the Aroostook County Telecommunications Demonstration system and CMITS are concerned are obvious. Less duplication of effort saves money and gets educational activities under way sooner than if programming has to be initially developed. In the case of the university system, courses that are not offered at one campus may be imported via telecommunications from the campus that can provide the course. Utilization of the system puts the providers of courses or educational services in contact directly with those requiring the services. The more direct the communication, the better the chance of satisfying specific needs.

Disadvantages of collaborating with other institutions and organizations to help provide services over the telecommunications systems stem from present patterns of attaining goals. Instructors must modify courses and teaching techniques in order to succeed in producing similar results over the telecommunications systems as those attained in the classroom. Territorial disputes can result when an institution in one area provides services to another institution's area. Experience with the CMITS has shown that these disadvantages can be quickly solved when people are willing to change once the benefits can be demonstrated. Institutions can share resources and thereby develop one very good educational program instead of four or five mediocre ones. Communication over slow scan or fast scan systems provides excellent opportunities for mutual savings and satisfaction in various educational areas.

A final, more general problem was the delay in the start-up of the project after funding had been approved. Medical Care Development submitted the Aroostook County Telecommunications Demonstration grant application in August of 1978, and a grant was awarded in November of 1978. The letter to begin the implementation of the grant arrived in November of 1979. Twelve months elapsed before the slow scan system could be initiated. Most of the time was spent waiting for a ruling by the FCC.

The original grant proposal called for the use of the Maine Public Broadcasting Network's cooperation in providing a connection between the Aroostook County Telecommunications Demonstration system and the Central Maine Interactive Telecommunications System. A request for waiver of the regulation to permit carriage of audio tones via studio link to an educational FM radio station where the material would be transmitted over the Subsidiary Communications Authority was submitted to the FCC in September of 1978. The request to utilize the MPBN microwave and SCA service was tied up in FCC red tape until September of 1979 when the decision was made by Medical Care Development to withdraw the request from the FCC and make other, more expensive, plans for the slow scan to fast scan interconnect. Telephone

circuits are now being used to carry the network signals; therefore, no other regulatory or legal impediments have been encountered.

Application to amend the original grant to provide for the above mentioned change was made to the telecommunications office of the Department of Health, Education, and Welfare, and permission to start on the network was received in November of 1979.

Because of the uncertainty of funding and the perceived and sometimes real technical problems, marketing the system has been difficult. If second-year funding had been available, it would have made a huge psychological difference.

Inadequate staffing has caused problems. This is true both for project staff and staffs in the hospitals. The directors of education already wear more than one hat. One hospital, due to financial cutbacks, now has no director of education. Efforts are being made to formalize the role of hospital staff in development of the system, such as writing it into job descriptions so that it can become part of the reward system.

More benefits have been experienced by the two sites that are most distant from the central part of Aroostook County where many of the meetings and education programs took place in the past.

STRATEGIES FOR INSTITUTIONALIZATION

The prime strategy for institutionalization is expanding the range of users beyond health care to include all members of the community and federal, state, and local government to make this system cost effective., Funding is being sought from the Farmers Home Administration to do this. More time is needed to demonstrate the effectiveness of the system. Attempts were made to locate funds from private foundations but these attempts were not successful. The potential for the hospitals to pick up the costs is good, but not until the system has demonstrated more usage. The hospitals have agreed to pay telephone costs on a quarterly basis. Documentation of travel savings has begun.

The cost of the system is a barrier to its institutionalization, especially in this time of cutbacks.

The chief executive officers of the sites have been in the forefront in using the system and encouraging others to use it. This visibility of top-level management has been crucial in the implementation process as it is in the development of ongoing organizational support which will hopefully lead to its institutionalization.

DISSEMINATION

Considerable interest in the efforts of slow scan technology exists in the country. Discussion of the project has taken place at three national conferences; one included a demonstration that involved interconnecting with Aroostook County. Staff will be participating in a conference on telecommunications at a session on slow scan television being held in Billings, Montanna, from their office in Augusta, Maine. The project was also described at the National Academy of Sciences' meeting in Washington, D.C., by a representative of Robot, the producer of the slow scan transceiver. Newsletters are regularly written and distributed to system users. See EXHIBIT 12 for samples. Articles have also been printed in local newspapers. See EXHIBIT 13. Further articles are planned to disseminate knowledge about this project.

The slow scan technology readily lends itself to creating a very flexible, relatively inexpensive teleconferencing system. Problems relating to the telephone connections can be overcome using straightforward engineering technology.

Demonstrations using the slow scan equipment have been held between the White River Junction Veterans Administration in Vermont and the Togus Veterans Administration in central Maine and between Dartmouth College in Hanover, New Hampshire, and the Family Medicine Institute in Augusta, Maine. A teleconference was held between central Maine and Raleigh, North Carolina, utilizing the slow scan technology. It was a discussion of slow scan teleconferencing and cost-effective education. The discussion included educators, state officials, and hospital administrators. Other uses are being explored, such as physician recruitment interviewers between Eastport, Maine, and San Diego, California. Interest in slow scan is developing in a number of other smaller hospitals in Maine, but before seriously considering purchase, they are waiting to see results of the Aroostook system demonstration.

Dissemination of information about the Aroostook County slow scan system has begun on an international level as well. Demonstrations of the system have been conducted for leading health professionals from Algeria, Guinea, Gabon, Cape Verde, and Tunisia.

Preliminary plans are being made not only to expand the system in Aroostook County but also to establish other networks in Maine building on cooperative arrangements where they exist. One of the major benefits of slow scan television networks is their ability to be conferenced using dial-up phone lines. The future for slow scan in Maine is very promising but now depends greatly upon the success of the Aroostook County Telecommunications Demonstration.

SUMMARY

In summary, since notification on November 2, 1979, that the project could commence with a revised engineering plan, all objectives have been accomplished on schedule. Some technical problems required cooperative engineering efforts between Medical Care Development and the New England Telephone Company, but have been resolved.

User response has been enthusiastic, and the demonstration phase should prove conclusively that the system is a viable means for improving education, reducing travel, and saving energy and money for the rural participants in Aroostook County.

Evaluation is proceeding as scheduled, including collection of information in the preoperational phase and design of evaluation instruments for the demonstration phase.

Organizational arrangements have been completed, a policy board is formed, a liaison committee has also been formed with the policy board of the central Maine system, and institutional participation in the management of the system is assured.

The project is at a critical stage. If support for the demonstration phase cannot be secured because of federal budgeting cutbacks, the system will almost certainly fail. The initial investment has been made, and the benefits can now be demonstrated. If the demonstration phase is carried out, it will almost certainly succeed and receive necessary local financial support and user participation.

EXHIBITS

EXHIBIT 1

DESCRIPTION OF MAINE

GEOGRAPHY:

Maine is New England's largest state with an area of 33,215 square miles. Its area is almost equal to that of the five other New England states combined. Maine's shoreline is the longest on the East Coast extending approximately 3,500 miles and supporting 1,200 islands on the Atlantic Ocean. Eighty-four percent of Maine's inland area is forested, giving Maine the largest ratio of forested land in the United States. Approximately 50% of that land is wilderness territory. With 2,500 lakes and 5,000 streams, the inland waterways take up seven percent of the inland area while the remaining nine percent of the land supports the municipalities and the residential, agricultural, and industrial areas.

The state is divided into 16 counties. The northernmost county, Aroostook, has an area so large (6,453 square miles) that it actually covers an area greater than the size of Connecticut and Rhode Island combined. Aroostook County is isolated from the rest of the state by a 150-mile stretch of woods. Sagadahoc, the smallest county, is located on the mid-coast. (Maine Almanac, 1978-1979).

CLIMATE:

Climatic conditions vary throughout Maine. Temperature and weather conditions vary markedly from the coastal to the inland areas--often with complete changes in the weather pattern within ten miles of the ocean. Penetrating fog along the coast causes hazardous driving conditions. These conditions are just as poor during the winter when Maine's highways and rural roads are besieged by heavy snows and freezing rains. While the average annual snowfall in the northern zone is approximately seven feet, the coastal zone witnesses about five feet of snow annually. Winter is a long season in Maine with freezing weather beginning in November and snowfall frequently continuing into April.

TRANSPORTATION:

Transportation problems are a major deterrent to attaining medical care. The thickest population density exists along the major Interstate Highway, I-95, which provides the greatest access to health care in Maine. In many areas of the state, residents must travel up to 45 miles to the closest medical facility on winding, secondary roads that are often in poor condition and extremely treacherous in winter.

An even greater problem exists for those individuals who do not own private automobiles. With no passenger rail service and limited bus and air transportation, an automobile is essential to Maine living, yet there are 25% more licensed drivers than cars in Maine. The state also has fewer automobiles than any of the other New England states, only about one-half the number of cars as there are people (United States Department of Commerce, 1980). In areas in the northwest part of the state and in central Washington County, residents can obtain little or no service from public bus systems. Even Maine's largest cities have only limited bus service. Some attempts have been made to provide bus service by the state and through local community action programs. For instance, special interest groups such as senior citizens and the handicapped have obtained buses from the Department of Transportation which must offer free service to their riders.

The coastal area offers one of the most severe transportation problems. The many peninsulas that line the vast coastline consist of tiny villages requiring a drive of up to 40 miles in order to reach hospitals and other facilities. Transportation to and from nearby islands is limited to private boating and public toll ferries. Emergency travel is a serious problem in this area. Since no major roads extend into the peninsulas, these communities are not adequately equipped in case of an emergency. Along the inland waterways, residents may be located directly across a river from a medical facility, yet a drive of up to 60 miles may be required to reach it due to sparsely located bridges (State Health Information Project, 1976). The most serious problem exists north of Portland to the Canadian border, where a large percentage of senior citizens often have no independent means of transportation.

POPULATION:

Maine has a total population of 1,123,560 according to 1980 figures. The population has remained steady over the years with only small increases. The distribution of residents is sparse with approximately 70% of the population living in rural communities of under 10,000 people. Piscataquis County (80% of which is wilderness territory) has the smallest population density with four people per square mile, while densely populated Cumberland County has 219 people per square mile. Maine's average of 34 people per square mile is considerably less than the national average of 62 people per square mile (Maine State Planning Office, 1980; Maine Almanac, 1978-1979; United States Department of Commerce, 1980).

Another serious burden on the state's health care system is the care of its elderly citizens. The elderly generally require more health services than do younger people. Presently, approximately 12% of Maine's population is age 65 or over which is about equal to the 1979 national level of 11%. In some rural communities, such as Deer Isle, the figure is as high as 20% (Maine Department of Human Services, 1979a; United States Department of Commerce, 1980).

EXHIBIT 1

EDUCATION:

In 1976, 14% of the persons 18 years old and over in Maine completed only eight years of school which equals the national figure. In this same age group, 39% completed high school in Maine, comparable to the United States rate of 36%, and 14% completed college for both Maine and the United States (United States Department of Commerce, 1980).

ECONOMICS:

Maine's leading industries are forestry, fisheries, agriculture, textiles, and food processing, a great many of which are seasonal, causing high unemployment in coastal and agricultural areas. The average annual unemployment rate in 1979 for Maine was 7.2% as compared to the United States rate of 5.8%. At 13.8%, Waldo County has the highest level of unemployment in the state. These figures may be underestimated since many of Maine's residents are self-employed in such fields as fishing and agriculture and these occupations are not included in unemployment rates (United States Department of Commerce, 1980; Maine Department of Manpower Affairs, 1981).

High unemployment combined with the existing low income level result in an area characterized by poverty. In 1979 this state claimed 9% of New England's population, yet its residents' per capita income of $7,057 was 20% below the New England level of $8,816 and 19% below the national figure of $8,706. Maine's 12% of persons with incomes below the poverty level is comparable to the national level of 11% (United States Department of Commerce, 1980). This figure, however, is not representative of the severe poverty that exists in certain areas. For instance, in 1978 the poverty rates in Washington and Aroostook Counties were 20% and 18%, respectively (Maine Department of Human Services, 1979a).

HEALTH STATUS:

In 1978 Maine's mortality rates for heart disease, cancer, arteriosclerosis, and pneumonia were among the highest in the nation. Maine's rate for heart disease ranks ninth in the United States, and deaths from cancer and arteriosclerosis rank eighth and fourteenth, respectively. Pneumonia ranks fifteenth (United States Department of Commerce, 1980). Cancer rates in Maine are consistently higher than the United States average. Age-adjusted death rates for all cancers in Maine and the United States from 1950 through 1978 show large differences, indicating that Maine residents are at a higher risk for this disease.

A number of occupations in Maine such as lumbering, fishing, and agriculture necessitate constant exposure to the harsh climate of this northern, coastal state. Lumbering, particularly, has one of the highest accident rates of any Maine occupation (Maine

Department of Manpower Affairs, 1979). Farmers and fishermen are self-employed and are consequently not provided with health insurance benefits. All of these factors, combined with isolation from resources, serve to decrease the health status of Maine's citizens.

HEALTH SERVICES:

A Carnegie Commission study has indicated that the primary problem in the supply of physician manpower is maldistribution (Carnegie Council on Policy Studies in Higher Education, 1976). This has been supported by other studies (United States Department of Health, Education, and Welfare, 1978; Chamberlin and Sturmthal, 1976). Unequal distribution of physicians is clearly a serious problem in Maine. The most populous county, Cumberland, has one physician for every 487 persons, while more rural areas such as Waldo County have up to one for every 1,860 persons. In some isolated areas, however, this ratio increases to 1:10,000, if federally funded physicians are discounted (Maine Department of Human Services, 1979a and b).

Physicians now living in rural areas are reaching retirement age at a much higher rate than younger doctors are replacing them. According to one study, the average age of Maine primary care physicians is 52, five years older than the national average (True et al., 1976). Presently, about 17% of Maine's primary care physicians are 65 and over, and one-third of all Maine physicians are 55 or older (Maine Department of Human Services, 1979a).

The New England College of Osteopathic Medicine accepted its first class in the fall of 1978, but until this time Maine had been one of six states without a medical school, and there has been a well documented family physician shortage. In recent years, six family practice residency training programs have been established in southern, central, and northern Maine. A number of those completing their residency training have already entered practice in physician-poor regions, providing a foundation for improved care to citizens in rural Maine.

New models of health care delivery are being developed in many sparsely populated areas of Maine. Approximately 30 ambulatory care centers have now been established in rural Maine by a number of communities and agencies. These centers involve the use of existing manpower and mid-level health practitioners such as physician assistants and nurse practitioners.

EXHIBIT 1

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EXHIBIT 2

DESCRIPTION OF AROOSTOOK COUNTY

GEOGRAPHY:

Maine's Aroostook County is the largest county east of the Mississippi River covering an area of 6,453 square miles or 4,138,309 acres (Maine Register, 1977-1978, 1978), which is more area than the states of Connecticut and Rhode Island combined. Located in the northernmost part of the State, Aroostook is bordered on the northwest and east by the Canadian provinces of Quebec and New Brunswick. Fifty-nine percent of the land area is classified by the State as unorganized and wilderness (Maine State Planning Office, 1970). The area is separated from the rest of the State by a 150-mile stretch of woodland. The terrain varies from gently rolling hills in the southeastern section to a mountainous Upland Region, part of the Appalachian chain.

CLIMATE:

Climatic conditions in Aroostook County are as varied as the terrain, but winters are characteristically long and snowbound. The snow may commence as early as October and remain on the ground until May, reaching a depth of 90 to 110 inches (Brunelle, 1978).

TRANSPORTATION:

Interstate Route 95 is the major link between Aroostook County and the closest commercial center, Bangor, 120 miles away. Most routes are winding, secondary roads which are often in poor condition and treacherous in winter. There is air transportation available to several points in the county as well as bus service. The area is served by the Bangor & Aroostook Railway which has discontinued its passenger service (Maine Register, 1977-1978, 1978).

POPULATION:

The 1976 population estimate for Aroostook County is 97,570 which averages 14.7 persons per square mile, considerably less than the Statewide and national averages of 32 and 56 persons per square mile, respectively (Bureau of Research and Vital Records, 1978).

ECONOMY:

The leading industries in Aroostook County are forestry and agriculture. The unemployment rate is 10.5% which compares unfavorably with the Maine average of 8.0% and the national average of 6.0% (Maine Department of Manpower Affairs, 1977). The percentage of persons with incomes below the poverty level in Aroostook County was 19.5% in 1970 which reflects a severe problem in that area. Maine's average was just over 13% which was also comparable to the national level (Bureau of the Census, 1977).

EXHIBIT 2

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EXHIBIT 3

NORTHERN MAINE RAISE

Northern Maine RAISE (Regional Approach to In-Service Education) is a community-based organization whose purpose is to develop and coordinate in-service educational opportunities for health care personnel in Aroostook County that will upgrade employee skills and result in improved patient care services. RAISE provides guidance and supervision to individual institutional programs, seeks appropriate resources for new programs, and serves a coordinator/consultant function for in-service education for participating institutions.

Northern Maine RAISE formally started operations in the fall of 1973, funded by area hospitals and Maine's Regional Medical Program. RAISE was established as an operational project of Research and Education Trust of the Maine Hospital Association, a nonprofit corporation whose primary mission is to encourage research in Maine health affairs and to develop educational programming for Maine health care personnel.

At the end of the grant period, RAISE continued with sole funding from the seven hospitals in Aroostook County with a reduced budget, organizational revisions, and a framework that could respond to change. At the present time RAISE is responding to the challenges of providing an ongoing, viable mechanism to respond to the educational needs of health care personnel in Aroostook County.

On an operational level, the RAISE Management Committee, consisting primarily of the seven hospital administrators, provides direction and establishes goals. The daily operations are delegated to the Director of Training who reports to the Senior Vice President of the Maine Hospital Association. In each of the participating institutions, a RAISE associate is appointed by the hospital administrator to assist with RAISE activities.

RAISE either convenes or is involved with the following groups:

--Hospital Administrators
--In-Service Coordinators
--Directors of Nursing
--Personnel Directors
--Physical Therapists
--Medical Records Personnel
--Discharge Planners
--Patient Care Coordinators
--Social Workers
--Dietary Department Heads
--Housekeeping Department Heads
--Maintenance Department Heads
--Central Service Department Heads

EXHIBIT 3

In addition, RAISE will be convening the following groups in the fall:

--Radiologists
--Pharmacists
--Emergency Room Nurses
--Operating Room Nurses
--Business Office Personnel
--Laboratory Technicians
--Switchboard Operators

EXHIBIT 4

AFFILIATION AGREEMENT

CENTRAL MAINE INTERACTIVE TELECOMMUNICATIONS SYSTEM

Agreement made this day of , 1979 by and between Medical Care Development, Inc. (hereinafter "MCD"), Augusta General Hospital (hereinafter "AGH"), Central Maine Medical Center (hereinafter "CMMC"), Mid-Maine Medical Center (hereinafter "MMMC"), and St. Mary's General Hospital (hereinafter "SMGH").

WHEREAS, the parties are involved in a communications project known as the Central Maine Interactive Telecommunications System (hereinafter "CMITS"), started under a Veterans Administration grant covering the period of January 17, 1975 to November 16, 1978, and

WHEREAS, the parties wish to see the CMITS continued;

NOW, THEREFORE, the parties agree as follows:

1. AGH, CMMC, MMMC, SMGH, and MCD on behalf of the Central Maine Family Practice Residency (hereinafter "CMFPR") (hereinafter collectively referred to as "Participants," and, where so referred to, their obligations shall be joint and several) agree to operate the CMITS in accordance with the directives of the Policy Control Board (defined in Paragraph 9).

2. The Participants agree that MCD shall be the coordinating agency responsible for the overall administration of the CMITS and MCD agrees to make the system available for use to the Participants, as directed by the Policy Control Board. The Participants, acting through the Policy Control Board, will cause to be hired by MCD the central staff for the System subject to the mutual agreement of the Policy Control Board and MCD and subject to the availability of funds set forth below.

3. MCD agrees to receive monies as set forth in Paragraph 11 from the other Participants and to contribute monies on behalf of the CMFPR and to distribute said sums, as directed by the Policy Control Board, to appropriate agencies and personnel as necessary to achieve the goals of the project as defined by the Policy Control Board.

4. This Agreement shall be effective for the period commencing November 17, 1978, through December 31, 1979, and indefinitely thereafter, and shall be terminable at the end of the initial period or at the end of any calendar year thereafter.

Notice of termination shall be given at least four (4) months prior to the date upon which such termination is to be effective. If any party gives said notice of termination, then every other party of this Agreement shall have a notice period of thirty (30) days to notify the other remaining parties whether it intends to terminate its participation in the CMITS. A thirty (30) day notice period will follow each notice to terminate by any of the parties until there are no further notices of intent to terminate the participation.

5. If MCD shall fail to receive sufficient funds from the Participants or other sources to operate the project as planned, then MCD shall notify Participants of the amount of funds available, shall specify to the Participants what MCD expects to accomplish with the funds available, and under the guidance of the Policy Control Board, will operate the project as feasible within prevailing financial restrictions.

6. Participants agree to administer this Agreement in accordance with the terms of the Agreement. In the event any Participant fails to administer this Agreement as aforesaid, the Participant shall be given thirty (30) days to correct such failure following written notice by the Policy Control Board specifying such failure. If at the end of the thirty (30) day period said Participant has not corrected such failure to the satisfaction of the Policy Control Board, said Participant shall be deemed to have breached this contract. In the event of such breach, said Participant shall not be entitled to any further benefit from the CMITS' service.

7. If this contract terminates prior to the end of the term of this Agreement, all obligations of the parties to provide monies shall be prorated based on obligations incurred during the term of this Agreement.

8. Disbursements from the account MCD administers will be made upon receipt of itemized statements from the Project Director on behalf of the Policy Control Board, or other evidence showing expenditures or obligations for payroll and other costs incurred. The Policy Control Board will receive quarterly expenditure reports showing the status of the account.

9. The parties agree that a Policy Control Board for the CMITS shall be formed and maintained for the general purposes of formulating operational policies, supervising operations, and evaluating CMITS performance. The composition of the Policy Control Board, its responsibilities, and procedures for its operation shall be in accordance with Attachment 1. Attachment 1 may be amended from time to time by the mutual written consent of the parties to this Agreement.

10. When the budget for each program year has been approved by the Policy Control Board, each party to this Agreement shall approve the budget by initialing a copy

thereof and the party's obligations pursuant to the terms of this Agreement shall be in accordance with the approved budget.

11. Subject to the approval of each Participant, each Participant agrees to contribute monies as its share of the cost of the CMITS. Said contributions shall be made in accordance with each Participant's written statement as to the preferred billing periods, with any monies unspent at the end of each year carried forward to reduce the subsequent year's contribution.

12. During the term of this Agreement, each Participant institution shall cause the equipment described in Attachment 2, which is located within that institution, to be insured in the name of MCD and the particular institution where the equipment is located and maintained as per Attachment 2. Title to all equipment shall remain with MCD.

13. Participants agree that they will cause equipment purchased with funds furnished by MCD pursuant to this Agreement to be identified by attaching to a clearly visible part of said equipment a tag or label which states that the equipment was purchased with funds from MCD and is owned by MCD, will prepare and retain records of such identification, and will make the records and equipment available for inspection by MCD, the applicable funding agency, or the Policy Control Board. Participants shall release to MCD any and all grant purchased equipment at the termination of this Agreement, except as provided below, or when requested or identified in writing by MCD, within thirty (30) days of such request and identification. Upon the termination of this Agreement, if MCD secures approval of the Veterans Administration, or applicable funding agency, MCD may transfer ownership of any or all the equipment to the Participants.

14. Each Participant, excepting MCD, shall seek to best utilize the CMITS by assigning, either in whole or in part, personnel to assist in the operation of the CMITS within each Participant's facility. Each Participant shall supply support services for the aforementioned representatives as recommended by the Policy Control Board.

15. Participants agree not to publish or cause to have published any material, exclusive of public relations material, arising from the result of its activities under this Agreement without acknowledging that the project was initiated under a grant from the Verterans Administration (or other applicable fundor) and indicating that the findings and conclusions do not necessarily represent the views of the Veterans Administration (or applicable funding agency) and MCD.

EXHIBIT 4

6. Participants agree to comply with the following federal legislation, rules, and policies:

(a) Section 601 of Title VI of the Civil Rights Act of 1964.

(b) Rules and policies relating to the institutional assurances involving human subjects and the Health Services and Mental Health Administration policies concerning research involving human subjects.

(c) Laws relating to the wages of laborers or mechanics.

EXHIBIT 4

SIGNED, SEALED AND DELIVERED
in the presence of:

_____

MEDICAL CARE DEVELOPMENT, INC.

By: _____
Manu Chatterjee, M.D.
Executive Director
Duly Authorized Agent for
Medical Care Development,
Inc.

AUGUSTA GENERAL HOSPITAL

_____

BY: _____

CENTRAL MAINE MEDICAL CENTER

_____

By: _____

MID-MAINE MEDICAL CENTER

_____

By: _____

ST. MARY'S GENERAL HOSPITAL

_____

By: _____

EXHIBIT 4

ATTACHMENT 1

POLICY CONTROL BOARD AND STANDING COMMITTEES OF THE CENTRAL MAINE INTERACTIVE TELECOMMUNICATIONS SYSTEM

1. In accordance with the terms of the Affiliation Agreement dated ; among the institutions participating in the Central Maine Interactive Telecommunications System, there shall be formed a committee to oversee the operation of the System to be known as the Policy Control Board.

2. The Policy Control Board of the Central Maine Interactive Telecommunications System shall be composed of a representative designated by the Board of Trustees of each of the following institutions: Augusta General Hospital, Central Maine Medical Center, Medical Care Development, Inc., Mid-Maine Medical Center, St. Mary's General Hospital; and by the U.S. Veterans Administration Medical and Regional Office Center at Togus, the University of Maine at Augusta, and the Central Maine Family Practice Residency Program. The members of the Policy Control Board so designated shall serve at the pleasure of the institution represented.

3. The institutions party to the Affiliation Agreement acknowledge that the Policy Control Board shall have primary accountability for the Central Maine Interactive Telecommunications System and shall develop the purposes and goals of the System, formulate its operational policies, oversee its operation, and evaluate the System's performance.

4. The Policy Control Board shall appoint a director of the Central Maine Interactive Telecommunications System who shall have the direct responsibility for all phases of the System's operation.

5. Responsibilities of the Policy Control Board which it delegates or directs to the director shall be the following:

(a) To make administrative and operational decisions. Any major change in activities which might affect the performance of the System must be reviewed and approved by the Policy Control Board.

(b) To approve all major expenditures, but to refer to the Policy Control Board for approval, purchases costing over $1,000 per item or the hiring of additional personnel not otherwise provided for in an approved budget.

(c) To prepare the annual Central Maine Interactive Telecommunications System budget for the approval by the Policy Control Board.

(d) To determine compensation of part-time staff.

(e) To recommend to the Policy Control Board the employment of professional staff persons.

(f) To prepare the annual and quarterly reports of the Central Maine Interactive Telecommunications System and submit this report to the Policy Control Board for approval and submission to Medical Care Development, Inc.

(g) To determine and recommend to the Policy Control Board personnel policies and salary ranges for positions or persons who are substantially employed by the Central Maine Interactive Telecommunications System.

6. A quorum of the representative members shall be necessary for the conduct of business by the Board. A quorum will be a simple majority of the members as long as said majority is continually present at said meeting.

7. Each member of the Policy Control Board shall be entitled to one (1) vote. Unless otherwise specified herein, the simple majority of those voting shall determine a question before the Board.

8. The Chairman of the Policy Control Board shall be elected from among the institutional representatives for a one (1) year term with the right to vote and no person shall serve more than two (2) consecutive terms as chairman. In absence of the chairman, the director shall act as chairman pro tempore.

9. Notice of all meetings, starting time, place, and agenda shall be given to each Policy Control Board member at least five (5) days preceding the date of the meeting.

10. The director of the Central Maine Interactive Telecommunications System shall be a member of the Policy Control Board ex officio without vote.

11. Standing committees of the Policy Control Board shall be formed to consider and act upon matters delegated by the Policy Control Board in areas of concern with which the committees are respectively charged.

12. Members on the committees shall be appointed by their institutions, with the chairman to be selected by the chairman of the Policy Control Board from among the Board members. Additional members without vote may be appointed to any committee by a majority of that committee.

13. Committees shall meet subject to reasonable notice and call by their respective chairmen or the director. A subcommittee is free to invite to committee deliberations an expert whom he or she selects to participate in the matter before that committee. Moreover, the member may ad hoc grant to such expert his or her proxy. A majority of those present at a duly constituted meeting will be sufficient to determine any question before the committee. A quorum for any committee meeting shall be a simple majority of the members of that committee and their proxies.

14. Each standing committee chairman shall serve for one (1) year and may not serve more than two (2) successive terms as chairman.

15. Standing committees may not take action on issues within their respective functions unless the Policy Control Board specifically delegates action to that committee. Otherwise their function is to recommend and the recommendations shall be brought to the Policy Control Board for action.

16. Issues of scope which extend beyond the responsibilities of any one standing committee will be referred to additional appropriate committees. The chairman of the Policy Control Board or the director will refer to any committee issues for the committee to consider.

17. The director shall be a member of all standing committees, ex officio without vote. In addition to other functions, he will serve as principal liaison between the committees, the full Board, and the System.

18. Upon reasonable notice, special meetings of the full Policy Control Board may be called by the chairman, or in his absence, by the director. Special meetings shall also be called by the chairman upon request of a majority vote of any committee.

19. Minutes shall be recorded of all Policy Control Board meetings and standing committees and these will be distributed in a timely fashion following such meetings.

20. The Policy Control Board shall adjudicate grievances and conflicts among program participants.

21. The Policy Control Board may require annual audit of all financial operations relating to the Central Maine Interactive Telecommunications System.

22. The full Policy Control Board shall meet at least every other month of the year, usually on the second Wednesday.

23. The Policy Control Board shall approve any changes that may be required from time to time in the Affiliation Agreement.

24. This document will be placed in effect within thirty (30) days after approval by Medical Care Development, Inc.

25. To the extent that the responsibilities of the Policy Control Board overlap or conflict with those of the Board of Directors of Medical Care Development, Inc., the Board of Directors of Medical Care Development, Inc. shall have final authority.

26. The functions of the Financial Subcommittee shall include, but not be limited to, the following:

(a) To advise the Policy Control Board regarding the relationships among the participating institutions in any matter relating to or affecting finances.

(b) To work with the director in the development of the annual Central Maine Interactive Telecommunications System budget and to recommend the budget to the Policy Control Board.

(c) To study and recommend to the Policy Control Board any formula for cost allocation and distribution.

(d) To review monthly operating statements.

(e) To review and forward to the Policy Control Board the annual audit of the System's fiscal year.

(f) To advise the Policy Control Board regarding the proper distribution of income generated from programs, production, graphics, and other media-related services rendered by the Central Maine Interactive Telecommunications System staff.

(g) To provide advice to the Central Maine Interactive Telecommunications System staff on efforts directed at obtaining additional funds for the System.

EXHIBIT 4

ATTACHMENT 2

PARTICIPANT RESPONSIBILITIES FOR

STUDIO TERMINAL EQUIPMENT

1. To provide insurance coverage of the studio terminal equipment consisting of the console, interconnecting cables, enclosed electronics, color monitor, remote control camera, and, where applicable, viewfinder camera and associated tripod. Insurance should provide a minimum of fire, vandalism, and theft coverage at equipment replacement value.

2. To reimburse the Project Office for the replacement and/or repair of equipment abused or not properly maintained, to include but not be limited to:

(a) Damage to photosensitive components upon exposure to direct sunlight or other extremely high intensity light sources.

(b) Sudden impact to microphones, cameras, or lighting instruments.

(c) Improper operation of equipment at levels or in a manner which exceeds design limitations.

(d) Inadequate cleaning of video cassette heads, where applicable.

(e) Severing of cables leading to and emanating from studio terminal console and cameras, including all cables connecting the console to the microwave transmitter.

3. To replace image pickup devices, picture tubes, video tape recorder heads, lighting elements, and video tape (where applicable) when not covered by warranty. Replacement and repair costs will include charges for all necessary labor and parts.

4. No CMITS equipment is to be serviced by any agent other than the authorized maintenance representative, except where the media specialist is assigned certain maintenance tasks by the Project Office and/or maintenance representative.

5. No CMITS equipment is to be modified without prior authorization from the Project Office.

6. To provide the maintenance contractor and/or Project personnel the rights of ingress, egress, and uninterrupted access to System equipment at reasonable times during normal working hours and/or with advance notice from the contractor at all other times during performance hereunder.

EXHIBIT 5

SLOW SCAN TV OPERATING INSTRUCTIONS

SETTING UP:

TURN ON WHITE "POWER" SWITCH. TURN "VOLUME" NOB SO THAT THE NOB AND CONSOLE MARKS MATCH. THE "VOLUME" LEVEL MAY BE CHANGED, IF DESIRED, ONCE INITIAL CONTACT HAS BEEN MADE. PLUG IN MICROPHONE LOCATED INSIDE BACK DOOR. MICROPHONE CORDS ARE LOCATED IN BOTTOM DRAWER.

TALKING:

SPEAK INTO A MICROPHONE WHILE DEPRESSING THE SWITCH ON THE MICROPHONE STAND.

RECEIVING A PICTURE:

SET THE "SPEED" SWITCH ON THE REMOTE CONTROL BOX TO 8, 17, OR 35 SECONDS, DEPENDING ON THE RATE AT WHICH THE PICTURE IS TO BE SENT. THE SENDER DETERMINES THE SPEED DEPENDING ON THE CLARITY OF PICTURE NEEDED--35 SECONDS GIVES YOU THE GREATEST CLARITY, 8 SECONDS THE LEAST.

POSITIONING CAMERA:

PRESS THE WHITE "CAMERA" BUTTON ON THE SIDE OF THE REMOTE CONTROL BOX. USE THE CAMERA FUNCTION CONTROLS TO MOVE THE CAMERA, UP, DOWN, LEFT, RIGHT, OR FOCUS. THE "IRIS" CONTROL ON THE END OF THE REMOTE CONTROL BOX IS USED TO VARY THE OPENING OF THE LENS. THIS IS USED TO HELP CONTROL THE LIGHTING AND IS USUALLY KEPT OPEN.

"FREEZING" A FRAME FOR SENDING:

SET THE DESIRED SPEED ON THE REMOTE CONTROL BOX AND PRESS THE RED "PICTURE SELECT" BUTTON. THE PICTURE WILL CHANGE TO THE "LIVE" IMAGE WHILE THE BUTTON REMAINS DEPRESSED. ONCE THE DESIRED PICTURE IS FOUND, RELEASE THE "PICTURE SELECT" BUTTON. THE "FROZEN" PICTURE WILL REMAIN ON THE TV SCREEN UNTIL REPLACED BY THE PROCEDURE JUST DESCRIBED OR BY SOMEONE AT ANOTHER LOCATION SENDING A PICTURE.

SENDING A PICTURE:

INDICATE THE SPEED SO THAT THOSE AT OTHER LOCATIONS CAN SET THEIR CONTROLS TO RECEIVE THE PICTURE AT THE SAME RATE. WHEN READY, PRESS THE RECTANGULAR "SEND" BUTTON ON THE REMOTE CONTROL BOX. IT WILL LIGHT UP AND REMAIN LIT WHILE THE PICTURE IS BEING SENT TO THE OTHER LOCATIONS.

SEE OTHER SIDE FOR ABBREVIATED INSTRUCTIONS

EXHIBIT 5

ABBREVIATED SLOW SCAN INSTRUCTIONS

I. TURN ON POWER SWITCH.

II. CONNECT MICROPHONES.

III. TURN UP VOLUME.

IV. PUSH BUTTON ON MIKE STAND WHILE TALKING.

V. PUSH WHITE "CAMERA" BUTTON WHEN ADJUSTING OWN PICTURE.

VI. SELECT "SPEED" FOR RECEIVING OR SENDING PICTURES.

VII. PUSH RED "PICTURE SELECT" BUTTON FOR FINAL ADJUSTMENT OF OWN PICTURE. RELEASE TO SELECT STILL PICTURE.

VIII. PUSH WHITE "SEND" BUTTON FOR SENDING THE STILL IMAGE CHOSEN WITH THE RED "PICTURE SELECT" BUTTON.

SEE OTHER SIDE FOR DETAILED INSTRUCTIONS

TROUBLE-SHOOTING GUIDE

PROBLEM	POSSIBLE CAUSE	REMEDY
NO POWER	-plug not in wall	plug it in
	-switch not in right position	push switch correctly
CAN'T HEAR	-volume level too low	turn up volume control
CAN'T BE HEARD	-not pushing button on mike stand while talking	push button while talking
	-microphone not plugged into front of console	plug it in
NO PICTURE		
From Other Location	-brightness control too low on set	adjust to suit
	-no picture sent	inquire of other locations
At Your Location	-iris control closed	open iris
	-picture not chosen	follow "Freezing" a Frame of operating instructions
PICTURE BUILDING IMPROPERLY	-speed sent not same as speed received	check speed before sending and coordinate with others

EXHIBIT 5

Examples of
Rate Mismatches

Sending Speed 8 secs.
Receiving Speed 35 secs.

Sending Speed 17 secs.
Receiving Speed 35 secs.

Sending Speed Faster
Then Receiving Speed

GRAPHICS GUIDE

TV TYPEWRITER GRAPHICS GUIDE

1. 20-25 characters per line (pica)
2. 5 lines per frame
3. Double space between lines
4. 3" x 4" horizontal format

EXHIBIT 5

-50-

TV 3/16 TV 1/8 TV1/4 **TV-3/4**

EXHIBIT 6

SUMMARY OF PRE-SYSTEM QUESTIONNAIRES FOR AROOSTOOK SLOW SCAN DEMONSTRATION

NUMBER OF QUESTIONNAIRES RECEIVED:

Physicians	17	10%
Nurses	73	45%
Staff	74	45%
AMHC	24	15%
CMC	23	14%
NMMC	49	30%
GMH	48	29%
HRH	20	12%
TOTAL	164	

How dependent are you upon inhouse programs to provide you with continuing educational opportunities?

Highly Dependent	29%
Somewhat Dependent	36%
Somewhat Independent	18%
Highly Independent	17%

How satisfied were you with -- relevance of programs to my needs -- in the educational programs at your institution in the past year?

Highly Satisfied	14%
Moderately Satisfied	63%
Moderately Dissatisfied	16%
Highly Dissatisfied	7%

How useful do you think slow scan television can be to others in this institution?

Highly Useful	39%
Somewhat Useful	34%
No Idea	27%

How useful do you think slow scan television can be to you professionally?

Highly Useful	31%
Somewhat Useful	45%
No Idea	24%

EXHIBIT 6

What types of remarks have you read or heard about the use of slow scan TV for reducing the costs of travel?

Highly Favorable	68%
Moderately Favorable	29%
Moderately Unfavorable	3%

What types of remarks have you read or heard about the use of slow scan TV for improving the quality of communication?

Highly Favorable	45%
Moderately Favorable	52%
Moderately Unfavorable	3%

What types of remarks have you read or heard about the use of slow scan TV for sharing educational resources among institutions?

Highly Favorable	61%
Moderately Favorable	39%

Please rank (1,2,3) the three most important elements in evaluating the use of slow scan television.

Cost	1	20%
	2	15%
	3	63%
Quality of continuing education programs for physicians	1	56%
	2	24%
	3	20%
Quality of in-service education programs for nurses and staff	1	55%
	2	39%
	3	6%
User acceptance and satisfaction	1	23%
	2	49%
	3	28%

How long have you worked in this institution?

1 year	14%
2 years	16%
3 years	18%
4 years	11%
5 years	8%
	67%

EXHIBIT 6

How would you expect the following to be affected as a result of this slow scan television system?

EFFECT OF SYSTEM	Increase Substantially	Increase a Little	Stay the Same	Decrease a Little	Decrease Substantially
The cost of medical care for this institution as a whole	7%	34%	47%	9%	3%
Total work for you	4%	48%	42%	6%	
Number of educational opportunities open to you	49%	39%	12%		
Number of educational opportunities open to others	59%	34%	7%		
Total quality of your annual continuing education programs	48%	39%	13%		
Total quality of educational programs for others	51%	42%	7%		
Your travel	9%	10%	39%	25%	17%
Convenience to you	40%	25%	23%	11%	1%
Communications with colleagues in other institutions	42%	41%	15%	2%	
Quality of patient care	38%	48%	14%		

EXHIBIT 7

PROGRAMS SCHEDULED IN AROOSTOOK COUNTY

July 9, 1980
- CMITS/ACTS Liaison Committee Meeting

July 29
- ACTS Policy Control Board Meeting

August 6
- DHS Family and Childrens' Services Council Meeting
- Maine Association of Hospital Pharmacists Executive Committee Meeting

August 11
- Operating Room Head Nurses' Meeting
- Methods of Social Work Practice IV: Skills for Serving the Aged at Home - Elder Abuse: Victimization of the Elderly. Ms. Elaine Walsh, M.S.W., of the Family Victimization Service, Inc., NY
- Orientation for MSHP & Executive Committee Meeting

August 13
- Association of OR Nurses Meeting

August 14
- Advisory Council Library Meeting
- Maine Association of Hospital Pharmacists Executive Committee Meeting

August 20
- OR/PAR Meeting

September 3
- DHS Family and Childrens' Services Council Meeting

September 10
- Operating Room Head Nurses' Meeting

September 17
- HSLIC Executive Board Meeting

September 25
- Secretarial Skills: Communications - Part II. Wendy Webster, R.N., Continuing Education Instructor, CMMC

October 1
- DHS Family and Childrens' Services Council Meeting

October 2
- Secretarial Skills: Communications - Part III. Wendy Webster, R.N., Continuing Education Instructor, CMMC

October 3
- Calcium Antagonism in Cardiovascular Therapy. Live via satellite from Florence, Italy. Participants: Italian Cardiologist Attilio Masari, M.D.; British Cardiologist Dennis Krikler, M.D.; and Douglas Rosing, M.D., Department of Cardiology, National Institutes of Health
- Dermatologic Problems in Infancy. Daniel Clarke, M.D., Dermatologist, KVMC

October 7
- Infectious Disease Rounds - Case Presentations. Michael C. Bach, M.D., SMGH

October 10
- Use of SSTV Demonstration
- Social Work Services Directors' Meeting

October 16
- Carcinoma of Prostate. Earle M. Davis, M.D. and Edward L. Salmon, M.D., Urologists, MMMC - Category I AMA & AAFP Credit

October 17
- Time Management: How to Distribute Your Time Effectively. (Session 1)

October 21
- Feeding the Cancer Patient. Ronni Chernoff, M.S., Ed.M., R.D., and Maurice Shills, M.D., Sc.D. -- a satellite program sponsored by the American Dietetic Association

EXHIBIT 7

October 23, 1980
Professional Standards Review Organization Meeting
October 29
Time Management: Organizing Your Work and Others' Work. (Session 3)
October 31
Time Management: Organizing Your Work and Others' Work. (Session 3)
November 3
Association of OR Nurses of Maine: Lateral Epicondylitis (Tennis Elbow). H. Winston Kipp, M.D., KVMC
November 5
DHS Family and Childrens' Services Council Meeting
November 6
Stress and Distress: Where Are You? Anitra Paterson, R.N., CMMC
Health Promotion Programming Development Committee Meeting
November 7
Time Management: Doing the Distasteful and Difficult. (Session 4)
November 10
FMI Journal Club: New England Journal of Medicine. Presenters: Fay Van Eenwyck, M.D.; Jean Wilbur, M.D.; Kimberly Duir, M.D.; and Ann Dorney, M.D., Residents, MDFPR. Discussers: H. Douglas Collins, M.D., Cary Medical Center and O. Thomas Feagin, M.D., KVMC
November 12
Hospital Pharmacy Journal Club: Lanced. September and October Issues
Operating Room Nurses Meeting
November 14
Time Management: Getting Staff Meetings to Work for You. (Session 5)
Social Work Services Directors' Meeting
Social Work Services - Shared Services Committee Meeting
November 17
Maine Society of Hospital Pharmacists Meeting
November 18
ACTS Policy Control Board Meeting
November 20
Secretarial Skills: Effective English. Deborah Kuritz, Instructor
November 21
Time Management: Filing for Your Own Needs. (Session 6)
November 25
CT Body Scanning. Barry Kutzen, M.D., CMMC - Category I AMA & AAFP Credit
Toxemia - Pre-eclampsia. Kimberly Duir, M.D., Resident, MDFPR with discussion by Herbert Bartholomew, M.D., Obstetrician/Gynecologist, KVMC
November 26
Hospital Pharmacy Journal Club: Drug Intelligence and Clinical Pharmacy. September and October Issues
December 1
Peripheral Vascular Disease: Prevention, Diagnosis and Management. Arthur Naitove, M.D., Associate Professor of Surgery, Dartmouth-Hitchcock Medical Center
Association of OR Nurses of Maine: Current Concepts in Ophthalmic Surgery - Vitrectomy in Radial Keratotomy. Kenneth P. Wolf, M.D., SMGH
December 2
Rehabilitation Program Planning Group Meeting
Developmental Disabilities Planning Project Meeting
December 3
Energy Contingency Planning. Lee Cayer, Director of Plant Operations, CMMC
DHS Family and Childrens' Services Council Meeting

EXHIBIT 7

December 4, 1980

Time Management Style Modification. Guvenc G. Alpander, Director and Professor of Management, College of Business Administration, UMO

Helping Working Women: The National Business and Professional Women's Club. Linda L. H. Barter, 1st Vice-President of the State Federation of BPW; and Carole Souviney, President of the Waterville BPW

Secretarial Skills: Effective English. Deborah Kuritz, Instructor

December 5

Social Work Services - Shared Services Committee Meeting

Teleconferencing in the 80's. (videotape) Appalachian Community Services Network

December 10

Maine Municipal Association: Waste Water Treatment Operators' Meeting

Hospital Pharmacy Journal Club: Drug Therapy. October and November Issues

Maine Association of Hospital Pharmacists

February 11, 1981

Hospital Pharmacy Journal Club: Hospital Formulary. December and January Issues

February 25

COPD Planning Meeting

March 3

Endocrinology. Hugh Johnston, M.D., Maine Medical Center - Category I AMA & AAFP Credit

Infectious Disease Rounds: Multiple Case Presentations

March 4

DHS Family and Childrens' Services Council Meeting

March 5

Assessment of the Malnourished Patient. Satellite broadcast sponsored by The American Dietetic Association

March 6

Management Update Series: Personnel Issues in the 80's. Alicia Kellogg-Hanson, Employment Coordinator, CMMC

March 11

Hospital Pharmacy Journal Club: Drug Intelligence and Clinical Pharmacy. November, December and January Issues

Developmental Disabilities Planning Project Meeting

March 13

Social Work Services Directors' Meeting

March 20

RAISE Associates Meeting

Management Update Series: Leadership Style Effectiveness. Guvenc Alpander, Ph.D., Director and Professor of Management, College of Business Administration, UMO

March 24

Interventional Radiology: Biliary, Vascular. Robert Stram, M.D., Chairman, Department of Radiology, KVMC - Category I AMA & AAFP Credit

March 25

Hospital Pharmacy Journal Club: Drug Therapy. December, January and February Issues

March 27

Organizational and Social Issues Affecting Occupational Health (national resources, benchmark legislation, roles of unions--past and present, etc.) Discussers: Christine Oliver, M.D. and Nancy Sprince, M.D., Co-directors, Occupational Health Clinic, Massachusetts General Hospital, Boston; and Lan Keilson, M.D., Director, Out-Patient Department, MMC

Looking at Occupational Diseases: Medical and Legal Aspects. Discussers: Nancy Sprince, M.D. and Christine Oliver, M.D., Co-directors, Occupational Health Clinic, Massachusetts General Hospital, Boston; and Michael Bedecs, D.O., Clinical Professor of Environmental and Occupational Medicine, New England School of Osteopathic Medicine

Social Work Services Directors' Meeting

EXHIBIT 7

April 1, 1981
DHS Family and Childrens' Services Council Meeting
April 3
Management Update Series: Team Building. Elvin J. Schlegel, Jr., Assistant Administrator, SMGH
April 6
Formulation of Psychodynamics: The Diagnostic Interview. Eli W. Lane, M.D., Senior Attending Psychoanalyst, Northwestern University Institute of Psychiatry. Panel Members: Walter Rohm, M.D., Joseph Sanders, Ph.D., and Robert Reinach, M.D., VA
The Impact of the Compression of the Childhood Years. Eli W. Lane, M.D., Senior Attending Psychoanalyst, Northwestern University Institute of Psychiatry
April 7
Infectious Disease Rounds: Multiple Case Presentations
Developmental Disabilities Planning Project Meeting
April 8
Hospital Pharmacy Journal Club: Annals of Internal Medicine. December, January and February Issues
April 10
Management Update Series: Management by Objectives. Joan Coleman, Assistant to the President, MMMC
April 13
Hospital Administrators Meeting
April 15
Radiation Safety Instruction. Slide presentation and talk by Terry Zipper, CMMC
April 16
Physiatry - Rehabilitation. Paul J. Corcoran, M.D., Tufts University School of Medicine - Category I AMA & AAFP Credit
April 17
Temporal Lobe Epilepsy. Thomas Browne, M.D., Assistant Professor, Neurology, B.U.S.M. and Chief, EEG Lab., Boston VA Hospital - Category I AMA & AAFP Credit
April 22
Hospital Pharmacy Journal Club: I.V. Therapy and Clinical Nutrition. January, February and March Issues
RAISE Finance Subcommittee Meeting
April 24
Nutrition Education: The Compliance Aspect. Cindy Hale, R.D., Nutrition Specialist, Diabetes Control Project, Medical Care Development
Social Work Services Directors' Meeting
April 27
Demonstration for African Visitors
EMS Council Meeting
April 28
Metabolism in Trauma and Stress. Sarah Steele, R.D., Dole Pharmaceutical Company, Minneapolis, Minnesota. (Topic to include 1) Energy and Nitrogen Balance; 2) The Metabolic Response to Trauma; and 3) Nutritional Assessment of the Patient)
Planning Meeting
April 29
Discussion on Cost Effective Education
RAISE Associates Meeting
Topics in Alcoholism: Disease vs Weakness. Frank T. Passini, Ph.D., Chief, Alcohol Dependence Program, VA
April 30
Hospital Administrators Meeting

EXHIBIT 7

May 1, 1981

EMS Council Meeting

Management Update Series: Staffing and Productivity Planning. Don Leaver, Director, Personnel Services, CMMC

May 4

Infectious Disease Rounds: Multiple Case Presentations

May 5

Parenting - Session 1 - Anticipatory Guidance: Developmental Assessment to Six Months. Anita Feins, M.D., The Child Development Unit, Childrens' Medical Center, Bosotn

May 6

DHS Family and Childrens' Services Council Meeting

Topics in Alcoholism: Early Warning Signs. Frank T. Passini, Ph.D., Chief, Alcohol Dependence Program, VA

May 8

Circuit Rider Advisory Committee Meeting

Social Work Services Directors' Meeting

May 12

Circuit Rider Advisory Committee Meeting

May 13

Hospital Pharmacy Journal Club: New England Journal of Medicine. February, March and April Issues

EMT Meeting

Topics in Alcoholism: Levels of Identification - State of Grieving. Frank T. Passini, Ph.D., Chief, Alcohol Dependence Program, VA

May 14

Pediatrics. Murray Feingold, M.D., Tufts University School of Medicine - Category I AMA & AAFP Credit

May 15

Management Update Series: Performance Appraisal. Guvenc Alpander, Ph.D., Director and Professor of Management, College of Business Administration, UMO

May 19

Personnel Directors Meeting

Parenting - Session 2 -- Early Childhood: First Stages Toward Autonomy and Developing Inner Controls. Donald Carey, M.D., Department of Maternal and Child Health, Dartmouth Medical School

Personnel Directors Meeting

May 20

RAISE Associates Meeting

Topics in Alcoholism: Two Theoretical Models. Frank T. Passini, Ph.D., Chief, Alcohol Dependence Program, VA

May 22

Parenting - Session 3 -- Helping Parents of Premature, Sick or Impaired Infants and Infants Who Die. Moderator: Helen M. Mitchell, M.D., MDFPR with panel of area parents

Social Work Services Directors' Meeting

May 27

Diabetes Planning Meeting

Hospital Pharmacy Journal Club: Hospital Formulary. February, March and April Issues

Boston University's Management Development Program for Health Care. Donald S. Simons, Director and Jennifer M. Brown, Assistant Director

Wrap-up to Topics in Alcoholism. Frank T. Passini, Ph.D., Chief, Alcohol Dependence Program, VA

May 28

Advances in Contraception. Russell DeJong, M.D., Obstetrician/Gynecologist, MMMC - Category I AMA & AAFP Credit

EXHIBIT 7

May 28, 1981
University of Maine at Orono's Master's in Business Administration Program. Guvenc G. Alpander, Ph.D., Director and Professor of Management

May 29
Inservice Training Session for PTO Hypertension Control Inpatient Audit
Management Update Series: Communication Styles. Linda Pelletier, R.N., M.C.E.D., Team Leader of Crisis Intervention Workers, SMGH

June 1
Parenting - Session 4 -- The Latent Years: What Goes On? Donald Delaney, M.D. (videotape)

June 2
Infectious Disease Rounds: Multiple Case Presentations

June 3
RAISE Associates Meeting
DHS Family and Childrens' Services Council Meeting

June 4
Nutritional Misinformation and Food Faddism. Johanna T. Dwyer, D.Sc., R.D., Associate Professor of Medicine and Community Health, Tufts Medical School and Victor Herbert, M.D., J.D., Chief of Hematology and Nutrition Laboratory, Bronx VA Medical Center - A satellite broadcast sponsored by The American Dietetic Association

June 5
EMS Council Meeting

June 9
Parenting - Session 5 -- Children with Hyperactivity, Handicaps and/or Learning Problems: The Primary Care Physician's Role. H. Burtt Richardson, M.D. and Kathryn Markochick, Director of Special Ed., Winthrop Schools

June 12
Personnel Meeting
Social Work Services Directors' Meeting

INTERACTIVE TV NEWS

An operational project of
MEDICAL CARE
DEVELOPMENT INC.
295 WATER STREET
AUGUSTA, MAINE 04330
(207) 622-7566

If you have a program suggestion, contact
ANNE NICHOLS
Project Director

CENTRAL MAINE
INTERACTIVE
TELECOMMUNICATIONS
SYSTEM PARTICIPANTS

CENTRAL MAINE
MEDICAL CENTER

KENNEBEC VALLEY
MEDICAL CENTER

MAINE-DARTMOUTH
FAMILY PRACTICE
RESIDENCY

MID-MAINE
MEDICAL CENTER

ST. MARY'S
GENERAL HOSPITAL

VETERANS
ADMINISTRATION
CENTER AT TOGUS

AROOSTOOK COUNTY
ALLOWCANA

AROOSTOOK MENTAL
HEALTH CENTER

CARY MEDICAL
CENTER

GOULD MEMORIAL
HOSPITAL

HOULTON REGIONAL
HOSPITAL

NORTHERN MAINE
MEDICAL CENTER

AROOSTOOK COUNTY INTERACTIVE TELECOMMUNICATIONS SYSTEM PROGRAM SCHEDULE

WEEK OF MAY 18-22, 1981

Tuesday, May 19
12:00N - 1:00P — Parenting - Session 2 -- Early Childhood: First Stages Toward Autonomy and Developing Inner Controls. Donald Carey, M.D., Department of Maternal & Child Health, Dartmouth Medical School (R)

Wednesday, May 20
11:00 - 11:30A — RAISE Associates Meeting (G)
3:00 - 4:00P — Topics in Alcoholism: Two Theoretical Models. Frank T. Passini, Ph.D., Chief, Alcohol Dependence Program, VA (V)

Friday, May 22
12:00N - 1:00P — Parenting - Session 3 -- Helping Parents of Premature, Sick or Impaired Infants and Infants Who Die. Moderator: Helen M. Mitchell, M.D., MDPTR with panel of area parents (R)
2:30 - 3:30P — Social Work Services Directors' Meeting (V)

WEEK OF MAY 25-29, 1981

Wednesday, May 27
11:00 - 12:00N — Diabetes Planning Meeting (G)
12:00N - 1:00P — Hospital Pharmacy Journal Club: Hospital Formulary. February, March and April Issues (CMC)
1:30 - 2:30P — Boston University's Management Development Program for Health Care. Donald R. Simons, Director and Jennifer M. Brown, Assistant Director (R)
3:00 - 4:00P — Wrap-up to Topics in Alcoholism. Frank T. Passini, Ph.D., Chief, Alcohol Dependence Program, VA (V)

Thursday, May 28
1:00 - 1:30P — University of Maine at Orono's Master's in Business Administration Program. Gwenc O. Alpander, Ph.D., Director and Professor of Management (R)

Friday, May 29
10:00A - 12:00N — Inservice Training Session for PTO Hypertension Control Inpatient Audit (MCD)
3:00 - 4:00P — Management Update Series: Communication Styles. Linda Pelletier, R.N., M.C.E.P., Team Leader of Crisis Intervention Workers, SMCH (S)

EXHIBIT 8

-60-

EXHIBIT 9

AROOSTOOK MEDICAL CENTER
ARTHUR R. GOULD MEMORIAL HOSPITAL DIVISION
Presque Isle, Maine

STATISTICAL DATA--1978:

100 Licensed Beds	23,481 Patient Days
3,782 Admissions	24,257 Emergency Room Visits

ACTIVE MEDICAL STAFF: 26

OTHER FULL-TIME STAFF: 237

PART-TIME STAFF: 133

PRINCIPAL COMMUNITIES SERVED BY HOSPITAL:

Ashland	Mars Hill
Blaine	Masardis
Bridgewater	Portage Lake
Castle Hill	Presque Isle
Chapman	Wade
Easton	Washburn
Mapleton	Westfield

SERVICE AREA POPULATION--1979: 26,376

EXHIBIT 9

AROOSTOOK MENTAL HEALTH CENTER
Caribou, Maine

STATISTICAL DATA--1979:

10 Licensed Beds*	1,800 Patient Days
170 Admissions	13,500 Outpatient Visits
	6,250 Community Support
	7,698 School Consultations
	1,200 Audiology
	250 Emergency Services

ACTIVE MEDICAL STAFF: 2

OTHER FULL-TIME STAFF: 100

PART-TIME STAFF: 6

PRINCIPAL COMMUNITIES SERVED BY CENTER:

All of Aroostook County

SERVICE AREA POPULATION--1979: 100,000

*Located at Community General Hospital in Fort Fairfield.

EXHIBIT 9

CARY MEDICAL CENTER
Caribou, Maine

STATISTICAL DATA--1978:

65 Licensed Beds	21,333 Patient Days
3,514 Admissions	14,527 Emergency Room Visits

ACTIVE MEDICAL STAFF: 20 Physicians and 7 Dentists

OTHER FULL-TIME STAFF: 187

PART-TIME STAFF: 141

PRINCIPAL COMMUNITIES SERVED BY HOSPITAL:

Caribou
New Sweden
Stockholm
Westmanland Plantation
Woodland

SERVICE AREA POPULATION--1979: 14,640

EXHIBIT 9

HOULTON REGIONAL HOSPITAL
Houlton, Maine

STATISTICAL DATA--1979:

86 Licensed Beds	18,697 Patient Days
3,225 Admissions	20,264 Outpatient Visits

ACTIVE MEDICAL STAFF: 12

OTHER FULL-TIME STAFF: 156

PART-TIME STAFF: 64

PRINCIPAL COMMUNITIES SERVED BY HOSPITAL:

Amity	Merrill
Cary Plantation	Monticello
Danforth	New Limerick
Haynesville	Oakfield
Hodgdon	Orient
Houlton	Reed Plantation
Linneus	Smyrna
Littleton	Weston
Ludlow	

SERVICE AREA POPULATION--1979: 25,000

EXHIBIT 9

NORTHERN MAINE MEDICAL CENTER
Fort Kent, Maine

STATISTICAL DATA--1978:

70 Licensed Beds	16,855 Patient Days
2,773 Admissions	7,547 Emergency Room Visits

ACTIVE MEDICAL STAFF: 9 Physicians and 3 Dentists

OTHER FULL-TIME STAFF: 139

PART-TIME STAFF: 41

PRINCIPAL COMMUNITIES SERVED BY HOSPITAL:

Allagash Plantation	New Canada Plantation
Eagle Lake	St. Agatha
Fort Kent	St. Francis
Frenchville	St. John Plantation
Grand Isle	Wallagrass Plantation
Madawaska	Winterville Plantation

SERVICE AREA POPULATION--1979: 16,880

EXHIBIT 10

SLOW SCAN EQUIPMENT

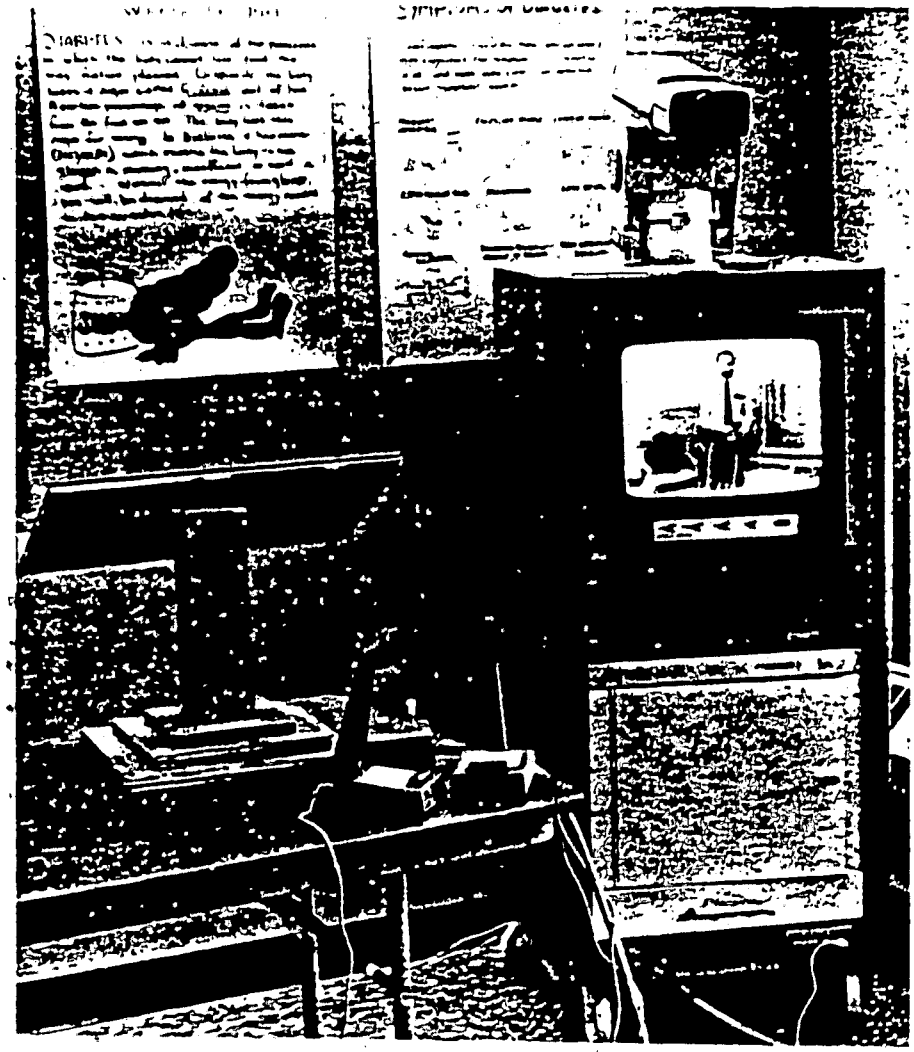
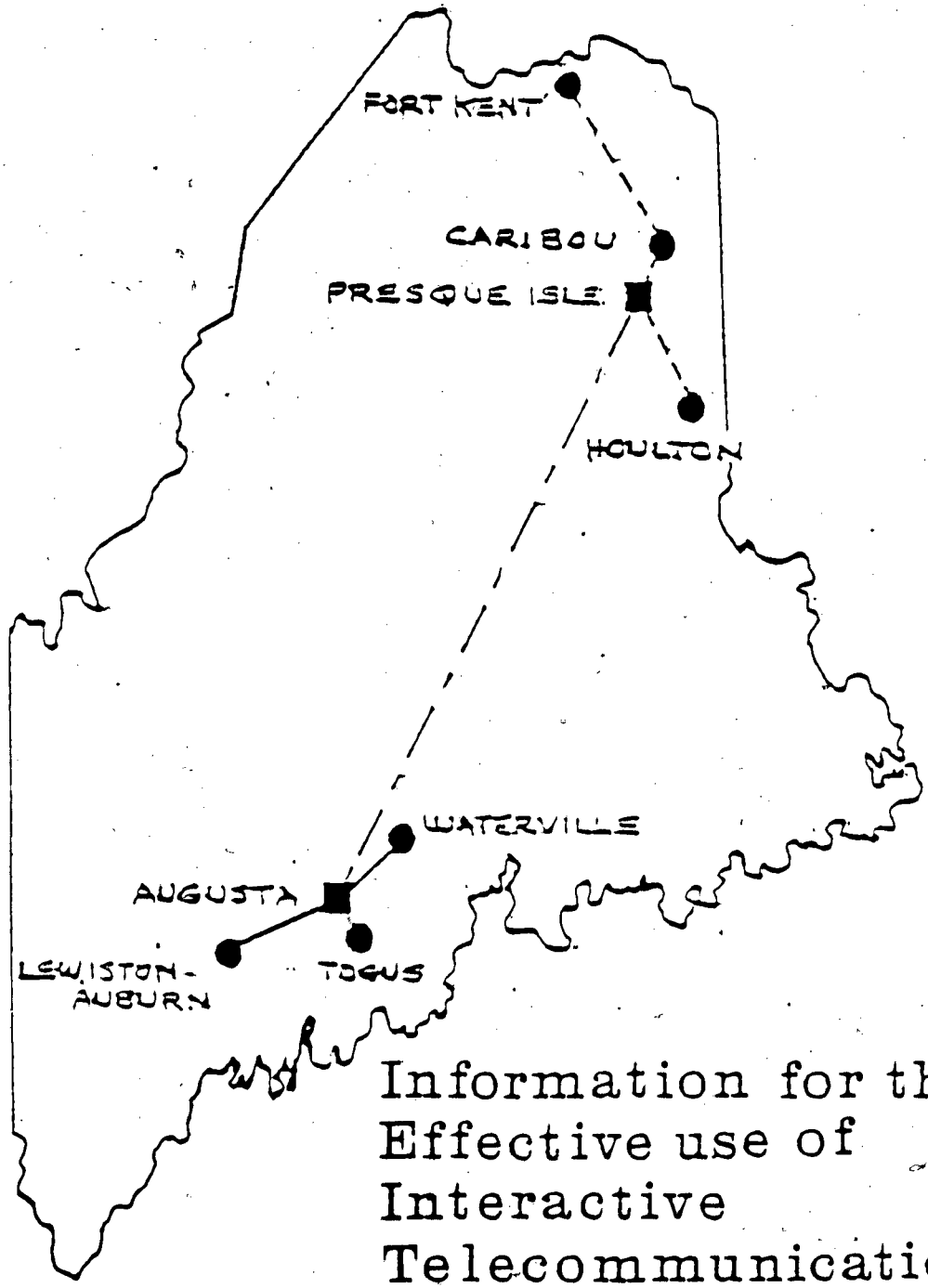


EXHIBIT 11



Information for the Effective use of Interactive Telecommunications

EXHIBIT 11

INTRODUCTION

Telecommunications, transmitting a verbal or graphic message over distance, dates back to early human development. Smoke signals, drums and even yelling are the result of the need to transmit knowledge quickly from one location to another. As knowledge increases, so does the need to utilize more efficient means of telecommunications. The proliferation of telephones, televisions and radios over the last half century is evidence that telecommunicating has become an accepted means of knowledge transmission. Modern day users of telecommunications have acquired the need of even more efficient, interactive devices.

Under the sponsorship of Medical Care Development, Inc. - a non-profit corporation conceived and chartered in 1966 to develop and improve health resources, health education, and the delivery of health care - two innovative telecommunications systems have been developed to enable health care providers to share educational resources and communicate ideas without the costs associated with travel. In addition, because of the cooperative nature of the systems, programming has been made available to the participants which they could not have received, economically, on their own.

The Central Maine Interactive Telecommunications System (CMITS) is a two-way television network which provides Central Maine Medical Center and St. Mary's General Hospital in Lewiston; Kennebec Valley Medical Center, Maine-Dartmouth Family Practice Residency and the University of Maine in Augusta; the Veterans Administration Center at Togus; and Mid-Maine Medical Center in Waterville with an ability to communicate ideas and share resources. The System utilizes microwave radio communication equipment in combination with

automatic switching equipment to create an unobtrusive, user operated interactive telecommunications system.

The Aroostook County Telecommunications System (ACTS) combines telephone and television technologies to provide Aroostook Mental Health Center and Cary Medical Center in Caribou; A. R. Gould Memorial Hospital in Presque Isle; Houlton Regional Hospital in Houlton; and Northern Maine Medical Center in Fort Kent with a teleconferencing system unique in design and effect. The System utilizes slow scan television, which is unlike the regular television most of us have experienced. Slow scan TV consists of a still, black and white image which builds down the television screen and because this single, still picture contains much less electronic information than normal TV, regular telephone lines are used to transmit and receive pictures.

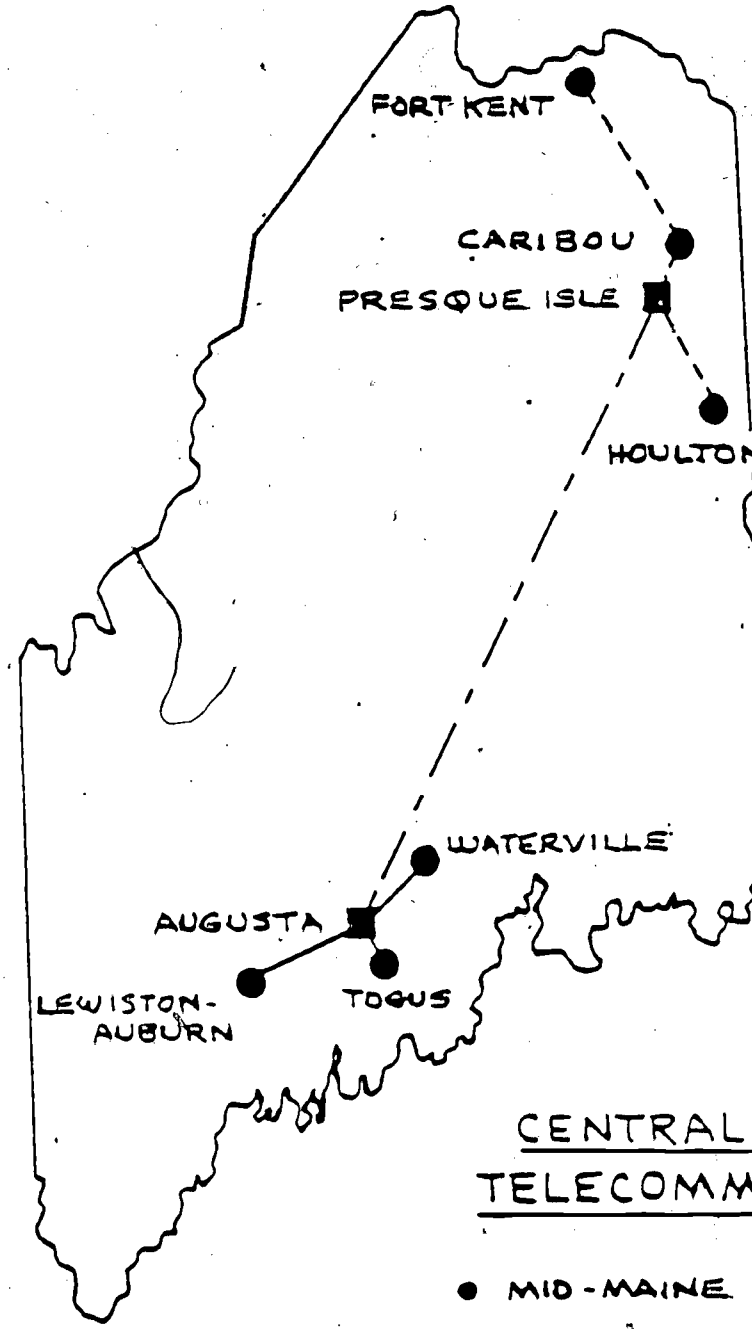
Use of the ACTS is coordinated by Northern Maine RAISE in conjuction with the ITS office in Augusta. Northern Maine RAISE (a Regional Approach to Improved Health Services Through Education) is a shared educational service supported by Aroostook County hospitals in operation since 1973. Its purpose is to develop and coordinate inservice and continuing education opportunities for health care personnel in the County that will upgrade employee skills and result in improved patient care. Slow scan television can be used to great advantage in supplementing the regional educational activities which RAISE sponsors, as well as in facilitating inter-hospital and agency communication. Scheduling of system use, both in Aroostook County and between the two systems, and training of system participants are two major areas in which RAISE is involved.

EXHIBIT 11

All participants within the CMITS and the ACTS have equal capabilities to receive or originate programming within their respective systems. In addition, the two systems can be interconnected thus allowing possible communications between sites over three hundred miles apart. (See Figure 1) With the recent advances in satellite communications and the ever increasing numbers of slow scan television users, it is even possible, with a little effort, to communicate with people halfway around the world using these existing networks.

EXHIBIT 11
FIGURE 1

INTERACTIVE TELECOMMUNICATIONS



AROOSTOOK SLOW SCAN SYSTEM

- NORTHERN MAINE MEDICAL CTR.
- AROOSTOOK MENTAL HEALTH CTR.
- CARY MEDICAL CENTER
- AROOSTOOK MEDICAL CENTER
- HOULTON REGIONAL HOSPITAL

CENTRAL MAINE INTERACTIVE TELECOMMUNICATIONS SYSTEM

- MID-MAINE MEDICAL CENTER
- KENNEBEC VALLEY MEDICAL CENTER
- MAINE-DARTMOUTH FAMILY PRACTICE RESIDENCY
- UNIVERSITY OF MAINE AT AUGUSTA
- VETERANS ADMINISTRATION AT TOGUS
- CENTRAL MAINE MEDICAL CENTER
- ST. MARY'S GENERAL HOSPITAL

MCD 3-81

EXHIBIT 11

OVERVIEW OF TELECOMMUNICATIONS

Many of us have grown up with television in the home. We have developed ideas of how television fits (or doesn't fit) into our lives. The CMITS and ACTS are different. Years of ABC, NBC, CBS, and PBS can only partially prepare us for these special forms of telecommunications. These systems must be experienced to fully appreciate what they can do for you. We suggest that if you will be using either system in the near future that you contact the RAISE office in Presque Isle (764-4178) or Medical Care Development's Telecommunications office in Augusta (622-7566) to set up a demonstration time.

In addition, glance at the remaining sections of this user guide. There is some useful information here that will help make your telecommunications experience more satisfying and fruitful.

EXHIBIT 11

GUIDELINES FOR THE PARTICIPANT

EFFECTIVE USE OF ANY INTERACTIVE TELECONFERENCING SYSTEM REQUIRES SPECIAL ATTENTION TO A FEW RULES OF THUMB.

1. SPEAK UP. THE PRESENTER OR CHAIRMAN NEEDS YOUR FEEDBACK TO AID IN PRESENTATIONS OR MEETINGS. (REMEMBER, USE A MICROPHONE.)

2. IDENTIFY YOURSELF. THIS PROVIDES SOME ORIENTATION FOR THE LEADER AS WELL AS THE OTHER PARTICIPANTS.

3. RESPOND WHEN REQUESTED. NOTHING IS WORSE THAN SILENCE. EVEN A VERBAL INDICATION OF "NO RESPONSE" SATISFIES THE PERSON ASKING THE QUESTION THAT HE OR SHE HAS BEEN HEARD. SOME TYPE OF RESPONSE HELPS MOVE THINGS ALONG.

4. BE CORDIAL. THE EQUIPMENT IS COLD ENOUGH; PLEASE DON'T ADD TO IT. AT THE END OF A MEETING OR PRESENTATION A "THANK YOU" TO THE PRESENTER MEANS A GREAT DEAL.

5. USE THE EVALUATION FORMS. THESE FORMS HELP STAFF KEEP TRACK OF THE SYSTEM'S UTILIZATION AND PERFORMANCE. IF PROBLEMS ARISE, PLEASE INDICATE SO ON THE FORMS. YOUR COMMENTS WILL BE HELPFUL IN REFINING THE USE OF THE SYSTEM AND IN TEACHING NEW USERS.

EXHIBIT 11

GUIDELINES FOR THE PROGRAM LEADER

1. BE REASSURED THAT THIS TELECOMMUNICATIONS SYSTEM IS NOT NBC. IT IS AN INFORMAL SYSTEM WHICH ALLOWS PEOPLE MILES APART TO INTERACT AND DISCUSS ISSUES OF COMMON INTEREST.

2. GET TO KNOW YOUR PARTICIPANTS. JOTTING DOWN NAMES AND LOCATIONS AS YOU CHECK WITH EACH SITE CAN HELP YOU IDENTIFY AND CALL ON PARTICIPANTS LATER IN THE PROGRAM. (REMEMBER TO IDENTIFY YOURSELF, BOTH AT THE BEGINNING AND INTERMITTENTLY DURING THE PROGRAM.)

3. HAVE MEETING OR LECTURE MATERIALS CLOSE AT HAND. THIS KEEPS THINGS MOVING.

4. TRY TO PRESENT MATERIALS IN 10 TO 15 MINUTE SEGMENTS. THIS ALLOWS PARTICIPANTS TO COMMENT AND ASK QUESTIONS.

5. ALLOW PARTICIPANTS TIME TO RESPOND. SOMETIMES 10 OR 15 SECONDS ARE NEEDED FOR RESPONDENTS TO FORMULATE QUESTIONS OR ANSWERS AND PASS THE MICROPHONE IF NECESSARY.

6. DIRECT QUESTIONS TO SPECIFIC INDIVIDUALS OR SITES. QUESTIONS WHICH ARE NOT DIRECTED TO INDIVIDUALS OR SITES MAY CAUSE DELAYS AND/OR CONFUSION. EXAMPLES: "ARE THERE ANY QUESTIONS AT HOULTON?" OR "JOHN, HOW DO YOU FEEL ABOUT THAT?"

EXHIBIT 11

7. VISUALS CAN MAKE OR BREAK A PRESENTATION. VISUALS MADE FOR TELEVISION MAY BE USED ANYWHERE. HOWEVER, VISUALS MADE FOR "IN-PERSON" VIEWING MAY NOT BE SUITABLE FOR TELEVISION. (CHECK THE SECTION ON "TV GRAPHICS.")

8. START ON TIME. RESPECT THE VALUE OF YOUR AUDIENCE'S TIME. ALSO, ROOM AND SYSTEM TIME IS BOOKED RATHER TIGHTLY, SO ADDITIONAL "RUN-OVER" TIME MAY NOT BE POSSIBLE.

9. FAMILIARIZE YOURSELF WITH THE SYSTEM. ACQUIRE SOME UNDERSTANDING OF HOW THE SYSTEM OPERATES. THIS MAKES YOU AND THE SYSTEM LOOK GOOD.

10. LASTLY, RELAX AND LOOK FORWARD TO HEARING FROM OTHERS MANY MILES DISTANT FROM YOU. IF YOU HAVE SUGGESTIONS OR COMMENTS, PLEASE COMMUNICATE THEM TO US BY USING THE EVALUATION FORMS OR CONTACTING THE RAISE OFFICE IN PRESQUE ISLE (764-4178) OR THE TELECOMMUNICATIONS OFFICE AT MEDICAL CARE DEVELOPMENT IN AUGUSTA (622-7566).

EXHIBIT 11

TV GRAPHICS

IF YOU PUT THE EFFORT INTO PRODUCING VISUALS FOR YOUR PRESENTATION, TAKE TIME TO BE CERTAIN THEY WILL BE EFFECTIVE FOR A TELEVISION FORMAT.

UNLIKE PROJECTED IMAGES, TELEVISION SCREENS REMAIN THE SAME SIZE; THEREFORE, THE FOLLOWING GUIDELINES SHOULD BE STRICTLY FOLLOWED FOR EFFECTIVE TV VISUALS.

1. KEEP MATERIALS SIMPLE AND STRAIGHTFORWARD. MAKE JUST ONE POINT PER VISUAL.
2. ALL MATERIALS MUST BE HORIZONTALLY ORIENTED. A NORMAL RATIO OF HEIGHT TO WIDTH IS 3 UNITS TO 4 UNITS.
3. USE THE TV TYPEWRITER GRAPHICS GUIDE PROVIDED TO CHECK A VISUAL FOR CORRECT ALIGNMENT OR PREPARE A VISUAL FOR PHOTOGRAPHING.
4. VERTICAL GRAPHICS, WHETHER SLIDES, TRANSPARENCIES, OR FLIP CHARTS, DO NOT USUALLY MAKE EFFECTIVE USE OF THE TV VIEWING AREA.

IT IS IMPORTANT TO REMEMBER THAT A VISUAL PREPARED FOR IN-PERSON VIEWING MAY NOT WORK ON TV, BUT A VISUAL PREPARED FOR TV WILL WORK ANYWHERE.

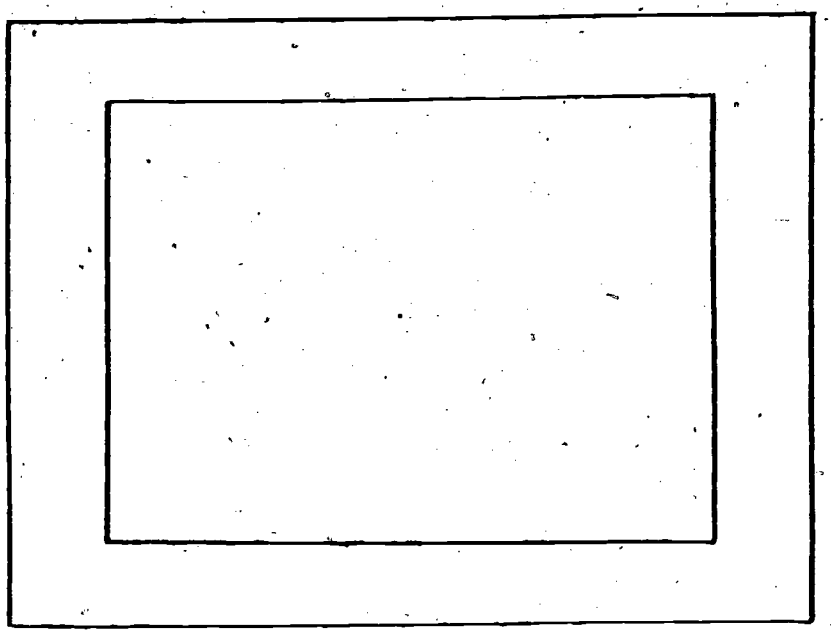


EXHIBIT 11

TV Typewriter Graphics Guide

1. 20-25 characters per line (pica)
2. 5 lines per frame
3. Double space between lines

If you put the effort into producing visuals for your presentation, be certain they will be effective for a television format.

Television screens remain the same size; therefore, the following guidelines should be strictly followed for effective TV visuals.

1. Keep materials simple and straightforward.

Make just one point per visual.

2. All materials must be horizontally oriented.

A normal ratio of height to width is 3 units to 4 units.

3. Use the TV Typewriter Graphics Guide to check a visual for correct alignment or prepare a visual for photographing.

4. Vertical graphics, whether slides, transparencies, or flip charts, do not usually make effective use of the TV viewing area.

Remember that a visual prepared for in-person viewing may not work on TV, but a visual prepared for TV will work anywhere.

This is an example of how to take the information on Page 9 and break it up into usable graphics groupings. One further step might be to edit each slide into just key words or phrases as has been done on the next page.

EXHIBIT 11

EXHIBIT 11

Visuals Produced for TV	TV Visual Guideline	One Point Per Visual
Horizontal Orientation	Use TV Typewriter Graphics Guide	Vertical Graphics don't usually work well
Visuals for TV work anywhere		

The information on each of these graphics provides viewers with enough information to orient them to the ideas being presented by the leader. Less attention is paid to reading the graphics and more attention is paid to listening to the leader.

EXHIBIT 11

STEPS FOR SCHEDULING SYSTEM TIME

1. Determine:

   A. The title of the program or the name of the group that is meeting.

   B. The first, second, and third best times for the program or meeting (dates and times of day).

   C. The person who may be contacted for further information.

   D. The sites which will be involved in the program and the site which will originate the program or meeting.

2. Contact your health education department with these details. They will contact either the RAISE office or the Telecommunications office at Medical Care Development in Augusta to confirm system availability.

3. If you are not associated directly with one of the participating health care institutions, then contact either the RAISE office in Presque Isle (764-4178) or the Telecommunications office in Augusta (622-7566) directly.

4. Get the information regarding your request to the appropriate person at least two weeks prior to the requested date. This allows plenty of time for scheduling of the system and institutional rooms. If you will be originating a program or are organizing a meeting, determining the availability of rooms at participating sites may be your responsibility. You and/or someone in your group from each site may need to check the availability of the meeting rooms that have system capability as part of determining the meeting time.

5. If you have a program which you wish to have advertised with a special notice or some other form of special promotion, please plan for at least four weeks of advance notice.

INSTITUTION	TELEPHONE	PERSONNEL	ROOMS	SEATING CAPACITY
Aroostook Mental Health Center 1 Vaughn Place Caribou, Maine 04736	498-6431	Edwina Anderson Program Coordinator	Conference Room	20
Cary Medical Center Van Buren Road Caribou, Maine 04736	498-3111 Ext. 143 Ext. 144 Ext. 144	Suzette Connolly, R.N. Director of Education Louise Adams Staff Education Secretary Gloria Bouchard Staff Education Instructor	Classroom Board Room	20 15
A. R. Gould Memorial Hospital Academy Street, Box 151 Presque Isle, Maine 04769	769-2511 Ext. 4152	Bonnie Wood, Ph.D. Director of Staff Education Vicki Flanagan, LPN Infection Control Nurse	Rotary Room A Rotary Room B Conference Room A Conference Room B	15 25 15 10
Houlton Regional Hospital 20 Hartford Street Houlton, Maine 04730	532-9471 Ext. 148	Elinor Harvey, R.N. Assistant Administrator	Conference Room 1 Conference Room 3	30 10
Northern Maine Medical Center 143 East Main Street Fort Kent, Maine 04743	834-3155 Ext. 132 Ext. 183	Alice Burns-Roach, R.N. Director of Staff Education Jane Bossie, R.N. Inservice Educator Nurse Orientator	In-Service Telelecture Room	45 15
Northern Maine RAISE 421 Main Street P.O. Box 1238 Presque Isle, Maine 04769	764-4478	Judith Feinstein Director Marion Higgins Administrative Assistant		

EXHIBIT 11

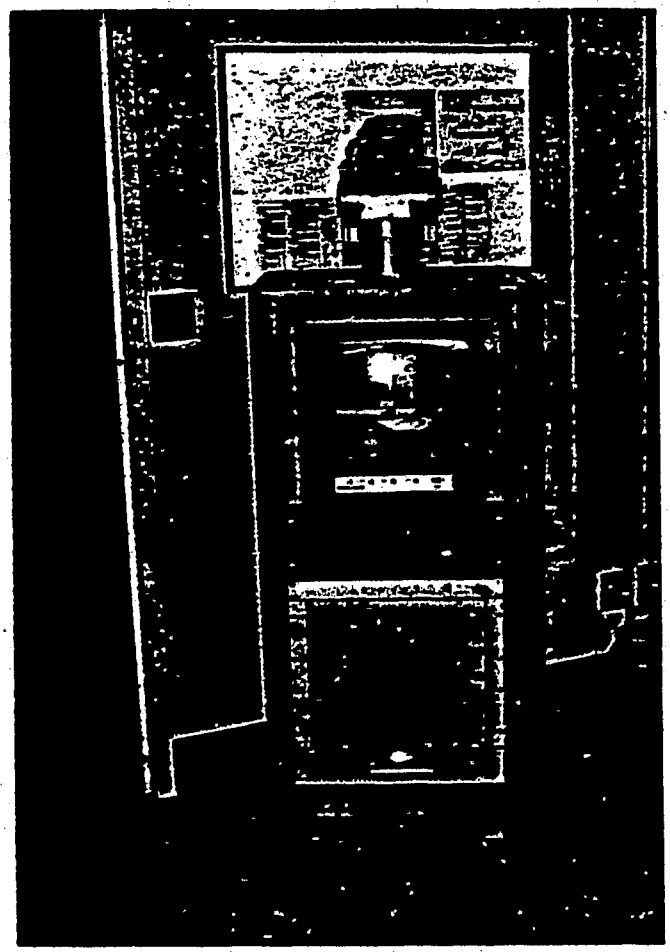
INSTITUTION	TELEPHONE	PERSONNEL	ROOMS	SEATING CAPACITY
Central Maine Medical Center 300 Main Street Lewiston, Maine 04240	795-2392	Florence Annear, R.N. Director, Continuing Education Department	ITS Room CB 4 TWA Hiebert Hall Conference Classroom	30 16 75 30 12
	795-2364	Dana Green Media Specialist		
Kennebec Valley Medical Center Augusta Division 6 East Chestnut Street Augusta, Maine 04330	623-4711 Ext. 240	Hunt Conard General Inservice Education Coordinator	Library Conference Room Library Classroom Lobby Conference Room Private Dining Room	10 20 35 25
	Ext. 279	Patricia Hutchinson, R.N. Nursing Education Coprdinator		
	Ext. 242	Paul Kennedy Media Specialist		
Mid Maine Medical Center Waterville, Maine 04901	873-0621 Ext.	Shirley Bastien Director of Education	South Wing Conference Room (Thayer Unit) Dean Auditorium (Thayer Unit) Dean 1 (Thayer Unit) Lecture Halls A & B (Seton Unit)	40 160 15 30
	Ext. 242	Barry Wherren Media Specialist		
Maine Dartmouth Family Practice Residency 12 East Chestnut Street Augusta, Maine 04330	622-9361	Elizabeth Dearnley	2nd Floor Conference Room	15
	623-4711 Ext. 242	Paul Kennedy Media Specialist (KVMC)		
St. Mary's General Hospital 45 Golder Street Lewiston, Maine 04240	786-2901 Ext. 295	Eleanor Blais, R.N. Director, Department of Education	ITS/Board Room Daughters Hall	20 100
	Ext. 439	James Haustere Media Specialist		

EXHIBIT 11

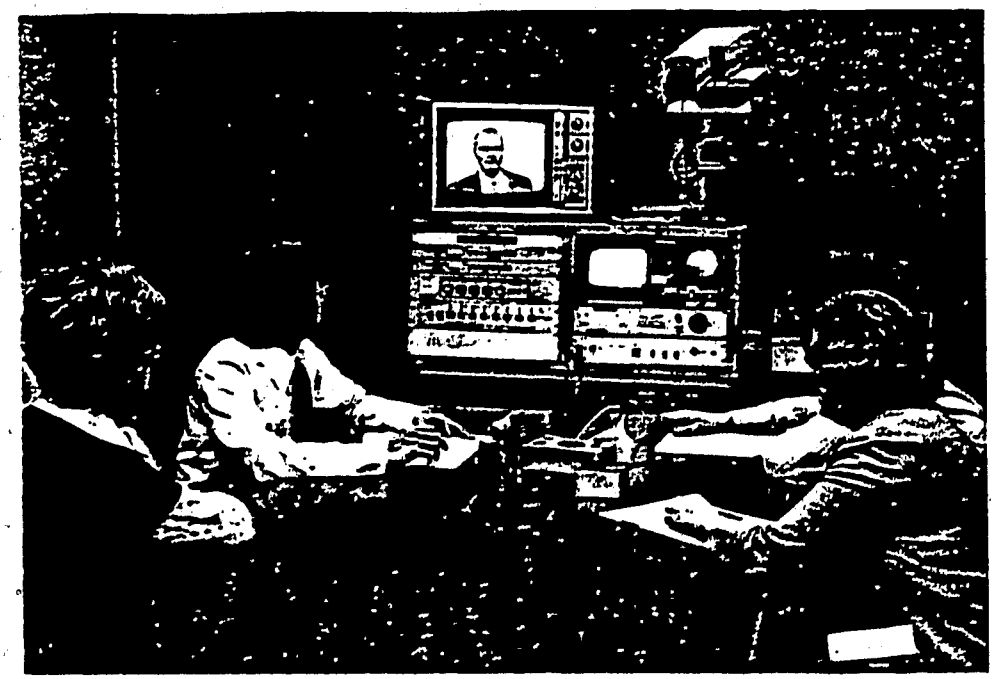
INSTITUTION	TELEPHONE	PERSONNEL	ROOMS	SEATING CAPACITY
University of Maine at Augusta University Heights Augusta, Maine 04330	622-7131 Ext. 343 Ext. 345	Deborah Felder Daniel Vachon	Television Studio Jewett Hall Auditorium (Rm 156) Photo Lab (Rm 5)	30 275 20
VA Medical & Regional Office Center Togus, Maine 04330	623-8411 Ext. 513 Ext. 513 Ext. 378	Burt Sheehan Coordinator, Cooperative Health Education Program Charlotte Taylor CHEP Donald Kluck Medical Media	Theater Stage	40
Medical Care Development, Inc. 295 Water Street Augusta, Maine 04330	622-7566	Anne Niemiec Project Director Robert Ellis Assistant Project Director Sterling Haskell Director of Engineering Diane Campbell (scheduling)		

EXHIBIT 11

EXHIBIT 11



A TYPICAL AROOSTOOK COUNTY TELECOMMUNICATIONS SYSTEM CONSOLE



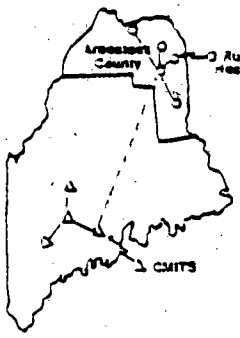
A TYPICAL CENTRAL MAINE INTERACTIVE TELECOMMUNICATIONS SYSTEM CONSOLE

EXHIBIT 12

INTERACTIVE TELECOMMUNICATIONS

VOL. I, No. 1 April 1980

PREMIERE EDITION OF TELECOMMUNICATIONS UPDATE



As Medical Care Development (MCD) moves toward an expansion of its telecommunications activities in Maine, the need to communicate with interested persons Statewide has arisen. There are many aspects of the Central Maine Interactive Telecommunications System (CMITS) and the soon to be started Aroostook County Telecommunications Demonstration (ACTD) that can be dealt with effectively in a newsletter format. Some of the areas that will be covered are effective uses of both TV Systems, user troubleshooting, upcoming events, interesting anecdotes, and general information that people might have the need to know.

If any of the articles stir your curiosity or raise questions, please feel free to contact the Telecommunications Division of MCD. The phone number and address will be listed at the bottom of each issue.

At present, this newsletter is being mailed to administrators, health educators, regular users, media specialists, and others who wish to be kept informed about telecommunications in Maine. If you know of people who want to receive this publication, please contact us and their name will be added to the mailing list.

AROOSTOOK COUNTY TELECOMMUNICATIONS DEMONSTRATION

On November 2, 1979, Medical Care Development was notified by the Office of the Assistant Secretary for Planning and Evaluation, DHEW, that it could proceed with implementation of its grant for a slow scan television network which will connect five health care facilities in Aroostook County for the purpose of educational and informational exchange. The five Aroostook participants are Aroostook Mental Health Center in Fort Fairfield; A. R. Gould Memorial Hospital in Presque Isle; Cary Medical Center in Caribou; Houlton Regional Hospital in Houlton; and Northern Maine Medical Center in Fort Kent.

In addition to the intracounty communication capability, there will be a provision for other slow scan equipment owners to interact with Aroostook County programming by calling into the System using any pair of telephone lines. Slow Scan equipment will be installed in a CMITS console thereby providing an interface between the Central Maine fast scan TV System and the Aroostook slow scan TV System.

The equipment is now in an assembly stage at Lake Systems in Newton, MA. Everything appears to be on schedule and an early date in May is still anticipated for delivery of the equipment to the Aroostook participants.

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INTERACTIVE TELECOMMUNICATIONS

VOL. I, No. 1 (Continued)

AIDS IN BECOMING A GOOD TELECOMMUNICATIONS SYSTEM PARTICIPANT (PART I)

In this month's newsletter and in subsequent issues, edited segments of the Central Maine Interactive Telecommunications System's User Guide will be printed. There are many very useful ideas in the guide that will aid the participants in better utilizing various aspects of the Systems.

How Can I Be a Good Viewer?

Probably the most important aspect to remember about the System is that you can ask questions of another individual located many miles away and actually be seen by the person if you wish. Many people watching a program over the System will remark to themselves that they would like to see a closer view of a diagram or chart and fail to realize that all they have to do is ask, just as they would if they were there in person.

Talk to People:

You have the option of asking any question or making any comment whenever you wish. If you cannot see something, say an x-ray, all you have to do is ask the lecturer to provide you with a closer view. If you cannot hear someone's question, say so and request that the lecturer repeat the question or comment for you. If someone has presented an object or chart too quickly, ask to see the item again. Remember that if you could not see an item clearly others probably feel the same way you do. There is always some anxiety associated with asking a lecturer a question or making a comment the first few times; but it will become as easy as using a telephone in a short time.

The only reminder is that when you want to speak to another individual, please move closely to the microphone or have someone pass it to you so that you may be heard clearly. Everyone participating in the program should be able to hear you if your microphone is within 12 inches or so and you use a normal speaking voice. If the microphone is more than three feet from you or turned away from your direction you will not be heard.

Identify Yourself:

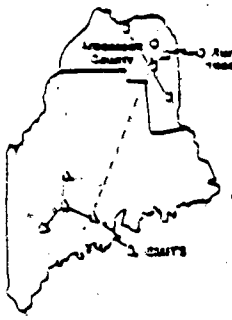
Say your name and your location when you speak over the System. This provides the lecturer with some idea of where you are and your name, should he or she wish to continue the dialog further. By providing your name, the lecturer's response will be much more personal and rewarding. We have noticed that lecturers and other viewers may have a very negative reaction to someone who interjects a comment without providing a name or location.

Probably the most disconcerting moment for a lecturer is when he or she asks "Are there any questions?" and receives NO response whatsoever. In a normal face-to-face setting the lecturer could quickly scan the room and determine whether anyone wished to make a comment. With interactive television it is not possible for the lecturer to see all locations at the same time and many lecturers find it uncomfortable when they cannot see a particular location or hear any questions.

EXHIBIT 12

INTERACTIVE TELECOMMUNICATIONS

VOL. I, No. 2 May 1980



WHAT IS SLOW SCAN

There are basically two types of television, fast scan and slow scan. The fast scan television picture is the moving picture we see on our home television sets and is actually a series of sixty still images per second. Because these images change so quickly, the picture seems to have movement. Slow scan television deals with just one of these images at a time. The information in this "frozen frame" builds down across the television screen from top to bottom. The rate at which the picture builds determines its clarity.

The system for Aroostook County will have three scan speeds--8, 17, and 33 seconds. Eight seconds provides the lowest quality picture, 17 seconds provides a medium quality, and 33 seconds provides the highest quality picture. The type of information transmitted determines the scan speed used. Normally, the 8 second speed gives more than enough clarity for meetings, etc. On the other end of the scale, 33 seconds is needed to show more detailed graphics, x-rays, etc. Speed of transmission versus picture quality is determined by the convenience factor.

The reason for using the still picture as opposed to the moving picture is economy. As you might imagine, there is a great deal of electronic information in the moving, "real-time" image. In order to transmit all of this information, expensive transmitters and microwave antennas are needed. With slow scan TV the telephone system is used to transmit and receive the picture. In spite of the relatively large phone bill, a comparison of equipment and maintenance costs between slow scan and fast scan shows that slow scan comes out much lower. In addition, a couple of phone lines allows participation in the system, as long as the equipment necessary to translate the television picture onto the phone lines is available.

Future articles will address more aspects of the slow scan television system. In the meantime, if there are any questions, do not hesitate to contact the Telecommunications Office at Medical Care Development in Augusta.

SLOW SCAN DEMO IN AROOSTOOK

On April 9, 10, and 11, Anne Niamiec, Director of Telecommunications, Sterling Haskell, Director of Engineering, Robert Ellis, Assistant Project Director of the Aroostook County Telecommunications Demonstration (ACTD) of Medical Care Development, and Edla Carlson, Administrative Assistant for RAISE, met with health education directors, administrators, medical staff, and support staff at the five institutions participating in ACTD. Demonstrations of slow scan equipment highlighted the meetings, with telephone calls placed from each Aroostook location to Laka Systems, Inc. in Newton, Mass. At Laka Systems, John Skinner, the sales representative involved with the Aroostook Project, exhibited some uses of slow scan teleconferencing. In addition to transmitting his own picture, he demonstrated the use of graphics and showed people a partially completed slow scan TV console. The delivery date for the consoles is still anticipated for early May.

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EXHIBIT 12

INTERACTIVE TELECOMMUNICATIONS

VOL. I, No. 2 (Continued)

SECRETARIAL SKILLS MINI-COURSE SUCCESSFUL

Over 30 secretaries, clerk-typists, and stenographers from the Central Maine area participated in a secretarial skills mini-course, "Work Planning and Organization," sponsored by the Central Maine Interactive Telecommunications System and Kennebec Valley Vocational Technical Institute. The four two-hour sessions were taught from three of the five participating sites (AGH, CMMC, MMMC, SMGH, and the VA). Patricia Leclerc, the instructor, provided participants with techniques necessary to effectively utilize work time--stressing self-awareness, identifying time wasters, and setting priorities. This is the second secretarial skills course to be offered and expansion of other secretarial courses by various skill levels is now under consideration for the future.

UPCOMING SATELLITE PROGRAM ON DIABETES

The American Dietetic Association is sponsoring a national satellite program entitled, "Modern Concepts in Diabetes," which will be broadcast over the Central Maine Interactive Telecommunications System on July 23rd. More details will be coming later.

AIDS IN BECOMING A GOOD TELECOMMUNICATIONS SYSTEM PARTICIPANT (PART II)

(Second in a series of edited segments of the Central Maine Interactive Telecommunications System's User Guide.)

What is Expected of You--the Presenter?

First, and foremost, you are not expected to be a TV "star." Teleconferencing is informal and brings people together to share information and experiences. What makes the Central Maine System unique is its ability to allow people to interact and discuss issues of common interest. It seems that the more formal the program, the lower the interaction and rapport between presenter and viewer.

The secret to success is to:

(1) Relax and look forward to hearing what others many miles distant from you have experienced.

(2) Spend a few moments and review the pages in the User Guide which are pertinent to you.

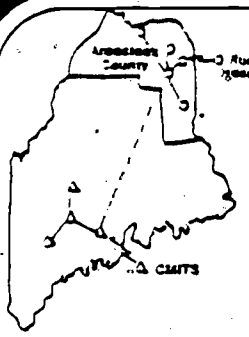
(3) Talk with the media specialist or staff educator in the institution from which you will be making the presentation to get some helpful hints on how to make your program more effective.

We are very interested in your experiences as a presenter and hope that you will take a few moments and give us some suggestions that we can pass along to other presenters or attempt to correct in the near future.

"The woods would be very silent if no birds sang there except those who sing the best." H. J. Prescott

EXHIBIT 12

INTERACTIVE TELECOMMUNICATIONS



VOL. I, No. 3 June/July/August 1980

ONE SUMMER NEWSLETTER PLANNED

Because of a very hectic schedule with the new slow scan network in Aroostook County and double coverage caused by vacation schedules, there will only be one issue of the Interactive Telecommunications Newsletter for June, July, and August. The regular monthly newsletter will start with the September issue. Have a good summer!!

AROOSTOOK SLOW SCAN EQUIPMENT IN PLACE

The slow scan television conferencing equipment in now in place at the five Aroostook County sites. Some testing has been done resulting in the identification of a few problems with the slow scan video. These problems have been resolved and programming is starting.

The telephone company is installing a "dial in" capability for the slow scan network. When this installation is finished, it will be possible for the Aroostook County Interactive Telecommunications System to connect with the Central Maine Interactive Telecommunications System, as well as any other location which has two phone lines and a Robot slow scan transceiver.

NORTHERN MAINE MEDICAL CENTER NAMES SLOW SCAN CONSOLE

Recently, Northern Maine Medical Center sponsored a "Name the Slow Scan Console" contest. Mrs. Alice Burns-Roach, R.N., the newly hired Director of Inservice Education, thought the contest would be a good promotional activity to acquaint employees of NMMC with the slow scan equipment. The response was very good. The panel of judges from X-ray, Lab, Medical Records, Billing, and Nursing were busy for a while debating which entry was the winner, and it was finally decided that Leone Daigle of the Dietary Department submitted the winning entry. As a result, NMMC's console now has the name "HERBY." As NMMC's weekly inhouse newsletter, Between Friends, of June 29th states, Herby's . . . "hobbies include: teaching others, exchanging ideas and information, and photographing people."

We hope to hear more about HERBY's exploits in the future as well as those of his friends at Cary Medical Center, the Aroostook Mental Health Center, A. R. Gould Memorial Hospital, and Houlton Regional Hospital.

CMITS GETS SWITCHING MODIFICATION

Sterling Haskell, Director of Engineering, has designed and built a new switching modification for the Central Maine System which will bring new meaning to the word "interaction." The Interact Controller will allow an originating site to set up a conference among any or all of the various sites. After the initial 'set-up', any of the conference participants will be able to interact with all of the other sites by simply pulling a switch on their mic stand. When activated, all participants can see and hear the questioner. When the switch is released, the

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INTERACTIVE TELECOMMUNICATIONS

VOL. I, No. 3 (Continued)

Switching Modification Continued

system goes back to its original configuration with the exception that the originator continues to see the questioner. This should further enhance the interactivity of the Telecommunications System.

AIDS IN BECOMING A GOOD TELECOMMUNICATIONS SYSTEM PARTICIPANT (PART III)

(Third in a series of edited segments of the Central Maine Interactive Telecommunications System's User Guide.)

What do I do With Visuals?

The presentation of visual aids creates the greatest problems for those lecturing over the System. It is fairly easy to overcome some of these difficulties if just a few points are kept in mind. First, materials presented via television should be simple and straightforward. If you are trying to make several points use separate visuals.

Second, all visual materials should be horizontally oriented. That is to say, materials need to be placed on cards or slides that are wider than they are tall. On a normal television screen the ratio of width to height is 4 to 3. If you are taking slides for use over any television system, they should be in the horizontal format--vertical slides do not work well at all because of the horizontal screen. Along this same line, it is wise to avoid transparencies due to their vertical nature and a tendency to pack the transparency with too much material. When you are developing information for television and a portion of your presentation involves the use of visual material, use the attached guide in preparing your information. Insert the guide under a white page and type within the box leaving ample room around the edges.

Remember that each typed line should consist of no more than 20-25 characters (pica), a maximum of 5 lines per slide, and double space between all lines. People will not be able to view the information if you exceed the suggested maximum. It is important to remember that a visual that is adequate for presentation to a group may not work well over television, but that any visual adequate for television will always be more than adequate for presentation to any group.

X-rays should be selected for their graphic ability to demonstrate a particular problem. Do not select x-rays that are difficult to see in person. It is also important to demonstrate only one x-ray at a time. It is possible to use several films for comparison purposes, such as the progress of patients over time, but a little advanced work is necessary to develop the best and most graphic presentation.

There is a tendency for lecturers to move too quickly through their slides or other visuals without letting the audience or camera locate the item of interest in sufficient time. Take your time. Give everyone a chance to look over the visual and let the information sink in. It might be helpful if you paused occasionally and asked people at the various locations if they can see the visuals you are presenting and if they have any questions.

EXHIBIT 12

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Medical Care Development, Inc.

Address correction requested

MANU CHATTERJEE, M.D. Executive Director
295 Water Street Augusta, Maine 04330
Telephone 207/622-7566

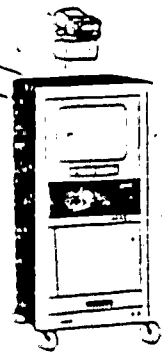
August/September 1980 NEWSLETTER Volume 14, Number 5

TELECOMMUNICATIONS IN AROOSTOOK COUNTY

In the fall of 1979, Medical Care Development began implementation of an innovative telecommunications demonstration project in Aroostook County which is funded by a grant from the U.S. Department of Education (formerly DHEW). A description of the System appeared in the February 1980 edition of the MCD newsletter, and the following is an update on the System's progress.

The interactive telecommunications system in Aroostook County uses a different type of television technology for the transmission and reception of video images. This slow scan technology utilizes everyday voice grade telephone circuits as the means by which the television and audio signals are transmitted.

Two parallel dedicated telephone circuits connect Aroostook Mental Health Center in Fort Fairfield, Cary Medical Center in Caribou, A.R. Gould Memorial Hospital in Presque Isle, Houlton Regional Hospital in Houlton, and Northern Maine Medical Center in Fort Kent. One phone circuit carries the audio signals, and the other carries the slow scan video signals. The telephone company will soon be installing a dial interconnect which will allow a number of outside participants who have Robot slow scan equipment to connect into the Aroostook County System. The primary use of this interconnect will be to share programming with the Central Maine Interactive Telecommunications System (CMITS). Slow scan equipment has been installed in the CMITS console at the Kennebec Valley Medical Center, Augusta Division (KVMC). All



MCD Newsletter (Continued)

of the other CMITS sites can communicate with Aroostook County through the KVMC console.

The pictures are still, black and white images which build down the screen over either eight, seventeen, or thirty-five seconds. The picture to be sent and its rate are determined by the operator. Transmission speed determines the resolution (clarity of the picture received); the shorter the transmission speed the lesser the resolution in the picture. Moving video images such as those seen on a regular television set actually consist of sixty still images per second. Slow scan technology deals with just one of those images and translates that picture into a series of audible tones, which are then converted back into video form at a receiving site.

The Aroostook County System is in its infancy but already programming is being planned and scheduled. The uses of the System will be similar to those of the CMITS and include in-service training, meetings, continuing medical education, and educational courses, both credit and noncredit. The advantages of slow scan television include its low cost and ease of operation of the equipment, the ability to use voice grade telephone circuits for sound and picture transmissions, and the relatively low cost of system maintenance.

There is every expectation that the Aroostook County Telecommunications Demonstration will be as successful as its counterpart in central Maine. Meeting with others by means of electronic teleconferencing has come of age in Maine, and MCD's telecommunications staff is constantly looking at new ideas and technologies which will improve upon this means of sharing resources and ideas.

Robert Ellis using slow scan equipment.

EXHIBIT 13

BANGOR DAILY NEWS

April 1980

Communications link set between county hospitals

By Maragaret Smith
District Correspondent

CARIBOU — A telecommunications link between five Aroostook County hospitals is expected to become active in May, a Cary Medical Center spokesman said Thursday.

Basically, the project will establish a slow scan television system that will provide for two-way voice and video communications between the Fort Kent, Cribou Presque Isle, Fort Fairfield and Houlton hospitals. The system will further provide this communication with other insittutions participating in the Central Maine Interactive Telecommunication System.

Funded by a grant from the Department of Health, Education and Welfare to medical care development, the intent of the project is to contain rising health costs through sharing of activities and programs, both with central Maine and among county hospitals.

With the energy shortage and an increased need for cooperative exchange to contain health costs, more agencies are utilizing tele-communications as a means of addressing these issues, the Cary announcement said.

Although the Aroostook County Network will not have the capacity for protraying motion, the demonstration will be the first lare-scale program to explore potential sharing.

Telecommujications will provide access to many programs attended by Central Maine counterpartrs. The SSTV network will also enable those in the county to share their own existing programs. CMITS says similar size institutions can accress many common educational needs from within their own staffs if a cooperative atmosphere is established.

The demonstration is further expected to address problems of isolatio. Medical care development research in physician retention and recruitment indicates that providing rural practioners with ability to interact with their peers and also giving them opportunity to serve as an adjunct in state programs will allow interchange of ideas and intellectual stimulation.

"We see a great potential for saving moeny by conducting meetings with other hospitals and not having to travel," Suzette Connally, director of staff education at Cary, said, commenting on the project. "In addition, the tie-in with other facilities in central and southern Maine will save travel expenses to educational programs, inter hospital in those parts of the state."

John McCormack, executive director of the Caribou Hospital, said, "with good utilization by a full complement of health care professionals, the potential for benefit in terms of shared ecuational programs, inter-hospital communication and cooperation, is a very exciting prospect."

EXHIBIT 13

AROOSTOOK REPUBLICAN AND NEWS, JUNE 4, 1980, PAGE 6B

Special TV equipment connects county hospitals

PRESQUE ISLE – Slow scan television conferencing equipment has arrived at A. R. Gould Memorial Hospital, the Aroostook Mental Health Center in Fort Fairfield, Cary Medical Center in Caribou, Houlton Regional Hospital in Houlton and Northern Maine Medical Center in Fort Kent.

All five facilities will participate in a slow scan television (SSTV) conferencing system that allows better access to medical information and educational programs and, at the same time, decreases the need for travel by physicians, nurses and support staff.

This slow scan project, the Aroostook County Telecommunications Demonstration (ACTD), is supported by a grant from the Office of Telecommunications, Department of Health, Education and Welfare. The grant was awarded to Medical Care Development, Inc. (MCD), an Augusta-based, non-profit health services organization, which will install and operate the system.

This SSTV is based in the Rotary Regional Education Center at A. R. Gould and will provide health professionals with the means of communicating verbally and visually via a dedicated telephone network. The slow scan picture will consist of a series of still television images which can be electronically taken apart at their origin and reassembled at a receiving site. Regular telephone lines will be used for transmitting and receiving the pictures, thus eliminating the costly microwave transmitting equipment needed for conventional television.

At A. R. Gould, the staff is in the process of getting acquainted with the new equipment and becoming familiar with its use. Maureen O'Reilly, RN, director of Inservice Education, says of the project, "We are excited over the endless possibilities of the slow scan television, such as sharing educational programs between county hospitals and exchanging ideas and information in group gatherings, thereby reducing travel costs." She anticipates many departments in the hospital will use the system, as well as members of the medical staff.

Northern Maine RAISE will assist MCD with the scheduling among the Aroostook hospitals. RAISE (Regional Approach to Inservice Education) works with member hospitals in developing cooperative inservice educational programs and hopes to use the SSTV network as another means of delivery of these courses to health care professionals in need of them.

The slow scan system will also have the ability to connect with the Central Maine Interactive Telecommunications System (CMITS), a fast scan microwave system connecting Augusta General Hospital, the Central Maine Family Practice Residency, and the University of Maine in Augusta; Central Maine Medical Center and St. Mary's General Hospital in Lewiston; Mid-Maine Medical Center in Waterville; and the Togus Veterans Administration Center. The CMITS, an operational project of MCD, was originally funded by a Veterans Administration grant in 1975 and is now supported by those participating institutions.

The five county hospitals will be able to originate programming, thereby sharing that facility's particular strengths with other institutions as well as participating in programs the other sites initiate.

Advanced Equipment Arrives At Fort Kent Medical Center

FORT KENT — Slow scan television conferencing equipment has arrived at Northern Maine Medical Center and four other Aroostook County Health Care Facilities including the Aroostook Mental Health Center in Fort Fairfield; Cary Medical Center in Caribou; A.R. Gould Memorial Hospital in Presque Isle, and Houlton Regional Hospital.

These facilities will be participating in a slow scan television (SSTV) conferencing system which will allow better access to medical information and educational programs and at the same time, decrease the need for travel by physicians, nurses, and support staff.

The slow scan project, the Aroostook County Telecommunications Demonstration (ACTD), is being supported by a grant from the Office of Telecommunications, Department of Health, Education, and Welfare to Medical Care Development, Inc. (MCD), an Augusta-based, non-profit health services organization which will install and operate the system.

The SSTV system will provide health care professionals with the means to communicate verbally and visually via a dedicated telephone network. The slow scan picture will consist of a series of still television images which can be electronically taken apart at their origin and reassembled at a receiving site.

Regular telephone lines will be used for transmitting and receiving the pictures, thus, eliminating the costly microwave transmitting equipment needed for conventional television.

Northern Maine R.A.I.S.E. will assist MCD with some aspects of the administrative responsibilities. R.A.I.S.E. (Regional Approach to Improved Health Services through Education) works with member hospitals in developing cooperative in-service educational courses and seminars and hopes to use the SSTV network as another means of delivery of these programs to health care professionals in need of them.

The slow scan system will also have the ability to connect with the Central Maine Interactive Telecommunications System (CMITS), a fast scan, microwave system connecting Augusta General Hospital, the Central Maine Family Practice Residency, and the University of Maine in Augusta; Central Maine Medical Center and St. Mary's General Hospital in Lewiston; Mid-Maine Medical Center in Waterville; and the Togus Veterans Administration Center. The CMITS, an operational project of Medical Care Development, was originally funded by a Veterans Administration Grant in 1975 and is now supported by the participating institutions.

Both systems will enable the participating institutions to share educational programs, courses, and exchange medical information. Each institution will have the ability to originate programming, thereby sharing its particular strengths with the other institutions.

In addition to programming within the telecommunications systems, the ability will exist to receive programming from outside the system by means of satellite communications and, in the case of SSTV, via long distance telephone calls. Expansion of the telecommunications systems within Maine and New England is presently under investigation by Medical Care Development's telecommunications' staff.

EXHIBIT 13