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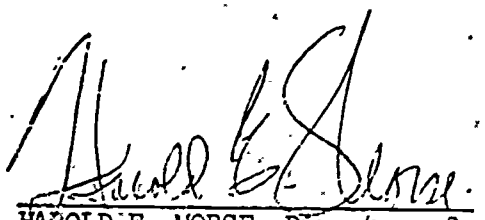
ABSTRACT

The objective of the Appalachian Education Satellite Project was to demonstrate the use of educational technology as a means of strengthening existing local education programs in Appalachia. Teachers at fifteen remote sites in Appalachia received graduate credit for completion of courses broadcast via satellite communication network. While utilizing this network, teachers were given the opportunity to develop instructional units from material available from widely diverse sources, and they were encouraged to participate in computer-based programs. The experiment generated information for the design of future large-scale resource sharing arrangements that cut across local and state boundaries. Such a resource network will utilize advanced communication media for the delivery of various educational services in remote locations. (CH)

THE APPALACHIAN EDUCATION SATELLITE PROJECT

EXECUTIVE REPORT



HAROLD E. MORSE, Director of Education

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INTRODUCTION

In 1965 Congress passed the Appalachian Regional Development Act establishing the Appalachian Regional Commission. The Congressional mandate to the Commission was to aid the Appalachian states in the development of new programs and approaches to improve their economic development. This included the goals of reducing unemployment, improving education, and in general, creating the conditions within which sound economic development could take place. Further, the Appalachian Act calls on the Commission to seek assistance from, and to coordinate Activities with other Federal agencies and their programs for the benefit of the Appalachian people. This activity of Federal resource sharing and coordination is well demonstrated by the Appalachian Education Satellite Project (AESP).

The broad objective of the AESP was to demonstrate the use of educational technology as a means of strengthening existing local education programs in Appalachia. Focusing on in-service education for the improvement of classroom teaching skills, teachers at 15 remote sites in Appalachia received graduate credit for the successful completion of courses broadcast via a satellite communication network. In utilizing this network, teachers were also given the opportunity to develop instructional units from material available from widely diverse sources, as well as, to participate in computer-based programs.

In summation, the experiment generated information for the design of future large-scale resource sharing arrangements that cut across local and state boundaries and which utilize sophisticated communication media for the delivery of various educational services in remote locations.

II. History

In early 1968 the Appalachian Regional Commission received a grant from the U.S. Office of Education to review the educational needs of Appalachia. As a result of this grant a two-year study by Arther D. Little and Company was undertaken which included a survey of over 32,000 Appalachian teachers. The resulting Appalachian teacher profile and related need assessment study indicated in-service education to teachers, especially in the areas of reading and career counseling, as being the priority educational needs for Appalachia.

Later in 1971, the Appalachian Regional Commission was approached by the National Center for Educational Technology to ascertain its position with respect to participating in a joint Health and Education Technology (HET) experiment utilizing the ATS-6 communication satellite to be launched by NASA. Partly in response to this question, the Commission, in November of 1971, convened an Educational Telecommunication Advisory Task Force comprised of selected representatives for higher education, instructional media, and educational broadcasting to assist the Commission in prioritizing its educational objectives and to suggest ways in which telecommunications might be used to help achieve these objectives within the region. In addition, the Commission requested and received a grant from the U.S. Office of Education to investigate the feasibility of utilizing satellite telecommunications for educational services in Appalachia. This grant resulted in a substantial report prepared by the Center for Development Technology, Washington University which outlined existing and potential telecommunication services for the Appalachian region.

Based on the results of the two aforementioned studies and recommendations by the Telecommunications Task Force, the Commission, in May of 1972, began preparation of a Proposal to the National Center of Educational Technology requesting participation in the HET experiment. The proposal outlined in-service education in the teaching of reading and career education as the recommended services and included a description of the structure to facilitate their dissemination which utilized the Commission funded Regional Education Service Agencies (RESA) and a Resource Coordinating Center (RCC) later to be established at the University of Kentucky.

After long and arduous negotiations, the Commission's proposal was accepted. Beginning in May, 1973, the Commission began the pre-planning phase of the AESP. During this phase the funding responsibilities of the HET experiment were transferred from NCET to the National Institute of Education (NIE). Further, the Commission met with representatives of the 16 Appalachian Regional Education Service Agencies who responded to the Commission invitation to participate in the project. Discussions were held to determine their geographical locations, available technology, programs in progress, possible credit transfer from local area universities and teacher in-service accomplishments. Based on this information an outside panel of experts designated five of the sixteen as the main sites to participate in the project. These RESA's were located in New York, Maryland, Virginia, Tennessee and Alabama. Additionally, the Commission under NIE supervision, developed a Request for Proposal for the project's Resource

Coordinating Center and convened a pre-bidders conference for the purpose of addressing the procedures and program elements specified in the RFP. This conference was attended by 14 institutions of higher education. Seven proposals resulted from the solicitation and were sent to a panel of outside experts. Site visits by this panel and the Commission staff served to confirm and amplify results of the proposal reviews. After budget negotiations with the two top contenders, the University of Kentucky was recommended by the Commission and approved by NIE as the AESP Resource Coordination Center.

III. AESP Education Objectives

The immediate educational objective of the AESP was to improve the effectiveness of the classroom teacher, thereby upgrading the quality of reading and career-education instruction available to Appalachian students. The question to be resolved by the AESP and similar projects was, can the linking together of existing organizations, like the Regional Educational Service Agencies (RESAs), and communications satellites result in more effective and significant in-service teacher training.

The educational ramifications are overwhelming when the project is viewed as a demonstration of the feasibility of producing high quality, revenue-shared courses in multiple disciplines for cross-state delivery via satellites. More specifically, the AESP, as an experiment in the applications of space-age technology to education:

1. explored the feasibility of using fixed-broadcast satellites and linking terrestrial communications systems to deliver educational services;

2. examined the effectiveness of the instructional sequence of televised lecture, audio questions with immediate feedback, ancillary practice activities, and review testing;

3. broadened understanding regarding workable ways to organize trans-state projects conceived to solve common problems when greater economy and quality is promised by large-scale delivery and resource pooling;

4. developed procedures for preparing software for heterogeneous audiences and various hardware systems;

5. demonstrated the feasibility of developing central computerized information systems for delivery via satellite;

6. demonstrated the feasibility of utilizing future communications satellites with increased broadcast channels, and air time, in order to increase course options and make quality education equally accessable to all parts of the country.

IV. AESP Project Description

The Appalachian Education Satellite Project (AESP) had a number of distinct levels of growth and operation. The first phase, which was described in the history and included the site selections might well be labeled the Pre-planning Phase. The remaining phases have included planning, development, operation, and evaluation. As one might suspect, this program had many overlapping and concurrent activities within these phases. An overall project description is thus best described by outlining the organization structure, program operation and content; the project accomplishments; the apparent program impact and finally what possibilities lie in the future. The following sections will address these topic areas.

Organizational Structure

The basic organizational structure of the AESP project can be divided into three main components: the Appalachian Regional Commission (ARC), the Regional Education Service Agencies (RESA) and the Resource Coordinating Center (RCC).

ARC

The Appalachian Regional Commission was responsible for the overall development and management of the project. In meeting this responsibility, the Commission worked in a complex framework of interagency participation to achieve the programmatic and technical objectives of the project.

In establishing and insuring that the project's programmatic objectives were met, the Commission staff maintained a close working relationship with the National Institute of Education. This was accomplished through weekly contact and reporting, as well as, through a continuous series of site evaluations, by both an in-house NIE evaluation team and by the Educational Policy Research Center at Syracuse University.

In pursuit of the technical objectives of the experiment the Commission staff maintained working relationships with a number of additional agencies. In designing, implementing and operating the AESP communication network, close coordination was maintained with the National Institute of Education (plans review), Department of Health, Education, and Welfare (terrestrial system), National Aeronautics and Space Administration (space system and vehicles), Federation of Rocky Mountain States (engineering, installation, and maintenance) and the other experimenters on the ATS satellite (scheduling).

Returning to the project's other main components, the implementation of the education experiment conceived by ARC was the function of the Regional Education Service Agencies and the Resource Coordinating Center.

RESAs

The Regional Education Service Agencies (RESAs) are best defined as confederations of school districts, sometimes called educational cooperatives, regional education service centers or cooperative educational service

agencies. Before the conception of the AESP, New York and Pennsylvania had established networks of RESAs. Kentucky, Tennessee and West Virginia had permissive legislation authorizing the establishment of RESAs, and North Carolina had regionalized organizations similar to RESAs. School districts in the 48 Appalachian counties participating in the AESP have joined together to form RESAs for participation in the project.

Initially, five lead RESAs and up to two associate RESAs per lead RESA were approved for participation in the AESP project. During on-site surveys three antenna locations per lead RESA were selected and thus the 11 participating RESAs with the 15 receiving sites, where class sessions were to occur, were established. (See Figure 1 for participating sites).

It was the responsibility of the RESAs to coordinate project related activities at the local level. To be specific, during the project, the RESAs:

1. developed administrative structures for the management of project activities;
2. arranged for local universities to grant graduate credit for teachers participating in the AESP courses;
3. staffed a Project Advisory Council with teachers, administrators, representatives of local boards of education and representatives of local institutes of higher learning;
4. gathered information on local programs and audio/visual equipment, to assit in the development of pre-service, site-utilization, teacher-selection, administration, engineering, and evaluation plans;

The Appalachian Region with the Five RESA Triangular Networks and Approximate Satellite Footprints

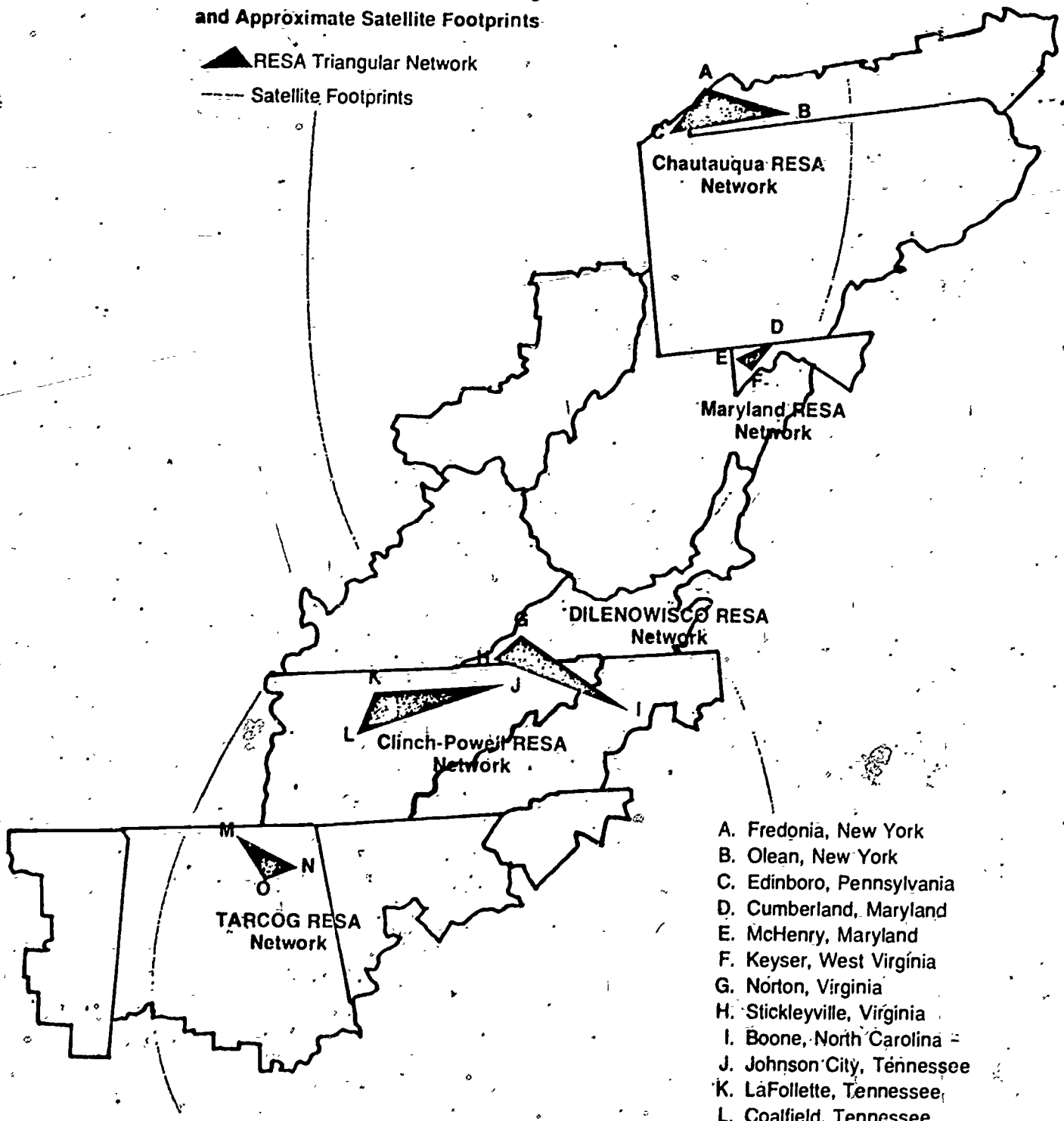

Figure 1

d. selected and developed for the career education courses supplementary instructional materials (ancillary materials) to augment the television and four-channel audio instruction.

3. The Television Component:

   a. produced the televised reading and career education courses and;

   b. broadcast the televised reading and career education courses.

4. The Four-Channel Audio Component:

   a. developed a series of four-channel one-way audio programs in reading and career education for broadcast to teachers participating in the AESP courses.

5. The Information Systems Component:

   a. developed combination of computer-based and manual systems for storing, retrieving, and delivering information and instructional materials in the areas of elementary reading and career education to the teachers enrolled in the AESP courses;

   b. supplied the 1,200 teachers in the reading and career education courses with computer-managed instructional materials.

6. The Evaluation Component:

   a. designed and implemented formative evaluation strategies;

   b. designed and implemented summative evaluation strategies.

7. The Management Component:

   a. developed a RCC management system;

   b. coordinated and managed RCC project activities and;

   c. established a Planning and Development Committee, composed of management, content and field personnel, to assess mission progress against project and mission guidelines.

The primary responsibility for day-to-day maintenance of each of the components was delegated to the appropriate mission director; and within this framework the objectives of the project were translated into the finished products. (Figure 2 depicts the organization of the AESP).

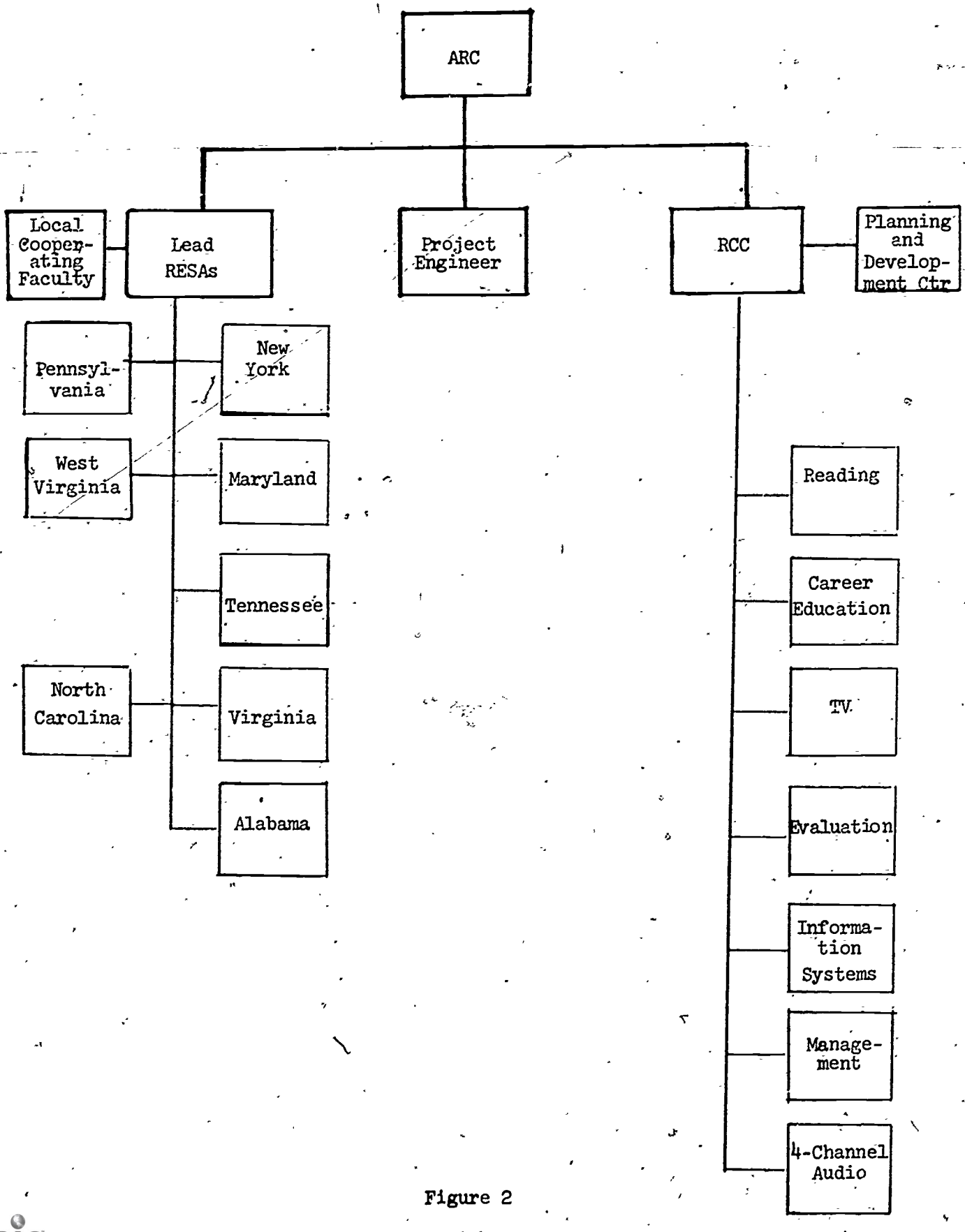
ARC
Local Cooperating Faculty
Lead RESAs
Project Engineer
RCC
Planning and Development Ctr
Pennsylvania
New York
West Virginia
Maryland
Tennessee
North Carolina
Virginia
Alabama
Reading
Career Education
TV
Evaluation
Information Systems
Management
4-Channel Audio

Figure 2

V. AESP Network Configuration

In 1966, the National Aeronautics and Space Administration (NASA) began the launching of a series of six Application Technology Satellites (ATS) to test and improve satellite communications. The sixth satellite in the series, ATS-6, launched May 30, 1974, is the largest and most powerful communication satellite ever sent aloft. This satellite is being used to conduct an extensive series of both technical and non-technical experiments. The AESP was one such experiment in educational technology.

The ATS-6 satellite maintained a fixed position (geosynchonous orbit) near the Galapagos Islands, 600 miles west of Ecuador in the Pacific Ocean. From this vantage point in space, the ATS-6 could transmit to most of the North America continent. The transmitter/receiver system of the satellite bounced signals off the craft's 30-foot parabolic reflector to produce a pair of beams which formed giant "footprints" on the earth, each 1,000 miles long by 300 miles wide. The AESP project staff worked closely with NASA in determining the reception areas in Appalachia and the technologics vailable for interfacing the ATS satellites. Interfacing techniques included a terrestrial system necessary to transmit audio and video signals from the RCC studios in Kentucky to one of NASA's facilities in Rosman, North Carolina.

Within the satellite footprints, five RESAs, the Chautauqua, Maryland, DILENOWISCO, Clinch-Powell and TARESA RESAs, had primary transmitting and receiving terminals with the capability to receive the satellite telecast

and also to transmit audio communication and data via satellite. (The transmitting capabilities were provided through NASA's ATS-3 satellite). These RESA terminals were defined as main sites. Each main site formed a triangular network with two ancillary sites which could receive the ATS-6 satellite broadcast, but could not directly transmit via the ATS-3 satellite. These sites, however, were connected to their respective main sites by land lines, so that questions and comments of teachers taking the courses could be relayed to the main sites and forwarded by ATS-3 satellite to the RCC studio for response.

As mentioned above, the AESP used two of NASA's ATS satellites: ATS-6 and ATS-3. The AESP also used two uplink stations: one in Rosman, North Carolina and the other in Denver, Colorado. Except for the four-channel audio programs the majority of the AESP produced material (both the pre-taped and "live" seminar programs) was uplinked at Rosman, North Carolina. However, since the Rosman uplink did not have the capability for transmitting multiple channels, the Denver uplink was used and also served as a back-up in emergencies. Voice data, such as the audience questions asked during the seminars, and other information requests were transmitted and received directly from the main sites to the RCC studio. (Figure 3 diagrams the AESP delivery patterns).

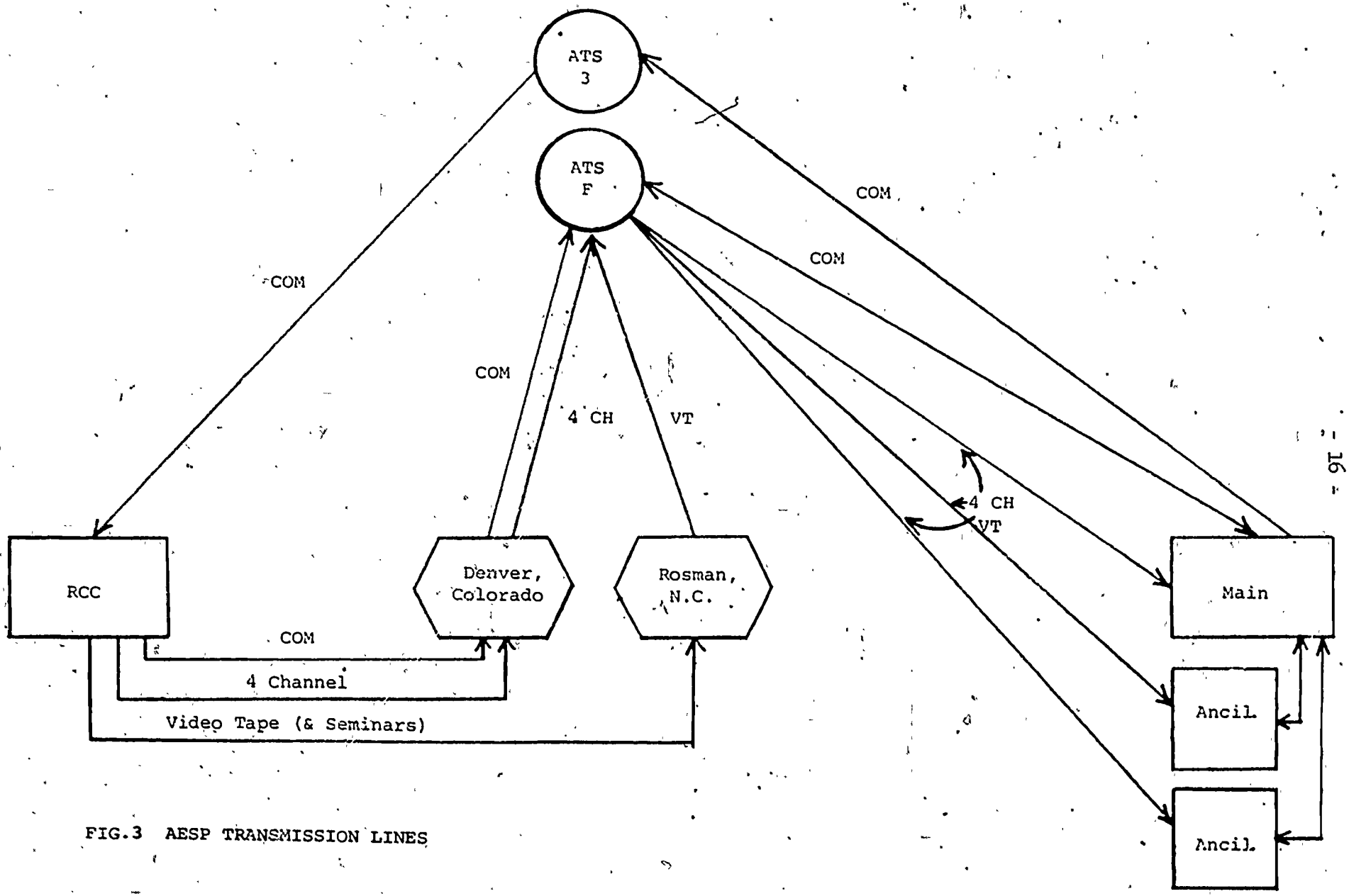

FIG.3 AESP TRANSMISSION LINES

VI. AESP Program Operation

Responding to priorities established by the local area participants, the AESP offered courses in the teaching of reading and career education via its unique communications network. During the summer of 1974 graduate credit courses were offered in reading (K-3) and career education (K-6). During the 1974-75 school year the AESP offered graduate credit courses in career education for junior and senior high school teachers and courses in the teaching of reading for the K-3, K-6, and 4-6 level teachers.

Summer Courses, 1974

Both the reading and the career education courses transmitted during the summer of 1974 involved 16 satellite broadcasts. These broadcast consisted of three quarter hour live video seminars and 12 one-half hour pre-taped video programs. The live seminars allowed for immediate audio interaction between the instructor and the students enrolled in the courses. The pre-taped programs were followed by 15 minutes audio question and answer reviews and pre-planned audio-instruction application periods. At the end of the sessions following the presentation of each program unit, there were multiple choice examinations.

School Year, 1974-75

The career education course, transmitted during the 1974-75 school year, consisted of 16 live video seminars 60 minutes in duration. During these sessions, direct interaction between the instructor in the RCC studio and the teachers in the classroom at the 15 receiving sites was possible.

The reading courses transmitted during the 1974-75 school year consisted of a varying mix of 17 pre-taped "programs" and 5 interactive seminars. In addition, four-channel audio instruction applications were again used. Perhaps the best way to describe the elements of an effective learning sequence as established in the AESP would be to briefly trace the development and related inter-activities involving the AESP courses.

Reading Program

During the planning and development phases of AESP the reading instructor made on-site visits to representative schools throughout Appalachia to observe the current reading assessment and teaching procedures so that the reading courses could be shaped to fit the target audience. It was determined that the teachers needed to know more effective ways to recognize student reading deficiencies and strengthen student reading skills. The course focused on how teachers could recognize and assess reading deficiencies, use computerized diagnostic-prescriptive information systems, apply a large number of reading-improvement techniques, and conduct individualized and small group instruction.

Modeled on the New York State Department of Education In-Service Reading Program, the reading courses emphasized practical techniques for the classroom teachers. Each individual program was similar to a documentary in that it was punctuated by slice-of-life shorts showing actual teachers in Appalachia using the techniques. For one-half hour prior to, during, and after each of four live seminars, an audio link was maintained between the RESA classroom sites and the RCC studio. During this time the students

enrolled in the courses could ask questions of the instructor or of the visiting experts.

The reading component director, a professor in reading, was responsible for the development of reading program scripts and accompanying ancillary materials. Assistants collected and organized reference materials, as well as, developed four-channel audio and ancillary activities. Data on reading skills, assessment procedures, and teaching methods was collected by computerized search of the literature in such files as ERIC, the Texas Computer Retrieval System, and the University of Kentucky Regional Educational Materials Center.

Career Education Program—

The elementary career education course focused on ways K-6 grade teachers can restructure curriculum around the world of work. The course provided teachers with broader understanding of career education and techniques they could use to help their students acquire self-awareness, decision-making skills, occupational information, academic skills, and healthy attitudes toward work.

Similar in format to the reading course, the K-6 career education course documented ideas with on-site filming. For instance, to impress upon teachers the importance of infusing career education into normal classroom instruction, there were film segments showing teachers preparing and performing actual career education lessons.

The career education course for junior and senior high teachers consisted entirely of live videos from the RCC studio at the University of Kentucky. During each seminar there was an audio return-link from the RESA classroom sites to the RCC studio. This link between the students and the professor was an efficient means of establishing the inter-personal relationship for individualized instruction. Usually student reaction to a televised course is collected only after the completion of the course, and a re-cycling of the product before letting others use it is the maximum effect student input can have. However, with the AESP, weekly feedback via the audio connection altered subsequent presentations, thereby adapting the content of the on-going course more toward the expressed needs of the participants.

In addition, the audio inter-connection provided the opportunity for students to interact with career education experts and community leaders taking part in the seminar discussions. Interaction with experts is the basis of seminar instruction in the universities. The transmission by satellite of one-way video and two-way audio made possible the expansion of this methodology from its present use in isolated classrooms to multiple inter-connected classrooms.

The format for each session of the career education course for high school teachers contained presentations on selected topics in the form of lectures, panel discussions or videos of episodes in the operation of successful career education projects. As questions arrived from the RESAs

repetitions were eliminated by off-stage coordinators, the questions were fed to the on-stage coordinator who asked the appropriate resource person for the answer. These questions were subsequently studied for clues as to how future programs could be modified to better meet the needs of this particular audience.

Four-Channel Audio Instructional Activity

A 15-minute pre-programmed audio review of the video content that followed each program that was not a seminar, demonstrate satellite capability for multiple-channel synchronized transmissions. Through his headphone, the participant heard a question, usually in the form of a problematical situation, pushed one of four buttons on a touch pad to indicate the response he judged most appropriate and heard a description of the factors he should have considered when making his response.

In addition, the incorporation of a response-accumulation device in the four-channel console, made possible the collection of data useful in program revision. With an accurate record of initial student responses made to questions constructed to elicit behaviors specified in the course objectives, it was possible to determine which behaviors the program did not adequately prepare the student to perform.

The response-accumulation device in the four-channel audio console also provided a mechanism for in-house revision of videos before they were released. The procedure was to have a group similar to the target audience view each completed video. They were told whenever the light over the television came on they were to turn the dial to "A" if they understood what

was being said or to "B" if they did not understand. They could be asked to answer any question pertaining to individual interest and understanding. From student recorded response, peaks and depressions were charted concerning the program content, and from this charting necessary revision was accomplished.

Information Retrieval Systems

Pre-planned activities and a depository of microfiche and hard-copy reference materials complemented each video and four-channel audio unit. To supplement the limited depository of hard-copy or microfiche reference materials at each site, the teachers in the course had access to computer-based information retrieval systems: The Computer-Based Resource Unit (CBRU), the Texas Computer Retrieval System (CRS), the Select-Education Prescriptive Materials Retrieval System (PMRS), as well as computerized index tapes to Educational Research Information Centers (ERIC), and Abstracts in Instructional Materials and Abstracts in Research Materials (AIM/ARM).

The CBRU data base consisted of units of study on career education topics. The computer matched the set of objectives supplied for a particular class or individual to potential resources and strategies and printed out a list of appropriate instructional activities, supplementary materials, and evaluative devices.

The Texas CRS with its 10,000-item data base identified reading instructional materials. During satellite-televised programs, the teachers were shown how to fill in forms specifying the kinds of materials wanted.

Requests were teletyped to the RCC for transmission to Texas; there the CDC 6600 Computer printed out microfilm numbers, shelf numbers, and program titles and teletyped the information back to RCC; the Recordak Microfilm Reader-Printer retrieved the abstracts that corresponded and either the abstract or the actual item was sent to the requestor.

The PMRS, based on approximately 4,000 instructional materials, was a retrieval system that permited the teacher to personally conduct searches for instructional materials, once certain varibles were identified and translated into terms contained in the PMRS thesaurus. The teacher was taught to use the system during one of the satellite-transmitted programs.

The ERIC tapes allowed computerized retrieval of selected citations of education reports and journal articles from worldwide sources. AIM/ARM citations supplemented the ERIC file; they were in the same format and were assigned retrieval numbers by the same system.

In order to determine the most efficient way to process information requests, three alternate and/or complementary communications system were tested:

1. Voice transmission via satellite during the times it was available to project personnel and simulated satellite transmission at other times via long-distance land lines;
2. Facsimile transmission via xerox facsimile telecopiers installed at the RCC and each RESA and;
3. Teletype transmission installed at the RCC and each RESA.

In summation, each of the elements in the learning sequence of the AESP courses explored different ways the satellite could be used to facilitate learning.

IV. PROJECT ACCOMPLISHMENTS AND IMPACT

IV. PROJECT ACCOMPLISHMENTS AND IMPACT

Previous sections of this report have made reference to a series of twelve Technical Reports that are being developed by the evaluation team at the RCC. These reports carefully list and explore the ramifications of the AESP. However, some of the more obvious project accomplishments can be reviewed here.

1. Twelve hundred (1200) teachers in Appalachia have completed in-service courses provided by the AESP.

2. These courses were graduate credit courses with 14 institutions of higher education in Appalachia participating as credit granting institutions.

3. A sophisticated satellite communication network has been established which includes:

   - Fifteen (15) receiving sites in Appalachia equipped with TV receivers, 4-channel audio equipment, teletype intercommunications, libraries, and special instructional materials with trained satellite communicators at all 15 sites
   - Two (2) of the most powerful communication satellite existing: ATS-6, and ATS-3
   - Two (2) satellite uplink stations located in Denver, Colorado and Rosman, North Carolina
   - Two (2) network Coordination Centers located in Denver, Colorado and Lexington, Kentucky.
   - Agreements with Central PBS and local PBS Stations to provide, where and when available, an extensive terrestrial backup.

4. A Resource Coordinating Center has been established where four (4) graduate credit courses have been developed which included extensive auxiliary materials with a highly imaginative computer support activity.

5. A video production and satellite broadcast center has been established at the Resource Coordinating Center in Lexington, Kentucky. This Center has produced over 64 hours of video broadcast via ATS-6 and over 720 hours data/voice transmission via ATS-3.

6. The video programs produced for broadcast have been of such a quality that the State of Tennessee has contracted for their use. The State Departments of, Maryland, Virginia, New York and North Carolina have also indicated their specific interest in the same.

7. PBS has shown interest in AESP produced video tapes with PBS/KETV now broadcasting AESP produced material.

8. Special regional demonstrations utilizing the satellite communication network have been successful and in the process pr ing to be highly effective in the regional exchange of information.

9. In-service programs previously unavailable in many parts of Appalachia are now available.

10. There is a nucleus of trained teachers that can work with RESA's to provide similar experiences for their colleagues and this training was a direct result of the AESP.

11. Extensive data have been compiled and now is being analyzed (see technical reports) in order to assist others in their attempts with similar projects.

12. A dissemination office has been established and has already processed numerous requests for the courseware developed during the AESP.

It is difficult to fully assess the impact of the AESP at the present time; however, some preliminary conclusions can be stated. Most of these conclusions are based on feedback from the NIE evaluation which, as noted previously, included an outside evaluation by the Education Policy Research Center, Syracuse University. Other conclusions are based on data collected throughout the program by the project's evaluation component and on data gathered by expert consultants appointed by the project director.

Two points, that are now clear are that the teacher response has been overwhelmingly favorable and that there has been a high degree of the classroom use of the concepts taught during the program, both in Reading and Career Education. To a large degree, this application of the knowledge garnered during the program is based upon support the teachers have received from their schools during their participation. However, it should be noted that the teachers perceived the courses as being "most relevant and useful" for the "real" classroom situation. In many instances, participants organized small groups in their schools to present and discuss the material covered during the program. Thus, it appears that the broadening of the initial knowledge base in the teaching of reading and career education throughout the participating areas has begun.

In terms of the effectiveness of the media, initial response to the seemingly complex equipment was surprisingly favorable; however, there was anxiety on the part of some teachers who were totally unfamiliar with much of the equipment. This "fear" of technology was quickly dissipated and a wide, general acceptance of satellite telecommunication technology now exists.

Institutionally, the impact of AESP is much more difficult to document, yet the following observation may be made.

Some of the RESAs have utilized the AESP as a major stepping stone in their long-range goals for an educational telecommunications system for their communities. This local telecommunication network is seen as having a strong influence on the local community in the future through community educational programs.

The AESP has achieved a major goal of facilitating the sharing of materials and expertise between several heretofore separate entities within the educational system. The participating RESAs have begun cooperative programs that now act across counties, as well as, state boundaries. Institutions of higher education have provided tuition free credit to participants in the AESP, when the courseware was not developed by these institutions, and when, in some cases, the content of this courseware may not have been a traditional area of interest for the institution. It should also be noted that the standards for successful performance in the AESP programs were not set by these institutions. In effect, for the first time in the Region, a major group of diverse educational institutions

(diverse both geographically and philosphically) are cooperating together in order to offer educational services to the widely dispersed residents of the Region.

Finally, when the AESP began operations in 1973, there was no national policy on satellite communications. The AESP, along with the other HET experiments, has kindled a major governmental discussion in an effort to effect a national policy dealing with telecommunications and, more specifically, satellite communications. This government consensus should point the way toward future efforts similar to AESP.

V. FUTURE DEVELOPMENT AREAS

V. Future Development Areas

As the present experiment moves toward its conclusion, it is apparent that there are adequate data to indicate a desire on the part of the institutions of the region to continue and expand the educational services now provided via the satellite. The Federal Government's position indicates that satellite technology has the support of the Federal Government and that a Federal policy is emerging favorable to the participation of funding agencies and the encouragement of private industries involved in satellite programs.

Realizing that policy formulation does not take place in a vacuum, this section will outline, to date, the major areas of development concerned with satellite telecommunication activities.

Applications Technology Satellite - ATS-6

The current HET experiments, which includes the AESP, have now been terminated and the ATS-6 satellite has been moved from the Western Hemisphere to Central Africa for the Indian Satellite Television Experiment (SITE) and the Apollo Soyuz mission.

ATS-6 is scheduled to return to the Western Hemisphere in the summer of 1976. At this time, ATS-6 is expected to have at least three additional years operating life. NASA has received formal requests in the name of the current HET experiments for use of the satellite during this time.

The Cooperative Technology Satellite - CTS

This satellite involves a cooperative effort between the United States and Canada. The satellite is now scheduled for launch in December of 1975 with the satellite being available for experiments by April 11, 1976.

The CTS satellite has been suggested by NASA as a follow-on for the HET experimenters with the AESP being conditionally accepted as an educational experiment depending on the availability of funding.

The CTS poses some difficulties to the current HET experiments because of the difference between the CTS and ATS frequencies. (i.e. 12GHz vs. 2.5GHz). If the AESP would intend to participate, this difference will require modification of ground terminals now in place for the ATS satellite. The Westinghouse Corporation has developed a prototype cenvertor which could modify the ground terrestrial making their compatibility to both satellite frequencies. The AESP staff is now reviewing this option.

Public Service Satellite Consortium (PSSC)

The consortium is composed of a wide variety of potential users and potential providers of satellite-based telecommunication services both

in the public and private section. The purpose of the group is to estimate the demand for satellite-based telecommunication services and to ascertain the technical, financial and organizations options available to meet this demand. An interim steering committee, chaired by former Governor H. Rex Lee, includes the representatives of the current satellite experimenters and in particular, the AESP.

In the near term, the PSSC appears to be playing the lead role involved in securing temporary or permanent provision of satellite-based communication services for the public sector. Some of the options that the PSSC is now exploring include proposals by Hughes Aircraft, RCA, Western Union, Fairchild Industries and other potential satellite service providers In addition, the PSSC has been developing a projected user traffic model to determine the immediate national demand for such services.

Interagency Committee to Coordinate New Communication Satellite Technology Applications

The interagency committee was established as a mechanism to coordinate Federal support of the effort to provide a commercial follow-on to the HET experiments on an operational basis. As stated in a memorandum by John Eger, Acting Director of OTP: "This committee would coordinate an analysis of potential Federal uses of a high power communication satellite service and investigate sources of Federal technical and financial support for the initiation of such a service." A meeting on January 29, 1975 was held to convene such a committee with attendes from the following Federal agencies:

The National Science Foundation

Housing and Urban Development

National Aeronautics & Space Administration

Health, Education, and Welfare

Department of Commerce

Veterans Administration

Department of Justice

One problem faced by this committee will be whether it can be organized and functioning in time to impact the future of the present users of satellite communication services.

In summation, as one may have discerned from the foregoing information, the Appalachian project, together with the satellite projects in Alaska and Rocky Mountains, has generated a ground swell of a favorable public opinion. The effect of this may, in the near future, culminate in a substantial Federal allocation towards continued satellite services to remote areas such as Appalachia. In response, the Appalachian Regional Commission should be again, prepared to provide the leadership to address this situation for the benefit of the Appalachian people.