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PROJECT PAPER (PP)
RADIO EDUCATION TEACHER TRAINING PROJECT
Project Number: 367-0123

USAID/Nepal
Kathmandu, Nepal

March 1977

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10. ESTIMATED COSTS (2000 OR EQUIVALENT \$) -											
A. FUNDING SOURCE		FIRST FY			LIFE OF PROJECT						
		B. FA	C. L/C	D. TOTAL	E. PE	F. L/C					
AID APPROPRIATED TOTAL (GRANT)		710	5	715	3011	275					
IL GRANT						275					
OTHER (R U.S.)	1.										
	2.										
HOST COUNTRY			25	25		523					
OTHER DONORS						523					
TOTALS		710	30	740	3011	798					
11. PROPOSED BUDGET APPROPRIATED FUNDS (2000)											
A. APPROPRIATION		B. PRIMARY PURPOSE CODE		C. PRIMARY TECH. CODE		E. 1ST FY <u>77</u>		H. 2ND FY <u>78</u>		K. 3RD FY <u>79</u>	
				C. GRANT	D. LOAN	F. GRANT	G. LOAN	I. GRANT	J. LOAN	L. GRANT	M. LOAN
(1)	EH	600B		690		715		604		1967	
(2)											
(3)											
(4)											
TOTALS						715		604		1967	
A. APPROPRIATION		N. 4TH FY		O. 5TH FY		LIFE OF PROJECT		12. IN-DEPTH EVALUATION SCHEDULED <div style="border: 1px solid black; display: inline-block; padding: 5px;">11/2/79</div>			
		Q. GRANT	R. LOAN	S. GRANT	T. LOAN	V. GRANT	U. LOAN				
(1)	EH					3286					
(2)											
(3)											
TOTALS						3286					
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PROJECT PAPER
RADIO EDUCATION TEACHER TRAINING PROJECT

Part I. Summary and Recommendations

A. General Data, Including Face Sheet

1. Face Sheet

The Face Sheet precedes the Table of Contents.

2. Project Development

Burton C. Newbry, Sector Development Officer, USAID/Nepal

Leslie A. Dean, Assistant Program Officer, USAID/Nepal

E. Clayton Seeley, ASIA/TR/EHR, AID/W

Stanley D. Handleman, TA/EHR, AID/W

John K. Mayo, Assistant Professor, Stanford University

Robert C. Hornik, Assistant Professor, Stanford University

Herbert E. Dawson, Broadcast Engineer, Morcom System, Inc.

Alexander Eddington, Head, Consultancies and Information Unit,
British Council

3. Executing Agency

His Majesty's Government of Nepal (HMG), Ministry of Education (MOE)

4. Grantor

Agency for Interna

(USAID)

B. Recommendations

-- USAID appropriated funds \$3,285,850

-- HMG contribution 523,000

Total Project Costs \$3,808,850

C. Description of the Project

1. This project will develop and test a training program for untrained rural primary school teachers through the medium of radio reinforced by written support materials and periodic short-term workshops.

This project will attempt to create a cost-effective mechanism and methodology for assisting untrained teachers to meet certification standards. It will also assist teachers in becoming effective change agents as envisioned in Nepal's program of Schools for Rural Transformation. It will provide approximately 125 work months of technical assistance, 15 study years of training (9 out-of-country, 6 in-country), and \$1,658,107 in commodities (including \$64,900 for building construction).

Phase I will be devoted to: ordering, procuring, and installing equipment; designing and building facilities; developing and refining a management structure; building up competent personnel in management, technical areas, production, and supervision; designing, validating and producing radio programs, written support materials and teacher's manuals adequate for the first year of pilot broadcasting; and developing an evaluation system. Phase II will be devoted to conducting and evaluating a year long program involving a pilot group of 100 to 150 teachers. Modified as necessary by these evaluations, Phase III will see the program expand to a broader target group of 1,000 teachers, initially, and then to 2,500 teachers who will have started training prior to project completion. Under slightly less controlled and structured conditions, program materials and methods will continue to be refined, and in-depth evaluations of results will be continued. Total time for these three phases will be four years. The newly developed curriculum for training primary teachers developed by the IOE and the new primary school curriculum developed by the MOE will serve as the content bases for the project.

2. The project will be under the overall direction of the MOE and will be sited at the Sano Thimi campus which is both the administrative headquarters of the IOE and the site of the Janak Education Materials Center (JEMC) which was developed under USAID/Nepal Agreements (1959-1970).

The technical assistance (TA) specialists (specified elsewhere in this document) along with their counterparts will have the basic responsibility for project development, but they will coordinate closely with the Ministry of Education, the National Planning Commission, the Institute of Education, Radio Nepal, the Curriculum Development Center and the National Education Committee. To assure coordination, a committee will be formed of one representative from each of the above organizations to formulate policy and to monitor project development.

3. The project purpose is "to create the capacity to provide in-service teacher training to at least 2,500 primary school teachers annually through radio broadcasts, brief residence instruction and textbook/workbooks at a per teacher cost will below the present cost." Technical assistance activities will be directed specifically to meeting that purpose and to attaining listed outputs. Design of the project has carefully related purpose and outputs to quality and level of the TA component and to participant and in-country training.

4. The end-of-project status leads directly from the purpose: that is, approximately 3,600 primary in-service teachers will have received or initiated training leading to certification. An intensive, continuous evaluation program during Phase II will have determined whether or not radio, with supporting materials and short periodic workshops, is a valid, cost effective method of teacher training. The capacity for HMG to retrain at least 2,500 primary teachers annually through radio will exist, including trained personnel, validated radio programs and printed materials, and an administrative, management, and production system capable of continuing the program in a satisfactory manner.

D. Summary Findings

1. The feasibility of this project has been thoroughly studied by a variety of qualified personnel, with the conclusion that the project is both feasible and ready for implementation. A feasibility study was conducted in 1974 by a team of specialists recruited by USAID, UNICEF, UNESCO, and the British Council. It concluded that educational radio is both feasible and desirable for Nepal, and that this particular project is both feasible and almost immediately implementable. HMG (including the National Planning Commission, Ministry of Communication, Radio Nepal, and the Ministry of Education) has studied the Feasibility Report and has reviewed the proposed project. The conclusion has been reached: (a) that radio is feasible and highly desirable for Nepal to use in an expanded fashion for formal and non-formal educational purposes; (b) that the proposed project is feasible, and that it has the potential to resolve one of the most critical educational problems of remote areas; and (c) that Nepali resources are available to carry out the project.

According to the above and in keeping with Mission policy, this project is seen as developing the basic technical and managerial foundations for future school and community-based integrated rural development activities using radio. It is anticipated that education and training elements of other Mission projects may be enhanced by building on the base provided here. It is further anticipated that this project will be expanded in FY 1980 to provide national coverage as the transmission capacity of Radio Nepal is improved to provide greater service.

2. This project meets all applicable statutory criteria. For details, see the completed criteria checklist annexed to this document (Annex G).

E. Project Issues

Several issues were raised by AID/W in State 062042, dated 3/20/75 (Annex L), which related primarily to the logical framework, but which also dealt with such questions as delivery modes, curricula, etc. These issues are dealt with fully in this Project Paper. All issues relating to elements of the logical framework are dealt with in Part II.B. and in the revised logical framework. Three issues raised in State 062042 are of particular importance: (1) the issue relating to project purpose, item 2.A. of referenced cable; (2) the issue relating to inputs, item 6 of cable; and (3) the issue relating to evaluation, items 6.H. and 6.I. of cable. Issues (1) and (2) are dealt with in Part II.B. Issue (3) is dealt with in Part IV.C. All other issues in the referenced cable are addressed in Part II.B.

Three of the principal issues noted above have been largely resolved. The Mission concurs with the AID/W view of project purpose, namely that the primary teacher training project be seen as a distinct project with its own clearly measurable objectives, and that its validity not rest on its being the first phase of a nationwide educational radio system. If the validity of teacher training through radio can be demonstrated, and the development of an efficient organization and mechanism can be developed for planning, programming, production, distribution and evaluation, a significant breakthrough will be accomplished which will provide the means for extending multi-disciplinary education and training programs (both formal and non-formal) to remote rural areas in conjunction with future AID supported rural development activities.

The second significant issue relates to inputs. We have revised inputs upward to (1) extend expatriate involvement, (2) increase dollar cost projections, and (3) increase participant training. Phase I will be extended to approximately 18 months, phase II will remain 1 year; and phase III will be extended to 18 months. The total technical assistance component is increased to approximately 129 work months.

The third issue, that of evaluation, is of critical importance to the project, and is to be a continuing process, with major evaluative efforts during phase II. It is essential that the evaluative process establish very clearly the cost effectiveness of the system. The effectiveness of radio-based teacher education will be compared with that of the traditional in-service training program. Thus, pre- and post-testing of an experimental group, with tests

administered under carefully controlled conditions, is of central importance. Testing must include a standard examination for a special teaching certificate administered by the IOE. Evaluation must also include behavioral and attitudinal measures conducted on a continuing basis as well as on a comparative basis between radio trained teachers and those trained through traditional means.

Detailed planning for the evaluation process is described in Part IV.C. of this paper.

Of the other issues raised by AID/W, that related to delivery modes requires amplification. We now believe, after extensive discussions with HMG and various donors, that the use of recorders and cassettes - except as applicable to the seminars and first review group activities - is not the best alternative for phase II. Technical problems would likely be excessive. Delivery, storage and utilization by the teachers would also present major difficulties. Either regular delivery of cassettes or the delivery of the entire course at once would be very difficult.

Regular broadcasts by Radio Nepal on existing medium wave transmission for the hill areas around Kathmandu and short wave transmission to cover the remainder of the experimental group appears to be the most economical delivery system for the project. This method will also provide signal comparison and reception reliability data for the research and development stage.

Finally, AID/W raised the question of the nature and effectiveness of radio education efforts thus far undertaken in Nepal. No formal evaluation has been made of any of the programs. On the basis of meagre existing evidence, it is difficult to make anything more than tentative observations as to their educational effectiveness. However, USAID commissioned a study by the New Educational Reform Associates in 1974, entitled RADIO LISTENING PATTERNS IN NEPAL, which was designed to gather baseline data on radio usage and listener interest. (See Annex A for a full discussion.) Its findings are a valuable starting point for further consideration of the subject. The study made no effort to evaluate the educational effectiveness of the education programs, and it did not consider the in-school broadcasts, since this was not included in the parameters of the study. Nevertheless, it found that a non-formal radio program in the right format can have very high listener interest, as is evidenced by the JTA and the old woman, with an 80% listenership. On the other hand, it found that general education programs prepared for adults were a favorite of only 2.9% of those surveyed, indicating the need for substantial modifications in the planning and production of these programs if their messages are to reach their intended audiences.

The fact that radio education has been stimulated to the extent it has with a minimum of external assistance is in itself indicative of the depth of interest running through the various ministries of Government, and the variety of programs, summarized in Annex C of this paper, indicates a belief in the value of radio for both formal and non-formal education purposes.

Part II. Project Background and Detailed Description

A. Background

1. Introduction

This project has grown out of long and intensive efforts by USAID/Nepal to assist His Majesty's Government to transform education into a dynamic force for development. It is supportive of HMG efforts to implement the National Education System Plan (NESP), which is the philosophical policy guide to educational development in the future. [Its major objectives may be summarized under three headings: (1) to meet manpower requirements for national development; (2) to extend educational opportunity; and (3) to increase educational relevance. While all three objectives will be difficult to achieve, the extension of educational opportunities to the remote rural and mountainous areas is seen as the most nearly insoluble problem if traditional formal education methods are utilized.] Clearly, innovative approaches built around communications technology could be extremely useful.

With Nepal being about 93% agricultural, and with national development tied largely to agricultural improvement, and with most farmers living in remote areas, the involvement of remote populations in the development process is seen as critical. [Nepal is also confronted with unique geographic constraints. Not only is it geographically isolated, but its rugged terrain has made standard forms of land and air communication between large sections of the country virtually impossible. Further, other forms of communication which are standard for most countries, such as television, radio, and telephones, are either non-existent in Nepal or limited to a small group of the relatively advantaged.] Television does not exist and it is judged impossible for many years to come. Telephone communication is limited to the principal population centers. Radio coverage is theoretically nationwide but present transmission facilities permit the broadcast of only one frequency at a time and reception in some areas is poor.

In 1974, at the request of HMG, USAID/N arranged with UNESCO, UNICEF and British Council to make a coordinated feasibility study concerning the utilization of radio for educational purposes in Nepal. This multi-donor study concluded that radio can be a powerful educational tool for Nepal for both in-school and out-of-school populations if it is carefully developed. It recommended that one

or more projects be undertaken immediately to test feasibility, effectiveness and cost in a carefully controlled research and development environment. Most important, it recommended that a project in teacher training by radio be undertaken.

Fortified by the above findings as well as those of other studies summarized in Annex B, [the British Council has assisted with a project to develop classroom instruction via radio (mostly in the lower secondary school); UNICEF has contributed some 500 radio receivers for distribution to schools in support of educational broadcast; and USAID/N is taking the challenge of assisting HMG to improve the quality of rural education and life by upgrading teacher skills and competencies.]

This project is consistent with the USAID/N Development Assistance Program, FY 1975, which states (p.144) "Radio is the innovation which has captured the attention of Nepalese and foreign donors as well as the medium which might deliver knowledge to the disadvantaged at reasonable cost, and which might also be a powerful device for strengthening the formal (and informal) school and teacher training program."

2. Primary Education in Nepal

[In 1971, the government of Nepal promulgated the National Education System Plan. The NESP specified new curricula weightings at all levels of education, endorsing an emphasis on language and numerical skills at the primary level. It restructured the 10 grades of pre-university education into 3 grade primary, 4 grade lower secondary, and 3 grade upper secondary schools. In addition the Ministry of Education, for the first time, took on the responsibility for paying 100 percent of primary school teachers' salaries, which were formerly absorbed by local communities.

The NESP also mandated a rapid expansion in primary school enrollments.] In 1975, official estimates placed 650,000 children in 8,677 primary schools. The percentage of school-aged 6-8 year olds enrolled is difficult to estimate since the 650,000 figure includes both under and over age children, and may also include the entire enrollments of the many primary schools in which 4th and 5th grades are still within primary school buildings.

The official language of instruction is Nepali, although "teachers may, however, use regional languages for explanation purposes" (NESP, p.29). Since many students come to primary school with little or no understanding of Nepali, this is essential.

There are about 20,000 primary school teachers. Only 8,000 are trained. Of the remaining 12,000, 6,000 hold the School Leaving Certificate (SLC) but lack training. The remaining 6,000 hold neither the SLC nor are they trained. SLC graduate trained teachers earn Rs.216.25 (\$17.32) per month. SLC graduates, without training, earn Rs.201.50 (\$16.12), non-SLC trained teachers earn Rs.182.25 (\$14.58) and non-SLC, UN trained teachers earn Rs.135 (\$10.80).

Instruction is, by and large, traditional. Rote methods and choral recitation are most common. Although textbooks have been prepared and printed, information about what proportion of primary school students have access to books is unavailable. Supervision, while officially available to every school at least twice a year, is only recently established. No evaluation of either the effectiveness, or the existence of these services in remote areas is available.

3. Teacher Training

The NESP assigned the task of teacher training to the Institute of Education, part of Tribhuvan University. Strenuous efforts to expand the output of trained teachers have resulted in an expansion of facilities so that the IOE now has the capacity to accept 4,000 students a year and produces approximately 800 primary teachers annually.

In-service primary teacher training is of two types. "A" level training is a 10-month course of SLC graduates and provides University credit as well as certification of the teacher as trained. The "B" level course enrolls non-SLC graduates, with a minimum of eight grades of education in a 10-month non-credit course which leads to certification. Successful completion of either course assures teachers of a salary increment and increased job security.

The campus-based system of teacher training faces major problems in trying to meet the demands for trained teachers under the NESP. First, at its present level of output, the IOE will be unable to supply enough teachers in the foreseeable future for the primary schools to have more than 50 percent trained teachers. Secondly, even were it able to expand its present capacity (it probably cannot; the shortage of qualified teacher educators is acute) it would be prohibitively expensive to do so.

In-service training is extremely expensive for HMG or local schools which must pay a full salary to the teacher while he or she is in residence at a campus center, as well as find and pay for a substitute teacher. It is also costly for the individual teacher who must support a family at home as well as himself at the campus center.

The IOE has made some preliminary efforts to resolve these difficulties. The On-the-Spot Teachers Training Program reaches teachers in and around urban areas with two hours of instruction each morning at a central location before the teachers return to their classrooms to teach. These sessions are supplemented by more intensive instruction during vacation months. While a useful extension program, the On-the-Spot Program is limited to teachers in urban zones, and is relatively expensive since it uses scarce teacher educator time heavily.

A two month residence, three month self-study extension training program is also under development for remote area teachers, but providing certification to attendees at such a program may prove difficult. However, the initial experience with self-study materials will serve as an important foundation for the radio-based project.

If a large proportion of presently untrained teachers are to receive satisfactory training, and if that training is to be done at an acceptable cost, then some alternative to traditional face-to-face instruction must be found. Radio instruction in combination with other teaching innovations would seem to be an effective and practicable strategy.

B. Detailed Description

1. Introduction

The project will be developed in the context of a continuing assessment of the possibility of expanding the currently fragmented and rudimentary educational radio service into a nationwide educational radio "system." The expansion of radio for educational purposes is expected to be supported by various donor agencies, possibly including the British Council, UNESCO, UNICEF, UNDP, and the IBRD.* The primary teacher training project may be viewed as a logical first step in the development of such a system, for it will be carefully developed, implemented, and evaluated, with its educational effectiveness being carefully studied, and its cost effectiveness determined. [The project's prime objective, however, will be to develop Nepal's capacity to train a minimum of 2,500 primary school teachers a year through regular radio broadcasts, brief residence workshops, and a text/workbook at a cost per teacher well below the present level. Within five to eight years of the project's full implementation, it will have trained enough teachers to meet the need for qualified personnel throughout the primary system.]

Other donors continue to support radio education; UNICEF by providing radios, training, and studio equipment; the British Council by providing training. Both supported development of this project by providing experts and consultants.

* The Radio Education Teacher Training Project implies no USAID funding for future projects in this area. It is understood that all interested donors will follow this project carefully and that decisions will be reached by the various donors as to possible follow-on activities at the appropriate time.

The project will be conducted in three phases: a development phase of 18 months; a pilot phase of one year; and an initial operational phase of 18 months. There will be a research component built into the entire project, with intensive evaluations at the end of both the experimental and the initial operational phases.

What follows is a description of the project design that has been developed by the Mission in close collaboration with HMG.

2. Project Design

a. Administration

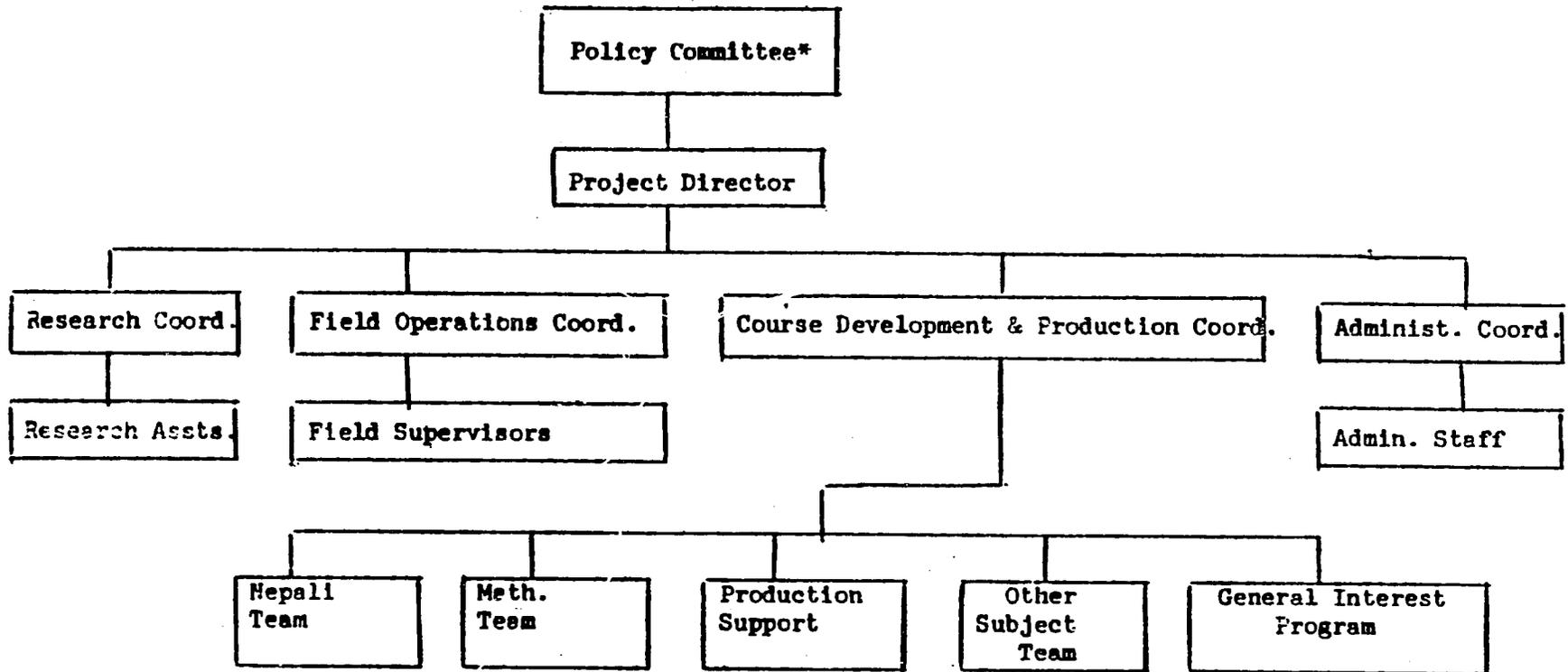
Overall responsibility for the project will be vested in a policy committee created by the Ministry of Education, chaired by the Secretary and including the Director-General of Radio Nepal, a Joint Secretary of the Ministry of Education, the Dean of the Institute of Education, Member-Secretary of the National Education Committee, Chief Administrator of the Janak Educational Materials Center (JEMO), the Director of the Curriculum Development Center and the Project Director as member-secretary.

The Radio Education Policy Committee will define policy directions for the operational staff, assure cooperation of all involved institutions in matters of personnel, logistical and budgetary support, and settle other issues in dispute when no consensus can be achieved at the working level.

Operational management of the project will be delegated to the Project Director who will be responsible to the Policy Committee. All personnel will be under the Project Director's authority. The project staff will be divided into four major sections: Course Development and Production; Field Operations; Research; and Administrative Services. Each section will have its own coordinator. (See Figure 1.)

The course development teams will include one or two content specialists, a producer-director, a production assistant and a secretary. The production subsection will provide technical backup to the course development teams, graphic artists and other text/workbook production personnel, and studio technicians and talent for the radio programs.

Figure 1
ORGANIZATION CHART



*Radio Education Policy Committee:
 Secretary, MOE (chairman)
 Member-Secretary, NEC
 Director-General, Radio Nepal
 Joint Secretary, MOE
 Dean, ICE
 Director, CDC
 Chief Administrator, JENC
 Project Director (member-secretary)

Field operations staff will include two field supervisors for the first two years of the project, probably more thereafter depending on the number of teachers enrolled. This group will assume responsibility for all of the face-to-face components of the project: recruitment, residence sessions and bimonthly workshops.

Administrative services will be limited to support of the operational staff in the first two years, but, as the numbers of teachers enrolled expands, paperwork and logistical demands will increase sharply. The research section will require a coordinator and three research assistants. Each of these sections will also require some non-professional support staff. See Figure 2 for a breakdown of annual HMG professional and support staff requirements.

Figure 2

ESTIMATED PROJECT STAFF REQUIREMENTS

	<u>Year</u> <u>1</u>	<u>Year</u> <u>2</u>	<u>Year</u> <u>3</u>	<u>Year</u> <u>4</u>	<u>Annual Salary</u> <u>(Current levels)</u>
<u>Professional Staff</u>					
Project Director	1	1	1	1	Rs. 15,000
Research Director	1	1	1	1	12,000
<u>Administrating Services</u>					
Coordinator	1	1	1	1	9,600
Field Operations Coordinator	1	1	1	1	12,000
<u>Course Development and Production Support</u>					
Coordinator	1	1	1	1	12,000
Content Specialists	7	7	7	2	9,600
Producer-Directors	4	4	4	2	9,600
Field Supervisors	2	4	10	20	9,600
Research Assistants	3	3	3	3	7,200
Sound Recordists	1	1	1	1	9,600
<u>Support Staff</u>					
Accountant	1	1	1	1	3,600
Clerk	1	1	1	1	2,400
Assistant Producers	6	6	6	2	3,600
Typists	8	8	8	6	3,600
<u>Educational Materials</u>					
Support Staff	2	2	1	1	3,600
Assistant Sound Recordists	2	2	2	1	3,600
Peons	2	2	2	2	1,900

b. Content: Curriculum Adaption, Radio Programming and Text/Workbook Preparation

A major task of the IOE personnel assigned to the project will be the adaption of the existing teacher retraining curriculum and the determination of appropriate objectives to be covered in the radio programs and their accompanying written materials.

[The course curriculum for the radio teacher retraining project will parallel that of the 10 month B-level residence course presently offered by the IOE.] It will be necessary to make major adaptations in that curriculum to respond to the new learning environment, however. Since teachers will remain in their villages and have no regular access to IOE campus libraries, themes which normally require additional reference materials will be curtailed. Similarly, since the teachers in retraining will be at work in their own classrooms every day, content objectives which build upon this regular opportunity for practice teaching will be emphasized.

Individual teachers in retraining will have only infrequent opportunities to clarify doubts or confusion which may result from the content of particular radio lessons or from faulty transmission. For this reason, it will be necessary to concentrate the radio lessons on relatively fewer objectives than would be covered in the parallel, face-to-face retraining course. To guarantee that the essential concepts are understood, the pace of the radio-based course will be slowed somewhat and more repetition will be built in.

Each week there will be five one-hour radio programs. Over a 10 month period that will permit 150 or more broadcasts. Each hour long program will include three segments, each approximately 20 minutes in length. The first and third sections will provide instruction. The middle section will provide some respite, material of general interest to teachers, responses to letters sent by listeners, and music.

Since each of the instructional segments will stand on its own, there will be a total of 10 instructional slots to be prepared each week. These will be weighted according to the importance given to particular subjects by the IOE. For example, four segments each week might cover teaching Nepali, three for math, two for social studies, and one each for the variety of other subjects. Another division of the segments might include more review and repetition. It will not be necessary to adhere rigidly to any particular division of slots throughout the year; the division criteria will obviously be determined by the relative importance of different course objectives.

Each course (teaching Nepali, for example) will be treated as a whole. To assure this, the responsibility for preparing all the materials associated with a given course will be given to an integrated team. Each team will be composed of content experts from the IOE. They will have responsibility for the overall structure of the courses, the preparation of outlines of what is to be included in each radio lesson as well as the preparation of text/workbooks. They will also be responsible for developing activities for the residence portions of the course and for defining the tasks to be undertaken by the supervisors during the bimonthly district level workshops.

One or more producer-directors from JEMO will also be a part of each course team. They will have the responsibility for developing the radio scripts and for actually recording all the radio lessons.

The responsibility for course preparation within each team must be shared, not compartmentalized. The radio lessons must reflect the producer-directors' knowledge of how to make interesting programs and the teacher-educators' knowledge of how to teach. Each section of the text/workbook will be carefully designed to overlap with and reinforce the radio lessons and vice versa. The courses themselves must demonstrate the kind of integrated instruction they seek to demand of the teachers in retraining.

c. Transmission

The continued short wave and medium wave broadcasting facilities of Radio Nepal will be utilized for the teacher retraining broadcasts. Several improvements to the existing system are anticipated and are discussed in the following paragraphs.

Assuming that normal administrative procedures are followed it is estimated that the formal project agreement will be completed and a contractor selected by September 1977, leaving approximately 16 months working time before commencement of radio transmissions.

Upgrading of the existing Radio Nepal facilities is necessary in order to be assured of broadcast time and reliable reception. Provision of hardware facilities (transmitters, antennas, etc.) enhance the operational reliability of Radio Nepal and will increase the probability of success in reception of programs by the teachers. Quantitative estimates of precise improvements in reliability of the present system by the addition of hardware are impossible at this time because of the lack of operating experience on the system. However, from the transmission point of view, there is no reason to limit or delay the pilot phase of program, i.e., for 100-150 teachers, because of the present hardware configuration at Radio Nepal coupled with the installation of the new 100KW short wave transmitter scheduled for installation in the spring of 1977.

A critical factor in project success will rest on a reliable transmission system, and the following improvements/conditions are essential:

- (1) The combined short wave and medium wave services of Radio Nepal must be utilized in an "optimum manner" for educational program broadcasting. The "optimum manner" must fit the needs of both the Ministry of Education and Radio Nepal. Discussion and explanation of operating in an "optimum manner" are contained in Part III. A. of this document.
- (2) Radio Nepal must have a new wide-band transmitting antenna with the requisite high angle radiation characteristics, suitable azimuthal characteristics and nominal gain for use with the existing 100KW MARCONI transmitter. The antenna will be supplied installed, connected and tested.
- (3) Immediate suitable factory training for two qualified engineers or technicians must be provided at the Harris Company (Quincy, Illinois) in order that Radio Nepal will be prepared for maintenance duties on the SW-100 transmitter when it is installed in the Spring of 1977.
- (4) A 100KW short wave transmitter, with necessary accessories, as described in Annex H, will be provided.
- (5) Detailed discussions with the Director-General (or other designated representative) of Radio Nepal must be initiated in order to work out an electronic technician training program that will be effective in up-grading the competence of the present operating staff. Discussions and recommendations for Radio Nepal staff training are contained in Part III, Section A. of this document.

With the inauguration of service on the new 100KW Harris transmitter coupled to a high-angle wide band antenna, the installation of a similar antenna coupled to the MARCONI 100KW transmitter, the availability of the 5KW AWA transmitter at Jawalakhel and optimum working frequency selection, satisfactory signal intensities should be available in most locations for at least 80% of the broadcasting time. Additional of the 100KW SW transmitter to be provided by this project will increase that reliability. As back-up to this estimate a series of propagation performance calculations have been completed for selected sites throughout the country (See Annex M). The results of these

calculations will allow verification of certain design characteristics and make possible the improvement of the transmitting and receiving system configurations prior to commencement of radio transmissions.

Since this is a one-way transmission system, adequate procedures and instructions to listeners must be incorporated in the programming in order to minimize lost transmissions because of propagation outage. Repeat transmissions will be provided on a regular schedule. Specific refinements can be made when accurate listener reports become available.

d. Reception

Teachers enrolled in this project will each receive a solid state battery-operated portable radio during the orientation program to be held in Kathmandu and Pokhara. The teachers will be thoroughly trained in operating techniques and procedures (in Kathmandu and Pokhara) in order to minimize the occurrence of missed lessons due to radio operating errors while in the field. A supply of batteries and a simple wire antenna will be provided with each radio and a service and supply schedule will be developed, centered on the school district headquarters or other convenient point. The radios and receiving installations should meet certain minimum performance specifications. These are more fully developed elsewhere in this document.

e. Residence and Other Face-to-Face Instruction

All participants in project design have recognized the importance of supplementing the distance components of the instructional system, radio and text/workbook, with some face-to-face contact. Limiting it will decrease effectiveness. Expanding it will increase cost. The need is to obtain an adequate balance. While recognizing that modifications can and should take place during the development period, the following kinds of face-to-face contact have been agreed upon.

During the vacation period and immediately before the initiation of the school year, all teachers who have been received for the program will come to the district education headquarters or some other convenient site for a two week orientation course. During this course, radio project or IOE staff, aided by district primary supervisors, will explain the workings of the program, distribute radios and written materials, and provide some general introduction to the course contents. A very important goal of this session will be to maximize teacher understanding of what is expected of them, what help they can expect from their supervisors, and what to do if a breakdown in the radio occurs.

Throughout the school year, bi-monthly two-day workshops will be organized for all teachers-in-training at district headquarters. During these sessions, primary supervisors and/or other personnel designated and trained by the IOE will review teachers' progress in the text/workbooks, and try to resolve any problems related to the previous months' work. As much as anything else, these bimonthly workshops will serve as a reinforcement mechanism for the long 10 months of individual listening and working in the schools. During their visits to schools, supervisors will also work with teacher-in-training whenever possible.

At the end of the school year, a final longer residence session will be held at the district level or at IOE campuses or at some other convenient location for all teachers who have participated in the program. Staffed by IOE teacher educators and other qualified personnel, these sessions will intensify and complete the substantive instruction provided during the previous 10 months. They will also provide an opportunity to review the years' material (tapes of the radio programs might also be made available and special sessions organized to review text/workbook exercises). The residence sessions will conclude with a certification examination and will be organized to demand as little expenditure as possible from the teacher-in-training. Financial inducements and per diem will be offered compatible with HMG practice.

f. Evaluation

Given the innovativeness and complexity of the radio teacher training project as well as its research and development objectives, evaluation activities will be built in from the start. To insure that project administrators will be able to base their planning on the most reliable information possible, formative evaluation strategies will be instituted. Radio programs and their accompanying text/workbook materials will be extensively pretested during the development phase of the project. Once broadcasting begins, feedback data on teacher attitudes and performance will be collected on a regular basis.

Building largely upon the same data base used for purposes of formative evaluation, a longer range summative evaluation will be undertaken to determine the project's overall performance and cost-effectiveness. Where appropriate, controlled studies will be undertaken to compare the effectiveness of the radio-based training system with that of the traditional, face-to-face training programs. Assuming that the radio teacher retraining program continues to be viewed as a first step in a much larger role for radio in Nepal's overall development strategy, the results of the summative evaluation activities will provide vital information on the probable costs and benefits of expanding the use of radio to other sectors. (See also Part IV.C., Evaluation Plan.)

g. Technical Assistance

USAID will provide a total of 129 person-months of technical assistance to the project. All of the TA assistance will place strong emphasis on training. Advisors will be recruited for the roles as indicated below. Additionally, short term technical advisors will be available for short term assistance in specialties such as radio engineering, studio design, management and cost analysis, as well as short term consultancies of the basic TA team members after completion of their initial long-term assignments in Nepal. Other trainers will be brought to Nepal solely for the purposes of teaching, including a contract electronics instructors and 4 or 5 U.S. manufacturers' representatives who will spend 2 to 4 weeks each teaching specialized aspects of radio maintenance and operation, equipment repair, specialized electronics, and other subjects relevant to the project.

Technical Assistance *

(1) Team Leader	46 months
(2) Radio Production Specialist	12 months
(3) Self-Instructional Materials Specialist	18 months
(4) Teacher Educator	12 months
(5) Evaluation Specialist	24 months
(6) Contract Electronics Instructor	9 months
(7) Short-term Technical Advisors -	24 months
(8) U.S. Manufacturers Representatives	<u>4 months</u>
<u>Total person-months - 149 months</u>	

h. Training

Various training strategies for Nepalese personnel will be implemented under project auspices. Training is viewed as being a key ingredient in this project and all of the expatriate personnel listed in the preceding section will spend a significant portion of their efforts in training. Training will be closely tied to project objectives and will be designed to develop a cadre of Nepalese able to carry on all phases of the project within four years.

*Total reduced to 129 person-months per mission and AID/W project committee recommendations. Item #7 decreased by 8 person-months; 12 person-months of long-term assistance (specific skills to be later determined) combined in one specialist.

At the outset of the project, 2-4 study visits of up to one month each will be undertaken by project leaders to one or more countries that have successfully used radio in teacher training. These include Pakistan, Australia, Thailand, and the Philippines.

The bulk of training will be conducted in Nepal by the expatriate advisors listed above. In-country training will initially include training for the approximately 60 Technical Assistants (TAs) and Junior Technical Assistants (JTAs) at Radio Nepal. This training will be conducted by the Contract Electronics Instructor and will concentrate on the basics of electronics and radio (theory and laboratory work). This portion of in-country training would require about 9 man-months for the contract Electronics Instructor. (More detail on training is given in Part III.A., Technical Analysis and Annex K.)

Following up on this training, U.S. manufacturers' representatives or other appropriate personnel would teach more in-country courses to Radio Nepal personnel on maintenance and operation of equipment. It is possible that some of this training will be met by sending technicians to commercial or national broadcasting facilities or manufacturers plants abroad for intensive on-the-job training. This portion of the training would require approximately 4 man-months of training by U.S. manufacturers' representatives.

More advanced training for technicians or engineers from Radio Nepal would include up to 48 man-months of training out-of-country. This would include possibly several people attending a long-term course in radio electronics in India and other short and long-term training to be arranged in Asia.

Training for the Project Staff (including IOE and JEMO) will be both in-country and out-of-country. In-country training will be provided by the team of expatriate advisors on a day-to-day basis, i.e., basically through on-the-job training. Out-of-country short-term training will consist of approximately four three-month production courses and three three-month sound recording courses. Also, approximately 24 man-months of training in the U.S. will be provided for Project staff.

Finally, up to 12 man-months of advanced short-term training in the U.S. and third countries will be provided to personnel of Radio Nepal and the Project Staff for courses, seminars, and conferences on production, engineering, research and other project-related training. This training would include some of the courses occasionally given or sponsored by AID/W if they were of an appropriate nature.

Summary of Project Training

	<u>Man-Months of Training</u>
<u>In-Country</u>	
- Basic electronics training for approx. 60 TA's/ JTA's at Radio Nepal given by Contract Electronics Instructor	50 man-months
- Specialized training for Radio Nepal technicians by U.S. Manufacturers' Representatives	20 man-months
- Training of Project Staff and JEMO personnel by U.S. advisors on day-to-day basis (total time cannot be quantified)	Unknown
<u>Out-of-Country</u>	
- 2 to 4 trips of up to one month each by Project officials to visit countries using educational radio for teacher training	4 man-months
- 4 three-month production courses, 3 three- month sound recording courses (third-country and U.S.)	21 man-months
- Advanced short-term training (courses, seminars, conferences) on production, engineering, research and project-related training	12 man-months
- Training in U.S. for Project Staff	24 man-months
- Long-term and short-term training in India or other Asian countries for Radio Nepal personnel in electronics, radio maintenance and operation, etc.	48 man-months
<u>Totals</u>	
In-country training	70 man-months
Out-of-country training	109 man-months
<u>Total</u>	<u>179 man-months</u> *****

1. Phasing and Site Selection

Phase I of the project (18 months) will be devoted to solidifying the institutional and personnel structures outlined above and to developing and producing the initial set of radio programs and accompanying written materials. Of first importance will be the establishment of a strong monitoring and policy review mechanism within HMG to make certain that policies are developed and actions taken consistent with project goals. Specifically, the following activities will be accomplished during Phase I:

- (1) Radio Education Policy Committee begins functioning under the Secretary of Education;
- (2) Expatriate advisory team fielded and local staff assembled and situated;
- (3) Familiarization of team members with local teacher training programs, teaching methods, and curricular materials;
- (4) Development of initial set of radio programs and accompanying text/workbook;
- (5) Evaluation techniques developed;
- (6) Participant training begun;
- (7) Commodities ordered and in place.

Phase II (1 year) will be devoted to conducting an experimental program of primary teacher training by radio and to evaluating the results. Specifically, the following will be accomplished during this period:

- (1) An experimental group of 100-150 primary school teachers, currently untrained, will be selected to undergo training. Half of the teachers will be selected from the Pokhara area and will receive their radio instruction via short wave; half will receive their instruction via medium wave broadcasts which are currently available only in the Kathmandu area.
- (2) During the vacation period, before the start of the regular school year, the experimental group will be given a two week orientation at their district headquarters or some other convenient location. During this time they will be instructed in the use of the radio as well as the text/workbook. The general purpose of this introductory session will be to familiarize the selected teachers with all elements of the system and to motivate them to carry through

with the program in their villages.

(3) After the introductory residence period, the teachers will return to their schools. One hour each day (probably 3-4 p.m.) they will listen to radio broadcasts, at the same time making use of the accompanying written materials. Each session will be divided into three parts: one which is content-oriented (based on specific areas); one which is "news for teachers;" and one which deals with teaching methods and which includes specific suggestions for how to put their learning into practice in the classroom. These broadcasts will continue for the remainder of the school year. At bimonthly intervals throughout the year, the teachers will be brought together for two-day workshops at the district level.

(4) There will be an on-going evaluation of the experimental program in order that problem areas can be quickly identified and corrected. This will require constant observation as well as the collection of feedback data by the research unit.

(5) Programs and materials will be revised on the basis of the first year's experience and research results.

(6) At the end of the year, the experimental teacher group will be reassembled for a one-month residence training course at an IOE campus or some other convenient location. During this course, the year's work will be reviewed and opportunity will be made available for remedial work before administration of a certification examination.

(7) Results of the year's work will be evaluated and compared with those of the traditional, campus-based training program.

(8) In-country and foreign training for Nepalese personnel will continue.

Phase III (18 months) will see the program expand to an audience of approximately 1,000 teachers. During this phase the program will operate under slightly less structured conditions, although the basic framework and components will remain the same. Programs will continue to be developed and refined, and the evaluation activity will continue. By the end of Phase III, the project will have reached a capacity to train 2,500 teachers per year, and this number of teachers will be in training.

At the end of this phase, a thorough summative evaluation will be prepared by the project's research unit in collaboration with the research advisor. It will synthesize all previous research endeavors, insuring that a complete record of the project will be available.

Part III. Project Analyses

A. Technical Analysis including Environmental Assessment

1. Appropriateness

At the conceptual level, the Agency has adopted a clear stance regarding the use of technology for educational purposes in its assistance programs in the developing world, this being one of the key problem areas (KPA) in TAB. Considerable attention has been given to questions of which technologies have the greatest potential for achieving the goals that the Agency set for itself, and scholarly evidence has mounted that radio has high potential as an educational tool in that (a) effective teaching can be done by radio, as effective in fact as that of more costly technologies, (b) the technical cost of reaching vast audiences is small compared with other technologies, and (c) the software costs of providing radio is much smaller than for television, for example.

Several donor agencies have independently concluded that radio is the most promising device or strategy currently available that appears to have the potential to improve dramatically the quality and access of educational opportunity to the remote and rural areas of Nepal. These agencies joined USAID in financing a feasibility study, Development Radio for Nepal, to look into the question of educational radio for Nepal. They include: UNESCO, UNICEF, the British Council, and to a lesser extent, UNDP.

Thus, the question of using radio for educational and informational purposes in Nepal has had the advantage of having received careful consideration by a number of agencies, and the conclusion--without known dissent--is that radio, together with appropriate support materials and supervisory management, offers a viable mechanism to assist Nepal in reaching its educational goals. The pilot project, which is the subject of this paper, will test the validity and cost effectiveness of increasing the skills of untrained teachers through a radio based program. Results also will be evaluated in comparison to Nepal's present in-service education programs.

Several related studies are described in Annex B to this paper, one of which was conducted by a team of specialists from Massachusetts Institute of Technology, entitled Radio Broadcasting and Telecommunications in Nepal. This study again endorsed the concept of instructional radio for Nepal. Both the concept of radio as an educational tool generally, and its specific application to Nepal, have been studied and evaluated by experts in the field, with positive conclusions.

This view is summarized by the Radio Feasibility Team on page 33 of their report:

"In the Team's judgement, there are a number of factors that make radio an especially attractive development tool for Nepal. The country's rugged terrain, coupled with severe shortage of roads, have heretofore prevented the wide-spread circulation of information and educational materials. Newspapers and other printed matter simply do not reach far beyond the few large population centers. Even if they did, it is unlikely that they would command much attention due to the low level of literacy throughout the nation. Radio alone among the mass media currently available in Nepal has the potential of providing useful information to isolated villages, and it does not depend on the audience's ability to understand the written word."

a. Suitable Technology

Other technologies have been considered, such as educational television, and have been ruled out because of expense or logistical and software problems. Educational television, as has been noted elsewhere, is several times more expensive than radio, is not demonstrably better as a teaching tool, and because of the terrain of Nepal, would be virtually impossible technologically as a nation-wide medium. Further, as noted elsewhere in this paper, Rathjens has pointed out that a first-class radio system can be built for less than the cost of minimum television service.

ETV via satellite has been considered, and ruled out on ground of cost also. Rathjens, Butman, and Warren, in AED Report No.9 conclude:

"In India there appears to be little case, on cost-effectiveness grounds, for a satellite system, the primary purpose of which is the distribution of TV signals; certainly none for one involving direct broadcast to village receivers. This does not mean that a satellite system can not be justified, however. It may well be that it can be on other grounds: for example, for bureaucratic reasons; for reasons of national pride... The same arguments would apply to other countries where the population density is high and where the population is more or less evenly distributed geographically. The arguments would apply a fortiori to countries that are smaller than India in area...."

In conclusion, the judgement of the best technical experts available to the Mission and other development agencies is that radio is the most suitable medium for use in Nepal as a means for promoting education in rural areas.

b. Employment Effects

The employment effects of the pilot project will be negligible inasmuch as those undergoing training are currently employed and will remain employed throughout their training period. The training will thus be training that trainees would not have received without this pilot project. If on the basis of this pilot project and other evidence, HMG moves to the development of a nationwide radio education system, then the effect on employment will be larger, but only marginally so inasmuch as a large part of the informational radio service will be a service that would not otherwise be provided to rural areas. There will thus be no labor displacement. Further, if the system is used for non-formal education in remote areas, as it will, then a large part of its impact will be in terms of quality improvement of those currently serving rural areas. For example, the principle agriculture extension agent is the junior technical assistant (JTA), currently poorly trained and ineffective. It is anticipated that the radio service would work through the JTA in large part, both in order to improve his training and to enhance his ability to work with farmers. Further, the major purpose of the project is to extend an educational service to areas and to people currently unserved, and with little chance of being served for decades if traditional approaches are used.

c. Suitability for Replication

The project is designed to demonstrate the effectiveness of teacher training carried out basically through the medium of radio. If that effectiveness is demonstrated, expansion of the service to a large audience, both in-school and out-of-school, is a function of adequate personnel and a transmission system. In other words, it is not a question of replication of a project, but rather of expansion of a system once its qualitative aspects have been demonstrated.

d. Host Country Capability For Operation and Maintenance

The ability of Nepal to cope with radio broadcasting has been demonstrated, both in terms of hardware and in terms of software. Radio Nepal is operating, and educational programs, both formal and non-formal, are being broadcast on a continuing basis. The problem is not primarily at the level of operation and maintenance; it is at the level of policy and planning. As the Feasibility Team said quite accurately: "Without some high level commitment to communication planning as a component of overall development planning in Nepal, it is unlikely that the recommendations of this report could be effectively implemented...The design of specific development strategies involving radio will also necessitate a high degree of

day-to-day interministerial planning and cooperation. To facilitate such cooperation, the team recommends that a development support unit be created in Nepal." Such a unit would not only serve to plan for future project activities, but it would also work for the increased effectiveness of the present broadcasting capability.

The above is not to suggest that there are no operation and maintenance problems at Radio Nepal; indeed, the Feasibility Study discusses these problems at considerable length (pp. 12-26). It is clear from that study that qualitative improvements must be made in Radio Nepal, and that through increased training and improved management, such qualitative improvements can be made.

e. Environmental Implications

Environmental implications of the project are negligible.

2. Technical Description

Inputs will be provided to the Janak Educational Materials Center, Radio Nepal and to the Radio Education Pilot Project directly. The contributions to each organization are described in this section. Further details, including costs, are provided in the annexes.

a. Janak Educational Materials Organization (JEMO) at Sano Thimi

The small studio and control room complex at the Janak Educational Materials Organization at Sano Thimi currently handles approximately seven one-half hour programs per week. Each program may require up to three hours recording time to produce. Therefore the recording facilities are in use up to twenty-one hours per week, not including editing work which is accomplished in the control room. With the additional production demands of the Radio Education Pilot Project, up to 18 programs will be required per week. Under the current operating mode that would mean possibly fifty-four hours of recording sessions per week or virtually full time.

The existing studio equipment has been in use since approximately October 1974. The equipment consists of:

- Gateway Model 80 Audio Console 1 unit
- Scully Series 260 Tape Recorder - reproducer,
single track with recording head number
502010000-01 2 units
- Gates 16" turntable and pickup system,
3 speed 2 units

- RCA ribbon microphones, BK 11A, 77BX,
two boom and tow table mounted 4 units
- Fairchild Model 659 and 659A
reverberation unit 1 assembly
- AKAI GMC-46D Cassette Tape Recorder
Reproducer, portable 1 unit
- Equipment rack with patch panel and
miscellaneous equipment 1 unit
- Sony TC-60A Cassette Recorder for
outside work 1 unit
- Test equipment available within the
studio complex consists of one AC
voltmeter (HP-400E) and one audio
oscillator (HP-200CD)

Specific technical problems which have arisen include the following:

- Noisy mixer-fader controls on the audio console.
- Objectionable distortion when attempting to use the
reverberation unit.
- Variations in motor speed with variations in power
line frequency.
- No method to measure power line frequency.
- Lack of method to time or measure tape travel on Scully
Recorder-reproducers.
- Studio-control room intercom defective.
- Pre amplifier defective in audio-console.

Certain operational problems exist which include the lack of standards or quality control over the audio system. In other words, sufficient test equipment is not available nor personnel available to conduct performance tests on a scheduled basis in order to maintain a specified standard of audio quality. There is also a need for control of quality in the studios of Radio Nepal. (This point has been discussed with Radio Nepal.) Since JEMO produced tapes are broadcast by Radio Nepal, a suitable off-the-air monitor would be an asset for monitoring and logging purposes.

(1) Commodities

Probably the most serious potential problems that will arise is the total lack of backup equipment should the present equipment fail. With the new recording load imposed by this project the following steps are necessary to up-grade and back-up the present hardware configuration:

- Supply of a new audio console similar in design and compatible with the Gateway. Engineer a parallel configuration to allow the Gateway to be used as back-up or "on-line" as a training console or separately should additional channel capacity be required.
- Supply of two studio tape recorder-reproducers to back-up and supplement the Scully units. Determine make and model only after comparison of performance and compatibility with Scully units.
- Supply of two portable tape recorders for editing use.
- Provision of rack mounted test equipment suitable for running rapid audio quality control tests. The test equipment would include:
 - Audio oscillator
 - Calibrated resistive attenuators
 - High impedance electronic voltmeter
 - Distortion measuring set
 - Noise measuring set with suitable weighting filters
- Supply of a line frequency meter of suitable accuracy.
- Installation of line frequency regulator.
- Supply of tape travel indicators for the Scully Recorder-reproducers.
- Provision of engineering services to design the integrated studio-control room for maximum efficiency and technical quality. During the design, determine need for additional microphones, speakers, test equipment, etc. Decision to be based on usefulness in an integrated system.

- Re-design and re-wire the existing equipment rack to include a flexible patch and test board in order that all circuit tests and monitoring can be accomplished from that point. It should be noted that the addition of equipment to the control room should not be done on a piece-by-piece basis, but should be fully integrated and professionally installed; otherwise, quality cannot be controlled and the end result may be unacceptable recordings and broadcasts.

- Provision of installation services to install new equipment and re-wire studio-control room in a professional manner. Run proof-of-performance tests and instruct technical personnel in measurement methods.

According to information from studio personnel the spare parts stock is almost non-existent; however, UNICEF is supplying some of JEMO's more urgent needs including recording tape (BBC standard) and parts for the audio console. While a definitive spare parts list has not been prepared, spares will be required and should be ordered with the new equipment. JEMO should be assisted in compiling a list of spare parts for their existing equipment, and in planning an integrated system for utilizing purchased items.

No maintenance unit is available for routine quality control and repair. With the addition of more equipment to the facility this need will increase. It would best be provided by a mobile unit, capable of HMG - wide service. The staffing of such a department has not been included in this program. Details on estimated costs for JEMO studio equipment and necessary services are provided in Annex J.

(2) JEMO Radio Unit Training

Significant amounts of training, as outlined in Section II.B.2.h. (Training), will also be required. Training provided will be both in-country (provided by the U.S. technical advisors) and out-of-country.

The additional requirements imposed by this project will require a wide variety of training needs. In just one area, for example, at present three sound recordists handle the recording duties in the JEMO Radio Unit. One recordist has been trained in the production facilities of the BBC. The other two recordists have acquired their skill through on-the-job training. However, with the increased workload imposed by the project, at least one additional professionally-trained sound recordist must be added to the staff. Similar additional requirements will result in other areas.

b. Radio Nepal

Radio Nepal, as a department of the Ministry of Communications, provides radio programming and broadcasting services to the Kingdom. Six studios are located in Kathmandu (Singha Durbar) and the radio transmitters are located at Khumaltar and Jawalakhel, on the outskirts of Kathmandu.

The transmitting equipments currently available are as follows:*

Khumaltar

<u>Band</u>	<u>Transmitter</u>	<u>Antennas</u>	<u>Remarks</u>
SW	100 KW Marconi (installed 1968)	- Quadrant type horizontal dipole for 25, 31, 40, and 60 M. - Horizontal half- wave dipole for 90 M.	Now transmitting on 90 M. Frequency changes difficult technically, so not done, spare parts extremely difficult to secure.
MF	10 KW Marconi (installed 1968)	300 ft. guyed mast on base insulator	Transmitting on 380 M.

Jawalakhel

SW	5 KW AWA (installed 1961) (2 separate 5 KW transmitter units)	Single band half- wave dipoles for 25, 31, 41, 60 and 90 M.	Stand by for 100 KW at Khumaltar on 90 M. Presently transmitting on 41 M. Spare parts not available. Must be adepted.
MF	1 KW Gates BC-IH (installed 1973)	Tee antenna shunt fed	Stand by for 10 KW transmitter at Khumaltar on 380 M.
	0.25 KW Philips (installed 1954)		

*This information is essentially the same as that published in 1975 in the report of Mr. H.J.A. Hendriks, ITU Expert.

The current broadcasting day runs from 0600 to 0930 when the transmitters are taken off the air. Broadcasting is then resumed from 1300 to 1600, then off the air until 1730 and resumed until 2300. Saturday transmissions include the period 0930 to 1030. There are 85 transmitting hours per week. At the present time the Marconi 100 KW transmitter is normally tuned for 90 meter transmissions while the 5 KW AWA is tuned for 41 meter transmissions. This provides day and night time frequencies near optimum for Nepal. Radio Nepal subscribes to the optimum working frequency predications of the National Physical Laboratory of India and could, if suitable auto-tuning were available, change frequency perhaps once or twice during day time hours to provide more optimum frequency selection. A new 100 KW short wave transmitter has been purchased (Harris SW-100) and is scheduled for installation in the spring of 1977. It will be equipped for pretuning of up to ten frequencies and frequency changing may be accomplished in as little as ten seconds. A wide-band, high angle transmitting antenna is also scheduled for purchase and installation to work with the SW-100.

(1) Transmission

As previously described (Part II, Section B.2.), the Radio Education Pilot Project will utilize the radio broadcast facilities of Radio Nepal with recommended hardware and training up-grade. A further discussion of the limitations of the transmission medium and certain basic operating considerations is in order. These concepts are important to the overall understanding of the system.

The following conditions are relative to providing reliable educational radio transmissions within a very limited period of time:

- (i) The medium wave broadcasting service originating in Kathmandu will provide usable signal availability approaching 100% (during broadcast hours) within the designed coverage area. Outage time will be generally caused by human error or equipment failure or a combination of the two. The medium wave coverage area can be described as the Kathmandu Valley and surrounding hills within a radius of approximately 40 kilometers of the transmitting station at Khumaltar.
- (ii) The short wave broadcasting service (also originating in Kathmandu) functions as the national service and provides radio signals of varying intensity throughout the country and neighboring regions. The availability of useful signal intensities during broadcast hours (excluding equipment failure) cannot equal that of the medium wave service. The reduced reliability of the high frequency propagation mode is a result of variations in the propagating medium.

The teacher in the remote rural location must be given every technical advantage possible in order to optimize his or her probability of receiving a useful (readable) radio signal throughout the training program. The teacher will not have had training as a radio operator and, in fact, may have little or no experience with a radio. He or she may have no idea what "short wave" or "medium wave" means. Therefore, the project will commence only when a set of minimum operating criteria are met for the transmission system. Following are these criteria:

- (i) The short wave and medium wave broadcast facilities of Radio Nepal should be simultaneously utilized for the educational program.
- (ii) The programs should be broadcast on a minimum of two (preferably three) short wave frequencies simultaneously. The short wave frequencies for national coverage should be selected on the basis of the optimum working frequency predications of the National Physical Laboratory of India, a service currently subscribed to by Radio Nepal. The frequencies used will be those assigned to Radio Nepal by international agreement and those used must therefore be chosen to most closely fit the NPL predictions.
- (iii) Adequate broadcast time should be made available for repeat broadcasts of the same program material in order to minimize lost training time to the teacher. Lost broadcasts may result from equipment malfunction, propagation outage or conflicts in teacher listening schedules. For the initial service, one hour in the morning and one hour in the afternoon will be assigned to training programs. After a suitable operating period has elapsed and sufficient listener reports have been accumulated, the total broadcast time may be modified to suit field conditions.

The concept of sumultaneous or multi-frequency transmission is explained further as follows:

In order to improve the reliability of the short wave transmitting system used to broadcast the project programs, broadcasts should be carried simultaneously on at least two, preferably three, separate transmitting frequencies on a scheduled basis. The reason for this is as follows:

- (1) If the teacher begins to experience difficulty in reception on a particular frequency due to fading, interference or a combination of the two, he or she

may consult the frequency schedule chart and tune to the second (or third) transmission immediately. The probability is good that the second (or third transmission) will be readable and allow the teacher to continue the lesson with minimum loss in instruction.

- (ii) If, under similar circumstances, the teacher loses the transmission completely (due to equipment malfunction at the transmitting end) he or she may similarly tune to one or the other of the scheduled frequencies in order to resume instructions.

It is not recommended to dedicate one transmitter solely to the broadcast of the educational program, even though scheduled frequency changes are made during the morning, mid-day and evening hours. This is because:

- (i) The optimum working frequency transition periods do not occur precisely at the same time every day even though the scheduled transmitter frequency change must occur precisely at the same time every day in order not to confuse the listener.
- (ii) The probability exists that at any particular time of day (or evening) one transmitting frequency is not optimum for all sections of the country, particularly during the transition periods which are most pronounced from sunrise to mid-day and from mid-day to sunset. Therefore, at least two (and preferably three) simultaneous transmissions will increase the probability of successful reception by the listener.

All the major commercial short wave services in the world employ simultaneous multi-frequency transmission to increase reliability. Most of these services are two-way, i.e., the operators know immediately when a particular frequency is no longer useful. They also employ other techniques to improve reliability which cannot be employed in this system because of complexity, cost, etc.

The project's program transmissions will be one-way and the transmitter will not know if reception is satisfactory until weeks later when reports begin to arrive. Simultaneous, multi-frequency transmission is one of the most effective means to improve short wave transmission system reliability and this method of operation should be available when the educational broadcasting begins.

Transmitting Equipment Reliability

The broadcast transmitters currently in service at Radio Nepal have operating service times ranging from eight to twenty-two years. There are three short wave transmitters and three medium wave transmitters currently in use. A fourth short wave transmitter will be installed in the spring of 1977. Factory supplied spare parts for at least one of the short wave transmitters (5 KW) are no longer available and spares for the 100 KW Marconi transmitter are difficult to obtain, delivery time being up to three years according to Radio Nepal. The level of spares maintained at the transmitter sites is probably ^{the} minimum consistent with the operating budget. Many components, particularly for the high power stages of the transmitters, are not stocked because of low probability of need. This is satisfactory procedure when the transmitter is relatively near to the source of spares. In the case of Radio Nepal all supply sources are overseas.

If a component not stocked fails in service there may be a considerable delay in obtaining a spare or in repairing the component on site. As service time increases the probability of component failure becomes higher.

The existing complement of transmitters currently provides adequate back-up for both short wave and medium wave service. There will be a serious problem with continuing degradation of service, however, because of the age of the equipment and the difficulties in obtaining spares. Radio Nepal has planned for eventual expansion of the short wave transmitter complement by additions of two 100 KW transmitters and two 20 KW transmitters. The installation of one or more of these units will measurably increase the reliability of the short wave transmission system and will directly aid this project provided that the recommended operating methods are adhered to.

Transmission Equipment

To immediately up-grade the facilities of Radio Nepal, and provide for a more reliable equipment basis for transmission during this project, the project will provide Radio Nepal with (1) a wide-band antenna (3-18 MHz nominal, VSWR 1.5:1 max), and (2) a 100KV short wave transmitter. This equipment will measurably increase the reliability of the broadcast signal, allowing a greater degree of assurance that teachers in the rural areas will receive a readable signal. The importance and necessity of this added equipment will increase as the current aged equipment deteriorates. Further, the added equipment will increase the post-project capabilities of Radio Nepal for educational radio broadcasting and help to insure that HMG can continue educational broadcasting for teacher retraining after the pilot project is completed.

Details of equipment descriptions and cost data are provided in Annex H, Estimated Costs-Radio Transmission System Hardware Up-Grade.

(2) Radio Nepal Training

The current technical maintenance and operating staff of Radio Nepal consists of three degreed engineers, thirty Technical Assistants (T.A's) and twenty eight Junior Technical Assistants (J.T.A.'s). The technical qualifications of the T.A's and J.T.A's are as follows:

Technical Assistant

Holder of School Leaving Certificate (SLC) and two or three years of technical training in electricity. Training is more practical than theoretical, with mathematics instruction only through algebra.

Junior Technical Assistant

About two years of technical training in electricity. The J.T.A. does not hold an SLC.

The need for fundamental training in electronic theory and practice is the most immediate requirement of the Radio Nepal maintenance and operations staff as reported by the Director-General. Most of the technicians have not had formal or practical training in electronics but have received some training in electricity and wiring. The personnel requirement that is most difficult to meet is that of obtaining an electronics technician capable of performing the required electronic and mechanical maintenance duties competently.

For the next four to five year period there will be a requirement for nine engineers and thirty-three skilled technicians apportioned as follows:

Radio Nepal Studio Operators

Specialized Areas Requiring Maintenance Talent

- (i) Tape recorder maintenance
- (ii) Consoles and other electronic equipment
- (iii) Technical quality and proof of performance

Required Staff: 3 engineers (BSEE or equal)

9 technicians specialists

Radio Nepal Transmitters

Specialized Areas Requiring Maintenance Talent

- (i) Transmitter maintenance
- (ii) Antennas and transmission lines
 - electronics
 - mechanical (riggers)
- (iii) Technical quality and proof of performance

Required staff: 6 engineers (BSEE or equal)

24 technician specialists

The development of these personnel will serve the long term plans of Radio Nepal in staffing the national medium wave broadcasting system as well as meeting the near term maintenance requirements.

There appears to be a definite need for several graduate electronic engineers with advanced training in management and business administration specifically for management duties within the planned national medium wave broadcast system.

The training of Technical Assistants and Junior Technical Assistants in fundamental electronics, theory and practice, would probably be accomplished most efficiently in Kathmandu. Based upon discussions with the Director-General of Radio Nepal, it should be possible to arrange classroom space at Tribhuvan University. Transportation to and from a central location in Kathmandu would have to be arranged in order that students could best coordinate classroom and work schedules. The following narrative develops one method of satisfying the immediate need for fundamental electronics training of the current staff of 30 Technical Assistants and 28 Junior Technical Assistants.

Assume a class size of ten students attending classes two and onehalf hours per day divided into 45 minutes of theory, a 10 minute break and 1 hour and 35 minutes of laboratory. Assume 4 days per week for each group of ten. If an instructor were under contract for twenty hours of classroom/laboratory instruction per week, that would allow two groups of ten to be trained for 4 days per week. A ten week course is assumed to be adequate for elementary training; hence in less than one year, it should be possible to reach each of the 58 technicians.

Two text books and one laboratory work book should be sufficient for the elementary course. A representative text would be the ARRL Handbook, an excellent source for elementary radio and electronic theory and practice. The ARRL Antenna Handbook would also be a good elementary text for basic training in antenna and transmission line theory. These publications are noted here as being representative of the level of instruction believed to be suitable. They are known world wide to radio amateurs and provide the basis for study leading to examination for FCC amateur radio licences. Texts equal in quality and content would be acceptable.

The instructor could be recruited from such sources as: RCA Institutes, N.Y.; Capitol Radio Engineering Institute, Washington, D.C.; and Cleveland Institute of Radio Engineering.

There should be a laboratory available for conducting elementary experiments and for learning to use basic electronic test instruments. Heathkit Corporation would be a suitable source of relatively low cost test instruments; in fact, instruments in kit form could be supplied as part of the course. The students could assemble the instruments in groups of two or three while the theory courses progress. They would then reach a point where they could apply the instruments to laboratory projects and after completion of the course the instruments could become part of Radio Nepal, or other communications departments' test equipment complement. The theory and laboratory instruction time should be divided roughly in half in order to keep student interest high while relating theory to practice.

Training for the technician specialists for near and long term maintenance requirements in the studios and transmitting facilities of Radio Nepal may be met best by providing manufacturers "technical representatives" training in Kathmandu or by sending technicians to commercial or national broadcasting facilities or manufacturers' plants overseas for intensive on-the-job training. The former approach is preferable, where a technical representative from the firm supplying the specific equipment installed at Radio Nepal travels to Kathmandu under contract and conducts an intensive course in the theory and maintenance of the equipment on-site. The training must provide "hands-on" repair and testing skills. The training period would typically cover two or three weeks of daily instruction on each individual equipment or assembly. The technical representative would be required to bring with him the necessary special tools and test equipment. Radio Nepal would be advised on the tools and test equipment they should acquire for continuing maintenance operations in the prescribed manner.

Other more advanced training out-of-country would also be desirable in order to insure that Radio Nepal has the requisite capabilities to maintain its current equipment and that to be provided through this project. Further details of training are provided in Section II.B.2.h. (Training).

c. Radio Education Pilot Project

Most of the inputs will be directly provided to the Project rather than to any other institution (though the "Project" is obviously made up of personnel from various institutions). De facto, many of both the commodity and training inputs will, in the long run, benefit other institutions equally. The special training given producers seconded from JEMO, and content persons seconded from the IOE, will accrue to those institutions as well. The building which will house project staff will be a permanent facility at Sano Thimi. The radios supplied to teachers will eventually be available for other uses. Following are the commodities, training and technical assistance to be provided to the "Project".

(1) Commodities

(i) Building:

A new building housing the entire project staff will be constructed at Sano Thimi. There is no suitable office space available in present facilities. The greatest portion of the remaining facilities at JEMO were constructed under AID funding. The cost of a building of 3,800 square feet, including 8 offices, a support staff area, a storage room and bathrooms, is estimated at approximately \$44,000 (includes inflation). Building cost is estimated at approx. \$10.50 per square foot. In addition \$15,000 will be required for office furnishings.

(ii) Receivers:

Recommendations for the equipment installation at the remote receiving station are as follows:

- (a) Reliable, battery operated, solid state portable radios meeting the requirements of CCIR Recommendation 415, Type B1 for those locations requiring short wave and medium wave coverage. For locations requiring only medium wave reception capability the Type A radio should be adequate and

should be less expensive. The CCIR Recommendations provide minimum electrical performance requirements but mechanical durability should also be a requirement in the purchase document. A summary of CCIR Recommendation 415 is contained in Annex A.

- (b) A simple "L" type antenna as described in CCIR Recommendation 140 should be installed at each receiving location.
- (c) A battery installation suitable for up to six months service without replacement is recommended.

Ideally, the portable radio purchased for the program should be a "standard, off the shelf" item in order to keep costs to a minimum. There should, however, be minimum performance specifications placed on the radio in order that some measure of quality control may be maintained for initial and subsequent purchases. The CCIR recommendation fits this requirement.

The recommended method for writing the purchase document is as follows:

"Request that the bidder quote on his standard model receiver meeting CCIR 415. If no standard model exists meeting those requirements he should quote on the standard model most closely meeting those specifications. He should alternately quote on the manufacture and supply of a radio meeting those specifications."

UNICEF has located a supply source for MW receivers suitable for educational broadcasting service in developing countries. The manufacturer is SEL (Standard Electric Lorenz, a German subsidiary of IIT) with manufacturing facilities in Hong Kong and Malaysia (IIT Transelectronics). UNICEF is aware of the importance of placing adequate performance specifications (both mechanical and electrical) on these radios and they now plan to obtain quotes from SEL and others for radios meeting the minimum requirements of the CCIR. It should be noted that the model now offered by SEL is not adequately specified and covers only the medium wave band.

Further details on costs for the radio receiving system, including receiving units and battery supply alternatives, are provided in Annex I.

(iii) Other Commodities:

- Vehicles (2) for field operations and research and evaluation activity. @ \$9000 each. \$ 18,000

- Printing and paper cost Text/Workbook @ Rs.25 per 500 pages - Total 3,600. The Ministry of Education printing facilities at JEMO are presently overburdened. It is not clear whether they would be able to undertake the printing of the text/workbooks. Printing costs for outside commercial printing of the text/workbooks are therefore budgeted. \$ 8,700

- Miscellaneous additional imported supplies and commodities \$ 46,000

(2) Training

The largest proportion of training will be done in-country by the expatriate advisors supplied under technical assistance, below. Visits to similar projects in other countries, and some short and long term training in special areas of production or research will also be provided. The emphasis on in-country rather than out-of-country training reflects the need to train a substantial number of people with a common set of skills, and the need to have all of those people ready simultaneously for project development work. Provisions will also be made for project personnel to attend relevant project-related seminars and conferences of an appropriate nature.

As with training provided to Radio Nepal and JEMO, further detail on training for project personnel is given in Section II.B.2.h. (Training).

(3) Technical Assistance

With the exception of the Team Leader and evaluation functions, all technical assistance will be primarily directed toward intensive training of Nepali staff and not toward actual project activity. This reflects HMG's strong insistence that advisors be brought in only when absolutely required, and only for so long a time as needed to adequately train Nepali staff.

Team Leader. This individual will be charged with overall responsibility for the USAID project involvement. Responsibilities will include overall management of the project team, recruitment, assignment of tasks, coordination with the various governmental and donor agencies involved in the project, and service as a counterpart of the project director. The person should bring substantial managerial capability, a knowledge of and experience with distance education, and if possible, knowledge of teacher training in developing countries. Knowledge of Nepal and Asia will be an additional asset. The Team Leader will remain in Nepal for four years.

Radio Production Specialist. This person will train Nepali producers, assistant producers and content specialists in the production of educational radio programs. He or she should be experienced with educational script preparation (for adults) and with studio production. Prior experience with production training in developing countries is essential. Additional assets would be experience in teacher training and distance education. Knowledge of Nepal and South Asia would be helpful. Knowledge of Nepali would be very valuable. This advisor will remain in Nepal for a minimum of 12 months.

Self-instructional Materials Specialist. This person will be charged with training Nepali content specialists in the design of the text/workbook to accompany the radio lessons. He or she must have substantial experience with the development of self-instructional materials, particularly materials to be used within a distance education program. Experience in training others to develop such materials, experience with an adult audience, and experience within developing countries will be important. Knowledge of Nepali will greatly ease this individual's tasks. The advisor will be in Nepal for about 18 months.

Teacher Educator. This person will help the Nepali staff adapt the existing primary teacher training curriculum to the radio-based distance education system. The most important experience this person will bring is in teacher education in developing countries. In addition, experience with distance education, with radio, and knowledge of Nepal and South Asia are all helpful assets. The advisor will remain in Nepal for about 12 months.

Evaluation Specialist. This individual would have two roles: the training of project research staff in research methods for formative and summative evaluation tasks of the project, and the development of a summative evaluation design to gauge the overall effectiveness of the project. He or she will have extensive training and experience in research on distance learning projects in developing countries. The advisor will remain in Nepal for about 18 months.

3. Reasonableness of Cost Estimates

Radio Nepal, JEMO and Teacher Radio Hardware Costs

Cost estimates for the transmission systems were developed from three sources:

- (1) The wide band transmitting antenna cost was developed from costs reported by Radio Nepal for a similar antenna.
- (2) The costs for the JEMO studio equipment were developed, for the large part, from RCA catalog prices.
- (3) The costs for test equipment, the 100KW transmitter and certain other electronic hardware were developed from recent costing experience with similar equipment.

Radio Nepal Training and Engineering Services

Cost estimates for the proposed training programs were developed with the assistance of the USAID Mission, Kathmandu. They reflect current experience by the Mission.

Cost estimates for engineering and installation services are based upon recent experience and costing methods employed by MORCOM Systems, Inc., a communications consulting firm.

4. Summary Conclusion/Technical Soundness

a. Transmission System

The use of the short wave broadcasting facilities of Radio Nepal to transmit the teacher retraining program represents a sound technical solution for program distribution. Radio Nepal is the chartered government department for radio broadcasting and is staffed adequately to provide operating and maintenance service during the life of the program. No other agency or department can provide the requisite facilities and personnel to support this program within the scheduled time frame.

The success of the program will depend, to a great extent, on following the recommended transmitter operating methods whereby broadcast simultaneously. Adherence to this method of operation is required through the life of the program.

b. Reception System

The provisioning of reliable, solid state portable radios purchased under an adequate performance specification is a sound approach to ensuring teacher success in receiving the broadcasts. A simple wire antenna and reliable power supply are also requisites to satisfactory operation.

B. Financial Analysis and Plan

Both USAID and HMG have been concerned about the budgetary impact of this project upon HMG, both during the period of USAID involvement and after. This project design, to the extent possible, has features that will help to minimize recurring expenses to HMG. Indeed, one of the main justifications of this project is to introduce an innovative and effective teaching method that will reduce teaching costs on a per student basis.

As seen in the summary table in this section, total HMG costs for this project, both financial inputs and in-kind contributions, total \$523,000. This is admittedly a significant cost, though a careful review of the HMG contribution will show that a number of these HMG costs are not necessarily additional costs to HMG, but a diversion of existing HMG resources for use on this project (e.g., utilization of Radio Nepal broadcasting time and equipment). Numerous conversations with HMG senior officials have indicated that the government's overall commitment to this project, including the financial commitment, is strong enough to assure necessary HMG inputs.

After project completion, recurring HMG budgetary costs, above expenses currently being incurred by HMG, will be of such a magnitude that HMG will be able to financially maintain the activities which will result from this project.

In the area of commodities, the project hopes to utilize rechargeable batteries or a solar cell power supply system for the radio receivers, recognizing that disposable "D" cells would place an expensive requirement upon HMG for replacement after USAID involvement in the project terminates. An upgrading of equipment, including purchase of one new transmitter, will help to minimize HMG's recurring maintenance costs (as well as improving transmitting reliability of this project).

In terms of personnel, this project requires a substantial additional staff requirement, though by the end of this four year project period much of this staff will no longer be required for the production of "B" level training materials for primary teachers. It is envisioned that most of the project staff, by then well-trained in the production of broadcasting materials and supporting educational materials, will be utilized by HMG on similar educational radio broadcasting efforts. Further, considerable technical training of Radio Nepal staff will minimize later HMG expenditures for training and will also help to assure effective maintenance and operation by Radio Nepal of its equipment.

In sum, we anticipate no serious financial difficulties accruing to HMG as a result of the budgetary impact of this project.

Following is the Summary Cost Estimate and Financial Plan for this project. This table summarizes the cost inputs described in the earlier sections of this paper, particularly in Part III.A., the technical analysis. Other financial detail is also given in the Project Paper Facesheet, the Logical Framework (Annex D), and various annexes.

SUMMARY COST ESTIMATE AND FINANCIAL PLAN*
(U.S. Dollars)

1. USAID Dollar Inputs

a. Technical Assistance

129 work months, including team leader, radio production specialist, self-instructional materials specialist, teacher educator, evaluation specialist, contract electronics instructor, short-term technical advisors (including U.S. manufacturers representatives) calculated at current rate of \$98,000/year

	\$1,285,043
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b. Training

(1) Study/observation trip by Project officials (4 man/months)	8,200
(2) Production courses in U.S. (12 man/months)	30,800
(3) Sound recording courses in Asian countries (9 man/months)	5,300

*Assumes 10% annual inflation factor in personnel, training, and commodity costs.

(4)	Long-term degree training in U.S. (24 man/months)	\$ 28,700
(5)	Advanced short-term training thru courses, seminars and conferences (12 man/months)	31,900
(6)	Long-term and short-term training in Asian countries for Radio Nepal personnel (48 man/months)	27,500
<u>c. Commodities</u>		
(1)	Radios (2,750 at \$60 each, plus shipping and inflation)	254,000
(2)	Solar cell power supply systems (2,750 at \$125, plus shipping and inflation)	529,250
(3)	Vehicles (2)	18,000
(4)	Printing and paper costs for text/ workbook (3,600 books of 500 pages at Rs.25 - \$2 per book, plus inflation)	8,700
(5)	Miscellaneous imported supplies and commodities	46,000
(6)	Antenna for existing transmitter	129,366
(7)	Transmitter (100 KW short wave)	449,649
(8)	Ins., Freight, Transport. for (6)&(7)	69,257
(9)	JEMC equipment: audio console, tape recorder-reproducers (2), portable tape recorder (2), audio oscillator, calibrated resistive attenuator (4), voltmeter, distortion measuring set, noise measuring set, line frequency meter, line frequency regulator, tape travel indicators (2), engineering and installation services for above equipment	60,000
(10)	Contingency	28,985

2. USAID Rupee Inputs*

a. Local Support Costs for Contractor Team

(1) Local clerical support	\$ 31,000
(2) Office expenses, excluding personnel costs	20,500
(3) Official vehicle maintenance and petrol	30,800
(4) Local travel and per diem (per diem out-of-Kathmandu).	30,800
(5) Housing rent, utilities, and per diem for short-term advisors in Kathmandu	70,100
(6) Language instruction and orientation	8,000
(7) Contingencies (10%)	19,100

b. Building Construction

(1) Building for housing Project Team - (3,800-sq. ft. at Rs. 130/sq. ft. at Rs. 130/sq. ft. = 38,152 plus inflation)	44,000
(2) Furnishings	15,000
(3) Contingencies (10%)	5,900

3. HMG Inputs**

a. Project Personnel (as described in Para. II.B.2) (Rs.1,340,000 base salary plus 20% benefits plus inflation)	129,000
b. Project Personnel Support Cost (Travel, per diem, supplies, other expenses at Rs.150,000 per year for 4 years, plus inflation)	55,900

These rupee requirements will be covered by dollar appropriations.

**Includes 10% annual inflation factor in all costs. Rupees converted at Rs.12.45 NC equals \$1.00.

c. Use of Radio Studio and Equipment	(20 hours per week, over four programming years, \$27,000 per year on the basis of \$48,000 studio value with 15 year life, and 7.5% discount rate, plus inflation)	\$ 12,700
d. Use of Transmission System	(Total of 400 hours per year over 3 years at Rs.820 per hour = Rs.984,250, plus inflation)	95,900
e. Non-Project Personnel, involved in administrative and other Project Support	(District education personnel, JEMO personnel, Ministry of Education officials, all other involved officials)	38,400
f. Teacher Time Listening to Radio Broadcasts	(5 hours per week, or 5/36 of full school week. Annual salary of Rs. 1,620 + 20% benefits or Rs. 1,944. 5/36 of that is Rs.225 per year of teacher time charged to teacher training project. 3,600 teacher years over 4 years of project, plus inflation)	75,500
g. Residence Costs	(6 weeks residence per year: 2 weeks at district headquarters, 4 weeks at IOE campus, including annualized capital cost Rs.25, travel cost Rs.60, living expense over and above salary Rs.135, incidental expense Rs.15. Total of Rs.235.)	78,600
h. Salaries of Personnel Receiving Training (excluding teachers)	(Pro-rata portion of salaries of JT's/JTA's Radio Nepal receiving in-country training; salaries of those at Radio Nepal, Project Staff and JEMO staff receiving out-of-country training)	9,000
i. Other Costs	(Miscellaneous costs not listed elsewhere, value of land for building extension for project staff, medical exams and travel costs on RNAC for participants, office and classroom space, postage, etc.)	28,000

Summary Table

1. <u>USAID Dollar Input</u>		
a. Technical Assistance	\$4,285,043	
b. Training	132,400	
c. Commodities	1,593,207	
Sub-Total		\$ 3,010,650
2. <u>USAID Rupee Input</u>		
a. Local Support Cost for Contractor Team	\$ 210,300	
b. Building Construction	64,900	
Sub-Total		\$ 275,200
3. <u>HMG Input</u>		
a. Personnel and Personnel Support	\$ 307,800	
b. Commodities	108,600	
c. Residence	78,600	
d. Other	28,000	
Sub-Total		\$ 523,000
<u>Total Project Cost</u>		\$ 3,806,850

Host Country Contribution

Nepal is one of the poorest of the Relatively Lesser Developed Countries. Despite severe limitations imposed by lack of physical resources, and a shortage of trained and competent managers and technicians, it has made considerable efforts in recent years to mobilize resources towards development. The national budget has grown significantly in recent years: within the total budget, HMG has allocated an increasing portion of its budget to the education sector.

Now, however, HMG is facing serious budgetary restraints in the educational field and the educational budget cannot continue to expand as rapidly as in the past. Thus, in new projects such as this one, HMG cannot always contribute as much towards projects as FAA provisions normally require, despite HMG's commitment to the project and emphasis upon educational radio development.

The total HMG contribution toward this project is \$523,000, or 14 percent of total life-of-project costs. Thus, this project does not meet the 25 percent requirement normally required under FAA, Section 110 (a), and a waiver is herewith requested. Provisions for this waiver are provided in Section 307 of the International Development and Food Assistance Act of 1975 which permits waiver of the 25 percent cost-sharing requirement for relatively least developed countries. This amendment contains two restrictions: (a) a waiver can be granted for a project or activity only on a case-by-case basis (i.e., no blanket country waivers), and (b) the determination of country eligibility must be based on the UNCTAD list of "relatively least developed countries".

This project qualifies under this provision and fully meets the various criteria for the waiver (as discussed in AIDTO CA-127 dated 3/2/76 and AIDTO CA-682 dated 12/23/76). This request for a waiver is on a "case-by-case basis", this specific request being the first waiver request submitted by USAID/Nepal. Further, Nepal is on the UNCTAD list of the relatively least developed countries and hence qualifies on that basis.

Other factors also importantly in consideration of a waiver request. Nepal's contribution, though not 25 percent, is a substantial 14 percent. Further, Nepal's commitment to this project is very strong and at the highest levels of Government, as discussed earlier in this Project Paper.

The nature of this project also provides a strong argument for a waiver. The purpose is to establish the feasibility of upgrading the training of primary teachers at a cost per teacher significantly below present per teacher costs. Thus, successful implementation of this project should help to provide Nepal with future savings in training costs per teacher.

This waiver request has been thoroughly discussed within USAID/Nepal, and in view of the strong arguments for such a waiver and this project's ability to meet statutory requirements, we firmly support the necessity and desirability for a waiver.

Summary Option, Financial Plan

The financial data in this Project Paper have been carefully prepared, utilizing the combined resources of Mission personnel and TDY radio technicians and experts from AID/W, experts from a U.S. university (Stanford), and a commercial radio consulting firm in the U.S. The data has been carefully reviewed by Mission personnel (Program Office, Controller's Office, etc.) and His Majesty's Government of Nepal. We believe this is a sound and firm financial plan and that the project design is financially sound.

C. Social Soundness Analysis

As indicated in AID Handbook Chapter 4, Appendix 5 A, there are three distinct but related aspects to social soundness analysis, and it is with these three elements that this analysis is basically concerned. These are: (1) the compatibility of the project with the socio-cultural environment in which it is to be introduced (its socio-cultural feasibility); (2) the likelihood that the new practices or institutions introduced among the initial project target population will be diffused among other groups (i.e., the spread effect); and (3) the social impact or distribution of benefits and burdens among different groups, both within the initial project population and beyond.

By way of historical background, the Mission was concerned with the sociological implications of the project during its very inception, which was in late 1973. Hence, the Mission commissioned a study by the New Educational Reform Associates, entitled Radio Listening Patterns in Nepal, which was designed to establish base-line data for project development, and to answer such basic questions as: How many radios are there? Who listens to radio? Why do people not listen to radio? How important to listeners is radio? What programs and stations do they listen to? How many actually seek out radios to listen to particular programs? What are "favorite" programs? The intent was to discover whether or not the listening environment was a receptive one among rural populations, or whether the technology of radio was so remote from the average experience as to require a whole new mind-set before potential listeners could be attracted to information programs on the radio.

The sampling technique was designed to provide information from all major language groups in all geographic regions of Nepal, ranging from the far west to the far east. Since Nepali is the dominant language, 56.3% of the owner sample was from that group, with proportionate samples from 11 other relatively important language groups. Further, 14 of Nepal's 75 districts were sampled.

While this research effort obviously did not answer all questions relating to listener habits--or even most of them--it did gather a significant body of data, and provided a substantial body of conclusions against which to test the social soundness of the project.

Among the major conclusions of the study, each conclusion supported by data presented in chart or graph form, are the following:

1. There are approximately 115,000 radios in Nepal; that is, 1 out of 100 individuals and 1 out of every 18 families possesses a radios, cost being the overwhelming reason for not owning a radio.
2. News is the favorite program among listeners (with a listenership of about 83%, while agriculture is second with 60%).
3. An average of about 6 listeners share a radio.
4. 63% of the radio owners are farmers. Further, of all radio owners, 59% are completely unschooled.
5. Radio listeners often communicate to others information which they hear on radio, especially information of national (as opposed to local or international) importance.
6. More than half of the non-owners listen to the radio at least twice a week, usually at a local shop or at a friend's house. They often search out radios to hear specific programs and their program preferences are similar to those of radio owners.
7. The agriculture program (educational in nature) has a regular audience of a majority of radio owners and occasional audiences of nearly 90% of the potential audience.
8. Most listeners to the agriculture program find it useful and practical, and nearly two-thirds report using one or more modern practices which they had heard about on the program.
9. Most listeners who have not incorporated new agricultural practices heard on the radio into their farming claim that the reason is lack of necessary agricultural inputs.
10. The family planning program has a regular audience of slightly more than 25% of all radio owners, and an occasional audience of nearly 90%. Significantly, twice as many radio owners first heard of family planning from radio broadcasts as first heard of it from any other single source.

A general conclusion of the researchers contains a significant commentary on the role of radio in this society: "More generally, what all of our data implies is that radio is taken as a serious communications device by those who possess receivers as well as those who do not. The two most popular radio programs among both groups, news and agriculture, are basically informational and not for entertainment; the second of these is overtly educational. In addition, radio listening appears to be a deliberate, serious, regularized pattern in the daily activity of owners and, to a lesser extent, among non-owners as well. Radio listening is not a haphazard affair in Nepal; for the listeners it seems to fulfill a desire for an awareness of things beyond the village. As such, it may be that radio's potential as an educational and motivational tool for national integration and development has only been very partially developed or utilized to date."

About 8% of the respondees to the questionnaire were either teachers or students, and the researchers concluded that there was no significant difference in response between the occupation patterns of radio listeners.

While the role of radio in the rural societies of Nepal (this study was almost completely in rural environments) seems relatively clear from the foregoing, the attitudes of teachers toward radio as an instructional medium has not been formally researched. However, the Dean of the Institute of Education, members of the Ministry of Education and the National Education Committee, and University personnel who have been extensively queried on this point, believe that the educational value of radio is as clearly recognized among teachers as it is in the general population. Those queried do not anticipate any resistance to the use of radio as an instructional mode. However, HMG officials clearly recognize the need to provide clear incentives to those who participate, as well as to provide very careful orientation to the program before it is aired. Until the program is tried, there can obviously be no final answer as to teacher receptivity and response, though most careful assessments to this point indicate no built-in inhibitions among teachers to use of radio.

Other than the general role of radio in Nepal's society, a large number of factors have been addressed during project planning to assure its viability. Two major factors are language and time of listening, for quite obviously if a significant portion of potential listeners lack either the time or the language facility to make use of the program, it will fail.

First, as to language. The Listening Patterns study noted above found that of the listeners surveyed, the percentage of listeners who did not understand Nepali (Nepal's national language, and the language of all radio broadcasts) was as follows:

Far Western Hills	--	0%
Far Western Terai	--	0%
Western Hills	--	0%
Western Terai	--	0%
Central Hills	--	0%
Central Terai	--	29%
Eastern Hills	--	0%
Eastern Terai	--	16%

This information is not definitive, of course, but it is indicative that the general audience can indeed understand Nepali in most of the country. The primary audience for the pilot project is in-service teachers, which means that by definition they are able to communicate in Nepali.

As to time, this has received careful attention in project design, for while the Listening Patterns Study demonstrated that morning and evening hours are by far the most common listening times, the pilot project takes into account the special demands on the teachers' time. Since a pattern of early morning workshops for teachers has been established and is acceptable, it appears that this pattern will also be acceptable for the pilot project. Some shifting will likely occur after the program is initiated, but it is not anticipated that significant shifting will be required.

As has been stressed earlier in this PP, a major goal of HMG is to involve the rural populations in the development process. This is stressed in the National Education System Plan, and it is a major purpose of the pilot "Schools for Rural Transformation" which are being set up by the National Education Committee. Under this concept, the school is seen as a basic contributor to rural life, and is a center for learning about various facets of rural life, ranging from better health, to family planning, to better agricultural practices, to basic education. Perhaps the major impediment to the spread of this concept is the failure of the teacher training program to prepare teachers, either emotionally or academically, to cope with this concept. Hence, the pilot project will be not only to train a specified number of teachers, but will also introduce a new approach to teaching and education, one which begins with the concept that a basic function of the school is to relate to its environment. Thus, the immediate target group is the teacher; the larger target group is the rural population that relates to the school.

D. Economic Analysis

One of the primary purposes of this project is to demonstrate the feasibility of utilizing educational radio for instructional purposes from an economic point of view. In this section, the costs for the existing B level training program at the IOE campuses are compared with projected costs for the radio-based system to be utilized in this project.

1. Campus-Based Training

The following table presents the costs per student for campus-based B level training under the current system being used by HMG. These data were derived with the assistance of the Dean of the Institute of Education.

Cost Per Student for Campus-Based B Level Training
(10 months training)

HMG Costs

a. Full salary of teacher

Rs. 135/month for 12 months Rs. 1,620

b. Cost for instructors at IOE

45 students per year using 4 instructors for
12 months at Rs. 650/month.
Cost per student 690

c. Other costs per student

Materials, books, library costs, overhead
(excluding new capital costs). Calculated
by IOE as 50% of instructor costs 345

d. Annualized capital cost per student

Cost of new facilities to teach approximately
400 students per year is Rs. 920,000.
Annualized over 30 years, cost per student 195

Sub total Rs. 2,850

Individual Costs

a. Travel Costs

Round trip from village to Kathmandu or Pokhara
(average) Rs. 60

b. Living expenses

Costs for 10 months living expenses:
 housing at Rs. 50/month is Rs. 500; food
 (cost above food costs of eating at home)
 is Rs.60/month or Rs. 600. Rs. 1,100

c. Other expenses

Other expenses incidental to living away from
 home: laundry, etc. Rs. 15/month or Rs. 150 150

Sub total Rs. 1,310

Total Costs

a. HMG costs	Rs. 2,850
b. Individual costs	1,310
	Rs. 4,160 (\$334)

2. Radio-Based Training

The following table presents the costs per student for radio-based B level training as envisaged in this project. Costs are discounted and spread over an eight year period of time in order to obtain a more realistic estimate of costs. For example, the cost of materials production should not be charged against only the teachers actually trained during the project, for these same materials will be used also by later groups of teachers.

The following table presents cost data, breaking it down into (1) USAID and (2) HMG and individual. The total costs and HMG/individual costs are then divided by the average number of students each year. These costs are then averaged out over the eight year period. Further notes on procedures are presented in the notes to the table.

Cost Per Student for Radio-Based B Level Training
(U.S. \$)

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>	<u>Year 7</u>	<u>Year 8</u>
Production/Operations								
Facility	59,000							
Equipment	74,250	10,000	10,000	10,000				
Operations		12,742	12,742	20,507	35,236	35,236	35,235	35,236
Start-up	46,954	34,212	34,212	25,210				
Teacher Time		1,807	18,072	45,181	45,181	45,181	45,181	45,181
Residence Expense		1,888	18,876	47,189	47,189	47,189	47,189	47,189

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>	<u>Year 7</u>	<u>Year 8</u>
Transmission (Rs.820 hour)		26,345	26,345	26,345	26,345	26,345	26,345	26,345
Reception								
Radio		6,600	66,000	108,900	16,500	16,500	16,500	16,500
Battery		89,500	-	-	8,950	8,950	8,950	8,950
Books		200	2,000	5,000	5,000	5,000	5,000	5,000
Expatriate Tech. Assist. & Trng.	225,750	216,250	72,083	72,083				
Total Cost	405,954	399,544	260,330	360,415	184,401	184,401	184,401	184,401
HMG & Individual Cost	46,954	76,994	110,247	164,432	184,401	184,401	184,401	184,401
USAID Cost	359,000	322,500	150,083	195,983				
Number of Students-		100	1,000	2,500	2,500	2,500	2,500	2,500
Average Cost - Total	-	3,995	2,603	144.17	73.76	73.76	73.76	73.76
Average Cost - HMG	-	770	110.25	65.77	73.76	73.76	73.76	73.76
Avg.annual cost over 8 years - Total		\$184						
Avg.annual cost over 8 years - HMG		\$ 87						

Notes for Table

Start-up costs are calculated from the portion of Nepali salaries that will pay for the production of the basic set of learning materials, i.e., radio lessons and text/workbook and basic research expenditure. The cost of field operations, of remaking up to 20% of the learning materials annually after year 5, and most permanent administrative costs are included as operations costs.

Transmission cost calculations are based on estimates in the draft feasibility report and include extensive training of Radio Nepal staff.

Expatriate technical assistance and training costs exclude activities at Radio Nepal which were factored into the transmission cost estimates.

Also only 2/3 of the remaining technical assistance and training are charged to this project in recognition that these expenditures were partially justified as a long term investment in building human capital for other efforts as well as this.

Radio and Battery costs are absorbed by USAID through year 4 of the project. Thereafter HMG is assumed to purchase replacement for about 10% of radio and batteries each year.

All costs are presented in 1976 dollars.

With both costs and student utilization properly discounted (using a 7.5% social discount rate) the average cost, when the system is operational, will drop to around \$74 per student. Assuming the project were to operate for eight years, reaching a total of 13,600 teachers, the average cost per student, including all costs, would be about \$184. To HMG and other local sources alone, excluding funds contributed by USAID, the average cost would be about \$87.

This compares to an estimated cost of about \$334 per student in the campus-based system, which in any case would not be able to provide training to large numbers of students because of lack of facilities and teacher educators.

3. Income Effects of Project

Upon completion of B level training, and after having passed a certification test given by the Institute of Education, teachers will be given incremental pay increases. Other direct income effects are not significant.

4. Employment Effects of Project

The employment effects of this project are discussed in Part III. A.1. (Technical Analysis--Appropriateness).

5. Conclusions of Economic Analysis

The comparative figures in the economic analysis above, comparing radio-based and campus-based teacher training, should be viewed as approximations only. Even allowing for a sizable margin of error, however, the analysis projects significant reductions in per teacher training costs by utilization of radio-based training. The margin of \$150 between the \$334 for campus-based training and \$184 for radio-based training is very considerable. If comparisons are made of solely HMG (and individual) comparative costs, then the difference is even larger: \$334 for campus-based training versus \$87 for radio-based training, a reduction of \$247, or 74

percent. This cost reduction provides a strong economic rationale for this project.

Based upon the above analysis, we believe this project is economically sound and fully justified from an economic point of view.

Part IV. Implementation Planning

A. Administrative Arrangements

The primary HMG organizations involved in the day-to-day implementation of this project are Janak Education Materials Center, where the project will be sited, Radio Nepal, the Ministry of Education, and the Institute of Education. Close liaison and coordination will also be required with the Curriculum Development Center, the Ministry of Communications, the National Planning Commission, and the National Education Committee.

The specific role of each of the main implementing organizations is discussed in detail in Part II.B., Detailed Description. These organizations will necessarily be interacting on a daily basis and close coordination will be essential. As also discussed in Part II.B., this coordination will be facilitated by the Radio Education Policy Committee, a committee to be created by HMG and to be chaired by the Secretary of the Ministry of Education. This Policy Committee will be charged with overall direction, policy guidance, and responsibility for the project.

To help insure the close coordination among various HMG organizations that is essential for the success of this project, all project personnel, regardless of their parent agency, will be under the supervision and authority of the Project Director, who in turn is responsible to the Radio Education Policy Committee.

The administrative aspects of this project are extremely important in view of the complexity of this project and the numbers of organizations involved in it. After several decades of AID involvement with the education sector in Nepal, however, and with AID involvement since inception with the Janak Education Materials Center (which was an AID project), we believe we can reliably evaluate the capabilities of these institutions and personnel to implement this project. Based upon these long-term contacts and extensive discussions relative to this specific project, we are confident that the implementing organizations have the requisite capabilities.

It should also be noted that HMG set up a policy level inter-organizational committee for another AID project, the Teacher and Materials Utilization and Development Project. That committee has successfully directed and guided that project, demonstrating HMG's capability to successfully utilize a policy-level committee in project implementation. It is prepared to set up a similar committee immediately to begin planning for implementation of this project.

During Phase I of this project, approximately 15 to 18 months long (depending on when contractor arrives in Nepal), HMG and the contractor will be further developing administrative arrangements in anticipation of the broadcasting phase, which begins with Phase II (approximately February 1979).

It is anticipated that the direct role of USAID in this project will be reduced as the project develops. USAID will assist in setting up administrative arrangement, monitor the project, and facilitate implementation and evaluation as appropriate but will attempt to minimize its involvement to the degree possible. USAID will also offer participant training support and services through the Mission's facilities. HMG and the contractor, however, will have primary responsibility for arranging participant training.

After approval of the Project Paper, USAID and HMG will sign a Project Agreement, with amendments as necessary, to obligate funds. A contractor will then be selected for project implementation, and a contract will be signed providing for payment of salaries and expenses for U.S. specialists (both short term and long term), participant training expenses (U.S. and third country), in-country training, and commodities. Certain costs, such as that for building construction, will not be included in the contract with the selected institution, since building construction may possible be initiated prior to arrival of the contractor.

The contractor selected (with HMG participation) to implement this project will be one with significant experience in both educational radio broadcasting and overseas development work.

B. Implementation Plan

Following is the currently projected implementation plan for the Radio Education Pilot Project:

<u>Date</u>	<u>Activity</u>
January 1977	Submission of PP to AID/W.
February 1977	Approval of PP.
Feb.-April 1977	One month factory training provided for two Radio Nepal engineers at the Harris Company on the new SW 100 transmitter. Funded separately by AID/Washington.
March-April 1977	1. Signing of Project Agreement and PIO/T. 2. RFTP sent out by AID/W. 3. Radio Education Policy Committee begins operation.

<u>Date</u>	<u>Activity</u>
June 1977	USAID and HMG representatives travel to U.S. for contractor selection.
August 1977	1. Project direct ^{or} /and section coordinators appointed. 2. Communications consultant contracted to prepare: (a) procurement and installation specifications for Radio Nepal transmitting station hardware, (b) procurement and installation specifications for radio receivers and power supplies, and (c) designs, engineering, procurement specifications for JEMO studio upgrade. 3. Contract negotiated between USAID and U.S. institution.
September 1977	1. Sign contract with A & E firm in Nepal for design of JEMO building extension for teacher retraining project staff. 2. Project director and section coordinators in charge of course development and self-instructional materials depart for 3-4 week site visit to distance learning projects in third countries. 3. Team leader makes 2-3 week planning visit to finalize TA and training schedules with Mission and HMG.
October-November 1977	Team leader arrives.
November 1977	1. JEMO extension plans ready for review. 2. Major staff appointments completed. 3. Engineering and procurement specifications completed and ready for review by project. 4. Teacher Education, Radio Production, and Self-Instructional Materials Specialists arrive and begin orientation.

<u>Date</u>	<u>Activity</u>
January 1978	<ol style="list-style-type: none">1. Procurement documents for transmission equipment approved. CED notice published, one month response period.2. JEMO extension plan revisions completed. Bid documents advertised locally - two month response time.
Jan. to Dec. 1978	During this period up to five technical representatives of manufacturing firms or broadcast operating agencies will visit Kathmandu for average stays of three weeks. They will provide intensive training in theory and maintenance on Radio Nepal equipment.
February 1978	<ol style="list-style-type: none">1. Develop with Radio Nepal the classroom and transportation arrangements for technician training using U.S. contract instructor.2. Sign contract with U.S. electronic training school to provide one instructor in fundamental electronics theory and laboratory for a nine-month residence in Kathmandu.3. Four month training course for course teams begins.
March 1978	<ol style="list-style-type: none">1. Bids evaluated for JEMO extension, contractor selected, work begun (6 month construction period).
April 1978	<ol style="list-style-type: none">1. Evaluation Specialist arrives and begins orientation.2. Contracts awarded for hardware and installation service. Estimated delivery FOB factory: studio equipment (2 months), antenna (4 months), other radio equipment (6 months).3. Instructor arrives in Kathmandu. Classes begin for fundamental electronics training.
June 1978	<ol style="list-style-type: none">1. Four month training course for evaluation unit begins.

<u>Date</u>	<u>Activity</u>
	2. Studio equipment shipped from factory (surface).
July 1978	Course teams begin producing radio programs and self-instructional materials for pilot year.
August 1978	1. Pretesting of pilot radio programs and written materials begins. 2. Studio equipment installed and tested at JEMO. Antenna arrives. Other radio equipment shipped from factory (surface).
September 1978	1. Orientation courses held for Kaski and Kathmandu District Education Officers and Supervisors. 2. Curricula developed for beginning of orientation residence session and bi-monthly workshops.
October 1978	1. Candidates for pilot year program identified in Kaski and Kathmandu districts. 2. JEMO building extension ready for occupancy.
November 1978	1. Printing of self-instructional materials for pilot year. 2. Antenna erected. 3. Teacher Educator, Radio Production, and Self-Instructional Materials Specialists complete initial tours.
December 1978	1. Radios, written materials, and power supplies distributed to district offices. 2. Cost consultant arrives for four-week tour with evaluation unit. 3. Other radio equipment arrives.

<u>Date</u>	<u>Activity</u>
	4. Resident fundamental electronics instructor departs for U.S. after completing four ten-week courses in theory and laboratory.
January 1979	Two-week residence courses held for pilot teachers in Pokhara and Kathmandu.
February 1979	1. Broadcasting begins to 100-150 teachers in Kaski and Kathmandu districts. 2. Other radio equipment, including LOOK! transmitter, arrives, installed and tested.
March 1979	Intensive observation of field operations begins.
April 1979	1. First bi-monthly workshops held in Kaski and Kathmandu districts. 2. Selected course team members depart for advanced three-month training in U.S. or third country.
May 1979	Initial radio maintenance survey completed.
June 1979	Ten districts selected for second year of broadcasting.
July 1979	1. Cost consultant returns for four-week tour. 2. Detailed planning for end-of-year residence course begun, instructors appointed.
August 1979	1. Mid-year evaluation completed. 2. Teacher Educator and Self-Instructional Materials Specialist return for two months. 3. Revision of radio programs and written materials.
September 1979	1. Workshops begin for district officers and supervisors in ten districts selected for 1980 course.

<u>Date</u>	<u>Activity</u>
	2. Evaluation Specialist completes initial tour.
October 1979	1. Printing of revised text/workbooks. 2. Second radio maintenance survey completed.
November 1979	1. Teachers selected for 1980 course. 2. Begin distribution of radios, written materials and power supplies for 1980 course.
December 1979	1. One month residence courses held for pilot teachers in Kaski and Kathmandu districts. 2. Evaluation Specialist returns for four weeks to work on pilot year evaluation report. 3. Radios returned to district headquarters.
January 1980	1. Two week residence courses held for 1,000 teachers in ten districts. 2. Evaluation of pilot year completed.
February 1980	Second year of broadcasting begins.
April 1980	Bi-monthly workshops begun in ten districts.
June 1980	Ten districts selected for third year of broadcasting.
July 1980	Teacher Educator, Materials Specialist, and Cost Specialists return for two one-month tours.
August 1980	Mid-year evaluation completed.
September 1980	Workshops begin for districts selected for 1981 course.
October 1980	1. Printing of revised text/workbooks. 2. Third radio maintenance survey completed.

<u>Date</u>	<u>Activity</u>
November 1980	1. Teachers selected for 1981 course. 2. Begin distribution of radios, written materials and power supplies for 1981 course.
December 1980	1. One month residence courses held for 1,000 teachers in ten districts. 2. Radios returned to district offices.
January 1981	Final evaluation begins.
January/ June 1981	1. (Activities for these six months will parallel those of the previous year). 2. Number of primary teachers enrolled in training course reaches 2,500
June 1981	Team Leader departs.

Contractual Arrangements

Implementation of this project will be achieved through a direct AID contract with an institution in the U.S., most probably a university. A direct contract, rather than a host country contract, is believed necessary. The contractual arrangements have been discussed thoroughly with HMG and HMG concurs fully that a direct AID contract would be preferable because of the following reasons.

First, HMG does not have at present the administrative capacity to manage the contract administration that is so necessary for a project as complex as this. A tight administration is essential for success in the view of both HMG and USAID.

Second, HMG currently has one host country contract on a major AID/HMG project in Nepal. Some problems have surfaced already on the administrative support and other contractual arrangements for this project. HMG and USAID deem it prudent and desirable to allow HMG to gain more experience in host country contracting before overburdening their thin management ranks with additional contracts.

Third, because of the innovative nature and complexity of this project, and its importance and potential (as judged by both us and HMG), we desire to minimize potential difficulties with project implementation. For the reasons cited above an AID contract, rather than a host country contract, will assure the most effective implementation possible and increase the probability for a successful project.

C. Evaluation Plan

There are two relatively distinct areas for research on this project. From the very first days of operation there will be a continuing need for formative research which will enable the project staff to have discussions based on adequate information from the field. In addition there should be some controlled overall evaluation during the experimental year, and also subsequently. The two research needs are detailed in this section.

1. Formative Research

This project is innovative. It would be so for almost any country; it is particularly so for Nepal. The project staff will be working in largely uncharted territory. For that reason they will need to spend considerable resources in planning, researching and evaluating it. At the outset, basic planning research will be required. Which teachers are interested? What level of education do they have? What is their present teaching knowledge, behavior and effectiveness? What attitudes to they hold toward change in their behaviour and in the classroom. When can they listen? What obstacles to attending residence classes will exist? How often are they in contact with District

Education Officers and supervisors? What are expectations of students and parents, and how will that affect a teacher's possibility of change. This list is long and only a beginning. Some of these questions can be answered with data available from previous research studies and from insights of experienced people. In that situation the research staff needs to gather the information and synthesize it for the project policy and operational staff. For many other questions, the answers are uncertain and new field research may be required.

As the project moves through its development year, additional research needs will surface. Are the radio programs comprehensible and interesting to the teachers? Can teachers learn from them? What production techniques are most effective? What format for the text/workbook is most appropriate? Pretesting of materials is essential.

Continuing into the pilot year, further formative research will be required. Is what is supposed to be happening actually happening, i.e., are radios being delivered, programs heard, textbooks used, face-to-face contacts realized? What obstacles to success appear in the form of irregular listening patterns of teachers, malfunctioning radios, poorly understood programs, headmasters who do not permit teachers access to school radios, and scheduled district level workshops that lack instructors or teachers?

The research staff must help the operational staff to define the information they need from the field and thus develop appropriate research strategies for obtaining the information in a reasonable time at an acceptable cost.

2. Overall Evaluation

This project is experimental. While all persons involved fully expect it to develop into an effective large scale program, this clearly cannot be assured. As an important influence on the HMG decision to expand the project as expected, as an impetus to the consideration of further uses for radio in development, and as information for AID to estimate the return on its investment, an overall evaluation is essential. This evaluation must gauge both overall effectiveness and illuminate the process through which the project operates. Process information will be gathered as a side benefit of the formative research; an administrative history will complement that. The effectiveness evaluation demands additional data gathering.

Two important comparisons needs to be made. First, we need to know, in an absolute sense, how much the teachers have progressed as a function of their participation in the program. What would their teaching knowledge and behavior have been had they not enrolled? Second, we need to know how much progress they would have made had they attended the customary campus-based IOE course.

The first comparison, an absolute estimation of progress, perhaps measured against some goal, is the easier of the two. A number of alternative designs would permit a more or less satisfactory inference to be made. The easiest would be simple before and after measurement during the school year on instruments designed to measure knowledge and behavior. For this design to permit valid inference one would need to assure that beginning of year and end of year teaching behavior does not vary systematically ordinarily, and that no improvement in behavior would have occurred without outside intervention. The assumption of no spontaneous improvement may be reasonable if we are dealing with relatively experienced teachers (2-3 years in the classroom) whose teaching environment has remained relatively constant.

If the no spontaneous improvement assumption is not tenable, then the project might need to recruit a non-participating control group. Ideally, this would involve random assignment of teachers to participate or not participate in the program. At the very least it would require that the selection process for the control group and participating teachers be identical.

Regardless of which of these approaches is followed, a set of goals for knowledge and behavior change would need to be specified. It will not be sufficient to indicate that the participating group knows more and teaches better than they would have otherwise; it is essential to estimate how much improvement has been achieved. What change has the program expected to achieve, and how close has it come?

The need to compare this program to the traditional mode of instruction is a more troublesome problem. This must be a cost-effectiveness analysis. Operating estimates for the capital and recurrent costs of each project would be fixed. That is a relatively straight forward task, as seen in Part III.D. (Economic Analysis). The more difficult goal would be to get estimates of comparative effects.

First, the students now assigned to receive institutional training are different from those who remain in their classrooms. They tend to come from places where substitute teachers can be found, and, since there can be substantial expenses for the individual teacher, they tend to be teachers who can afford that expense. The chances are that such teachers will take different advantage of any training course. The notion of randomly assigning students to radio-based training, while attractive, may be: a) impractical since willingness to enroll in each type of training may differ; and b) susceptible to substantial distortion from routine institutional training because of the special circumstances of selection.

Also, it should be recalled that this program is not meant to be a replacement for institutional training; it has been developed to provide training to those teachers who would not have access to training otherwise. Inclusion of traditionally trained teachers as a comparison group is because we need to have some standard of expectation. If radio-based training produces a given change, we need to understand

how much that differs from the traditional campus-based B level training.

Finally, it will be exceedingly difficult to compare teaching behavior of a group of teachers simultaneously trained at a campus with the radio-trained teachers because the campus trained teachers are not in the classroom until the following school year.

In conclusion, the most appropriate method of obtaining a comparison group may be to locate previously campus-trained teachers already back in the classroom. We could thus make estimates of comparative behavior of campus-trained and radio-trained teachers in a given district. It would be clear that small differences could not be easily attributed to training method, but these would probably not be of sufficient importance to affect program discussion in any case. With a reasonable degree of confidence, larger differences in behavior and knowledge could be attributed to the training method.

3. Administrative Arrangements

The formative evaluation activity will be undertaken by the research section of the project with substantial design training and advice from the expatriate Evaluation Specialist. The summative or overall evaluation will be designed carefully by the Evaluation Specialist, and then, with some combination of internal project staff and external local research firms, the necessary data collection will be arranged. Analysis and interpretation will be done collaboratively.

D. Conditions, Covenants, and Negotiating Status

The following conditions and covenants will be contained in the Project Grant Agreement:

1. Prior to the initial disbursement or the issuance of the initial commitment document under the Project Agreement, the Cooperating Country shall furnish the following in form and substance satisfactory to A.I.D.:

(a) Evidence of the establishment of the Radio Education Policy Committee and appointment of its members;

(b) Evidence of the appointment of the Project Director;

(c) Evidence that adequate staff from the Ministry of Education and Radio Nepal will be provided to the Project;

(d) Evidence that sufficient personnel will be made available for the requisite training activities; and

(e) Evidence of the appointment of or the provision for the appointment of sufficient number of section coordinators and field supervisors.

2. Prior to disbursements or the issuance of commitment documents for procurement of transmission facilities, receivers and power supply for receivers, the Cooperating Country shall furnish the following in form and substance satisfactory to A.I.D.:

- (a) A test of alternative methods of power supply for receivers;
- (b) Selection, based on the testing under 1 above, of the most appropriate alternative for the project conditions; and
- (c) Plans for the establishment of maintenance units for transmitter, receiver and studio production equipment.

3. The Cooperating Country shall covenant to carry out the following: —

- (a) Upon certification of teachers trained under the Project, provide salary increases according to standards established for such certified teachers;
- (b) Provide use of the facilities of Radio Nepal as required for the Project; and
- (c) Conduct an overall Project evaluation in year three of the Project and implement recommendations agreed to by the Cooperating Country and A.I.D.

ANNEX A

SUMMARY OF CCIR RECOMMENDATION 415
PERFORMANCE SPECIFICATIONS FOR LOW-COST
SOUND BROADCASTING RECEIVERS

1. GENERAL

- 1.1 Each of the three types of receivers should be available for either mains or battery operation. For battery operation, all three types of receiver should be fully transistorized to ensure economy of power consumption. For mains operation, either valves or transistors may be used, consideration of cost being the guiding factor.
- 1.2 For battery operated receivers, the minimum performance specifications listed in this Recommendation should be achieved for the nominal battery voltage less 30% as specified in the relevant IEC publication.
- 1.3 The methods of measurements employed should be those recommended in the relevant IEC publications for amplitude-modulation receivers and frequency modulation receivers (see Recommendation 237).
- 1.4 The receivers should be simple, robust and well protected against dust. Those intended for use in regions of high temperature and humidity should be treated so that they can be used under the climatic conditions laid down by the administration concerned. The appropriate tests required by the administration procuring such receivers should comply with the relevant IEC publications.
- 1.5 If national regulations prescribe methods of measurement or tests differing from the standard IEC methods, administrations will, where necessary, draw attention to this.

3. SPECIFICATION FOR TYPE B RECEIVER

(the two types differing only in frequency range)

- | | | |
|-----|--|---|
| 3.1 | Frequency coverage | B1: 0.525-1.605; 2.3-16 MHz
B2: 0.525-1.605; 2.3-21.75 MHz |
| | | The receiver shall be provided with adequate mechanical and/or electrical means for easy tuning. |
| 3.2 | Sensitivity for 50mW output 30% modulation at 400 Hz. | not worse than 150 V (microvolts) |
| 3.3 | Signal-to-noise ratio, for input as under item 3.2 | 20 dB (mains-operated tube receivers)
26 dB (transistor receivers) |
| 3.4 | Power output, for less than 10% distortion | not less than 0.1 W |
| 3.5 | Overall selectivity | |
| | at - 6 dB points | passband not less than \pm 3KHz |
| | at - 20 dB points | passband not less than \pm 10KHz |
| | at - 40 dB points | passband not less than \pm 20KHz |
| 3.6 | Image, intermediate frequency and spurious response ratio | MF - not less than 30 dB |
| | Intermediate frequency and spurious response ratio | HF - not less than 12 dB |
| | Image response ratio | HF - not less than 5 dB |
| 3.7 | Overall fidelity including acoustic response of loudspeaker, or, alternatively, it may be more convenient for some manufacturers to consider only electrical characteristics which should be | 250-3150 Hz within 18 dB limits

100-4000 Hz within 12 dB limits (in a graphical presentation 400 Hz should be taken as the reference 0 dB level) |

- 3.8 A.g.c. performance: change in output when the input is reduced by 30 dB from 0.1V not greater than 10 dB
- 3.9 Frequency stability must be such that the receiver does not require frequent retuning.

SUMMARY OF RECENT STUDIES
REGARDING EDUCATIONAL DEVELOPMENT IN NEPAL
AND THE POSSIBLE ROLE OF EDUCATIONAL RADIO

Considerable background work has been carried out on development problems of Nepal, on the functional role of education/manpower training in the development process, and on the possible role of radio in education. The most relevant documents relating to those subjects are reviewed below.

1. IBRD Economic Report on Nepal, Section II, Education.

This analysis of the Nepalese education system generally, and the National Education System Plan in particular, gives high marks to HMG for its imaginative attack on its educational problems, saying that the NESP "deserves warm endorsement," but indicates rightly that the NESP is a policy document rather than an implementation plan; thus "the main problem is to translate its recommended policies into a realistic action program." (page 2) The report comments favorably on the various thrusts of the NESP, but it anticipates grave problems in reaching the goals of the Plan within the time frame laid out. Among its recommendations is the recommendation that HMG "concentrate first on the development of sound teacher training."

2. The USAID/Nepal Development Assistance Program, FY 1975, contains a thorough analysis of the state of Nepal's development, its development aspirations, and the major constraints to attaining its development goals. Mission strategy in each of its development assistance sectors is outlined, with its education strategy beginning on page 143. The DAP notes (p.144) that "Radio is the innovation which has captured the attention of Nepalese and foreign donors as well, as the medium which might deliver knowledge to the disadvantaged at reasonable cost, and which might also be a powerful device for strengthening the formal school and teacher training program."

3. Television and its Lower Cost Alternatives, a Summary of Research, 1974, Bureau for Technical Assistance, USAID.

This report deals specifically with two aspects of media: (1) their value as an educational tool, and (2) their cost. The most pertinent of the author's conclusions are quoted below without elaboration:

(a) Instructional Radio. The few good evaluations of instructional radio suggest that, supplemented with appropriate printed materials, it can teach most subjects as effectively as traditional classroom instruction or instructional television. Because of the potential role of radio in developing countries, much more survey and experimental research is needed.

(b) Students usually learn as much from an instructional medium as from classroom teaching. There is no general learning superiority for "big" media (television, videotape, computer assisted instruction, films) over "little" media (radio, programmed instruction, audiotape, filmstrips, transparencies, etc.)

(c) The potential advantages of radio for a wide variety of educational tasks are:

— Cost: the costs of radio are usually about one-fifth those of television, and radio production does not require as high levels of technical training.

— Coverage: radio already reaches much of the rural population.

— Effectiveness: research up to now suggests that radio instruction is as effective as television.

— Localness: the lower expense of radio allows for the creation of local stations closer to the needs of the population and providing a greater opportunity for flow of information from the field to the station.

4. Development Radio for Nepal, Report of the Radio Feasibility Study Team, February, 1975.

This Report was prepared after intensive study of the Nepal situation by a team of eight specialists in various aspects of radio education, who were provided by USAID, UNICEF, UNESCO, and the British Council. This Report concluded (a) that radio can be a powerful educational tool generally, for both in-school and out-of-school populations; and (b) that it has great potential for vastly expanded use in Nepal for educational purposes if carefully developed. It recommended that if HMG decides tentatively on the expanded use of radio for education, that one or more projects be undertaken immediately to test feasibility, effectiveness, and cost in a carefully controlled research and development environment. It recommended that a project in teacher training be undertaken.

5. School Broadcasting in Nepal, Final Report, December, 1974,
by Margaret Sheffield.

Margaret Sheffield is a Colombo Plan specialist who worked in Nepal for three years in the capacity of School Broadcasting Advisor to HMG. Her final report reviews the state of school broadcasting, points out a number of pitfalls that must be avoided in any future developments

in this area, and makes a series of recommendations. She notes that the number of school broadcasts has remained constant since April, 1973 when the service began at one per week (from 1400 hours to 1430 on Sundays), and concludes that "One program per week is not enough either to increase staff proficiency or to make an impact on the potential audience. One program per week does not deserve the appellation 'service', and a school broadcasting service is required before the radio will make any useful contribution to school education." Furthermore, she points out that only 20 schools have radios, although 500 more radios are to be delivered.

She also comments on inspections of the Schools Broadcasting Unit in New Delhi, pointing out that severe problems exist in their program, including teacher resistance, inoperable radios, lack of importance given to educational radio by officials of radio stations, lack of program evaluation, and lack of support materials, concluding that these problems have implications for Nepal as it moves ahead in the expansion of radio education.

6. Radio Broadcasting and Telecommunications in Nepal, Center for International Studies, Massachusetts Institute of Technology, by Rathjens, Bitman, and Vaidya.

The Rathjens study was carried out as part of a formation study entitled Technical-Economic Considerations in Public Service Broadcast Communications for Developing Countries, 1973. Both the Nepal specific study and the overall study have interesting implications for the proposed project in Nepal.

First, as to the question of whether or not radio is an effective educational device, and how it can be compared in effectiveness to TV, Rathjens states that radio can be as effective as TV as an educational tool. "The experience of the British Broadcasting Corporation supports the conclusion that radio is as effective, if not more so, for certain types of instruction." Further, Rathjens states that "where resources are scarce, radio instruction should seriously be considered on the basis of its low capital and recurring costs as compared to television. A financial outlay that may provide the minimum needs of an ETV system could instead be used to institute an instructional radio system of very high quality." (Technical Economic Considerations, etc., p. V-43 and 44.)

In Radio Broadcasting and Telecommunications in Nepal, Rathjens argues that the answer to the question of whether to use educational radio nationwide should depend on a determination of its effectiveness as an educational tool rather than on its cost.

7. Radio Listening Patterns in Nepal, 1974, by New Educational Reform Associates.

This USAID funded research was designed to begin the collection of data on the use of radio in Nepal. It was designed as a descriptive study rather than an evaluative one, as is noted in the statement of objectives: "The basic objective of this study was to gather, in a preliminary fashion, information which would assist in describing the current place of radio as a means of mass communication in Nepal. This general objective does not call for an "explanation" or "evaluation" of the place of radio, but simply for its description. As such, the objective was to gather that basic information which would form a "foundation of understanding" from which further research or development might logically proceed."

The findings of this study are of significance to any continued efforts to expand educational radio in Nepal, and they suggest the importance of certain policy decisions being made as a requisite to any contemplated expansion of radio service in any form.

(a) The first policy decision involves radio transmission: Radio service outside Kathmandu Valley is through short wave, and reception in the west is poor. Short wave usage for nation-wide broadcasting has been called by some specialists "second class service" because of problems of reception during daytime hours in particular. Hence, the question of what kinds of service the country of Nepal wants, needs, and can afford must be addressed.

(b) The second policy decision involves reception. This study calculates that there are only 115,000 radios in Nepal, or 1 out of every 100 persons, with a high percentage of these in population centers. The study concludes that the high cost of radios in Nepal, with almost 50% of the purchase cost being import duty, precludes most of the population owning a radio. Fully 3/4 of those interviewed who do not own radios said that they could not afford to buy a radio which cost more than 300 rupees (\$24), yet only about 7% of the radios currently owned cost less than that amount. The question of import duty on radios is thus of great significance if HMG wishes to expand the use of radio for informational and educational purposes.

The general conclusion of the study is noteworthy:

"What all of our data implies is that radio is taken as a serious communication device by those who possess receivers as well as by those who do not. The two most popular radio programs among both groups, news and agriculture, are basically informational and not for entertainment; the second of these is completely educational. In

addition, radio listening appears to be a deliberate, serious, regularized pattern in the daily activity of owners and, to a lesser extent, among non-owners as well. Radio listening is not a haphazard affair in Nepal; for the listeners it seems to fulfill a desire for an awareness of things beyond the village. As such, it may be that radio's potential as an educational and motivational tool for national integration and development has only been very partially developed or utilized to date." (Underlining added.)

8. Planning Of Communication for Development, Kingdom of Nepal, 1974, by L. W. Sargent, UNESCO.

While this report deals with a seminar on various communications media, it stresses the importance of radio as an educational tool, and makes a number of proposals for increasing the use of radio. As a first step, it proposed an educational media conference in Nepal to "coordinate long-range plans for educational broadcasting." This conference, the report said, "should be timed to influence development of Nepal's new five-year plan."

ANNEX C

BRIEF DESCRIPTION OF CURRENT EDUCATIONAL PROGRAMS BROADCAST BY RADIO NEPAL

1. Ministry of Education programs

There are currently four programs per week, each of $\frac{1}{2}$ hour duration: an information program for teachers which answers questions and provides general information on the NESP and other professional subjects (Monday night); two "education" programs for general listeners containing information on, and exhortations to support, the NESP (Thursday and Saturday); a school broadcast for in-school use, grade 4 social studies (Sunday). Current plans call for the expansion of the in-school broadcasts to include one $\frac{1}{2}$ hour program in social studies for grade 5; a $\frac{1}{2}$ hour program in Nepali language instruction for primary grades; and a $\frac{1}{2}$ hour program in English for grade 4.

The in-school program is very limited, with only 20 schools having been provided with radios. However, UNICEF has agreed to provide 500 additional sets, which are currently being distributed. Further, learning results are not known since "evaluation" efforts have been largely attitudinal, with information having been secured through forms filled out by the teachers in the schools. According to these reports a constant complaint of the teachers is that the quality of reception is extremely uneven making it very difficult to develop a sequential education experience. (Radios are provided in three districts: Chitwan, Kaski, and Kavre, the first two being at some distance from Kathmandu, and the last being close.) A second major criticism is the difficulty of maintenance of the radios. These two problems have been discussed in the development of this Project Paper.

2. Agriculture

The agriculture program is currently broadcast four times per week (Sunday, Monday, Tuesday, and Friday), each show being 15 minutes in duration. There are four formats: the Sunday program is always an interview with an agricultural expert; the Monday program is the experiences of a fictional progressive farmer; the Tuesday program is a family drama, with each situation built around seasonal farming activities; the Friday program is built around the Junior Technical Assistant (JTA) and the Old Woman, and consists of a dialogue between the two. While the agriculture programs in general are the second most popular programs in Nepal, the JTA and the Old Woman is a heavy favorite among all programs. This is apparently largely attributable to an appealing format, with identifiable and believable characters having established themselves as real persons with the listeners, to talented writers and to the utilization of prime listening time - 6:30 to 7:00 in the evening.

While the study did not evaluate the effect the radio programs had on farming practices, it did present evidence (attitudinal) to indicate that a high percentage of farmers use practices that were advocated on one of the radio programs. Thus, while the evidence is not conclusive, it points to the value of radio as an educational tool, one which can be made highly popular with the right ingredients, and one that can apparently change behavior of a largely traditional group. In the words of the authors of Radio Listening Patterns in Nepal, 1974, "Neither this information,...nor the previously discussed high popularity of the Agriculture Program among both radio owners and non-owners, conclusively proves that broadcast agriculture information actually changes behavior patterns of listeners. Nevertheless, the overwhelming weight of evidence argues persuasively that radio does play a significant, although unmeasured, role in such change."

3. Family Planning

There are actually two family planning programs, both of 15 minutes duration, one on Saturday, and one on Sunday. Both programs are informational, with no fixed format such as the agriculture programs have. Nationally, the report found that 29% of the listeners "almost always" listen to the family planning programs, and 53% "sometimes" listen. The conclusion of the report is as follows: "It appears that the Family Planning Program, although listened to by a considerable percentage of radio owners, does not always meet the interests or perceived needs of many others. Perhaps this is inherent in the subject matter itself; perhaps it is in the format by which the information is being presented. The fact, however, that many respondents express a clear desire to obtain more specific and detailed information, and to obtain it through the medium of radio is indicative of the general acceptance of radio as an informational and education vehicle in the rural areas of Nepal."

4. Women's Program

This is broadcast six days a week, Sunday through Friday, one hour per day. The Radio Survey Team encountered substantial difficulty in carrying out the survey for this portion of the study, the major problem being that of interviewing women. Hence, little can be deduced from survey results. Apparently substantial numbers of women do listen, but beyond that little can be concluded except that Nepali women do not own radios. This could be significant, however, and it may be that the number of women having access to radios, and who therefore listen, is in fact less than "substantial."

5. Public Health Program

This program is aired as a 15 minute segment of the Rural Program, and is aired once a week, on Thursday. No effort was made to assess the listenership of the health segment apart from the larger Rural Program. All that can be said, therefore, is that the Rural Program is the 4th rated in terms of popularity, with about 23% of the listeners indicating that it is their "favorite".

6. Youth Program

This program is broadcast every Saturday morning from 0830 to 0900. It is directed to "youth," although age limits are not defined, and it is largely given over to exhortations to youth to feel greater social responsibility, develop more moral attitudes, and participate in national development. Since only 1.6% of those interviewed indicated that this was a "favorite" program, and since the sample interviewed was not broken down according to age, little can be concluded from the study.

Conclusion: Although a considerable amount of time, money, and talent is currently devoted to radio programs of an educational nature, there have been no evaluations of the program effectiveness; this appears to be a pressing need. Judging by the preferences expressed by the sample interviewed, in the AID sponsored Radio Listening Patterns in Nepal (1974), the agriculture program is by far the most influential of all educational programs.

ANNEX D

AIE 1480-20 (7-74)
SUPPLEMENT 1

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

(INSTRUCTION: THIS IS AN OPTIONAL FORM WHICH CAN BE USED AS AN AID TO ORGANIZING DATA FOR THE PAR REPORT. IT NEED NOT BE RETAINED OR SUBMITTED.)

Life of Project: 4 years, 2 months
From FY 77 to FY 81
Total U.S. Funding \$3,285,850
Date Prepared: JANUARY 6, 1977

Project Title & Number: Radio Education Pilot Project, 367-0123

PAGE 1

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Program or Sector Goal: The broader objective to which this project contributes:</p> <p>To increase the access of the rural and remote population to relevant and quality education.</p>	<p>Measures of Goal Achievement:</p> <ol style="list-style-type: none"> 1. A reduced percentage of student dropouts after project completion. 2. A reduction in the number of repeaters. 3. An increase in the percentage of rural children attending school. 4. An increase in the rural literacy rate. 5. Percentage of trained (certified) primary school teachers will increase to 55% by 1981/82 from estimated 31% in 1975/76. 	<ol style="list-style-type: none"> 1. MCE enrollment and retention register. 2. MCE enrollment and retention register. 3. MCE enrollment and retention register. 4. MCE statistics. 5. MCE teacher qualification records other MCE statistics. 	<p>Assumptions for achieving goal targets:</p> <ol style="list-style-type: none"> 1. No major non-school factors influencing dropouts will exist. 2. Sufficient budget support for teachers after they are retrained will exist. 3. HMG will continue to emphasize rural access to education. 4. There is a relationship between dropouts, repeaters, enrollment and teacher qualifications. 5. Funds to meet recurring costs will be made available by local and national governments. 6. Motivation for rural families to send children to school will be maintained.

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

ANNEX D

Life of Project: 4 years, 2 months
From FY 77 to FY 81
Total U.S. Funding \$3,285,850
Date Prepared: January 4, 1977

Project Title & Number: Radio Education Pilot Project, 367-0123

PAGE 2

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Project Purpose:</p> <p>To create the capacity to provide in-service teacher training to at least 2,500 primary school teachers annually through radio broadcasts, brief residence instruction and text/workbooks at a per teacher cost well below the present cost.</p>	<p>Conditions that will indicate purpose has been achieved: End of project status.</p> <ol style="list-style-type: none"> 2,500 teachers will be in training at the end-of-project and will complete training without project technical assistance. Annual increases in the number of retrained teachers. Radio is established as a cost effective method of teacher training. Radio Nepal staff is properly staffed, trained and equipped to transmit programs. The Institute of Education is staffed, trained and equipped to handle residence training. The JEMO Radio Unit is staffed, trained, and equipped to produce programs. 	<ol style="list-style-type: none"> Project evaluation report. Project records, including evaluation reports, and MOE records. Records of ICE, MOE, Radio Nepal and project evaluation report. Discussions with FMG personnel. Radio Nepal records and project evaluation report. MOE and ICE records and project evaluation report. MOE records, project evaluation report. 	<p>Assumptions for achieving purpose:</p> <ol style="list-style-type: none"> Coordination will exist between relevant ministries in developing and implementing the project. FMG will support resident training centers and staff. FMG will revamp its teacher training program. Teachers retrained will continue to teach. Continued government commitment to the objectives of the NESP. FMG's commitment to the development of educational radio will continue.

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project: 4 years, 2 months
From FY 77 to FY 81
Total U.S. Funding: \$3,285,350
Date Prepared: JANUARY 7, 1977

Project Title & Number: Radio Education Pilot Project, 367-0123

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	LEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p><i>Outputs</i></p> <ol style="list-style-type: none"> 1. New teacher training curriculum developed. 2. Radio teacher training packages broadcast on a regular basis. 3. Development of text/workbook and other training materials. 4. Nepali professional staff trained to carry on teacher training program. 5. Program evaluation system in place. 6. Teachers retrained. 	<p><i>Magnitude of Outputs</i></p> <ol style="list-style-type: none"> 1.-2. 15 or more daily program packages produced by end of third year. 3. Approximately 2,500 text/workbooks produced and printed by end of third year. 4. Approximately 179 man-months of formal training completed by end of project for project staff, Radio Nepal, JEMO, and IOE personnel. 5. Nepali research/evaluation people trained by end of project and conducting evaluation. 6. 1,100 - 1,150 teachers retrained; 2,500 more teachers in training at termination of project. 	<ol style="list-style-type: none"> 1.-2. Project records, including evaluation reports. 3. Project records. 4. Project records. 5. Project records, including evaluation report, and discussions with officials of JEMO, MOE, and IOE. 6. Project records, including evaluation report, MOE and IOE records. 	<p><i>Assumptions for achieving outputs:</i></p> <ol style="list-style-type: none"> 1. Teachers are motivated to use textbooks and will follow radio lessons. 2. Broadcast programs and text/workbooks are available on schedule. 3. HMG supports the project as agreed with adequate manpower, money, and materials, and will take the necessary administrative actions to implement the project. 4. Radio Nepal will make the necessary amount of time available, at appropriate hours, and can broadcast a readable signal.

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project: 4 years, 2 phases
From FY 77 to FY 81
Total U.S. Funding: \$3,285,200
Date Prepared: January 4, 1977

Project Title & Number: Basic Education Pilot Project, 367-0123

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Inputs.	Implementation Target (Type and Quantity)		Assumptions for providing inputs:
<u>USAID</u>	<u>USAID</u>	<u>USAID</u>	
<u>Dollar Inputs</u>	<u>Dollar Inputs*</u>	Project financial reports, USAID/ Nepal Controller records, procure- ment records.	
a. Technical Assistance 129 mm	a. \$1,285,043 (FY 77 - FY 81)		1. HMG will provide adequately trained personnel to manage and supervise project implementation.
b. Training: In-country - 70 mm Cut-of-country - 109 mm	b. 132,400 (FY 77 - FY 81)		2. HMG will provide necessary money and materials.
c. Commodities	c. 1,593,207 (FY 77 - FY 80) \$3,010,650 (FY 77 - FY 81)		3. Technical assistance personnel provided under contract will be competent and effective.
<u>Rupee (Rs NC) Inputs**</u>	<u>Rupee (Rs NC) Inputs**</u>		4. Qualified trainees (teachers to be retrained and participants) are available.
	(Dollar Equivalents)		5. Commodities are delivered on schedule.
a. Local support costs for contractor team	a. \$ 210,300		
b. Building construction	b. 64,900 \$ 275,200		
	* Dates represent years for fund obligation.		
	**Rupees will be obtained with appropriated dollars.		

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project: 4 years
From FY 77 to FY 81
Total U.S. Funding: \$3,285,850
Date Prepared: January 11, 1977

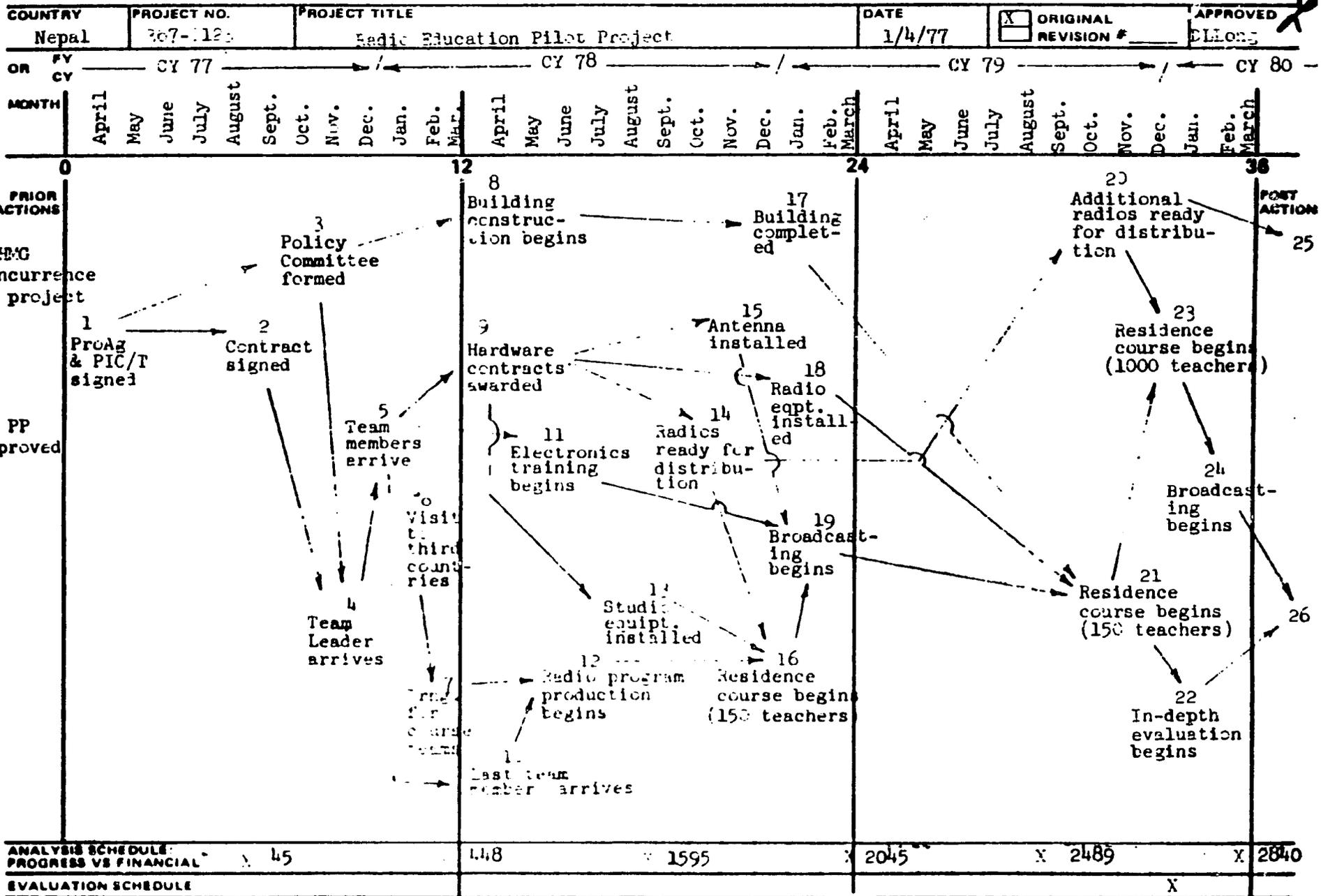
Project Title & Number: Radio Education Pilot Project, 367-0123

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Inputs:</p> <p><u>Government of Nepal (ING)</u></p> <p><u>Rupee (Rs NC) Inputs</u></p> <p>a. Personnel and personnel support</p> <p>b. Commodities</p> <p>c. Residence</p> <p>d. Other</p>	<p><u>Implementation Target (Type and Quantity)</u></p> <p><u>Government of Nepal (ING)</u></p> <p><u>Rupee (Rs NC) Inputs</u></p> <p><u>(Dollar Equivalents)</u></p> <p>a. \$307,800</p> <p>b. 108,600</p> <p>c. 78,600</p> <p>d. 28,000</p> <p style="text-align: center;"><u>\$523,000</u></p> <p><u>Recap of Project Costs</u></p> <p>USAID dollars - \$3,010,650</p> <p>USAID rupees - \$ 275,200*</p> <p>ING rupees - \$ 523,000</p> <p style="text-align: right;"><u>\$3,808,850</u></p> <p>*Rupees will be obtained with appropriated dollars.</p>	<p><u>Government of Nepal (ING)</u></p> <p>ING financial records, annual budget, and project records.</p>	<p>Assumptions for providing inputs:</p>

PROJECT PERFORMANCE NETWORK CHART

ANNEX E

COUNTRY	PROJECT NO	PROJECT TITLE	DATE	<input checked="" type="checkbox"/> ORIGINAL	<input type="checkbox"/> REVISION #	APPROVED
Nepal	367-0123	Radio Education Pilot Project	1/4/77			ELLong
PROJECT PURPOSE (FROM PRP FACESHEET)						
<p>The project purpose is to create the capacity to provide in-service teacher training to at least 2,500 primary school teachers annually through radio broadcasts, brief residence instruction and text/workbooks at a per teacher cost well below the present cost.</p>			<p>15. 12/15/78 Antenna arrives and installed. (GON, CONTR.)</p> <p>16. 1/15/79 Two week residence courses begin for 100-150 teachers in Pokhara and Kathmandu. (GON, CONTR.)</p> <p>17. 1/30/79 JEMO building extension ready for occupancy. (GON, CONTR.)</p> <p>18. 2/15/79 Other radio equipment, including 100KW transmitter, arrives, installed and tested. (GON, CONTR.)</p> <p>19. 2/15/79 Broadcasting begins to 100-150 teachers in Kaski and Kathmandu districts. (GON, CONTR.)</p> <p>20. 11/15/79 Additional radios, power supplies and written materials ready for distribution. (GON, USAID, CONTR.)</p> <p>21. 12/1/79 One month residence course begins for 100-150 pilot teachers. (GON, CONTR.)</p> <p>22. 1/15/80 In-depth evaluation begins. (GON, CONTR., USAID)</p> <p>23. 1/15/80 Two week residence courses begin for 1,000 teachers in ten districts. (GON, CONTR.)</p> <p>24. 2/15/80 Broadcasting begins to 1,000 teachers. (GON, CONTR.)</p> <p>25. 11/15/80 Additional radios, power supplies and written materials ready for distribution. (GON, CONTR., USAID)</p> <p>26. 12/1/80 One month residence course begins for 1,000 teachers. (GON, CONTR.)</p> <p>27. 1/15/81 Two week residence courses begin for 2,500 teachers. (GON, CONTR.)</p> <p>28. 2/15/81 Broadcasting begins to 2,500 teachers. (GON, CONTR.)</p> <p>29. 5/30/81 Final evaluation completed and project purpose accomplished, i.e., capacity to provide in-service teacher training to 2,500 primary school teachers annually with a demonstrated per teacher cost well below the present campus-based training costs. (GON, USAID, CONTR.)</p> <p>30. 6/30/81 Team leader departs. (CONTR., USAID)</p>			
CPI DESCRIPTION						
1.	4/30/77	Project Agreement and PIO/T signed. (USAID, GON)				
2.	9/30/77	AID-institution contract signed. (AID/d, Contractor)				
3.	11/30/77	Radio Education Policy Committee begins operation. (GON)				
4.	12/31/77	Team leader arrives in Nepal. (CONTR.)				
5.	1/31/78	Teacher Education, Radio Production, and Self-Instruction Materials Specialists arrive in Nepal. (CONTR.)				
6.	2/28/78	Visit to third country educational radio projects. (GON, CONTR., USAID)				
7.	3/31/78	Four month training program for course teams begins. (GON, CONTR.)				
8.	4/30/78	Contract awarded and work begins on JEMO building extension. (CONTR., GON, USAID)				
9.	4/30/78	Contracts awarded for hardware and installation service. (CONTR., GON, USAID)				
10.	5/15/78	Evaluation Specialist arrives. (CONTR.)				
11.	6/30/78	Classes begin in fundamental electronics training. (CONTR., GON)				
12.	7/30/78	Course teams begin producing radio programs and self-instructional materials. (GON, CONTR.)				
13.	9/15/78	Studio equipment arrives, installed, and tested. (GON, CONTR.)				
14.	11/30/78	Radios, power supplies, and written materials ready for distribution. (GON, CONTR., USAID)				



CRITICAL PERFORMANCE INDICATOR (CPI) NETWORK

AID 1020 38 (6-74)

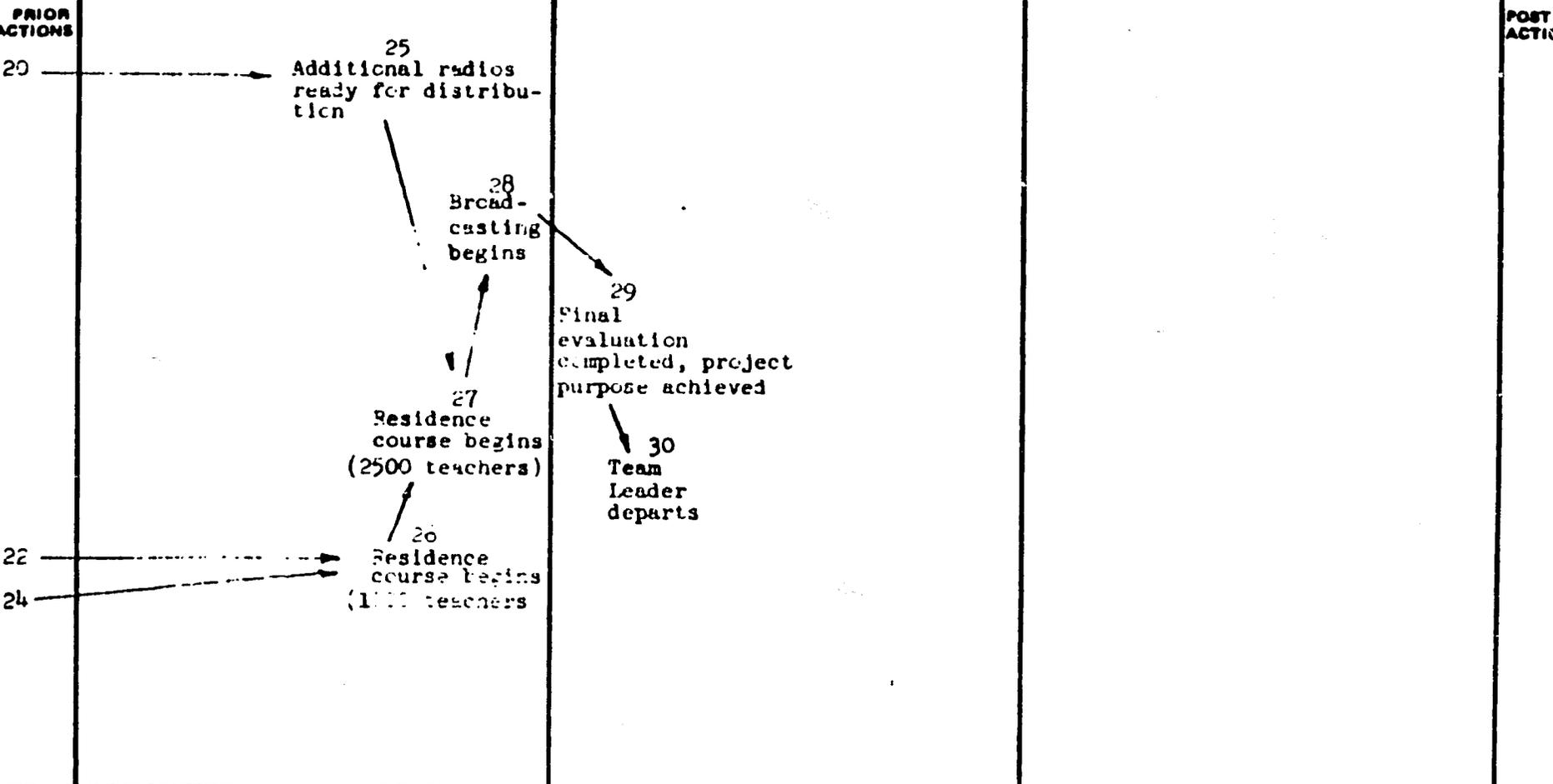
(\$000's, cumulative expenditures)

COUNTRY Nepal	PROJECT NO. 007-0123	PROJECT TITLE Radio Education Pilot Project	DATE 1/4/77	<input checked="" type="checkbox"/> ORIGINAL <input type="checkbox"/> REVISION #	APPROVED DLLong
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OR FY CY 80 / / CY 81 / /

MONTH	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
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36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 100



ANALYSIS SCHEDULE:	3043	3259	3286
PROGRESS VS FINANCIAL			
EVALUATION SCHEDULE			

PROJECT DESCRIPTION PROPOSED
FOR THE PROJECT AGREEMENTI. Project Description

This project is a new multi-year project which is designed to develop and test a training program for untrained rural primary school teachers through the medium of radio reinforced by written support materials and periodic short-term workshops. It will demonstrate the economic and educational feasibility of using these media for teacher training in remote rural areas, though its implications will be equally applicable to village and urban settings. It will create a cost effective mechanism and methodology for assisting untrained teachers to meet certification standards. It will also assist teachers in becoming effective change agents as envisioned in Nepal's experimental schools for rural transformation. This Project Agreement obligates initial U.S. dollar funding for a contract with a U.S. institution to provide technical assistance personnel to assist HMG/carry out the purpose of the project as outlined below (approximately 129 work months); to provide commodity and capital inputs as elsewhere described in this Project Agreement (\$833,800); and to provide 15 study years of participant training (9 out-of-country, and 6 in-country).

The Project will be conducted in three phases: a planning and development phase (18 months); a controlled experimental phase for 100-150 teachers (12 months); and an expanded experimental and evaluation phase for 3,500 teachers (18 months). There will be a research component built into the entire project with intensive evaluations at the end of both the experimental and the operational phases.

A. Statement of Purpose

The project purpose is "to create the capacity to provide in-service teacher training to at least 2,500 primary school teachers annually through radio broadcasts, brief residence instruction, and the use of textbooks/workbooks at a cost per teacher will below the present cost."

All elements of the project are designed to focus on the attainment of that purpose. However, the project will be developed in the context of a continuing assessment of the possibility of expanding the currently fragmented and rudimentary educational radio service into a nationwide educational radio "system." The primary teacher training project may be viewed as a logical first step in the development of such a system, for it will be carefully developed, implemented, and evaluated, with its educational effectiveness being carefully studied,

and its cost effectiveness determined. Within five to eight years of the project's full implementation, it will have trained enough teachers to meet the need for qualified teaching personnel throughout the primary school system.

B. Project Activities

The project will be developed and implemented in three phases, with project activities falling logically into one of these phases.

1. Phase I. Phase I of the project (18 months) will be devoted to solidifying the institutional and personnel structures and to developing and producing the initial set of radio programs and accompanying written materials. Of first importance will be the establishment of a strong monitoring and policy review mechanism within HMG to make certain that policies are developed and actions taken consistent with project goals. This process will be well under way even before the arrival of contract team members. Specifically, the following activities will be accomplished during Phase I:

- (a) Radio Education Policy Committee functioning under the leadership of the Secretary of Education;
- (b) Contract specialists fielded and local staff assembled and situated;
- (c) Contract specialists familiarized by their Nepalese counterparts with local teacher training programs, teaching methods, and curricular materials;
- (d) Initial sets of radio programs and accompanying textbook/workbook materials developed;
- (e) Evaluation techniques developed;
- (f) Participant training begun;
- (g) Commodities ordered and in place;
- (h) Pilot groups of teachers selected, and detailed plans for their orientation, supervision, follow-up training, and evaluation developed.

2. Phase II. Phase II (1 year) will be devoted to conducting an experimental inservice teacher training program for untrained primary school teachers by radio, supporting materials, and periodic group sessions, and to evaluating the results. Specifically, the following will be accomplished during this period:

(a) An experimental group of 100-150 untrained primary school teachers will be selected to undergo training. Half of the teachers will be selected from the Pokhara²⁷⁸² or another mutually agreeable area and will receive their training via short wave; half will be selected from the hill area around the Kathmandu Valley and will receive their training via medium wave.

(b) During the vacation period, before the start of the regular school year, the experimental group will be given a two week orientation at their district headquarters or some other convenient location. During this time they will be given detailed instruction on the course, the use of the radio, and the use of the supporting materials.

(c) Following the orientation, the teachers will return to their schools, where they will listen to the educational radio program for a minimum of one hour each day, at the same time making use of the supporting materials. Each session will be divided into three parts: one which is content oriented; one which is "news for teachers", and one which deals with teaching methods. These broadcasts will continue for the remainder of the school year. At bi-monthly intervals, the teachers will be brought together for two-day workshops at the district level.

(d) There will be an on-going evaluation of the experimental program in order that problem areas can be quickly identified and corrected. This will require constant observation as well as the collection of feedback data by the research staff.

(e) Programs and materials will be revised on the basis of the first year's experience and research results.

(f) At the end of the year, the experimental teacher group will be reassembled for a one-month residence training course at an IOE campus or some other convenient location. During this course, the year's work will be reviewed and an opportunity will be made available for remedial work before administration of a certification examination.

(g) Results of the work will be evaluated and compared with a control group of campus-based, traditionally trained students.

(h) Training for Nepalese personnel will continue.

(i) Program materials will continue to be developed.

3. Phase III. In this phase the program as carried out in Phase II, but modified as necessary, will be provided to approximately 1,000 teachers. This phase will be conducted under less structured conditions, although it will be structured the same. Programs will continue to be developed and refined, and the evaluation activity will continue. Following the training course for 1,000 teachers, the program will be further expanded so that by the end of Phase III another 2,500 teachers will be in training. Finally, in Phase III, a thorough evaluation will be prepared by the project's research staff which will insure that a complete evaluative record of the project is available.

II. Project Administration

Overall responsibility for the project will be vested in a policy committee created by the Ministry of Education, chaired by the Secretary and including the Director-General of Radio Nepal, a Joint Secretary of the Ministry of Education, the Dean of the Institute of Education, Member-Secretary of the National Education Committee, Chief Administrator of the Janak Educational Materials Center (JEMO), the Director of the Curriculum Development Center and the Project Director as member-secretary.

The Radio Education Policy Committee will define policy directions for the operational staff, assure cooperation of all involved institutions in matters of personnel, logistical and budgetary support, and settle other issues in dispute when no consensus can be achieved at the working level.

Operational management of the project will be delegated to the Project Director who will be responsible to the Policy Committee. All personnel will be under the Project Director's authority. The project staff will be divided into four major sections: Course Development and Production; Field Operations; Research; and Administrative Services. Each section will have its own coordinator.

The course development teams will include one or two content specialists, a producer-director, a production assistant and a secretary. The production subsection will provide technical backup to the course development teams: graphic artists and other text/workbook production personnel, and studio technicians and talent for the radio programs.

Field operations staff will include two field supervisors for the first two years of the project, probably more thereafter depending on the number of teachers enrolled. This group will assume responsibility for all of the face-to-face components of the project: recruitment, residence sessions and bimonthly workshops.

Administrative services will be limited to support of the operational staff in the first two years, but, as the numbers of teachers enrolled expands, paperwork and logistical demands will increase sharply. The research section will require a coordinator and three research assistants. Each of these sections will also require some non-professional support staff.

ANNEX G

CHECKLIST OF STATUTORY CRITERIA

Listed below are, first, statutory criteria applicable generally to FAA funds, and then criteria applicable to development assistance funds.

A. GENERAL CRITERIA FOR COUNTRY

1. FAA Sec. 116. Can it be demonstrated that contemplated assistance will directly benefit the needy? The Project Paper clearly discusses the method in which this project will directly benefit the needy in the rural remote areas of Nepal.
2. FAA Sec. 481. Has it been determined that the government of recipient country has failed to take adequate steps to prevent narcotics drugs and other controlled substances (as defined by the Comprehensive Drug Abuse Prevention and Control Act of 1970) produced or processed, in whole or in part, in such country, or transported through such country, from being sold illegally within the jurisdiction of such country to U.S. Government personnel or their dependents, or from entering the U.S. unlawfully? No.
3. FAA Sec. 620(a). Does recipient country furnish assistance to Cuba or fail to take appropriate steps to prevent ships or aircraft under its flag from carrying cargoes to or from Cuba? No, as far as known.
4. FAA Sec. 620(b). If assistance is to a government, has the Secretary of State determined that it is not controlled by the international Communist movement? Yes.

5. FAA Sec. 620(c). If assistance is to government, is the government liable as debtor or unconditional guarantor on any debt to a U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) debt is not denied or contested by such government? No such indebtedness is known to exist.
6. FAA Sec. 620(e) (1). If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities? No.
7. FAA Sec. 620(f); App. Sec. 103. Is recipient country a Communist country? Will assistance be provided to the Democratic Republic of Vietnam (North Vietnam), South Vietnam, Cambodia or Laos? No, to first question. No, as far as known, to second question.
8. FAA Sec. 620(i). Is recipient country in any way involved in (a) subversion of, or military aggression against, the United States or any country receiving U.S. assistance, or (b) the planning of such subversion or aggression? No, as far as known.

9. FAA Sec. 620(i). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction, by mob action, of U.S. property? No.
10. FAA Sec. 620(l). If the country has failed to institute the investment guaranty program for the specific risks of expropriation, inconvertibility or confiscation, has the AID Administrator within the past year considered denying assistance to such government for this reason? An investment guaranty program for the specific risks cited has not been instituted. The AID Administrator has not considered denying assistance to Nepal for this reason.
11. FAA Sec. 620(o); Fisherman's Protective Act, Sec. 5. If country has seized, or imposed any penalty or sanction against, any U.S. fishing activities in international waters, Nepal has not seized or imposed penalties or sanctions against any U.S. fishing activities.
- a. has any deduction required by Fishermen's Protective Act been made?
- b. has complete denial of assistance been considered by AID Administrator?
12. FAA Sec. 620(g); App. Sec. 504. (a) No.
(b) No.
(a) Is the government of the recipient country in default on interest or principal of any AID loan to the country?
(b) Is country in default exceeding one year on interest or principal on U.S. loan under program for which App. Act appropriates funds, unless debt was earlier disputed, or appropriate steps taken to cure default?

13. FAA Sec. 620(s). What percentage of country budget is for military expenditures? How much of foreign exchange resources spent on military equipment? How much spent for the purchase of sophisticated weapons systems? (Consideration of these points is to be coordinated with the Bureau for Program and Policy Coordination, Regional Coordinators and Military Assistance Staff (PPC/RC).)
- Nepal's budget for FY 1976/77 shows 6% of the country's total budget devoted to defense. Little foreign exchange is used to acquire military equipment or sophisticated weapons systems.
14. FAA Sec. 620(t). Has the country severed diplomatic relations with the United States? If so, have they been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption?
- No, to first question. Second question not applicable.
15. FAA Sec. 620(u). What is the payment status of the country's U.N. obligations? If the country is in arrears, were such arrearages taken into account by the AID Administrator in determining the current AID Operational Year Budget?
- Nepal is not in arrears in its obligations to the U.N.
16. FAA Sec. 620A. Has the country granted sanctuary from prosecution to any individual or group which has committed an act of international terrorism?
- No.

17. FAA Sec. 666. Does the country object, on basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. there to carry out economic development program under FAA?

18. FAA Sec. 669. Has the country delivered or received nuclear reprocessing or enrichment equipment, materials or technology, without specified arrangements on safeguards, etc.?

No.

19. FAA Sec. 901. Has the country denied its citizens the right or opportunity to emigrate?

No, as far as known.

B. FUNDING CRITERIA FOR COUNTRY

1. Development Assistance Country Criteria

a. FAA Sec. 102(c), (d). Have criteria been established, and taken into account, to assess commitment and progress of country in effectively involving the poor in development, on such indexes as: (a) small-farm labor intensive agriculture, (2) reduced infant mortality, (3) population growth, (4) equality of income distribution, and (5) unemployment.

The Government's commitment and progress in each of these areas is reviewed as appropriate in preparation and evaluation of projects. Criteria, when appropriate, are established within the context of each project as objectively verifiable indicators.

b. FAA Sec. 201(b)(5), (7) & (8); Sec. 208; 211(a)(4), (7). Describe extent to which country is:

- (1) Making appropriate efforts to increase food production and improve means for food storage and distribution.

The Fifth Development Plan (1976-1980) puts major stress on increased food production and improved marketing of agricultural products.
- (2) Creating a favorable climate for foreign and domestic private enterprise and investment.

Nepal provides tax benefits to foreigners investing in needed development projects. The government has taken some actions to create a favorable climate for domestic private enterprise and investment, especially in the case of import substitution or export commodities.
- (3) Increasing the public's role in the developmental process.

Villagers in parts of Nepal are building schools, water systems and farm-to-market roads. This is on a modest scale so far but is an appreciable start.
- (4) (a) Allocating available budgetary resources to development.

68% of Nepal's total FY 1976/77 budget is devoted to development.

(b) Diverting such resources for unnecessary military expenditure and intervention in affairs of other free and independent nations.

Nepal has one of the lowest per capita military expenditures of any country in the world.
- (5) Making economic, social, and political reforms such as tax collection improvements and changes in land tenure arrangements, and making progress toward respect for the rule of law, freedom of expression and of the press, and recognizing the importance of individual freedom, initiative, and private enterprise.

The monarchical system in Nepal is gradually broadening. HMG is allowing greater freedom of expression, although the press is still largely government-controlled. There is a Parliament with some, if limited, effective powers. Entrepreneurs operate fairly freely. The government is seeking Western advice in legal matters, taxation, finance, private enterprise, and information services.

(6) Otherwise responding to the vital economic, political, and social concerns of its people, and demonstrating a clear determination to take effective self-help measures.

HMA has strengthened its commitment to development in recent years, and has shown a new willingness to take meaningful self-help measures in order to carry out the Fifth Five Year Plan.

c. FAA Sec. 201(b), 211(a).

Is the country among the 20 countries in which development assistance loans may be made in this fiscal year, or among the 40 in which development assistance grants (other than for self-help projects) may be made?

Yes.

d. FAA Sec. 115. Will country be furnished, in same fiscal year, either security supporting assistance, or Middle East peace funds? If so, is assistance for population programs, humanitarian aid through international organizations, or regional programs?

No to first question. Second question not applicable.

A. GENERAL CRITERIA FOR PROJECT

1. App. Unnumbered; FAA Sec. 653 (b)
 - (a) Describe how Committees on Appropriations of Senate and House have been or will be notified concerning the project; (a) Congressional Notification sent to Congress June 15, 1977.
 - (b) Is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than \$1 million over that figure plus 10%)? (b) Yes.
2. FAA Sec. 611(a)(1). Prior to obligation in excess of \$100,000, will there be (a) engineering, financial, and other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?
 - (a) Yes.
 - (b) Yes
3. FAA Sec. 611(a)(2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance? No legislative action is required.
4. FAA Sec. 611(b); App. Sec. 101. If for water or water-related land resource construction, has project met the standards and criteria as per Memorandum of the President dated Sept. 5, 1973 (replaces Memorandum of May 15, 1962; see Fed. Register, Vol 38, No. 174, Part III, Sept. 10, 1973)? Not applicable
5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed \$1 million, has Mission Director certified the country's capability effectively to maintain and utilize the project? Mission Director has so certified (See Annex Q).

6. FAA Sec. 209, 619. Is project susceptible of execution as part of regional or multilateral project? If so why is project not so executed? Information and conclusion whether assistance will encourage regional development programs. If assistance is for newly independent country, is it furnished through multilateral organizations or plans to the maximum extent appropriate?
6. No.
7. FAA Sec. 601(a); (and Sec. 201(f) for development loans). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.
- (a) Will have an insignificant effect on international trade other than to finance imports needed for the project.
(b) No discernible effect.
(c) No discernible effect.
(d) No discernible effect.
(e) Will improve technical efficiency by improving the quality of primary school instruction.
(f) No discernible effect.
8. FAA Sec. 601(b). Information and conclusion on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).
- The project will be carried out by a U.S. contractor selected on a competitive basis.
9. FAA Sec. 612(b); Sec. 636(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized to meet the cost of contractual and other services.
- The Project Grant Agreement contains provisions which assure that the Government of Nepal will utilize local currencies for support of local cost of local personnel, travel and training

A.

10. FAA Sec. 612(d). Does the U.S. own excess foreign currency and, if so, what arrangements have been made for its release?

No.

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

a. FAA Sec. 102(c); Sec. 111; Sec. 281a. Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production, spreading investment out from cities to small towns and rural areas; and (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions?

(a) The purpose of the project is to extend and improve teacher training in remote rural areas of Nepal. This will increase both educational access and improve quality of education for the rural poor.

(b) Not applicable.

b. FAA Sec. 103, 103A, 104, 105, 106, 107. Is assistance being made available: (Include only applicable paragraph—e.g., a, b, etc.—which corresponds to source of funds used. If more than one fund source is used for project, include relevant paragraph for each fund source).

FAA Section 105.

(3) (105) for education, public administration, or human resources development; if so, extent to which activity strengthens non-formal education, makes formal education more relevant, especially for rural families and urban poor, or strengthens management capability of institutions enabling the poor to participate in development.

The project is specifically designed to strengthen and make more relevant teacher education in remote rural areas. A major byproduct of the project will be increased access of rural poor to nonformal education. There are currently ten nonformal programs being broadcast, but because of poor transmission capability, and few receivers, access to these programs is limited. Both transmission capability and numbers of receivers will be greatly increased. There will be virtually 100 percent signal coverage.

B. 1. c. FAA Sec. 110(a); Sec. 208(e).
Is the recipient country willing to contribute funds to the project, and in what manner has or will it provide assurances that it will provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or has the latter cost-sharing requirement been waived for a "relatively least-developed" country)?

d. FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than three years? If so, has justification satisfactory to Congress been made, and efforts for other financing?

e. FAA Sec. 207; Sec. 113.
Extent to which assistance reflects appropriate emphasis on; (1) encouraging development of democratic, economic, political, and social institutions; (2) self-help in meeting the country's food needs; (3) improving availability of trainer worker-power in the country; (4) programs designed to meet the country's health needs; (5) other important areas of economic, political, and social development, including industry; free labor unions, cooperatives, and Voluntary Agencies; transportation and communication; planning and public administration; urban development, and modernization of existing laws; or (6) integrating women into the recipient country's national economy.

c. The Government of Nepal has committed financial support for the project up to the level of 14%. Because of Nepal's position as one of the relatively less developed countries, the 25% cost sharing requirement has been waived.

d.
No.

e.
The Project's principal impact will be to increase access to education for the rural poor, and to improve educational quality. Nearly all remote area teachers are currently without any training, many of them having no more than 8 years of schooling. The project is designed to address this problem.

B. 1. f. FAA Sec. 281(h). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country, utilizes the country's intellectual resources to encourage institutional development; and supports civic education and training in skills required for effective participation in governmental and political processes essential to self-government.

g. FAA Sec. 201(b)(2)-(4) and - (8); Sec. 201(e); Sec. 211(a)(1)-(3) and-(8). Does the activity give reasonable promise of contributing to the development: of economic resources, or to the increase of productive capacities and self-sustaining economic growth; or of educational or other institutions directed toward social progress? Is it related to and consistent with other development activities, and will it contribute to realizable long-range objectives? Does project paper provide information and conclusion on an activity's economic and technical soundness?

h. FAA Sec. 201(b)(6); Sec. 211(a)(5), (6). Information and conclusion on possible effects of the assistance on U.S. economy, with special reference to areas of substantial labor surplus, and extent to which U.S. commodities and assistance are furnished in a manner consistent with improving or safeguarding the U.S. balance-of-payment position.

f. From the perspective of the central Government, increasing access of rural people to services of Government is one of the major goals of the 5th five-year plan; the Government's perception is that one of the major desires of the rural people is schooling for themselves and their children. From the perspective of the rural people, schooling is one of their major desires. The project not only builds a specific program for massive teacher training, but it also builds an institutional infrastructure which supports the provision of nonformal education in a wide-range of fields. About ten programs of this nature are now aired, but as a results of the project, coverage will be vastly increased.

g. (1) The project is directly pointed toward the increase in educational access and improved educational quality to rural poor; (2) it is consistent with GON's development goals, and it is consistent with the AID mandate; (3) The Project Paper contains analyses of the project's economic and social soundness.

h. No appreciable affect.

ESTIMATED COSTS
RADIO TRANSMISSION SYSTEM HARDWARE UP-GRADE*1. 100 KW Short Wave Broadcast Transmitter

Supply, install and test a 100 KW power output AM short wave broadcast transmitter in the Khumaltar Station of Radio Nepal. Nominal frequency range 3.2 to 22 MHz. Tuning method shall be manual or auto-tune with pretuning of up to ten frequencies. To be supplied with a suitable complement of spare parts.

a. Transmitter including spare tubes and other parts, integrated circuits	\$305,412
b. Step Down transformer	21,115
c. Installation Materials for Transmitter	25,230
d. Automatic Voltage Regulator	26,500
e. Output Patching Equipment	2,465
f. Supervision of Transmitter installation	28,050
Sub-total	408,772
Inflation at 10 percent	40,877
Sub-total	449,649

2. Wide Band Antenna

Supply, ship, install, connect and test a wide-band antenna (3-18 MHz nominal, VSWR 1.5:1 max), high angle radiation (250° to 78° nominal half power beam width in the vertical plane) near circular pattern in the horizontal plane and exhibiting nominal power gain over a half-wave dipole.

Wide-band antenna (per above specifications) including maintenance and erection tools, supervision of installation and testing - all under sub-contract to separate antenna manufacturer	117,605
Inflation at 10 percent	11,761
Sub-total	129,366

-2-

3. Insurance, Freight, Transportation U.S. to Kathmandu	\$ 62,961
Inflation at 10 percent	6,296
Sub-total	69,257
TOTAL (of 1,2 and 3)	648,272**

* Procurement of equipment subject to conditions set forth in State 231322 (Sept. 26, 1977).

** Per State 231322, figure excludes dummy load (\$28,985 including 10% inflation). The ceiling of \$651,000 established in the same cable did not exclude 10% inflation when dummy load was eliminated. The ceiling, however, remains firm per the cable.

ESTIMATED COSTS
RADIO RECEIVING SYSTEM

Cost Evaluation Factors

A. Radio Receivers

1. UNICEF has purchased (April 1975) from Philips of Holland a quantity of portable, solid state receivers covering the medium wave band and 120 meters through 12 meters short wave bands. The Philips model number is 90 RL 315 and the purchase price was \$21.50 less 10% or \$19.35. The radios were supplied to JEMO for use in the field in their educational broadcasting program. No valid reports are available from the field in regard to reliability, ease of use and audio quality.
2. UNICEF has received quotations from SEL (ITT Transelctronics) for a prototype medium wave portable receiver designated the SEL "Teddy M". The unit cost for a production run of 5,000 is \$17 in accordance with a quotation received in April 1976. The radio will be supplied with a simple long wire antenna and can also be supplied with an extension speaker for \$4. The major cost in production is reported to be the injection molded PVC case and if a less expensive manufacturing process can be developed the cost of the receiver will be reduced. It is reported that with the addition of short wave reception capability the cost of the receiver may fall within the range of \$20 to \$30 per unit.
3. UNICEF has also received a quotation from Philips for a portable radio meeting the general requirements described in Appendix "K" of the original draft report "Development Radio for Nepal" submitted in February, 1975. The quotation was based upon a production run of 20,000 and the unit cost was \$85.

The standard production portable radios available in the United States providing multiband receiving capability range in price from approximately \$30 to \$150, many of them equipped for FM and VHF reception in addition to the medium wave and short wave broadcast bands. The performance specifications for the receivers, particularly in the areas of sensitivity, stability, and audio response and distortion are rarely published.

Therefore, without a firm quotation for a receiver meeting CCIR Recommendation 415 and considering the wide range of known unit costs we recommend that a unit cost of not less than \$60 be used for estimating purposes.

Radio receiver, portable, solid state, battery operated, meeting the minimum performance recommendations of CCIR Rec. 415.

Estimated Unit Cost	\$ 60
Shipping Cost (40%)	<u>\$ 24</u>
Estimated Unit Total	\$ 84
Total Quantity	2,500
10% Space	<u>250</u>
	2,750
Sub-Total	\$ 231,000
Inflation Cost (10%)	<u>23,000</u>
Estimated Total Cost	\$ 254,000

B. Antenna for Radio Receivers

Antenna, #12 AWG, simple "L" type in accordance with CCIR Recommendation 140 including three glass insulators.

Estimated Unit Cost	\$ 5
Total Quantity	2,500
Estimated Total Cost	\$ 12,500

Funding for antennas is included in the financial plan (Part III.B.) under "miscellaneous imported supplies and commodities".

C. Power Supply Alternatives for Radio Receivers

1. "D" Cells: Typical solid state portable radios utilize 4 to 6 "D" cells providing up to one month of use for approximately two hours of listening per day. The estimated quantity of "D" cells consumed per radio per year in the teacher training program would then be approximately 60 for ten months use. If the unit cost per cell were \$0.40 the total cost per radio per year would be \$24.00. Replacements would continue through the life of the radio. Total estimated cost for one year: \$66,000. Inflation would raise these costs further.

2. Alkaline Cells, 18 Volt: Under the same conditions as in 1. above the alkaline cell of greater capacity is estimated to last approximately six months for a unit cost of \$4.50. Total cost per radio per year would be \$9.00. Replacements would continue through the life of the radio.

Battery, Alkaline, 2AH capacity, 18 Volts

Estimated listening time per day = 2 hours

Approximate volume/unit: 171 cm³

Weight/unit: 0.28 Kg

Unit cost: \$4.50

Total number of batteries required for approximately six month service time: 2,750

Total estimated cost for approximately six month service time: \$12,375

Total estimated cost for one year: \$24,750

Inflation would raise these costs further.

3. Gelled Electrolyte, Secondary Cells, 12 V: The gelled electrolyte secondary cell is rechargeable. A unit of adequate capacity is estimated at \$30. A suitable charging location would be the district headquarters. If this location had primary power a multiple unit battery charger could be installed for approximately \$180. If no power were available, a bicycle generator-charger assembly would probably be the best solution. This machine can be fabricated locally or imported. Assuming a locally fabricated machine the estimated cost is \$280. The bicycle would have to be pedaled for approximately eight hours continuously in order to charge a bank of ten cells. The cells would last the life of the radio.

Because of the difficult transport problems in Nepal and also considering the capital expenditure required per year of operation for primary cells, we believe that the rechargeable cell solution is a better solution for providing power to the radio receivers than alternatives 1 and 2 above. A support plan would have to be developed prior to start of the program to ensure correct fabrication of the bicycle generator-charger and to ensure reliable collection and distribution of cells.

SUMMARY
ESTIMATED GELLED ELECTROLYTE BATTERY AND CHARGER COSTS

- a. Battery, gelled electrolyte, sealed, 12 V. approximately 10 AH capacity

Estimated Unit Cost	\$ 30
Estimated Shipping Costs (40%)*	<u>12</u>
Estimated Unit Total	\$ 42
Quantity Required	2,750
Total Cost	\$115,500

- b. Bicycle generator-charger, local fabrication, suitable for charging minimum of ten gelled electrolyte batteries simultaneously.

Estimated Unit Cost	\$ 280
Quantity Required	25
Total Cost	\$ 7,000

- c. Sub-total \$122,500
- Inflation Cost (10%) \$ 12,250
- Total Cost \$134,750

4. Solar Cell Power Supply

In each of the above power supply alternatives, batteries have to be either replaced or re-charged at a central location using a proposed bicycle driven generator at locations without electric generating facilities. Another alternative is the supply and installation of solar energy cells at each portable receiver site. Budgetary quotations have been received from two U.S. manufacturers of solar cell assemblies suitable for use on this project. The manufacturers responded to a brief description prepared by MORCOM (see Annex N). The system can be described as follows:

*Shipping costs could be less.

The proposed solar cell assembly would be mounted on or adjacent to the building used by the teacher when receiving the radio program. The panel could be mounted on the roof or on a wooden pole attached to the building or on a pole driven into the ground. The only requirement is that the panel be free from shade during daylight hours. The panel would consist of 28 to 36 silicon solar cells encapsulated in silicon rubber mounted on a reinforced fiberglass circuit board. The panel would be protected with a "Flexiglas" or "Lexan" cover to protect against hail stones and other destructive material.

The panel would present approximately 40 to 60 square inches (259 to 389 square centimeters) of surface area and weigh approximately 3 lbs. (1.4 kilograms). A battery charge control circuit would be part of the assembly.

Two wires would lead from the panel assembly and connect to a small rechargeable battery located in the radio listening area. The battery would weigh approximately 4.5 lbs. (2 kilograms) with dimensions of approximately 5" x 4" x 3" (12.7 cm x 10.2 cm x 7.6 cm).

The portable radio would be equipped with a cord and plug so that it could be easily connected to the battery. The radio would be specified to work from either internal cells or the external solar power supply.

The solar array would be expected to have a useful life of about twenty years and the battery about five years under the service conditions contemplated.

The solar cell power supply could be easily moved from one location to another and would require no maintenance other than cleaning the surface of the array with a wet cloth. Minor variations in the specifications can be made to suit the power requirements of the portable radio receiver to be chosen for this project.

SUMMARY
SOLAR CELL POWER SUPPLY COSTS

Solar cell assembly with battery and solar cell panel, 9 volt secondary cell system.

Estimated Unit Cost	\$ 125
Estimated Shipping Costs (40%)*	\$ 50
Estimated Unit Total	<u>\$ 175</u>
Quantity Required	2,750
Sub-total	\$ 481,250
Inflation Costs (10%)	<u>\$ 48,000</u>
Total Costs	\$ 529,250

Either Alternative 3, gelled electrolyte cells, or Alternative 4, solar cell power supply, would be an acceptable solution for meeting power requirements for the radio receivers for this project. There are a number of advantages to the solar cells, however, including the long life of the batteries and cells, maintenance free operation, and the ability to use the solar cell system without dependence upon a central source for replacement or re-charging of batteries. For these reasons, we believe the solar cell alternative should be considered and funding for the solar cell system is included in the financial plan for this project.

*Shipping costs could be less.

ANNEX J

ESTIMATED COSTS
JEMO STUDIO EQUIPMENT AND SERVICES COSTS

A. Commodities

1. Audio Console, to provide compatible service with Gateway Model 80. Professional broadcast quality, monaural, minimum five feeder with preamplifiers. Console to be specified in conjunction with integrated studio design. For costing purposes RCA type BC-15 can be considered minimum requirement.

Estimated Unit Cost = \$ 3,700

Quantity = 1 unit

2. Tape Recorder-Reproducer, studio application, monaural, reel-to-reel, dual speeds, NAB equalization, performance specifications equal to or better than those of RCA type RT-20.

Estimated Unit Cost = \$ 2,950

Quantity = 2 units

Estimated Total Cost = \$ 5,900

3. Portable Tape Recorder-Reproducer, editing application, monaural. Audio frequency performance shall equal or exceed those of section 2, EIA Standard RS-219.

Estimated Unit Cost = \$ 950

Quantity = 2 units

Estimated Total Cost = \$ 1,900

4. Audio Oscillator, 19" rack mount, capable of satisfactory application to frequency response and level testing with a studio facility meeting EIA RS-219 standards Hewlett-Packard or equal.

Estimated Unit Cost = \$ 650

Quantity = 1 unit

5. Calibrated Resistive Attenuator, impedance range 600 to 1500 hrs. capable of absolute accuracy in accordance with the requirements of section 5.2 EIA RS-219 standards Daven or equivalent.

Estimated Unit Cost = \$ 75

Quantity = 4 units

Estimated Total Cost = \$ 300

6. High Impedance Electronic Voltmeter, true rms Hewlett-Packard or equivalent.

Estimated Unit Cost = \$ 750

Quantity = 1 unit

7. Distortion Measuring Set, total harmonic distortion, selectable sine wave test tone. Hewlett-Packard or equivalent.

Estimated Unit Cost = \$ 1,200

Quantity = 1 unit

8. Noise Measuring Set, with weighting filters, c-mg and/or CCIR. Northeast Electronics or equivalent.

Estimated Unit Cost = \$ 800

Quantity = 1 unit

9. Line Frequency Meter, vibrating reed type. Frahm or equivalent.

Estimated Unit Cost = \$ 50

Quantity = 1 unit

10. Line Frequency Regulator, nominal, 230 VAC, 50 Hz single phase, 10 KW capacity. Topaz or equivalent.

NOTE: The availability of this unit is unknown at time of this writing. To be confirmed.

Estimated Unit Cost = \$ 3,200

Quantity = 1 unit

11. Tape Travel Indicators for Scully Series 280
Recorder-Reproducers. Confirmation to be obtained from
manufacturer.

Estimated Unit Cost	=	\$	75
Quantity	=	2 units	
Estimated Total Cost	=	\$	150

B. Engineering Services

Engineering services: design, develop studio drawings,
procurement and installation specifications, test procedures.
Studio performance to meet EIA RS-219 standards.

50 man days @ \$200/day	=	\$	10,000
1 round-trip: Washington/ Kathmandu	=		2,100
7 days per diem @ \$30/day	=		210
Supplies, drafting, services	=		1,690
Estimated Total Cost	=	\$	14,000

C. Installation Services

Installation Services: install, test and provide operating
instruction to JEMO studio technicians in Kathmandu in accordance
with engineering plans and specifications.

50 man days @ \$150/day	=	\$	7,500
2 round trips: Washington/ Kathmandu	=		4,200
50 days per diem @ 30/day	=		1,500
Tools, test eqpt, shipping	=		600
Test equipment rental	=		700
Estimated Total Cost	=	\$	14,500

COST SUMMARY
JEMO STUDIO EQUIPMENT AND SERVICES COSTS

Hardware	\$ 18,600
Shipping Costs (40%)	7,440
Engineering Services	14,000
Installation Services	14,500
Inflation Costs (10%)	<u>5,460</u>
Total Estimated Costs	\$ 60,000

ANNEX K

ESTIMATED COSTS
IN-COUNTRY FUNDAMENTAL ELECTRONICS TRAINING
FOR RADIO NEPAL PERSONNEL

Provide fundamental electronic training to approximately 60 Radio Nepal Technical Assistants and Junior Technical Assistants over a nine month period. A recommended method of providing this training is described in Part III, Section A.2. of this document. Estimated costs for this system of instruction are:

Contract electronic instructor for nine month period. Salary, housing, insurance, transportation included (calculated at standard rate for Mission. plus inflation)	\$ 80,850
120 textbooks at an average cost of \$10/unit, plus inflation (10%)	1,980
Laboratory kits, assumed to be test equipment assembly kits and simple lab kits containing components for experiments, plus shipping costs and inflation (10%)	
Test equipment kits. 20 at an average cost of \$72	1,585
Experiment kits. 60 at an average cost of \$24 each. Student tool kits. 60 at \$15 each	990
	<hr/>
Estimated total cost to AID of in-country training	\$ 85,405

Funding for the contract electronic instructor above is included in the funding for technical assistance presented in the Financial Analysis and Plan (Part III.B.). Funding for the laboratory kits and other commodities are included in the \$46,000 shown in the Financial Plan for "miscellaneous imported supplies and commodities".

U N C L A S S I F I E D
Classification

Department of State

TELEGRAM

I N C O M I N G

AID/W PRP APPROVAL MESSAGE

20 MARCH 75

R 192030Z MAR 75
FM SECSTATE WASHDC
TO AMEMBASSY KATHMANDU 5833-5834
BT
UNCLAS STATE 062042

AIDAC

E.O. 11652: N/A

TAGS:

SUBJECT: PRP REVIEW - RADIO EDUCATION

1. ON MARCH 7, 1975, THE NESA ADVISORY COMMITTEE HELD ITS REVIEW OF SUBJECT PRP FOR RADIO EDUCATION. THE COMMITTEE APPROVED THE PRP BUT FELT THAT A NUMBER OF ISSUES MERITED MISSION RESPONSE AS IT MOVED TOWARD DEVELOPMENT OF THE PP. THESE ISSUES FOLLOW:

2. ISSUES

A. PROJECT PURPOSE (UNDERSCORED)

THE RELATIONSHIP BETWEEN GENERAL PROJECT PURPOSE AND THE SPECIFIC PROJECT ACTIVITY AS STATED IS UNCLEAR. WE SUGGEST THAT PRIMARY TEACHER EDUCATION RADIO PROPOSAL BE SEEN AS A DISTINCT PROJECT WITH CLEARLY MEASURABLE OBJECTIVES AND THAT IT NOT BE PREDETERMINED TO BE THE FIRST PHASE OF A NATIONWIDE RADIO SYSTEM ALTHOUGH SUBSEQUENT EVENTS MAY LEAD THAT WAY. THIS APPROACH WOULD, IN OUR VIEW, PRESERVE THE INTEGRITY OF THE TEACHER TRAINING PROJECT AS ONE WHICH REFLECTS HMG PRIORITIES AS OUTLINED IN THE NESP AND WOULD ALLOW HIM TO POSSIBLY EXTEND THE USES OF RADIO AS A NATURAL OUTGROWTH OF A SUCCESSFUL TEACHER TRAINING PROJECT.

U N C L A S S I F I E D

B. EVALUATION OF PREVIOUS EFFORTS IN RADIO EDUCATION IN NEPAL (UNDERScoreD)

SINCE THERE HAVE BEEN SMALL-SCALE RADIO PROJECTS IN NEPAL AS WELL AS A FEW CURRENT PROJECTS IN THIS AREA, (UNESCO, MIN. AG) SUGGEST THAT THESE BE MORE CAREFULLY DISCUSSED IN PP WITH PARTICULAR EMPHASIS ON CURRENT PROJECTS AND LESSONS TO BE LEARNED WHICH COULD PROVE USEFUL IN PLANNING/IMPLEMENTATION OF PROPOSED PROJECT.

C. OTHER DONOR INPUTS (UNDERScoreD)

THE PRP STATES THAT DEVELOPMENT OF A BROAD EDUCATIONAL RADIO SYSTEM WILL DEPEND, TO A LARGE DEGREE, UPON MULTI-DONOR ASSISTANCE. SUGGEST CLARIFICATION, INsofar AS POSSIBLE, TYPE AND SCOPE OF SUCH ASSISTANCE IN RELATION TO SUBJECT PROPOSAL AND TO WHAT EXTENT WILL ITS IMPLEMENTATION DEPEND UPON OTHER DONOR INPUTS.

D. LOGICAL FRAMEWORK (UNDERScoreD)

THE LOGICAL FRAMEWORK REQUIRES CRITICAL REVIEW FROM SEVERAL POINTS OF VIEW:

1. WHAT ARE LINKAGES BETWEEN CONDITIONS AT END OF PROJECT AND MEASURES OF PROJECT GOAL ACHIEVEMENT? FORMER SEEM MUCH LARGER AND BROADER THAN WHAT MAY BE EXPECTED AS AN EFFECT ARISING FROM PROPOSED PROJECT. E.G., DEVELOPMENT OF A TESTED TEACHER TRAINING PROGRAM.
2. WHAT ARE LINKAGES BETWEEN EXPECTED OUTPUTS AND CONDITIONS EXPECTED AT END OF PROJECT?
3. (1) BASIC ASSUMPTIONS AS SOME LEVELS SEEM SKETCHY AND NOT SUFFICIENTLY REFLECTIVE OF POSSIBLE OBSTACLES TO SUCCESS, E.G., NO ASSUMPTIONS AT SECTOR GOAL AND INPUT LEVELS, (2) PROJECT PURPOSE LEVEL/MEANS OF VERIFICATION; E.G., WHICH HMG AGENCY WILL TAKE THE LEAD IN PROJECT EVALUATION? CAN EVALUATION BE CONSIDERED TO BE INDEPENDENT IF CARRIED OUT BY HMG AGENCIES INVOLVED IN PROJECT IMPLEMENTATION? (3) WILL EVALUATION BE PERFORMED ON AN ANNUAL BASIS? WE ASSUME THIS TO BE THE CASE AND FURTHER ASSUME THAT THESE EVALUATIONS WILL SERVE AS THE BASIS FOR PROJECT EXPANSION. (4) OUTPUT LEVEL; SPECIFY HMG FUNDING LEVELS OVER THREE-YEAR PERIOD, IF POSSIBLE.
4. IN SOME INSTANCES, THERE IS DUPLICATION OF PROJECT OUTPUTS AND END OF PROJECT INDICATORS, E.G., DEVELOPMENT OF TEACHER TRAINING MATERIALS, DEVELOPMENT OF EVALUATION TECHNIQUES AND DEVICES.

5. LINKAGES BETWEEN INPUTS-OUTPUTS-EOPS AND PURPOSES REQUIRE RECASTING IN TERMS OF SPECIFICITY AND INTERNAL CONSISTENCY, E.G., HOW DO TA INPUTS SPECIFICALLY RELATE TO OUTPUTS; HOW DO OUTPUTS RELATE POINT BY POINT TO EOPS.

6. ON INPUT SIDE, SUGGEST THAT INTENDED PHASE-OUT OF ALL EXPATRIATE TA BY THIRD YEAR OF PROJECT IS UNREALISTIC, GIVEN PROJECT COMPLEXITY AND RELATIVE INEXPERIENCE OF HOST COUNTRY PERSONNEL. WE ALSO BELIEVE MISSION COST PROJECTIONS FOR INPUTS TO BE TOO LOW, PARTICULARLY IN AREAS OF PERSONNEL AND PARTICIPANT TRAINING. ALSO SUGGEST CONSIDERATION OF INCREASE IN PARTICIPANT TRAINING.

E. USE OF RADIO/CASSETTES (UNDERScoreD)

IT IS UNCLear WHETHER BOTH THESE DELIVERY MODES ARE TO BE USED AND TO WHAT END. THIS IS AN IMPORTANT CONSIDERATION IN VIEW OF DIFFERING IMPLICATIONS OF EACH FOR TEACHER ORIENTATION, SCHEDULING AND UTILIZATION.

F. RELATIONSHIP BETWEEN NEW CURRICULUM, SUPPORT MATERIALS, TEXTBOOKS AND RADIO BROADCASTS (UNDERScoreD)

BECAUSE OF INTER-RELATIONSHIP OF ABOVE ELEMENTS, CLARIFICATION IS NEEDED AS TO HOW WIDESPREAD IS USE OF NEW CURRICULUM/TEXTBOOKS AS WELL AS STEPS REQUIRED AND TIMING OF DEVELOPMENT OF PROJECT WRITTEN MATERIALS, E.G., TEACHER RADIO GUIDES.

G. TRANSMISSION/COVERAGE (UNDERScoreD)

WHAT FURTHER INFORMATION IS REQUIRED TO BETTER RELATE PRESENT AND/OR FUTURE SIGNAL COVERAGE TO TEACHER DISTRIBUTION?

H. EXPERIMENTAL DESIGN/EVALUATION (UNDERScoreD)

WE BELIEVE PP SHOULD CLEARLY SPELL OUT PROJECT'S EXPERIMENTAL AND EVALUATION DESIGN. ALSO, CAREFUL ANALYSIS OF WHO WILL PERFORM THESE AND IMPLIED HMG COORDINATION INVOLVED SHOULD BE KEY FACTORS.

I. MEASUREMENT OF PROJECT EFFECTIVENESS (UNDERScoreD)

THE PRP SEEMS UNCLear AS TO WHAT DETERMINANTS WILL BEST MEASURE PROJECT SUCCESS, I.E., MEASUREMENT OF PRE- AND POST STUDENT EXAMINATION SCORES, MEASUREMENT OF OBSERVABLE CHANGES IN TEACHER BEHAVIOR.

J. PROJECT PHASING (UNDERScoreD)

THE TWELVE-MONTH PERIOD OUTLINED FOR DEVELOPMENT OF PHASE

1 APPEARS TO BE TOO SHORT TO ACCOMPLISH THE NINE GOALS OUTLINED FOR THIS PHASE. MISSION SHOULD CONSIDER REDUCTION OF NINE GOALS TO A MORE MANAGEABLE NUMBER. IN ANY EVENT, AN EIGHTEEN-MONTH PERIOD WOULD SEEM TO BE MORE REALISTIC.

K. TEACHER INCENTIVES (UNDERScoreD)

IN VIEW OF ADDITIONAL TIME AND EFFORT WHICH WILL BE REQUIRED OF CLASSROOM TEACHERS TO BE INVOLVED IN PROJECT, WHAT INCENTIVES WILL BE BUILT INTO THE RETRAINING SYSTEM TO ASSURE TEACHER COMMITMENT?

3. AS MISSION MOVES TOWARD DEVELOPMENT OF PP STAGE, WE WOULD WELCOME ITS RESPONSE TO THE ABOVE ISSUES AS WELL AS ANY PROJECT PLANNING ASSISTANCE NEEDS, E.G., MAYO'S RETURN VISIT. HE HAS REQUESTED US TO CONTACT MISSION SO THAT HE MAY PLAN HIS SCHEDULE OVER NEXT FEW MONTHS. INGERSOLL

BT
JFH/0850

ANNEX M

MORCOM SYSTEMS, INC.
1728 N Street, N.W.
Washington, D.C. 20036

REpublic 7-1125
Cable Address: MORCOM
Telex: 248563

Telecommunication and Electronic
Systems Specialists

Alfred Hotvedt
Office of Engineering
Agency for International Development
Washington, D.C. 20523

Ref: Radio Education Pilot Project - Nepal
(Teacher Retraining Program)

Dear Mr. Hotvedt:

Enclosed please find a copy of the High Frequency Radio Propagation Predictions for shortwave broadcasting of the teacher re-training programs in Nepal. Also enclosed is a summary of the results for the specific hours requested for program transmission by Radio Nepal.

We recommend that a copy of these data and the summary be sent to Dr. Burton Newbry, Chief, Human Resources Development Division, USAID Mission, Kathmandu, Nepal for inclusion in the Project Paper (PP) as an annex. This is in accordance with our agreement before leaving the field. We are sending a copy of the summary and a cover letter to Dr. John Mayo, Institute for Communication Research, Stanford University, for his information.

Sincerely yours,

/s/ Herbert E. Dawson

Herbert E. Dawson
MORCOM Systems, Inc.

HED/rbe
Enclosures

Summary

High Frequency Radio Predictions
Radio Education Pilot Project-Nepal

The following predictions are based on the use of a half-wave horizontal dipole antenna and 50 KW transmitter output power. The recommended operating frequencies (given in wavelengths) correspond to Radio Nepal's current (December 1976) assignments and capability. When one operating frequency is listed it should not be interpreted to mean that only one frequency should be transmitted. On the contrary, a minimum of two frequencies should be transmitted simultaneously at all times. The criteria represented here for the frequencies listed are 99% of the days within the month that sky-wave will be present and that the required signal-to-noise ratio will be attained. Where percentages appear in parentheses it means that a lower percentage is predicted for those particular operating hours and the percentage indicated is the highest that can be achieved for the fraction of the days that the sky-wave mode is predicted to occur. The predictions reflect a 50% service probability. In other words there is 0.50 probability that the skywave will be present for the given percentage of days of the month.

Recognizing that we have recently passed the minimum in sunspot activity and are now beginning the period of increased activity (reaching maximum in the period 1981-83) the predictions indicate that the reliability of the teacher re-training broadcasts via shortwave broadcast should be relatively high, probably exceeding 80% availability of useful signal during the 0900-1000 and 1500-1600 local time periods provided that a minimum of two shortwave frequencies are broadcast simultaneously.

Recommended Operating Wavelengths
to Achieve 99% Circuit Reliability
(Figures in parentheses indicate lower reliability)

LOW SSN (10) June 15

<u>Hours</u>	<u>Pokhara</u>	<u>Dhankuta</u>	<u>Surkhet</u>	<u>Dandeldhura</u>
0800 - 1000	90/60	90/60	90/60	60
1400 - 1600	90	90	90	9/60

LOW SSN (10) December 15

0800 - 1000	90/60	90/60	90/60	90/60
1400 - 1600	90(62%) & (52%)	90(73%) & (62%)	90(78%) & (68%)	90(90%) & (82%)

HIGH SSN (100) June 15

0800 - 1000	90/60	90/60	60	41/60
1400 - 1600	90	90	90	90

HIGH SSN (100) December 15

0800 - 1000	90/60/41/31	90/60/41/31	90/60/41/31	90/60/41/31
1400 - 1600	90/60	90/60	90/60	90/60

SOLAR CELL POWER SUPPLY SYSTEM

System Description

Up to 2500 individual portable solid state shortwave/medium wave radio receivers located in remote areas of Nepal (reference geographic coordinates: 85.33 degrees East, 27.75 degrees North) will be required to operate up to 3 hours per day (two periods/day, 0900 - 1030 and 1500 - 1630 local time). The radio power drain will be (typically) 112 milliamperes at 9 VDC during the operating periods. At other times the radio will be turned off or disconnected. The ambient temperatures in the operating locations will range between approximately - 10°C to 40°C depending upon location within the country.

Required

A photo-voltaic cell charger and a 9 volt secondary cell system suitable for installation at each radio receiver location providing at least five years of maintenance free duty. Certain locations experience relatively frequent hail stone activity with the diameter of the stones reaching 1.3 to 1.9 centimeters. Simplicity and reliability are of prime importance.

(See also Annex I for further detail on solar cell power supply.)

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FA/ED/106/

CON LETTER ON PROJECT CONCURRENCE

ANNEX 0

His Majesty's Government

MINISTRY OF FINANCE
Babar Mahal,
KATHIMANDU
NEPAL.

March 9, 1977.

Dear Mr. Butterfield:

Kindly refer to the project proposal on "Radio Education Pilot Project" which has been submitted for the approval of His Majesty's Government of Nepal (HMG/N).

While the technical details of the project could be finalized with the concerned officials of the Ministry of Education, HMG/N, I am pleased to inform you that the project under reference is acceptable in principle to HMG/N. You may wish to advise your concerned staff to get in touch with the Ministry of Education, HMG/N for further details.

Yours sincerely,

Bal Gopal K. C.
(Bal Gopal K. C.)
Under Secretary

Mr. Samuel H. Butterfield,
Director
USAID/Nepal

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Subject File Copy
Action Taken: NAN
Cable or Telegram _____
Letter _____
Other _____
Date 5/16/77
Initials BC

ELNCT - INTER-...
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ATM/ML

ANNEX P

C O P Y of letter of request from the Ministry of Finance

April 20, 1977

Dear Mr. Butterfield:

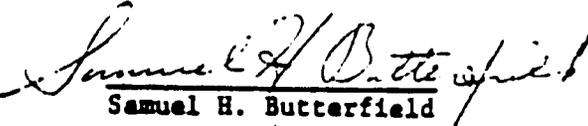
In continuation of our letter FA/ED/106 dated March 9, 1977 regarding Radio Education Pilot Project, I am desirous to write you that His Majesty's Government of Nepal would like to request USAID to kindly provide necessary assistance for implementation of the above project which, as you know, has been prepared jointly by the concerned Ministries of HMG and USAID/N. I may also add that HMG will be pleased to provide necessary support to the project in general terms as outlined in the project document.

/s/ Bal Gopal K. C.
Under Secretary
Ministry of Finance

Nepal - Radio Education Project
Certification Pursuant to Section 611(e) of the
Foreign Assistance Act of 1961, as amended

I, Samuel H. Butterfield, principal officer of the Agency for International Development in Nepal, having taken into account, among other things, the capacity of the Government of Nepal and its agencies to properly utilize the commodities being imported under this Grant as well as the technical assistance and training to be funded, do hereby certify that in my judgment Nepal has both the financial and human resources capability to utilize effectively the inputs for this radio education project.

This judgment is based in part upon the project analysis as detailed in the Radio Education Project Paper and is subject to the conditions imposed therein.


Samuel H. Butterfield
USAID/Nepal

6/15/77
Date