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A Guide to Planning and Implementation

The Clearinghouse on
Development Communication

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PN-ABC-729

INTERACTIVE RADIO INSTRUCTION HANDBOOK
A Guide to Planning and Implementation

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Introduction

Fourteen years ago the first interactive radio instruction team began developing a systematic method for teaching mathematics by radio. Six years later, commenting on the success of that project, David Sprague, of the Agency for International Development's Office of Education, wrote, "Thus, our hope that the project would produce a methodology that was generalizable to other countries and to other subject matters has been realized."

With the methodology in hand, the Office of Education went on to test its transferability to the teaching of English in primary schools in Kenya, to the teaching of the basic primary curricula to children without schools in the Dominican Republic, and to the teaching of science at the upper primary level in Papua, New Guinea. In all of these subject areas and countries, the methodology proved sound. It was flexible and adaptable. It was not culture-specific. It used the ubiquitous and inexpensive radio. It was based on the national curricula. And it welcomed the participation of teachers, curriculum designers, broadcasters, and creative artists.

The *Interactive Radio Instruction Handbook* is an attempt to distill these rich experiences into an outline of how to adapt a systematic, proven methodology to a particular nation's needs and experience.

The *Handbook* is not complete; it is designed to incorporate additional modules as they are prepared. It is not a self-instructional manual, but a common-sense guide to adaptation and implementation of interactive radio instruction. Different modules will be appropriate to different audiences and needs. Policy makers and educational planners will find the modules on feasibility and planning useful. Curriculum specialists will want to look at the modules on curriculum design and scriptwriting. Instructional-materials writers will want to study the scriptwriting modules, and broadcasters the modules related to radio production. The *Handbook* is intended to reassure the reader that a careful, thoughtful, and systematic process allows the radio to assume the instructional burden at a level of quality and a breadth of coverage that might not otherwise be possible.

The successful use of interactive radio instruction can provide greater access to quality instruction in many countries. The *Handbook* is meant to take the mystery out of instructional radio and to provide practical advice on the use of this economical and effective medium.

*Interactive
Radio
Instruction
Handbook*

*Interactive
Radio
Instruction*

1

Interactive Radio Instruction

What Interactive Radio Instruction Is

Interactive radio instruction (IRI) is the name of a new, innovative teaching process. Although it uses radio as a medium, unique characteristics differentiate it from most other instructional radio:

- It promotes *extensive interaction* between learners and radio teachers. IRI calls for responses from children at least once every 10-20 seconds.
- It provides *highly systematized instruction* to ensure quality education. Practice is divided into short segments and distributed over time. Responses are immediately reinforced.
- It permits *wider access to schooling*.
- It has been *proven effective*.

IRI combines two technologies: systematic instructional design and radio. Systematic instructional design is the mechanism for ensuring quality instruction. Radio provides the delivery system necessary to reach previously unreachable learners. Neither technology alone can meet so many of the constraints on effective education in developing countries.

Ten years of research and development have gone into IRI. Although most of the educational principles followed in IRI are not new, the combinations and the emphasis are often different and are what make IRI effective.

The first IRI project funded by the U. S. Agency for International Development was carried out in Nicaragua. The project taught mathematics at the primary level. One of the strengths of the Radio Mathematics Project was that it built on previous experience in programmed instruction and on some of the interactive techniques from this field. The use of radio, however, stimulated the writers to try new ways to involve the learners, to encourage their participation.

Results from the second undertaking, the Radio Language Arts Project in Kenya, confirmed the results from Radio Mathematics and convincingly demonstrated that intensive IRI could be used to teach other subjects in other countries. The Radio Language Arts Project developed even further the interactive aspects of the methodology. Recognizing the constraints of radio as a one-way medium, but realizing the importance of two-way communication in developing language skills, the project strongly emphasized interaction between the radio characters and the children.

Children responded to the radio once every few seconds.

Both the math and language-arts IRI lessons were broadcast to schools and were supported in classrooms by regular teachers. Among other activities, the teachers encouraged and helped children talk to the radio characters. Teachers also taught follow-up lessons that extended the practice initiated by the radio instruction.

In the next IRI effort, the Community Basic Education Project in the Dominican Republic, the IRI methodology was used to teach mathematics and initial reading in Spanish to children in regions where no schools existed and hence no trained teachers were available. The method was adapted to make use of facilitators rather than teachers. The facilitators received only a minimum of training in order to serve as aides during the broadcasts. This project further demonstrated that IRI could be adapted to new teaching situations and to differing educational needs.

Still another example of adaptation took place in Thailand. The Radio Mathematics lessons from Nicaragua were translated from Spanish to Thai and adapted to the Thai curriculum. Primary school children in Thailand who received mathematics instruction by radio showed significantly higher achievement than children in regular classrooms.

The Honduran Radio Learning Project is developing a new model for using IRI to teach mathematics. It is a mental-arithmetic curriculum covering all aspects of mental computation for first through third grades. The program, broadcast daily for 15-20 minutes, is completely self-contained in the sense that virtually no materials or teacher training is necessary. For this reason, it can be used with out-of-school audiences as well as in-school ones. The curriculum will be a powerful complement to virtually any existing mathematics program at the primary level.

In Papua, New Guinea, the Radio Science Project is expanding the application of IRI in other directions. A radio-based science curriculum for children in grades four through six is being developed. Inquiry is a key component of science instruction; thus, teaching science requires special pedagogical approaches. For example, children need to have hands-on experiences with materials and the opportunity to respond to open-ended questions. The Radio Science team is developing an instructional program that meets these pedagogical demands.

Two other adaptations are under development. In Lesotho, the Ministry of Education is adapting the Kenyan Radio Language

**Why
Interactive
Radio
Instruction
Is
Important**

Arts program for teaching English to children in grades one through three. In Bolivia, a private voluntary organization, *Fey Alegria*, is adapting the original Radio Mathematics program materials for use in the nation's schools.

IRI can deliver uniform, carefully planned, thoughtfully developed curricula to children in urban and rural environments alike, regardless of the availability of highly qualified teachers. It has been proven effective in providing quality instruction in different subjects in different parts of the world.

It can also be an effective medium for addressing educational problems common in most of the developing world—for example:

- Expanding primary-school-age populations
- Diminishing educational resources
- Poor access to schools, particularly in rural areas
- Irrelevant curricula
- Poor quality of instruction.

Depending on the specific needs of a country, IRI may offer an immediate solution to some of the most troublesome problems. Radio should perhaps be viewed as a temporary strategy until other resources and combined approaches can be implemented. Both technological and human resources must be developed over the long term in order to create an educational strategy that serves all of the local needs and is consistent with the cultural aspirations and the economic development of the country. IRI can, however, provide immediately observable improvement in the delivery of education to primary school children while other strategies are being explored.

Equitable education for all children is still an illusive dream in most developing countries. Despite a high proportion of national budgets set aside for education, rising expectations and burgeoning primary-school populations outstrip the resources of governments to provide the kind of education that will meet economic goals and fulfill human aspirations.

Large strides have been made in some countries, however. Building programs, often undertaken with great sacrifice by local communities, have provided classrooms for millions of new primary school children who would not have been able to attend school 10 years ago. School curricula and teaching materials have

***How
Interactive
Radio
Instruction
Is
Accomplished***

been nationalized or localized and made relevant to the learners. Teacher training institutions have sprung up in the most remote corners of countries to serve teachers and learners. New technologies have been introduced to make education more efficient, more interesting, and more effective. IRI can build on these achievements, using technologies that show convincing evidence of improving educational systems.

Much of the major research and development work on IRI has been completed. The methodology has been tested with different content, in different geographical regions, and in different educational settings. The mathematics model has been adapted to a different language, different educational situations, and a different type of curriculum.

Clearly the IRI methodology has wide application. This series of modules is designed to help readers adapt IRI to their local needs and circumstances. The modules deal with the practical procedures and techniques necessary to develop and administer an effective IRI project.

A country considering the use of IRI should first address several general issues. Analysis of these issues will lead to an appropriate decision about whether to use IRI.

***Educational
Needs***

An analysis of educational needs (particularly at the lower primary level) will determine whether existing problems are those that IRI can address. Where educational resources such as textbooks, audiovisual aids, television, computers, and highly qualified teachers exist, IRI is just one of many resources that may be used. Few educational systems have these luxuries, however. IRI was specifically developed to compensate for the lack of facilities, teaching materials, and qualified teachers in many developing countries. The major problems for which IRI can offer solutions—at least temporary ones—are equity, access, and quality.

***Educational
Radio
Capabilities***

An analysis of this issue would include a study of the technical and human resources necessary to implement an IRI project. The broadcast capabilities identified in the following list must already be in place or must be created specifically for IRI. Where such capabilities already exist, IRI can be implemented rather quickly. Where they exist only in part, facilities and personnel must be augmented.

4

- Sufficient air time for IRI broadcasts, which may require more time than supplementary educational radio
- Studio time and equipment adequate for the expanded production needs of IRI, including pre- and postproduction facilities
- Adequate transmitter range
- A sufficient number of radios in classrooms
- A maintenance scheme and maintenance personnel
- The human resources necessary to adapt the IRI model to local needs—curriculum specialists, scriptwriters, and radio production personnel
- A distribution scheme for radios, batteries, and student and teacher materials.

Costs

A careful study of both start-up (development) and recurrent costs is necessary. The extent to which the IRI materials must be adapted is a cost factor in the beginning, mainly in terms of time and people. Broadcast requirements are another expense. The initial costs may be high, but the extent to which facilities and experience can be used for further development of radio instruction and the extent to which new students can be reached will reduce the costs per pupil. Finally, the recurrent costs of radios, batteries, and print materials for teachers and pupils must be considered.

Costs must be related to resources. Although the development of a new IRI project may seem expensive, the benefits may warrant the investment. Long-term savings may actually result, with fewer pupils being retained at grade level or dropping out of school. Academic achievement may also be improved.

How to Determine Potential Benefits

The following questions may help readers determine whether their country can benefit from IRI:

- Are the educational needs of the country chiefly ones of equity, access, and quality, particularly at the lower primary level?
- Does the country lack educational facilities, teaching materials, and qualified teachers?

-
- _____ Is sufficient air time available for IRI broadcasts? If not, can existing programs be modified or cancelled to provide the necessary time?
 - _____ Is existing studio equipment adequate for the expanded production needs of IRI? If not, can it be upgraded, or can new equipment be obtained?
 - _____ Do available transmitters have an adequate range? If not, can their capabilities be boosted, or can new ones be obtained?
 - _____ Can a sufficient number of radios be provided for classrooms?
 - _____ Is a maintenance scheme for equipment in place, or can one be readily built on existing systems? Are available maintenance personnel adequate to keep equipment running smoothly? If not, can they be trained or new ones recruited?
 - _____ Are available human resources adequate to adapt the IRI model to local needs? If not, can the necessary personnel be recruited or trained?
 - _____ Is a distribution scheme for radios, batteries, and student and teacher materials in place, or can one be readily built on existing systems?
 - _____ How much adaptation of existing IRI materials is necessary, and are available financial resources adequate to support it?
 - _____ How much adaptation of broadcast facilities and equipment is necessary, and are available financial resources adequate to support it?
 - _____ What are the benefits of investing in IRI, and do they offset the costs?

*Interactive
Radio
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*Feasibility
and
Planning
for
Interactive
Radio
Instruction*

2

Feasibility and Planning for Interactive Radio Instruction

What Feasibility and Planning Are

Feasibility means possibility. To determine the possibility of using interactive radio instruction, decision makers must first ask a series of basic questions. The answers will tell them whether using radio to accomplish their educational goals is feasible, or possible.

If a decision is made to go ahead with radio instruction—that is, if radio instruction is determined to be feasible—planning begins. Implementing a successful interactive radio instruction project is not just a matter of developing instructional radio lessons. It also involves putting into place many other features that support radio broadcasts.

Why Feasibility and Planning Are Important

The purpose of determining feasibility and developing an implementation plan is to ensure that decisions to use radio instruction are founded on all of the relevant information and that the project design takes into account all of the constraints that might present problems to implementation. Feasibility studies and planning enable decision makers to prepare for each activity and develop the resources necessary to complete a successful project.

Projects fail for a number of reasons. The major ones include the following:

- Unforeseen complexity of the task
- Unanticipated costs
- Unprepared personnel
- Inconsistent objectives
- Failed logistics and delivery.

Planning can take these into account and prepare strategies to meet the circumstances of a particular country and its educational system.

How Feasibility Is Determined

In the how-to series of which this module is a part, the writers have assumed that using interactive radio instruction is possible. It may not always be, however. Several related areas affect feasibility. Following are the kinds of questions that have to be answered in each country. Most of the questions will probably

***Assessing
Broadcast
Capability***

not be answered with a simple yes or no; rather, there will be degrees of possibility.

One major area of concern is the current broadcast capabilities of the country. The following questions will help decision makers identify resources already in place or show areas in which additional capabilities need to be developed:

- Are broadcasting facilities adequate? Is the range of the radio transmission sufficient to reach the target audience? Is sufficient air time available?
- Does an organization exist for broadcasting to schools?
- Are there radios currently in the schools? Are more needed? How are the problems of maintenance and power supplies solved?
- What percentage of the classrooms have electricity? Are batteries readily available?

***Identifying
Logistical
Capability***

Interactive radio instruction projects have kept print materials to a minimum. In some cases nothing is required for the children. Most often, however, some materials are needed for the children and the teachers. The project must be able to deliver these materials on time. Some pertinent questions to be asked are:

- What are the country's printing capabilities?
- Is a system in place for delivering materials to schools? To teachers?
- Who will bear the cost of student workbooks, exercise books, and other supplies—parents or the government?

***Estimating
the
Potential
Size
of
the
Project***

The larger the number of pupils involved, the lower the per-pupil costs of radio instruction. To determine the costs, decision makers need information about the size of the audience and the distribution of that audience throughout the country.

- How many learners (children or adults) are in the intended audience? How many schools? How many first-grade classrooms?
- How many learners are in each stream?
- Are there multigrade classrooms?
- Do the schools operate on double shifts?

Evaluating Teachers' Capabilities

Radio instruction assists teachers. Decision makers need to know teachers' qualifications and experience in order to provide effective guidance to them in the form of orientation and teacher's notes. Also, the teachers' educational level, teaching experience, and previous use of instructional radio are important factors in designing effective broadcasts and support materials.

- Do teachers have experience with educational radio? If so, with what programs and subjects? What role did the radio lessons play in instruction? What are teachers' attitudes toward radio instruction?
- What are the qualifications of teachers?
- Is there a regular system for inservice teacher training?
- In what ways might teacher training institutions be involved in and lend support to the interactive radio instruction project?
- If the proposed project will be implemented in a nonschool setting, are buildings and equipment available in the communities? Does a community organization exist that can support the programs? Are there potential facilitators to manage the group receiving radio instruction?

If the answers to the preceding questions are no's, further questions need to be asked. For example, if broadcast facilities are not adequate, can they be made adequate with additional resources? Can those resources be found?

How Planning Is Accomplished

The plan for the life of the project—often called an implementation plan—includes a cost analysis, an adaptation scheme (that will match the interactive radio instruction model to the local curriculum and educational setting), and a design for the technical and logistical support and activities necessary to carry out the project.

An implementation plan identifies critical activities, puts them in sequence, and schedules them. The plan also specifies the necessary personnel to carry out the activities. Module 3, *Staffing an Interactive Radio Instruction Project*, discusses the latter subject in detail.

The implementation plan is based on an analysis of the particular educational setting. Such an analysis should provide information on a variety of factors, and that information should be available when planning begins. It should be collected through surveys,

needs assessments, and analyses of educational data available from the Ministry of Education or other resources.

Information on the following factors provides the basis for planning among educators, broadcasters, and financial and technical specialists:

- Characteristics of the desired product (subject matter, level of adaptation, number of grades to be included, etc.)
- Availability and capability of personnel
- Amount of technical assistance needed
- Extent to which physical facilities need to be upgraded (offices, studios, transmitters, etc.)
- Number of students, classrooms, and teachers to be involved, and the time schedule for their involvement
- Time schedule for implementation
- For implementation of a nonformal project, the level of community organization and availability of group facilitators.

A look at two factors, (a) availability and capability of personnel and (b) extent to which physical facilities need to be upgraded, will illustrate how the planning discussion may go. An analysis of personnel may indicate that educators are available to work on the project but they need specialized training in instructional radio. This information affects planning because of cost (to provide technical assistance for training and to provide time and subsistence support to personnel) and scheduling (training must be completed before scriptwriting can begin).

An analysis of the physical facilities may reveal that—

- *Office space* is available at a curriculum development center.
- There are *good studio facilities*, but additional microphones, sound-effects records, cartridge players, etc., are needed.
- The *transmitters* are adequate, except to reach the extremely remote area of the country; the project may need to provide cassettes and cassette players for schools in this area.

Based on this information, the implementation plan must take into account cost (for new equipment) and scheduling (for purchase and distribution).

Each factor must be carefully studied to determine its effect on project implementation. After all of the factors have been studied

*How
to
Evaluate
an
Implementation
Plan*

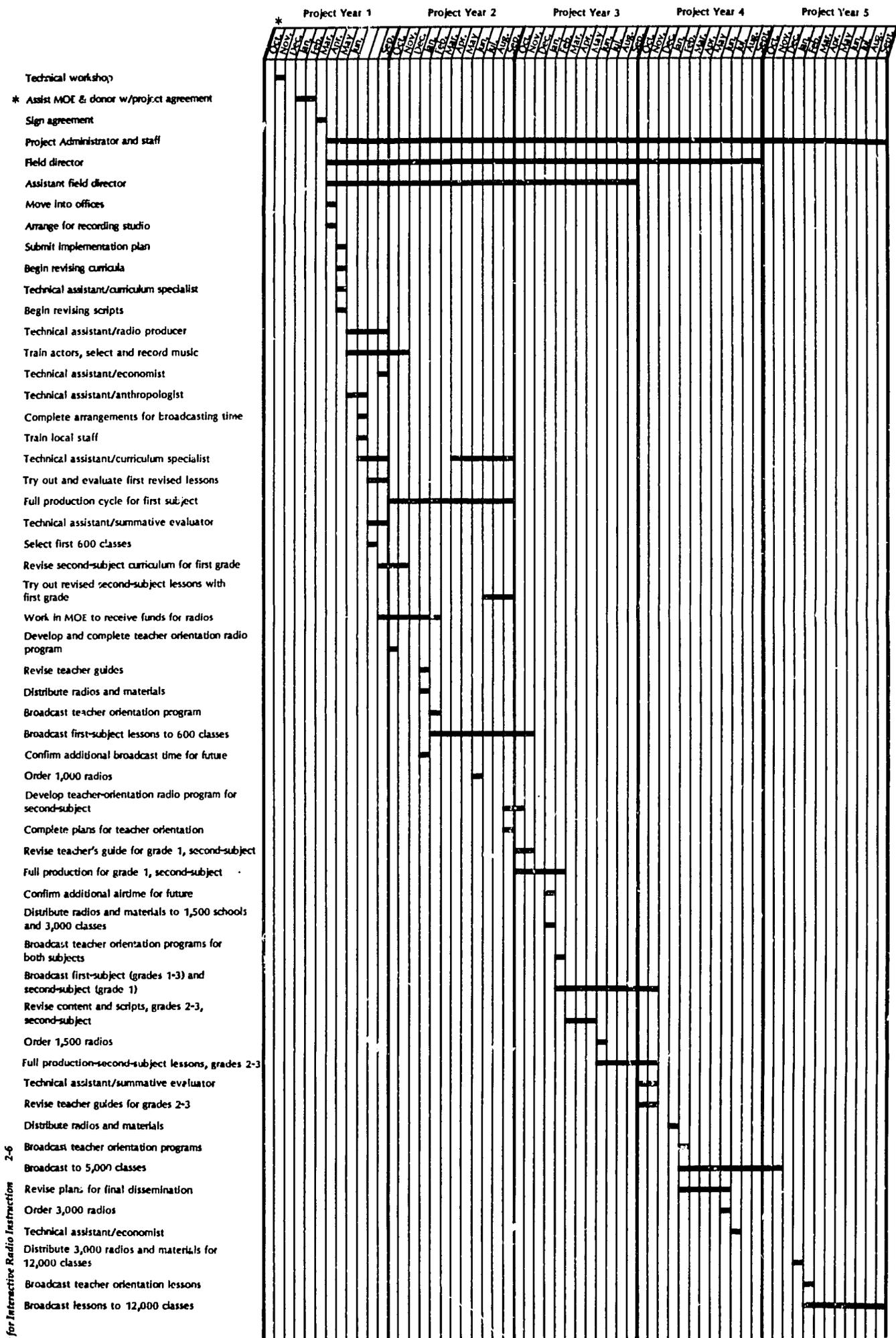
and decisions made, the decisions are put into a time line, or schedule of activities, over the life of a project.

The development of an implementation plan is a collaborative effort among many people. The plan can be carried out only if all of the institutions and the people affected by it have participated in making the decisions on which it is based. The plan represented in Figure 1 is only an example, offered to illustrate the planning process. It does not fit any particular situation. It should help the reader understand feasibility and planning, however.

The adequacy of an implementation plan might be judged by addressing the following questions:

- ___ Has the feasibility of interactive radio instruction been determined on the basis of a look at broadcast, logistical, and teacher capabilities and the potential size of the project?
- ___ Has information on the following factors been collected and studied for its cost and scheduling implications:
 - ___ Characteristics of the desired product?
 - ___ Availability and capability of personnel?
 - ___ Amount of technical assistance needed?
 - ___ Extent to which physical facilities need upgrading?
 - ___ The number of students, classrooms, and teachers to be involved and the schedule for involving them?
 - ___ The schedule for implementation?
 - ___ If a nonformal project, the level of community organization and the availability of group facilitators?
- ___ Have decisions been made and put into a schedule of activities for the life of the project?
- ___ Have the institutions and the people affected by the implementation plan participated in making the decisions on which it is based?

A SAMPLE IMPLEMENTATION PLAN



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* Ministry of Education
** Or first month of project

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*Interactive
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*Staffing
an
Interactive
Radio
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Project*

3

Staffing an Interactive Radio Instruction Project

What Staffing Is

Any interactive radio instruction project requires special staff. Whether the project is adapting previously designed and tested instructional materials or developing new interactive radio lessons, certain staff members are key. They should have a full-time and exclusive commitment to interactive radio instruction. The staff should include personnel with experience in curriculum, teaching, writing of instructional materials, and radio. The assistance of some personnel with experience on other interactive radio instruction projects is desirable if at all possible. The exact combination of personnel depends on their experience, the level of adaptation required for the lessons, and the specific subject matter to be taught.

The goal of the project may be to develop a completely new series of radio lessons. More likely, the project will be adapting a curriculum and lessons already used in another country. The effort and staff requirements depend on whether the adaptations are minor or major.

During the development or adaptation phase of the project, the following categories of personnel are needed:

- Project administrators
- Curriculum specialists
- Scriptwriters
- Radio producers
- Radio technicians
- Actors
- Musicians
- Evaluation specialists
- Teacher trainers
- An education economist
- An education anthropologist
- Clerical staff.

Some categories of personnel, such as project administrators, require long-term assignments. Others can make their contribu-

**Why
Staffing
Is
Important**

**Project
Administrators**

tion through short-term involvement. For example, the education anthropologist may be required only for an initial analysis of the target population.

All the people listed in the preceding section help make an interactive radio instruction project successful. This section discusses why each category of personnel is important to a project. It also suggests the types of people who might fill the positions.

Developing a new interactive radio instruction project is a complex effort, requiring many people performing a variety of functions. Effective management of all the resources and personnel is a large undertaking. Even a minor adaptation of a curriculum for another setting requires many of the same categories of people, if not the same numbers. The project administrators manage or guide all of the activities.

The following administrators are necessary in developing a new project. A project that is adapting a curriculum may need all, two, or one of them, depending on the scale of the adaptation and the experience of available personnel.

1. Field director. This administrator assumes overall management responsibilities for the project, including contractual responsibility to the funding agency. The field director usually has technical skills to contribute as well, for example, in instructional design, content specialization, or radio.
2. Assistant field director. In a large project, this person shares some aspects of management with the field director. He or she may direct the day-to-day technical activities of the whole team, provide training, or perform some other role.
3. Host-country administrator. If the field director is an expatriate technical advisor, there should also be a host-country administrator, with a locally appropriate title. The host-country administrator provides liaison with host-country institutions and the project. He or she also provides the continuity between development and implementation, becoming the chief administrator on full implementation of the project. It is important for the host-country administrator to share in all administrative functions of the project in order to ensure successful integration of the project into the educational system. Like the field director and the assistant

field director, he or she may also have technical expertise in one or more specific areas.

Curriculum Specialists

The curriculum specialists prepare the radio curriculum and ensure that the radio curriculum matches the approved curriculum in a subject area—for example, math, science, or English. If no approved curriculum exists, they may have to develop a new curriculum and have it approved before they prepare the radio curriculum. Curriculum specialists usually serve in other roles on the team as well, most often as scriptwriters. The number of curriculum specialists needed depends on the level of adaptation required. A minimum of adaptation may call for only one person.

Scriptwriters

The scriptwriters, of course, write the instructional segments that make up the scripts of the radio lessons. The number of scriptwriters needed depends, again, on the level of adaptation. If the adaptation is minor, one person may be able to do the job because he or she can keep the types of adaptation in mind and organize the tasks easily. Several scriptwriters will be necessary if new subject matter is to be taught and new scripts are to be written. The writing schedule will also affect the number of scriptwriters required. Writing one 20-30 minute script per day with accompanying student worksheets will require four to six writers, depending, of course, on their experience and skill.

Radio Producers

The producer (sometimes called the director) supervises turning the script into a radio broadcast. He or she is in charge of the studio and the personnel who record the lesson on tape for broadcast later. Only one producer is needed, although other staff members should be trained to substitute when necessary and to assist when the production load becomes heavy. An assistant producer can do much of the preparation necessary before studio production with the actors takes place. Assisting provides excellent training in analyzing the script for production ideas and in selecting the appropriate sound effects, music, and so on. In many studios, producers and writers exchange roles so that they gain experience in both jobs and understand the constraints of each.

Radio Technicians

The technicians, or studio engineers, run the broadcast or recording equipment. Under the supervision of the producer, lessons are actually taped and then played on the air. As with the pro-

ducer, only one is needed at any one time, but others should be trained to provide backup in a heavy production schedule. Producers often learn the technician's job so that they can step in if necessary.

Actors

The actors bring the scripts to life. They play the characters who instruct, provide examples and illustrations, and capture the learners' interests. The main requirement for actors is to present the instruction clearly. Their speech must be easily understood and their characters identifiable. Having actors who can play more than one role is an advantage, of course.

Musicians

Local musicians can provide music that is meaningful and interesting to the radio learners. Commercial recordings of music from other countries are never quite satisfactory. If the music is to be carefully integrated with the instruction, creative musicians are necessary to provide the right music for the right words. One musician may be enough, especially if he or she is also a talented songwriter. Complicated musical arrangements are not appropriate for instructional radio.

Evaluation Specialists

The evaluation specialists help determine whether the radio lessons are successful or not. They develop the strategies and tests necessary to judge the lessons' effectiveness and to evaluate the learners' progress. Formative evaluation is a continuing process that must inform the writers on a regular and timely basis whether the lessons are succeeding. Summative evaluation must rigorously test the overall effect of the instructional program to determine its cost-effectiveness. At least one full-time person should be hired to manage the evaluation of the lessons. Additional, part-time help will be necessary for writing and administering tests and for analyzing results.

Teacher Trainers

Teacher trainers design the teacher's notes and orient teachers to the broadcast lessons. At least one person on the team should have teacher training experience. This expertise may be provided by part-time assistance and training of team members if none have the experience. Short-term assistance should be available periodically to assess the effectiveness of the teacher training materials.

**Education
Economist**

Short-term assistance will be needed to evaluate the cost-efficiency of the radio lessons. It is not necessary to have an economist on the team, but having aid in designing a cost study and in interpreting the data is important.

**Education
Anthropologist**

Short-term assistance may be necessary in adapting radio materials from one culture to another. Someone with this training can more objectively identify instructional strategies, specific content, and other educational or media factors that will help make the lessons more effective.

**Clerical
Staff**

A number of efficient secretaries and other clerical staff are vital. Scripts must be prepared quickly and accurately if schedules are to be maintained. Print support materials also have to be available on time. The ability of the whole team to function happily and efficiently depends greatly on the support staff.

Others

Special circumstances of the host country may require other short-term staff members for technical assistance or training. Testing specialists, linguists, graphic artists, and engineers, for example, can help solve particular problems on projects.

**How
Staffing
Is
Accomplished**

The following sources can provide personnel with relevant experience:

- Departments of curriculum and instruction
- Departments of instructional radio
- Schools
- Departments of evaluation and testing
- Colleges, schools, and departments of education
- Free-lance writers
- Radio and television studios
- Professional and amateur theaters.

Most personnel will need specific training in the requirements of interactive radio instruction, but a mix of people from the institutions or disciplines just listed will provide the variety of experience necessary for a project.

To assess a job candidate's potential, a short test should be developed for each type of position. The test should require applicants

**How
to
Evaluate
Staffing**

to perform tasks similar to those involved in the daily work of the project. Candidates for scriptwriter positions should be asked to write some instructional segments, under guidance.

Administrators might judge the adequacy of a project's staffing by asking the following questions:

- ___ Are the number and the types of personnel adequate to achieve the goals of the project?
- ___ Have people been hired who have skills and experience in more than one area, so that some staff can trade jobs routinely, some can perform two roles, and some are available for backup when the workload becomes heavy? If the desired versatility is not present in existing personnel, is training being provided on the job?
- ___ Have host-country personnel been placed in roles that will ensure successful integration of the project into the country's educational system?
- ___ Have personnel been given training in the specific requirements of interactive radio instruction?
- ___ Is the balance of full- and part-time personnel adequate to achieve the goals of the project?
- ___ Have tests been developed to screen candidates for the various types of positions? Have the tests proved valuable in selecting competent personnel?

*Interactive
Radio
Instruction
Handbook*

*The
Production-
Cycle
Management
Plan*

4

The Production-Cycle Management Plan

*What
a
Production-
Cycle
Management
Plan
Is*

Production cycle refers to all of the various activities required to get an interactive radio lesson on the air. Production sometimes refers to what happens in the radio studio during the broadcast or the tape recording of a broadcast. The production cycle, as described here, however, includes many more activities: planning, writing, recording, broadcasting, and evaluating. These activities occur over and over as new lessons are produced. Each repeat of the process is a cycle.

Meeting broadcast deadlines and school timetables and maintaining high-quality lessons require a management plan that organizes and paces the multistep production cycle. All activities must relate to each other in the correct sequence and at the correct time. Essentially the production-cycle management plan is a tool for effectively organizing and controlling time, activities, and the people responsible for those activities.

A production-cycle management plan can be designed in a number of different ways, just as the same job can be done with different tools. This module discusses one plan. It can be adapted to different circumstances and conditions. For example, one set of conditions would apply in writing new lessons, another set in adapting lessons. The size and the experience of the staff create other conditions. The amount of time needed for each of the stages will vary depending on these conditions and will require changes in the production-cycle management plan.

The important point is that, whatever the conditions, a tool—a system—is needed for controlling time and activities. This tool is the production-cycle management plan.

*Why
a
Production-
Cycle
Management
Plan
Is
Important*

The production of interactive radio instruction requires the collaboration of several types of people with different skills. Each person on the interactive radio instruction team has a special contribution to make, but it must be coordinated with the creative work of others. To make the best use of people's time and creative energy, everything should run smoothly. If it does not, individual team members will become impatient, feelings will be hurt, tempers may flare, production will be slow, and the quality of the work will suffer.

Putting together an interactive radio instruction lesson is a little like building a house. One person can do it, but several people working together are probably better. One will know about the

overall design of the house, another about erecting the walls, another about putting on the roof, and so on. To build an acceptable house, they must coordinate their work. They must decide who will do what, in what sequence, with what tools and help. They must also agree on how to evaluate their work to determine when the house meets their standards.

The terms *production* and *management* are borrowed from industry and business. In these instances vast resources are expended, and large numbers of people must work efficiently together in order to create a product that will compete with other products and earn a profit.

Effective management of the production cycle is important for a number of reasons:

1. It clarifies areas of responsibility. A plan clearly shows each activity and how it fits with other activities. The person or persons responsible for the activity know what the deadlines are. (Also, other team members know who fails to meet his or her deadlines.)
2. It provides a sense of where the effort is going. The plan can show, in small increments, what the targets are. It can also show which targets have been met. This has important psychological effects in creating a sense of direction and accomplishment.
3. It ensures that school schedules and air dates are met. Gaps in a broadcast schedule can ruin otherwise good radio instruction. Teachers and administrators cannot take seriously radio lessons that fail to meet the school schedule.
4. It makes recordkeeping systematic and observable. On a collaborative project, records of what has been taught and what is going to be taught are essential. Individuals' memories cannot be relied on to keep track of increasingly complex information. Faulty recollection and lack of time for communication require a good system of recordkeeping to which each team member has access.
5. It calls attention to problem areas. Because the production cycle can be observed by all team members, any problems in meeting deadlines can be caught early and solutions provided. The problem may be a mechanical failure, a human failure, or an unrealistic target, but a solution is possible when the problem is clearly observable, before it gets out of hand.

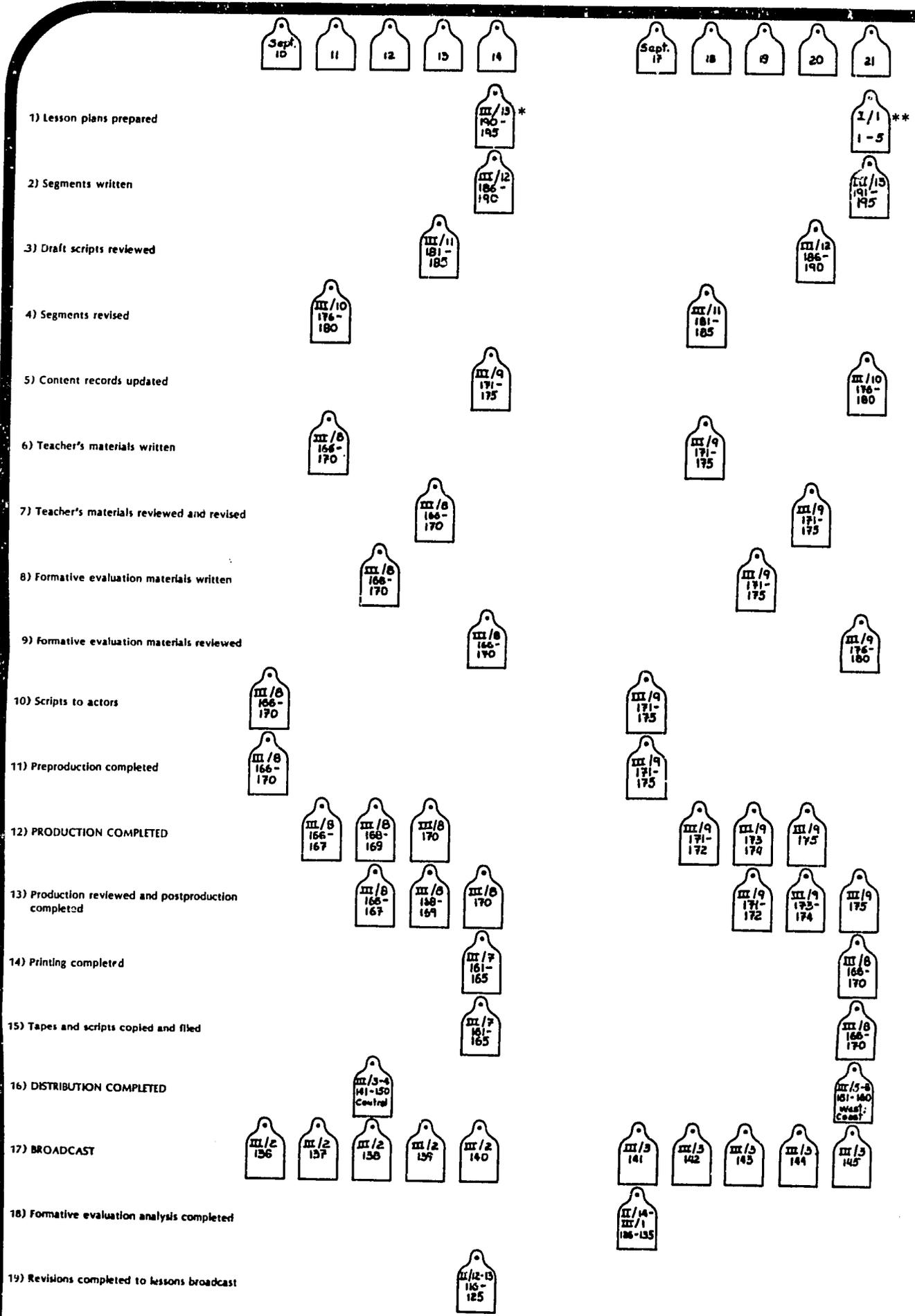
*How
a
Production-
Cycle
Management
Plan
Is
Developed
and
Displayed*

6. It ensures quality control. Quality is generally improved through the careful review of each aspect of a lesson. This review must be scheduled in the same way that writing or studio production is scheduled. The production-cycle management plan integrates review as one activity.
7. It increases creativity, reduces tension. When each staff member knows the areas of responsibility and the deadlines, it is easier to establish individual work habits that are satisfying but still produce the expected results. People can meet their own goals and are not under so much tension from last-minute efforts.
8. It uses time effectively. Another lesson from business and industry is that time is money. Because most educational efforts are produced under limited budgets, providing people with an organization that permits them to use their time productively is one of the most important results of an effective production-cycle management plan.

An important part of the production-cycle management plan is a device to visually display the schedule of activities and to measure progress in meeting the deadlines. This can be done on a large display board showing both the activities and their scheduled completion dates. The Radio Language Arts Project in Kenya hung a production board on the office wall where all staff members could see it. Figure 1 reproduces a section of the board covering two weeks' time.

Along the top of the board were entered a series of dates, each representing a week. Down the left side were listed all of the activities required to produce the lessons. A paper tag, designating a week's worth of programs, was hung next to an activity under the appropriate deadline. When the activity was completed, its tag was turned over. On any date, the team could look at the production board, locate the activities planned for completion by that date, and determine if they were finishing on schedule. In weekly team meetings the entire team reviewed progress and turned over tags for activities completed. When the last activity was completed and its tag turned over, the staff knew the lessons had been broadcast and evaluated. The package was ready to be stored for use with new students the following year.

The production board is a very effective management tool that serves two major purposes. First, it helps organize the production team's time by giving specific deadlines. Second, it helps the project manager and the team track their progress. The following



* End of term III standard 2 week 13 lessons 190-195
 ** Beginning of term I standard 3 week 1 lessons 1-5

Prebroadcast Activities

discussion represents a modification of the production-board system used by the Radio Language Arts Project in Kenya.

The list of activities on the production board can be broken down into three sections. First are the prebroadcast activities. Next are the lesson-package delivery and the broadcast itself. Last are the postbroadcast activities.

Prebroadcast activities include the following:

- Preparing lesson plans
- Writing segments
- Reviewing scripts
- Revising scripts
- Charting the lesson content
- Writing teacher's materials
- Revising teacher's materials
- Writing formative-evaluation materials
- Revising formative-evaluation materials
- Getting the scripts to the actors
- Preparing for production
- Producing and recording each lesson
- Revising after production.

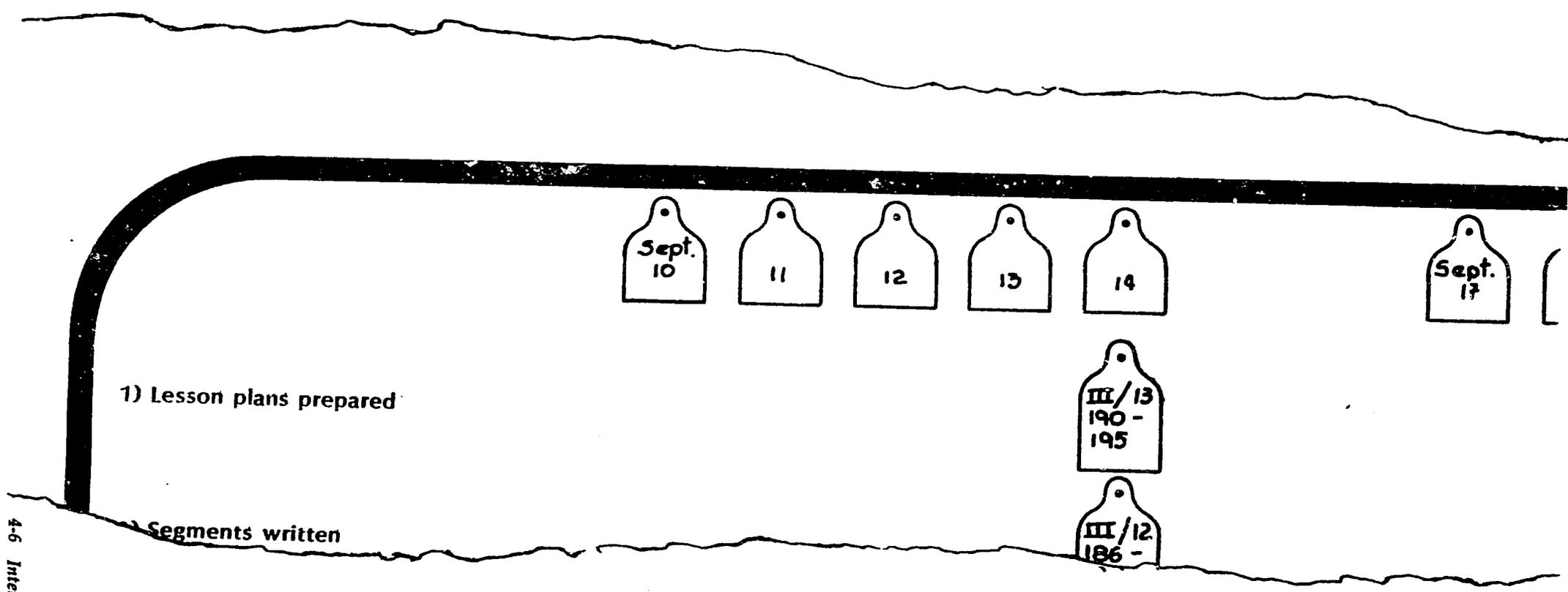
Some of these activities are discussed in detail in other modules. The reader will more readily understand the production-cycle management plan through a look at this sequence of prebroadcast activities and the way in which they are scheduled. The curriculum, at this point, is already prepared.

Preparing Lesson Plans

Lesson plans provide outlines and suggested methodology for teaching the curriculum. It is advisable for one person to write lesson plans. Other team members should learn how to write them, but on a day-to-day basis maintaining the same type of lesson plans for the scriptwriters is easier if one person is responsible.

Lesson plans are prepared in sets of five, that is, one week's worth of broadcasts. In the row of the production board extending horizontally after the label Lesson Plans Prepared, a tag with the

Figure 2



lesson number is placed under the scheduled completion date at the top (see Figure 2).

Writing Segments

A segment is a portion of the radio lesson complete in itself but related to other segments in the day's lesson and in future lessons. Segments range in length from a few seconds to a few minutes. The script format agreed to for an entire year—or some suitably long period—indicates how many segments go into a set of lessons. These segments are divided among the writing team. Some team members may be full-time writers; others may be part-time because they may have other duties as well.

Segment writing cannot begin until the lesson plans are finished. The scheduled completion dates should therefore fall an appropriate length of time after those for the lesson plans. These dates are indicated on a horizontal line after the label Segments Written and under the target dates (see Figure 3).

Reviewing and Revising Scripts

The scripts are best reviewed in several steps starting with the small segments. This activity might be broken down on the production board as Segments Reviewed, Segments Revised, and Final Scripts Revised. A team with limited experience should have a more thorough review process, which will result in fewer changes later on. Therefore, the smaller segment steps are probably advisable. Each activity would, of course, have its own scheduled completion date indicated on the production board.

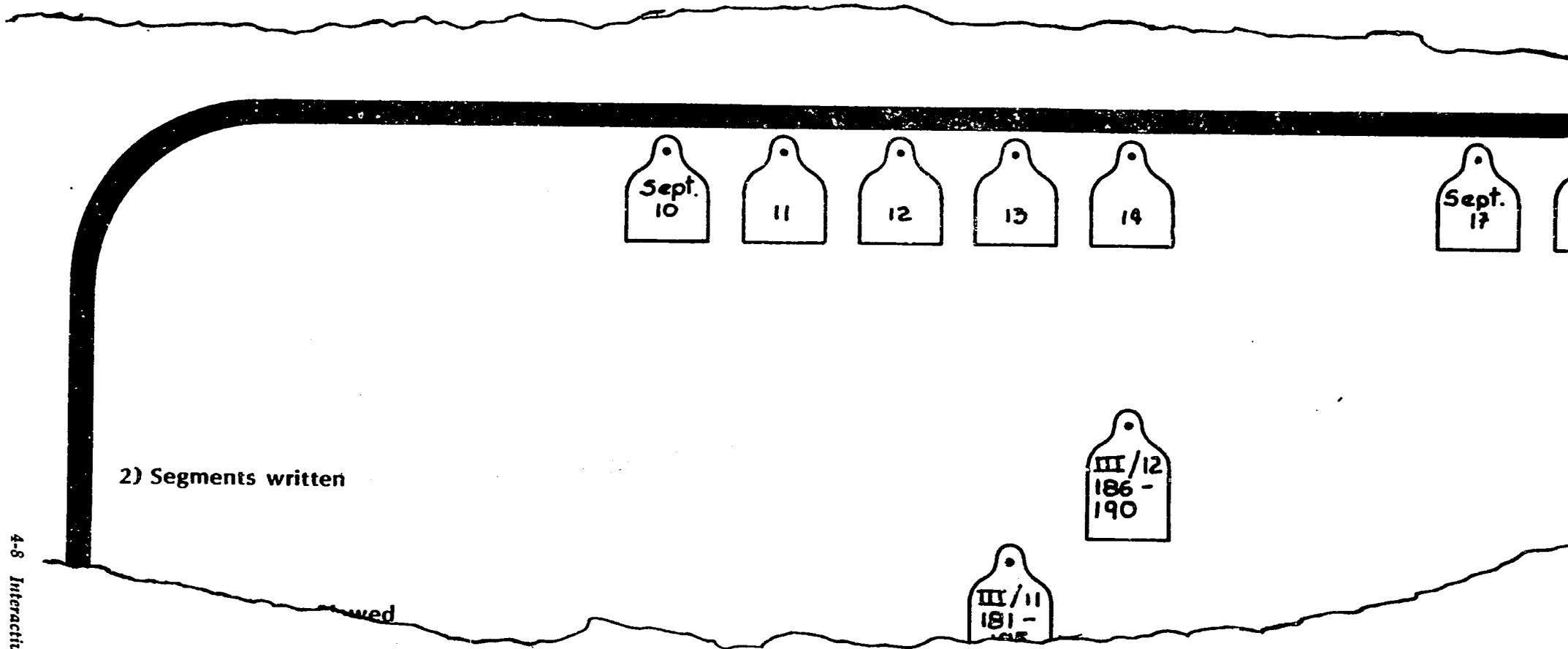
Charting the Lesson Content

The content that is taught in the lessons should be carefully noted down and up-to-date records kept. This enables scriptwriters to look at the records or charts and tell whether items have been introduced, how much they have been practiced, and so on.

In language teaching, for example, a vocabulary list is important. Words used should be marked down, and when the words are used again, they should be checked off. This need not be done throughout the cycle—just until it is reasonable to assume that the vocabulary item has been mastered. The rule of thumb in Kenya was 15 occurrences.

This kind of charting is equally important in other subjects. In teaching, introducing a concept or a skill once and then dropping it is not enough. The scriptwriters cannot rely on memory alone to ensure that items have been used sufficiently. Records must be kept current.

Figure 3



Writing and Revising Teacher's Materials

Interactive radio instruction projects to date have made use of teacher's notes and pupil materials. The pupil materials are written, reviewed, and revised along with the broadcast scripts. The teacher's notes are prepared later so as to include any special instructions for carrying out the lessons. These activities may also be broken down into small steps: Teacher's Notes Written, Teacher's Notes Reviewed, and Teacher's Notes Revised. Each activity should have its own completion date—an appropriate length of time after the lessons are written and revised.

Writing and Revising Formative-Evaluation Materials

Formative evaluation may be carried out using a variety of materials: observation instruments, self-reporting forms, tests, and so on. Whatever materials are used, the purpose is to find out how well the radio lessons are working and how they might be made more effective. The formative-evaluation materials are based directly on the lessons and thus should be scheduled for completion some time after the lessons have been completed.

Getting the Scripts to the Actors

The radio actors need the final, approved scripts a few days before they rehearse and record the radio lessons. This requires making sufficient copies and distributing them in a timely fashion.

Preparing for Production, Producing and Recording Each Lesson, and Revising After Production

The producer also needs the script in time to schedule the production and to help the technician get any preproduction work under way. Special sound effects and recorded or live music must be selected and organized.

Then the script comes to life in the recording studio. The set of lessons that started as lesson plans is now recorded.

In some cases, postproduction work may be required. Most often, postproduction work is necessary to make minor adjustments in the length of the broadcasts, balance the volume between effects and voices, and the like. Major problems should have been taken care of during the recording.

***Lesson-
Package
Delivery
and
Broadcast***

When the foregoing activities are completed, the lesson package is ready for delivery and broadcast. The package includes the following items:

- A copy of the actual script used for the production of the radio lesson
- The tape-recorded lesson ready for broadcast
- Teacher's notes
- Pupil worksheets
- Formative-evaluation materials.

The remainder of the production cycle is shorter than the preparation of the lessons. Nevertheless, each activity should be included on the production board with an appropriate deadline.

Delivery includes the following:

- Completing printing
- Making sure that the taped lessons are delivered to the radio station in time for the broadcast
- Distributing the teacher's notes and pupil worksheets to the schools and getting the observation materials (forms, tests, etc.) into the hands of the observers
- Evaluating the effectiveness of lessons by observing children participating during the broadcast.

***Postproduction
Activities***

Postproduction activities are as follows:

- Reviewing the results of the formative evaluation
- Deciding whether (and if so, how) to revise the materials, and duplicating all of them for the files.

By the time the lessons and the broadcast are completed and postbroadcast activities are undertaken, the lesson planners, the scriptwriters, and the producer are well into the next cycle of activities.

**How
to
Evaluate
a
Production-
Cycle
Management
Plan**

How does a team know if its production-cycle management plan is effective? The following questions may help in evaluating a plan:

- Has a broadcast been missed?
- Are all deadlines being met?
- If all deadlines are not being met, is the source of the problem known?
- If the source of the problem is not known, is the plan detailed enough?
- Are some important activities being omitted?
- Is the plan too detailed? Is too much time being spent on planning and not enough on doing?
- Does the work seem to flow smoothly, or is there always a crisis?
- Are deadlines being met at too much personal expense? Are team members short-tempered, tense, unhappy?
- Do team members know what they will be doing next week? Next month?
- Can team members report to others on how well they are meeting production deadlines?

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5

*Interactive
Radio
Instruction
Handbook*

*Curriculum
Design*

5

Curriculum Design

What Curriculum Design Is

Instruction may be delivered in a number of ways: by teachers, textbooks, computers, televisions, radios. Effective instruction is organized by a curriculum, and the shape of the curriculum is affected by the medium, or the combination of media, used to teach students. This module describes the process by which a curriculum may be adapted to make it teachable by radio.

A curriculum, once adapted for radio, is the guide for scriptwriters. It provides the basic elements, which scriptwriters bring to life through activities that are appropriate to the subject, the learner, the time available, the resources, and good radio use.

A curriculum is a "map" of a body of knowledge or a set of skills. It shows the particular features that are important, and it shows the ways to get from one place to another, usually starting from where the learner is.

Different kinds of curricula are designed for different purposes, just as different kinds of maps are. One kind of map, for instance, emphasizes roads, trails, or paths, that is, the routes for getting from one place to another. Another kind of map features the bodies of water in a region or a country, that is, streams, rivers, lakes, and oceans. Still another type charts the terrain, showing elevations of land, mountains, hills, and valleys. Examination of each type of map tells a little more about the territory being studied, but no single map provides all of the information.

A curriculum also selects and emphasizes certain parts of a subject. All of a subject cannot be absorbed in a limited period. Some subjects require a lifetime of study. Even then, no individual can know a subject completely—all of the English language or all of mathematics, for instance. At any stage of learning, one knows only a portion of the total subject. A curriculum is someone's judgment about what students should learn in a certain span of time, for example, in three, six, or nine years of schooling, or in a much shorter time—say, eight hours, six weeks, three or six months.

A curriculum—a map of a subject being taught—is designed by considering the subject, the learner, and the time available. The design may also take into account other variables, for example, what the learners intend to do with their knowledge or skills, what resources are available, and what medium of instruction is being used. The curriculum designers, who are often a group of educators rather than a single person, analyze the variables

*Why
Curriculum
Design
Is
Important*

carefully in order to create the best map for learners under the circumstances.

A curriculum is usually a compromise. The designers would almost always like more time for instruction than is possible and more resources (such as laboratories, audiovisual aids, and supplementary materials) than are available. Also, as just noted, what is included in a curriculum represents only a small portion of the entire subject.

A curriculum is a guide for instructional-materials writers and teachers. If teachers have no textbooks, they use the curriculum to identify the basic content of a course. They then provide the details, the examples, the exercises, and the contexts for using the curriculum. It is as if they have been given a map of roads and they must fill in the rest of the countryside.

A curriculum design is dictated partially by the nature and logic of the subject matter itself (language, mathematics, science, history, geography, and so on). But as already suggested, it also takes into account the learner, the time available, the resources, and the medium of instruction.

The medium in this case is radio. Most curricula are developed to be taught by a teacher in a classroom setting. A curriculum may be incorporated into or supported by a textbook and supplementary instructional aids. Interactive radio instruction is designed for situations in which some of the usual curriculum resources are not available. The curriculum is not incorporated into or supported by a textbook. The children probably do not have textbooks. Supplementary instructional aids are minimal if they are available at all. So the radio transmission carries the major burden of instruction, in support of a teacher, but often a lesser-trained teacher, perhaps even a teacher's aide.

A curriculum for radio teaching must have a special design that takes into account the following features or constraints:

- Lessons are usually shorter than in regular classes on the same subject, partly because radio lessons are so carefully structured.
- More redundancy in lessons is necessary because radio is a strictly aural, one-way medium.
- The curriculum is conveyed through aural lessons, not through textbooks or other print material.
- Radio teachers are not expected to clarify, explain, or discuss

*How
Curricula
Are
Designed*

very much, as teachers might do in a regular classroom. The radio instruction must be sufficient in itself.

- Radio lessons must be lively because the radio teacher cannot observe how children are responding.
- Radio lessons cannot adjust the pace of instruction in response to the context or the mood of each class.

An excellent way to explain how curricula are designed is to relate an actual experience in adapting an established curriculum to interactive radio instruction. The example used is the English curriculum for the first three standards, or grades, in Kenya.

Specification of the radio curriculum occurred in three developmental stages:

- The Kenyan English syllabus was analyzed.
- The content was reorganized as a yearly plan, which was called the Scheme of Work.
- On the basis of the Scheme of Work, daily lesson plans were developed.

*Analyzing
the
Syllabus*

The Kenya Syllabus for Primary Schools: English specifies the curriculum content for all English instruction in Kenyan public schools. The curriculum is implemented through a series of textbooks called *The Progressive Peak English Course*. The syllabus and the texts were developed, tested, and adopted several years ago after the usual extensive review process followed by the Kenya Institute of Education.

Objectives

The first step in analyzing the syllabus was to see whether the objectives were compatible with radio instruction in English. The syllabus summarized the objectives as follows: "All children should acquire a sufficient command of English in spoken and written form, to enable them to communicate freely, follow subject courses and textbooks, and read for pleasure in the language." More specifically the syllabus indicated that children who completed Standard 7 should have the following:

- A pronunciation of international intelligibility
- A good ear for language
- A working command in the necessary skills of words and phrases (including idioms) of general serviceability

- A working command in the necessary skills of grammatical items (often referred to as "Sentence Patterns") of general serviceability.

Behaviors

These objectives were not specific enough in behavioral terms for daily lessons or instructional segments within lessons. One task identified from the analysis of the curriculum, then, was further specification of the instructional objectives. Objectives needed to be developed for each skill area—listening, speaking, reading, and writing. A typical speaking objective stated in behavioral terms might be "to talk about getting up in the morning and to describe the situation." This behavior requires the integration of considerable language, but focuses on the communication activity of speaking within the linguistic environment of the home. The objective tells what the learner is expected to do: speak. It also indicates what (the content) he or she is to speak about: getting up in the morning. The designers wrote a series of such objectives that became part of the basic planning document, the Scheme of Work.

Vocabulary

Many curriculum guides and syllabi list the vocabulary to be taught at each standard or grade. The vocabulary taught in any language program is somewhat arbitrary, but selections are generally made on the basis of immediate utility, learners' familiarity with objects and activities in their experience and environment, and learners' interests.

Psychologists have identified a number of practices that foster vocabulary learning:

- Learners acquire vocabulary more easily if it is related to their needs and if words are grouped and taught together in a meaningful way. For example, words related to food and eating can be learned more easily if they are introduced together in the context of food-related activities, than if they are introduced with other words and activities.
- Vocabulary exercises normally are more effective if they create or simulate a social and communicative setting, which encourages speakers to talk to each other in a lifelike way.
- Concrete words are easier to learn than abstract ones. So, for example, words in Kenyan children's rural experience were easier for them to learn than words like *important*, *slightly*, and *know*.

- The exact meaning of function words, such as the prepositions *to*, *for*, and *around* or the articles *a*, *an*, and *the*, is difficult to understand. The words occur with such frequency in English, however, that they usually become clear over a period of instruction.

The point is that one can be somewhat flexible in presenting vocabulary and need not worry about the presence or absence of individual words. Obviously, in Kenya, introducing the word *sun* is more important than introducing the word *snow*, but if a learner never learns the English word *carrot*, he or she will still be able to buy carrots. Following predetermined vocabulary lists rigidly is not necessary; a better principle is to introduce vocabulary that fits the communication situation and the behaviors that are being taught.

Modifying an existing list is easier than developing a new one. The Kenyan syllabus included two sets of vocabulary items for each of the seven years of primary English, one set for listening and speaking, the other for reading. Together the sets encompassed 1,600 oral and 1,200 reading words. The syllabus did not specify the level of mastery expected of learners. Scriptwriters incorporated most of the words and added additional words as necessary for situations used in the lessons.

Structures

Somewhat more uniformity of opinion exists on the basic English structures, or sentence patterns, that learners need to acquire, than exists on the vocabulary they should learn. Most language teachers agree that simple subject + verb + object sentences are easier and pedagogically more useful than complex sentences that include several prepositional phrases, subordinate clauses, and so on. Although adult native speakers of the English language may use many complex sentences, the beginning language learner more easily acquires an understanding of the way in which the language works by mastering simpler, basic sentences.

The sentence patterns listed in the Kenyan syllabus for the first three standards were very similar to those in many beginning programs for teaching English as a second language. There were 45 sentence patterns for the first year, 45 for the second, and 30 for the third.

Given the density of the sentence patterns in the syllabus, it was unlikely that very many Kenyan children ever approached mastery of the more complex structures. Designers should question whether it is better for learners to master fewer simpler sentence

Figure 1
A SAMPLE FRAME

Standard 2, Frame 13

Version A 10/1/82
Begin Term II

Topic	Skills	Competencies	Structures	Vocabulary	Additional Notes
Getting up	A. Listening	1. Understand descriptive words related to morning and getting up. 2. Begin to hear difference between verb forms, e.g., She looks into the room. I look into the room.	1. It's dark at night. 2. It's raining. 3. Is there somebody in the room? Yes, there is. No, there isn't. 4. There's somebody in the room. 5. There's nobody in the room.	1. light (noun) 2. turn on 3. turn off 4. call 5. leg 6. shoe 7. put away 8. down 9. neck 10. night 11. asleep 12. safe 13. woke up 14. dark 15. light (adj.)	Use first-person narrative-like worksheet to show verbs. Follow-up: RWU, 1-17 Worksheet 1 2-3 family members getting up—mother, daughter
	B. Speaking	1. Talk about getting up and describe the situation.			
	C. Reading	1. Comprehend narration of series of events based on habitual order.			
	D. Writing	1. Write answer to question: Is there somebody in _____'s room? 2. Write from dictation: She wakes up. I wake up.			

*Reorganizing
the
Content
into
a
Scheme
of
Work*

patterns and study some of the more complex ones later, or to give learners the widest opportunity to use real language and acquire what is most useful for them individually. Again, opinion is not uniform. For the Kenyan radio curriculum, because the curriculum had been thoughtfully designed and the textbook series covered all of the sentence patterns, the same approach was taken. To be consistent with the behavioral objectives and the situations developed in the Scheme of Work, however, the sentence patterns were presented in a different order.

From the language content of the syllabus and the rather universal objectives, the designers developed a systematic series of curriculum units, the Scheme of Work. The Scheme of Work was, in effect, a restated version of the Kenyan English curriculum. It formed the basis for lesson planning, radio methodology, and script development and was also the standard reference point from which formative-evaluation test items were written.

The Scheme of Work was divided into frames, the number per year corresponding roughly to the number of weeks in the year. Most frames required one week for initial teaching. The complex ones required more time, the simpler ones less. Each frame had a unity in the relationship developed between vocabulary, sentence patterns, and the topic or situation suggested for using the language. Figure 1 shows how each frame was organized. The column headings in Figure 1—topics, skills, competencies, structures, vocabulary, and additional notes—are discussed below.

Topics

Topics are suggested settings for the dramatic action of a script. They are situations or activities requiring communication, around which vocabulary and sentence structures can be used realistically. When topics are used the first time, they provide the context for introducing new language. When they are repeated, they enable scriptwriters to integrate and expand the language at a more sophisticated level. Topics should be ones familiar to children.

Skills

Traditionally, language teaching focuses on the four skills listed in the second column of Figure 1. It is desirable for scriptwriters to be aware that certain objectives, or competencies as they are called in the Scheme of Work, can best be achieved through the practice of one skill alone rather than two or more together, even though the skills frequently overlap in real life. Listening and

speaking are usually paired in normal communication, but educators expect learners to be able to understand much more than they can speak. For purposes of instruction, each skill can be isolated and emphasized.

Competencies

One way to state competencies in language teaching is to stress "linguistic items"—words and structures—particularly their forms. In this approach, exercises point out and call for a practice of the formal or grammatical differences. For example:

She looks into the room *every day*.

She *looked* into the room *yesterday*.

Consistent with current language-teaching trends, the designers of the Kenyan radio curriculum added another approach. The competencies for a frame were stated somewhat generally, indicating what students were expected to be able to do with the language. The relationship between sentences in an exercise was based more on meaning than on formal differences. Students were expected to speak three sentences like the following based on a real-life situation:

I get up at 7 o'clock. I wash my hands and face. My mother makes my breakfast.

Naturally, the objective was for students to know correct forms—the difference, for example, between *I wash* and *She washes*. The focus was on communication, however, not on grammar for its own sake.

Structures

The essential structures specified by the syllabus were covered. They were grouped, as much as possible, into clusters that related to the topics and provided the basic grammar necessary to achieve the competencies identified for the week.

Vocabulary

The vocabulary was also grouped to relate to the topic. Script-writers tried to use the vocabulary listed because it was from the syllabus. They had freedom, however, to delay teaching words that were not appropriate and to introduce words from later frames that were more useful. They also, of course, used previously learned words.

Additional Notes

The additional notes, mainly for the production team, referred to miscellany related to the frame. As in the sample, notes would

*Developing
Daily
Lessons*

often suggest follow-up activities (here a reading selection in the school textbook) or topics for worksheets to accompany the scripts. Notes also indicated integrative activities, messages for the teacher's notes, etc.

The essential aim of the curriculum design was to preserve the linguistic content of the Kenyan syllabus, to sequence individual items differently in order to take advantage of the radio medium, and to specify measurable objectives in order to evaluate the success of teaching. The next step was to amplify the curriculum into daily-lesson or script plans, including suggested teaching methods.

Linguistic Principles

The major focus was on communication. A few general principles guided the treatment of the linguistic aspects of the syllabus.

First, throughout the three years of the project, the focus was on the grammar system (syntax), rather than on the sound system (phonology) or the word-form system (morphology). For academic purposes, children need a thorough grasp of the basic structures of the language more than they need perfect speech. Comprehension of the grammar system allows students to incorporate new language into the system as they mature. As they learn to read extensively, they gain both language experience and knowledge of the subjects they are studying.

Notwithstanding the project's emphasis on grammar, from time to time, exercises, games, and drills were devised that emphasized sound or form contrasts—voiced and voiceless consonants, verb tense forms, and so on. Indeed, it became necessary to develop exercises to stress sound contrasts that were perfectly clear in live speech but did not come across very well in areas of poor radio reception. For example, during the first year, children had great difficulty producing the initial sounds in the pronouns *he* and *she*. The designers suspected that the children in poor reception areas were hearing a generalized noise for both sounds. The children's belief that they were hearing the same sound for both pronouns was probably strengthened by the fact that third-person-singular pronouns in many Kenyan languages have no gender contrast. In Swahili, for example, *yeye* means *he* or *she*.

Exercises were developed to contrast these sounds. Other exercises differentiated initial and final voiceless stops [*p*], [*t*], and [*k*]. Infrequently, exercises pointed up contrasts such as singular and plural noun forms (*boy, boys; book, books; box, boxes*); third-person-

singular and non-third-person-singular verb forms (*she sings, you sing*); and present- and past-tense verb forms (*I walk, I walked*).

The second principle followed in the treatment of the curriculum's linguistic aspects was to proceed from the simple to the complex. Linguistic complexity is a combination of sentence length and intuitively judged syntactic complexity. In the early stages, children were asked to repeat or produce three-, four-, or five-word sentences. These sentences became longer and syntactically more complex as time went on. However, when children encountered unfamiliar material that they were required to repeat, they were not able to repeat more than 10-15 words. Formative evaluation of early lessons showed where they were too complex.

Third, later in the first year and from the beginning of the second year, the designers followed the principle of emphasizing global sentence-marking elements—for example, *wh-* words such as *who* or *what*. These helped the learner recognize very quickly, for example, whether a sentence was a question or a declaration, whether it was negative or positive, and whether a clause was coordinate or subordinate. Such elements are much more important for comprehension than "local" elements like single nouns and verbs. To put it another way, the global elements are basic to communication, the local elements are niceties.

At a relatively early stage, then, children were introduced, say, to the various question forms of English, together with appropriate answer forms. Thus, they quickly internalized the contrast between questions requiring a simple *yes* or *no* answer and questions beginning with *wh-* words, requiring more complex answers. And they recognized the appropriateness of using *because* in response to *why* questions. By acquiring command of these words, children could interact with radio characters through question-and-answer dialogues.

Lesson Plans

The lesson plans consisted of the following parts and related directly to the frames:

- A breakdown of the overall competency for the week into behavioral objectives
- A breakdown and a sequencing of a structure into daily lessons
- Specification of the number of segments for a structure
- Suggestions for situations and dramatic contexts for teaching a structure

*Factors
Affecting
Adaptation
for
Radio*

- Appropriate methodology for the content
- Notes on the best use of the radio, the classroom teacher, and follow-up sessions.

Some plans provided more detail in one area than in another. Each one, however, provided the scope and sequence for a week and specific suggestions to help scriptwriters get started.

Curriculum designers structured the Kenyan schools' English curriculum so that scriptwriters could turn it into radio lessons. A number of factors affected decisions at every stage. The most important ones in adapting an English curriculum included the following:

- The medium for delivering instruction, in this case, radio
- Language, including the target one (English), the learners' mother tongue, and any other language the learners already knew
- The learners themselves—their known skills, experience, culture, and so on.

Many factors had less influence on curriculum adaptation, more on scriptwriting, production, and formative evaluation.

*How
to
Evaluate
Curriculum
Design*

The following questions may be helpful to readers in assessing whether they have achieved their objectives in curriculum design:

- Does the curriculum take into account, at a minimum, the subject, the learner, the time available? Does it, as well, reflect what learners intend to do with their knowledge or skills and what resources are available?
- Does the curriculum take into account the constraints and the features of radio as a medium—brevity, redundancy, aural presentation, self-sufficient instruction, liveliness, and inability to adjust to a class's mood or context?
- Are the objectives of the curriculum compatible with radio instruction?
- Are the objectives sufficiently specific in behavioral terms for measurement of their accomplishment, or is further specification necessary?
- Are the practices selected for use in the curriculum known from research or professional consensus to foster learning of the particular subject?

-
- Does the Scheme of Work accurately state/restate the objectives of the new curriculum/the curriculum being adapted for radio instruction?
 - Does each frame of the Scheme of Work have unity among its elements?
 - Does each lesson plan relate directly to its corresponding frame in the Scheme of Work, breaking competencies down into behavioral objectives, daily lessons, segments, suggested topics, recommended methodology, and notes on uses of the medium, the instructor, and follow-up?

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*Interactive
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*Scriptwriting
for
Instructional
Radio*

6

Scriptwriting for Instructional Radio

*What
Scriptwriting
for
Instructional
Radio
Is*

Scriptwriting for radio is the process of creating a written version of a radio program. In most cases a script is a word-perfect representation of every sound and action a program will contain.

In instructional broadcasting, a script takes its substance and direction from a curriculum, a guide to a body of knowledge or a set of skills. Curricula are designed by educators to emphasize the knowledge, skills, and attitudes they judge to be most important to students at a particular time. Module 5, *Curriculum Design*, discusses curriculum in more detail and illustrates the relationship between scriptwriting and curriculum design. It should be studied in conjunction with this module.

Scriptwriting for all types of instructional radio follows certain general principles and guidelines. Principles and guidelines pertaining to the following topics are discussed in this module.

- Suiting the script to the medium
- Suiting the script to the audience
- Segmenting the lesson
- Maintaining spontaneity.

Distinctive principles and features of scriptwriting for interactive radio instruction are treated in Module 7.

*Why
Scripts
Are
Important*

The script is one of the key components of instructional radio. It is where content goes in, where methodology is realized, where the goal of instructional broadcasting—the seamless joining of the educator's and the broadcaster's arts—is accomplished. In instructional broadcasting, an entire program is carefully and completely scripted in advance. This ensures accurate content, appropriate pacing, and overall balance. If words or sentences were left for actors to create, instructional content might be misrepresented. Scripting in advance also provides a written record of what is broadcast.

*How
Scriptwriting
Is
Accomplished*

*Basic
Considerations*

The instructional radio scriptwriter should keep in mind three important considerations:

- The special characteristics of the radio medium
- The methods by which radio can simulate or substitute for regular classroom instruction
- The listening skills of the audience.

Special Characteristics of the Medium

Radio is an aural medium. Everything the audience is required to understand must be conveyed through sound—voices, music, and sound effects. Because sound is so central, using a lot of it is tempting. The secret is to find the perfect balance—enough sound to convey the message, not so much sound that confusion results. Effective employment of voices, music, and sound effects in instructional radio is discussed in more detail later in this module and in Module 11, *Music and Sound Effects*.

Simulating or Substituting for Regular Classroom Instruction

Many kinds of learning situations exist in schools. Radio instruction can be similar to some types of classroom instruction. One such type, a traditional model, is called direct teaching. In this model the instructor has specific knowledge or skill to transmit to learners, and the attributes of a successful learning environment include organization, discipline, motivation, and care and concern. The instructional radio scriptwriter might simulate or substitute for these in various ways. For example:

- **Organization** Follow a format based on the curriculum and on specific objectives for lessons and segments.
Follow an efficient teaching strategy: introduce the topic, demonstrate, allow practice, constantly reinforce right answers, summarize.
- **Discipline** Provide consistent periods of work, physical activity, and relaxation.
- **Motivation** Use appealing aural cues, songs, and exercises to stimulate learners' interest.
- **Care and concern** Give children the opportunity to know radio characters. Allow the personalities of the characters to come through.
Accommodate children who cannot keep up (e.g., through regular review segments).

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There is also the question of what materials and teacher assistance are available on site. In some instructional radio series the broadcast provides the content—the background, the method, the problem—and the classroom teacher and the students practice, analyze, and problem-solve to get ready for the next program. Programs in science and math may leave the students with an experiment to conduct, an application of a principle to test, an assignment to collect specimens, etc.

Listening Skills

One of the first responsibilities of instructional radio scriptwriters is to be aware of the listening skills of their audience. The term *listening skills* refers to an individual's ability to understand information received through the ear alone, without the aid of visual stimuli.

Listening to radio with understanding is to some degree an acquired skill. Radio is an artificial medium, producing sounds dissociated from their original source. Normally a human voice comes from an identifiable, live body. A human voice issuing from a "box" is at best a partial person, who may initially lack reality for the unsophisticated listener.

In natural listening, sounds emanate from different, identifiable sources—a bark from a dog, engine noises from an auto, music from an instrument. In radio, all sounds emanate from the same apparent source—the radio receiver. A leap of faith is required for a listener to imagine a bird or a car merely by hearing a chirp or a horn through an electronic box.

Moreover, the process of recording a sound creates some distortion. The sophisticated listener makes allowances for the distortion and hardly notices it. To the uninitiated ear, however, even slight distortion, together with the lack of a visible object to assist identification, can result in confusion.

When a number of sound clues are used simultaneously or in rapid succession, the demands on the listener increase. He or she is now expected not just to infer a source from the sounds but to project a narrative sequence from them, in much the same way that a reader draws meaning from imagery in poetry. This raises the question of the degree to which sequenced, narrative imagery can be sparked by sound alone (including the human voice). Not much research has been done on the subject, but evidence shows that when radio is to be the chief medium of instruction with unsophisticated listeners, scriptwriters should prepare several programs in the early part of the series that orient the audience to listening to radio in a learning mode. In such orientations, script-

General Principles

writers should remember that listening for learning is different from listening for entertainment and from absorbing background noise without paying close attention. Observing radio classes regularly helps scriptwriters be sure that the level of listening skills is adequate for the learning that is to take place. To reinforce good listening habits, the scriptwriter may find it useful to develop special listening-skill exercises from time to time during the course.

Suiting the Script to the Medium

Radio is a powerful dramatic medium. Before the age of television, radio was as appealing a storyteller as it was a music machine. Even now, in locations where television is unavailable, radio can be an exciting storyteller. The instructional scriptwriter's challenge is to capture the narrative and dramatic power of radio for use in education.

The term *story*, in instructional broadcasting, means the dramatic dialogues and short narratives commonly used in radio lessons. Although passages of this kind may not qualify as stories in a strict sense, most scriptwriters keep basic narrative and dramatic principles firmly in mind as they write.

Principle 1: The story itself—the plot—is usually not as important as the telling of it. A good story is a well-told story, not merely a clever or original plot. In fact, really new plots are rare. What keeps audiences interested in stories is largely the way in which they are related—through skillful and consistent use of narrative techniques. Such techniques can be learned, and the writer who masters them can hold an audience whether or not the plot is new.

Principle 2: Stories involve conflict. All stories have conflict and resolution. Without movement from one to the other, there is no story. Instructional radio scripts often do not contain complete stories, but the principle of conflict is still important.

Conflict can occur between two people who want different things. For example, Carlitos wants to play with his friends, but Abuelo says he must help in the garden. When the radio is playing her favorite music, Sarita likes to turn it up loud, but the noise disturbs the neighbors.

Or there can be inner conflict, a personal crisis. Claudia has broken a dish, and she is afraid to tell her mother: What should she do? Owino has enough money to buy candy or a carton of milk: Which should he choose?

Conflict can be the action of heroes or historical figures struggling against nature or caught in the course of great events. After months at sea, Columbus has not sighted land, and his men are near mutiny: Will he turn back? (Even though everybody already knows the answer, if the story is told with dramatic flair, listeners will feel and enjoy the suspense.)

Principle 3: Stories arouse curiosity and delay its satisfaction. Good stories make people want to know something--What is the answer? What is going to happen? But they withhold the key information until the tale is nearly over. The principle applies even when the resolution is obvious, or when, as in the case of Columbus, the answer is already known.

Principle 4: Stories have a moment of crisis, followed quickly by a resolution. Well-told stories nearly always have a similar structure: Tension builds slowly toward a crisis, at which moment the writer gives the audience the answer to the question or the solution to the mystery. Then, with the crisis resolved, the tension falls away quickly, and the story comes to an end. An extension of the earlier example illustrates: Claudia, having broken the dish, worries and thinks about her choices for three 30-second segments. In the fourth segment the following crisis and resolution occur. The notation FX stands for sound effects.

1. FX BROKEN DISH FRAGMENTS 2. FADE UNDER LINE 2
2. MOTHER: (OFF MIKE) Claudia . . .
3. CLAUDIA: (THOUGHTFULLY) Oh! . . . She's found the dish . . . What will I do?
4. MOTHER: (ON MIKE) Claudia, did you break this dish?
5. CLAUDIA: (ALMOST IN TEARS) . . . Yes . . . It was an accident . . .
6. MOTHER: (FIRMLY BUT KINDLY) All right, dear . . . I know it was an accident. But try to be more careful.

The moment of crisis is Mother's discovery of the broken dish. Claudia is forced to act. What will she do? Tell a lie? Say her sister did it? And how will Mother react? Will she be angry? Will she believe Claudia? Will she punish Claudia? Claudia decides to tell the truth. Her mother's mild reaction shows that telling the truth was the right decision. Crisis and resolution.

Principle 5: Characters are consistent. Characters should not do or say things that run against common-sense beliefs about how people act. Nor should they behave in a manner that contradicts or is incompatible with already established traits. People detect inconsistencies very easily and are bothered by them. Children are usually as perceptive as adults about inconsistent or false characterizations.

In long-running series, scriptwriters should be particularly careful about consistency in character because the same cast may appear in 100 or more programs in a year. Starting with character sketches and maintaining close communication among scriptwriters and fellow staffers help ensure that the behavior of radio characters is consistent.

In instructional radio there is generally no need to characterize elaborately. A convenient trick is to give each character a "hook," an identifiable trait: Carlitos likes candy too much, Daniel is forgetful, Sarita sings to herself. Any little characteristic will do. A single, consistently used hook makes a character more lifelike and also helps radio listeners identify that character easily.

Principle 6: Stories do not tell; they show. This is specifically a principle of dramatic writing. In pure drama, everything happens through conversation, expression (e.g., facial aspect, tone of voice, or gesture), and action. An essayist or a novelist may explain; a playwright may not. In instructional radio programming, one may do both, but a good rule is to rely on dialogue and dramatic action, not exposition. Plain exposition—just putting explanations in an actor's mouth—is usually a weak approach. Ideally the scriptwriter never explains; he or she shows, through dramatic action. Instructional content and objectives, continuity, and characterization should be communicated in the same way.

- Don't tell young learners the difficulties of Columbus's first voyage; present and reinforce as much content as possible in dramatic form.
- Don't tell children that good nutrition is important; demonstrate its importance dramatically.
- Don't tell listeners what characters are like; let characters explain themselves and one another by what they say and how they say it.

Here are examples of telling and showing:

Example A: A Segment That Explains Without Showing

1. RADIO CHARACTER 1: Carlitos likes to eat candy instead of healthful food.
2. RADIO CHARACTER 2: When he eats too much, he feels tired and sick.
3. CARLITOS: Yes . . . If I eat too much candy, I feel tired and sick.
4. RADIO CHARACTER 1: Carlitos would rather eat candy than fruit.
5. RADIO CHARACTER 2: That's a mistake! Carlitos should eat fruit, and avoid candy.

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6. RADIO CHARACTER 1: Students, it's important to eat healthful foods, like vegetables and fruit.

Example B: The Same Segment Rewritten as Instructional Radio Drama

1. CARLITOS: I'm hungry!
2. RADIO CHARACTER 2: Here's a mango, Carlitos. —
3. CARLITOS: I don't want a mango. I have ten cents. I'm going to buy some candy!
4. RADIO CHARACTER 1: Don't spend your money on candy, Carlitos. Eat a mango. It's better for you.
5. CARLITOS: I like candy.
6. RADIO CHARACTER 2: Carlitos, remember when you found some candy yesterday and ate it all?
7. CARLITOS: Yes . . .
8. RADIO CHARACTER 1: How did you feel?
9. CARLITOS: (REMEMBERING) Ohh . . . I felt a little sick.
10. RADIO CHARACTER 2: Carlitos, growing children need to eat vegetables and fruit.
11. CARLITOS: (BRIGHTLY) All right . . . I'll have that mango.

Principle 7: Stories do not waste words. A good script, like a good poem, is marked by the force of few words. One is often startled by how true to life dialogue sounds in a good movie or play. But no matter how authentic it seems, it is never literally real. It is more direct, more condensed, and better organized than real-life conversation. No audience would sit through the real-life equivalent of a dramatized dialogue because in normal conversation, people do not get to the point soon enough to satisfy an audience. Even the sharpest real-life conversations are full of digressions, hesitations, unclear or incomplete thoughts. A good script is not a literal record of conversation; it is highly condensed, carefully edited conversation.

Condensing real speech, but retaining its essence, is the scriptwriter's job. How is that done? Scriptwriters create dialogue by observing real characters and using their imagination, of course. But they also do it by editing themselves. A first draft is never as lean as it might or should be. Scriptwriters go back over it, sharpening, refining, cutting, changing. They keep on editing until they have cut out all the unnecessary words.

**Suiting
the
Script
to
the
Audience**

Most instructional radio broadcasting, particularly the interactive type, is designed for children. Simplicity, predictability, clarity, appropriate manner of expression, and challenge are some important criteria to remember in addressing a young audience.

Simplicity

Characterization should be broad and obvious, plots logical. Sentence structures should not be complicated.

Predictability

Children like predictability. They are thrilled to know that a particular character is going to say or do something, that a certain activity is about to happen. Thus, *repetition* is a good narrative technique. Refrains are an example. Small children take great pleasure in knowing that the wolf will threaten, "I'll huff and I'll puff and I'll blow your house down," each time he prepares to demolish one of the houses of the three little pigs. They wait eagerly for this refrain and join in when they hear it.

Predictability can also be achieved by creating *anticipation*. Children gain confidence and take an added interest in what they are listening to if they have anticipation cues. For example, using a particular piece of theme music before the appearance of a certain character alerts children to what is coming and prepares them to participate.

Another way to offer predictability is through *idiosyncratic characterization*. Children like to know radio characters in the same way they know classroom teachers. They like the behavior of radio personalities to be predictable. This can be achieved by giving each radio character particular characteristics. As in real life, people's idiosyncrasies make them individuals. Character development need not consume a lot of time. It can be achieved by devices as simple as having one character always take a gloomy view of things, or be given to singing, or be forgetful. The radio lesson can make use of these characteristics so that the characters attract the children and instruct them at the same time.

Clarity

Children like to know what they are doing and why they are doing it. Running a number of different objectives and activities together in one lesson can be confusing enough in a classroom with a teacher present to give a guiding hand. On radio, it can be disastrous.

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*Segmenting
the
Lesson*

Appropriate Manner of Expression

Children are quick to detect a patronizing tone. Properly adjusting the scripted tone of voice—not childlike, but not grown-up either—requires a delicate hand.

Challenge

Radio instruction should be neither too hard nor too easy. The scriptwriter is advised to keep in mind the intended instructional level, the material, and the age and sophistication of the learners, and carefully adjust the material accordingly.

A typical program in instructional radio is roughly the equivalent of a daily lesson in regular classroom instruction. It is made up of a sequence of segments preceded by an introduction and followed by a close. A normal half-hour lesson consists of 12-15 segments, each no more than a few minutes long. The segments are either instructional, conveying material to be learned, or enriching, offering a break from the concentration required for learning but promoting readiness or providing reinforcement.

A first reason for segmentation is pedagogical. Instruction is broken into small units presented across a half-dozen or more lessons and reinforced following initial presentation. This practice makes learning easier.

Segmentation is a standard device in children's programming, including the commercial type. Short, discrete units that at times repeat content enhance learning and retention. They also help hold attention.

Segmentation is a useful device for keeping learners on track in spite of missed lessons. In some situations, occasional missed transmissions and occasional-to-frequent learner absences are to be expected. Distribution of instruction across a sequence of segments makes it more likely that learners will experience enough to comprehend the sense of the instruction.

Finally, a segmented format is convenient for development of the script by a team—a usual practice in instructional radio scriptwriting. As a rule, each member of the team writes only a segment or two of a script. The segments are the pieces from which the continuity writer, the editor, or the producer assembles a coherent script. Other approaches are possible, but the segmented format is easy to manage when a team of writers is involved.

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Maintaining Spontaneity

Writing instructional radio scripts day after day may seem to be a burden at times. Occasionally a scriptwriter feels drained of ideas and inspiration. The following suggestions may help maintain spontaneity and liveliness.

1. Get to know, understand, and identify with the audience. Visit classrooms, see what the children respond to best, and keep them constantly in mind. Remember the purpose of the effort—to give young people a chance at a better education and therefore a better life.
2. Listen to broadcasts of scripts you have written. Radio characters' interpretations may provide ideas for development in future scripts.
3. Get together with the other scriptwriters for the series, and brainstorm. In a classic brainstorming session, any and all ideas that come up, however absurd, are written down. One idea builds on another, and even seemingly crazy ideas often lead to very good ones. If scriptwriters talk and work together, they often find it easier to create a bank of ideas, story plots, character sketches, etc., on which they can all draw. Sharing ideas with fellow writers and getting their reactions also helps a writer feel less isolated.
4. Take the view that having to meet very specific objectives is challenging, not constraining.
5. Keep in mind the overall objective of the segment being written. Be observant and look around. Think about how ordinary people use or express the objective in daily life. Then simplify the everyday situation for presentation in a radio lesson.
6. Be aware of the number of segments that have been designated for the teaching of a particular objective. Write a draft of all of them before writing individual ones. There is a better chance of writing interesting scripts if all of the segments on one topic are considered as a whole and seen in perspective.
7. Consider the overall characteristics and styles that are being used in the series. If, for example, certain traits have been determined for the radio characters, use them to guide the direction and tone of the segments to be written. If the early parts of each program are to contain the segments that require the greatest concentration, and the later parts the segments that require less concentration, adjust the writing to a segment's place in the total script. Sometimes a little

**How
to
Evaluate
a
Script**

extra interest can be added through characters' behavior or remarks at the start or the close of a segment, perhaps playing on established traits.

When a scriptwriter has finished writing a segment, he or she should check it to be sure it meets all of the requirements. As far as possible, the script sent to the producer should be perfect. The following questions will be helpful in making a final check of a script:

- Have previously established patterns been maintained? If certain conventions have been laid down as to how particular types of instructional material should be presented, does the script adhere to them?
- Have the objectives been clearly met?
- Is the script suited to the radio medium?
- Are the stories well told? Do they introduce conflict, build to a crisis, and offer resolution?
- Have previously established character traits been maintained? If new traits have been introduced, are they consistent with what has already been created?
- Is the script believable? That is, do events happen in a logical sequence? Is the passage of time clearly indicated? Do people speak in ways that suit them and sound natural?
- Have conversation, expression, and action been effectively used to convey plot?
- Has the script been sharpened?
- Is the script suited to the audience?
- Is the lesson interesting and alive?
- Is all of the punctuation and spelling correct?

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7

Scriptwriting for Interactive Radio Instruction

*What
Scriptwriting
for
Interactive
Radio
Instruction
Is*

Interactive radio instruction takes its name from its most important feature: intense interaction between learners and the broadcast. Interactive radio instruction is viewed as a conversation between the radio characters and the audience: The script is one-half of the conversation; the other half consists of the many responses that the lesson elicits from learners. A typical half-hour program may contain 80-100 pauses for student response. The continuous rhythm of pauses may seem a little odd on first exposure, even to informed listeners. The learner is constantly active in lively, focused study and learning: answering questions, engaging in structured conversations, reading, writing, calculating, solving problems, standing up, moving purposefully about, and participating in songs, games, and exercises.

*Why
Scriptwriting
Is
Important*

Scriptwriting is particularly important in interactive radio instruction because the sequences of questions/directions to learners, pauses for their responses, and reinforcement from the radio characters must be carefully coordinated to achieve the effect of interaction, which contributes significantly to learning. Formative evaluations over several years of experimentation with interactive radio instruction have indicated what goes into the successful structuring of these sequences to teach knowledge, skills, and attitudes.

*How
Scriptwriting
Is
Accomplished*

Intense interaction being a salient feature of interactive radio instruction, the scriptwriter must provide frequent pauses for student response. Usually, no more than 20 seconds of air time should elapse without such a pause. Long stretches, up to 30 seconds, may be needed for some modeling sequences, however, and in some instances, having a noninteractive period in the lesson—for example, story time—is useful.

*Pausing
for
Student
Response*

Instructional writers of any kind are well accustomed to working within tightly circumscribed requirements. In scriptwriting for interactive radio instruction, with a little practice, they will find that all of the elements of a good broadcast—variety, pace, plot and character, tension and resolution, arousal and satisfaction of curiosity—remain fully available.

**Motivating
Children
to
Respond**

Because oral response is not a part of everyday radio listening, interactive radio broadcasts should provide a strong motivation for response to help learners overcome resistance to it. Songs and games of various types are useful in encouraging children to interact with the radio.

Songs

In the early stages, simple songs (no more than four lines) that have a strong, clear beat and melody are best. An effective procedure is for the radio character to present a song two or three times and invite learners to join in as they learn the words and the tune.

Games

For many children, physical response to radio is initially even easier than vocal response. Radio characters can invite children to join in very simple action games. For example:

1. RADIO CHARACTER: Children, this is the sound of a drum.
2. FX DRUM ROLL
3. RADIO CHARACTER: Children, when you hear the drum sound, I want you to stand up. Let's try it. Wait for the drum sound.
4. FX DRUM ROLL UNDER AND HOLD
5. RADIO CHARACTER: (OVER DRUM) Stand up!
6. FX DRUM OUT
7. RADIO CHARACTER: Are you standing up?
8. PPR 2
9. RADIO CHARACTER: Now listen. This is the sound of a whistle.
10. FX WHISTLE
11. RADIO CHARACTER: When you hear the whistle, sit down. Let's do it.
12. FX WHISTLE
13. RADIO CHARACTER: (OVER WHISTLE) Sit down!

Let's play again. When you hear the drum, stand up. When you hear the whistle, sit down.

So the game progresses. Sometimes the drum or the whistle is sounded twice or more in succession, signaling the children to continue standing or sitting, as appropriate. So the children have to learn to listen very carefully.

Almost all children like to show off their knowledge. An effective way to encourage children to interact with radio is by posing questions to which they already know the answers. For example:

1. RADIO CHARACTER 1: Children, we're going to play the Big/Little Game. I'll give you the name of

*Differentiating
Types
of
Segments*

something, and you tell me if it's big or little. For example, if I say "elephant," you say . . . "big." If I say "ant," you say . . . "little." That's the way to play the Big/Little Game. Let's go. Mountain.

2. PPR 2
3. RADIO CHARACTER 2: Big—the answer is "big."
4. RADIO CHARACTER 1: Mouse.
5. PPR 2
6. RADIO CHARACTER 2: The answer is "little."
7. RADIO CHARACTER 1: Baby.
8. PPR 2
9. RADIO CHARACTER 2: Little.
10. RADIO CHARACTER 1: Giant.
11. PPR 2
12. RADIO CHARACTER 2: Big.

Such an exercise encourages children to listen and to respond. Once they become accustomed to using radio in this way, they can begin to use interactive radio for instructional purposes, with a radio voice asking a question, the children being given time to respond, and a radio voice providing immediate reinforcement of the correct answer.

Similar games can be played with sound effects, the radio character inviting children to listen to a sound and identify its source. An effective way to begin is with the sounds of animals commonly known to the children.

Four types of segments are most commonly used in interactive radio instruction: initial teaching, drill or reinforcement, application, and readiness or enhancement.

Initial-Teaching Segments

Initial-teaching segments are those in which a concept or a skill is introduced and taught. It is wise to introduce only one concept or skill per segment. Having radio characters model the concept or skill (see the discussion of modeling in Understanding Basic Segment Elements) helps students learn it. Using simple, clear instructions—always the same ones for a particular concept or skill—is important while students are in the learning phase. Instructions should be tested on a sample audience to be sure that they can be followed easily and accurately.

The scriptwriter should not assume that all learners will understand a new concept after a single introductory presentation.

Introducing new skills or concepts generally requires more than one lesson. The proper number of initial-teaching segments is governed by the nature of the material and by classroom observation.

If teacher's notes are to be provided with the radio lessons, the corresponding information in them should be in the same words that will be used by the radio characters. Observers or evaluators should always be alerted to the presence of initial-teaching segments and related objectives, and be asked to check on learners' success in acquiring the new skill.

Drill or Reinforcement Segments

Once a skill has been introduced, drill segments are often useful in providing learners with facility. They may be included for short-term maintenance, reviewing material taught a week or two earlier, or long-term maintenance, going back over content or skills introduced three to five weeks before. A drill segment can be thought of as tapering. At the beginning of the segment, learners receive full, clear instructions, which are presented slowly and repeated as necessary. As learners gain facility, the amount of instruction is gradually reduced until the pattern becomes question from the radio character/pause for student response/reinforcement of the correct answer by the radio character.

As the amount of instruction is being reduced, the pace of the drill quickens. Correct pacing is very important to promote concentration as well as to enhance learning. If the pace is too slow, learners may become bored. In a regular classroom, pacing is monitored by the classroom teacher. In radio teaching, the scriptwriter must acquire a sense of pacing by observing lessons in use or by studying the notes of other observers. (More about pacing appears in Module 10, *Timing*.)

Following is an example of a drill segment:

1. RADIO CHARACTER 1: Children, today we are going to work on spelling. I am going to say a word, and I want you to tell me its first letter. Listen while Jill [Radio Character 2] and I do it. I will say a word, and Jill will tell me the first letter of the word. Bell.
2. RADIO CHARACTER 2: B.
3. RADIO CHARACTER 1: B. Yes. The word bell begins with the letter b. Now children, it's your turn. I will say a word, and you tell me the letter it begins with. Boy.

4. PPR 2
5. RADIO CHARACTER 2: B. The word boy begins with the letter b.
6. RADIO CHARACTER 1: Listen to the next word and tell me the letter it begins with. The word is dog.
7. PPR 2
8. RADIO CHARACTER 2: D. The word dog begins with the letter d.
9. RADIO CHARACTER 1: Now tell me the first letter of this word: man.
10. PPR 2
11. RADIO CHARACTER 2: M. M is the first letter in man.
12. RADIO CHARACTER 1: Next word . . . pot.
13. PPR 2
14. RADIO CHARACTER 2: The first letter is p.
15. RADIO CHARACTER 1: Next word . . . tap.
16. PPR 2
17. RADIO CHARACTER 2: T.
18. RADIO CHARACTER 1: Bug.
19. PPR 2
20. RADIO CHARACTER 2: B.
21. RADIO CHARACTER 1: Cat.
22. PPR 2
23. RADIO CHARACTER 2: C.

The reader should note how the amount of instruction being given by Radio Character 1 and the amount of explanation being given by Radio Character 2 are gradually reduced over the course of the drill; all that remains by line 23 is the word, the response pause, and the answer. The drill might continue for several minutes now in this mode.

In the above example, Radio Character 1 gives all the response cues, Radio Character 2 all the answers. This division of responsibility is often too rigid to be useful. In some kinds of drill, however, it adds clarity because learners quickly realize that one voice is delivering the questions, the other giving the answers.

Instruction can be similarly tapered over a sequence of drill segments on the same skill, presented in a series of lessons. Full directions are required on the first and second days; afterward, complete instructions are unnecessary. By the fourth or fifth day, for example, a segment can be introduced as follows:

1. RADIO CHARACTER 1: Children, it's time for spelling. I want you to give me the first letter of each of the words I say. Here's the first word: day.
2. PPR 2
3. RADIO CHARACTER 2: D. The first letter of day is d.

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4. RADIO CHARACTER 1: What's the first letter of this word:
top?
5. PPR 2
6. RADIO CHARACTER 2: T.
7. RADIO CHARACTER 1: Next word: box.
8. PPR 2
9. RADIO CHARACTER 2: B.
10. RADIO CHARACTER 1: Car.
11. PPR 2
12. RADIO CHARACTER 2: C.

The radio characters give far less explanation of the procedure in this segment than in the first presentation because the children are already familiar with what is to be done. If the same drill were dropped and then resumed after several weeks, the radio characters would explain it briefly again.

The scriptwriter should not be reluctant to announce a drill. Drill is an important part of radio learning. Children will enter into a drill more willingly if they know it is coming than if radio characters use a round-about way to motivate them to drill.

Application Segments

In application segments, skills or concepts are practiced in real-life contexts. A classic example—and a classic opportunity for good use of radio's instructional power—is the interactive radio version of the story problem in elementary math:

1. RADIO CHARACTER 1: (SOUNDS OF HIS EATING AND ENJOYING IT).
2. RADIO CHARACTER 2: (ENTERING) John [Radio Character 1] ... John ... Oh, here you are. I've been looking everywhere for you. What are you do— (INTERRUPTING HERSELF) ... Eating again!! Don't you ever do anything but eat?
3. RADIO CHARACTER 1: (TALKING WHILE EATING) Maria [Radio Character 2], I like eating!
4. RADIO CHARACTER 2: I know. Children, John and I went to the market yesterday, and John bought *so much food*, particularly fruit. Listen while I tell you about it, and *you* can count up all the pieces of fruit John bought. When we first got to the market (FADING OUT) ...
5. FX MARKET SOUNDS UP 5, FADE AND HOLD UNDER TO LINE 13
6. RADIO CHARACTER 1: Now ... look at all this wonderful fruit. I want some. I'm going to buy

- some oranges . . . Excuse me . . . I would like *two* oranges, please.
7. RADIO CHARACTER 2: Children, how many oranges does John want?
8. PPR 2
9. RADIO CHARACTER 1: Two. Oh, and look at the bananas! I must have *one* big banana.
10. RADIO CHARACTER 2: Children, how many bananas?
11. PPR 2
12. RADIO CHARACTER 1: One.
13. CUT FX MARKET
14. RADIO CHARACTER 2: Children, John now has *two* oranges and *one* banana. How many pieces of fruit does he have?
15. PPR 3
16. RADIO CHARACTER 2: *Three*. But that wasn't all. He bought more fruit before the day was over. Remember, he now has *three* pieces of fruit. Let's see how many he will have when we leave the market. (FADING OUT)
17. FX MARKET NOISE UP 5, UNDER AND HOLD TO LINE 23
18. RADIO CHARACTER 1: Oh, look . . . plums. I love plums. I must have *three* plums.
19. RADIO CHARACTER 2: But you already have three other pieces of fruit.
20. RADIO CHARACTER 1: Now I have three more.
21. CUT FX MARKET
22. RADIO CHARACTER 2: Children, how many pieces of fruit does John have now?
23. PPR 5
24. RADIO CHARACTER 2: *Six*. Six pieces of fruit. And that's not all he bought . . . Listen . . .
25. FX MARKET NOISES UP 3, UNDER AND HOLD TO LINE . . .

And so the story can continue, depending on learners' skills and abilities. Stories or dramatic episodes are an excellent way of putting concepts and skills into an everyday setting, particularly if the incidents involve the radio characters and require interaction and assistance from students.

Readiness or Enhancement Segments

Readiness or enhancement segments are those used to introduce a concept or skill before it is taught formally or to reinforce concepts and skills indirectly. With young children such segments usually consist of physical activities, games, or songs. Older students also like stories, jokes, and riddles.

In instructional radio, physical activities are of two kinds. One kind calls for physical response as an element in learning. Learners may be asked to manipulate physical objects or to take some physical action to demonstrate that they understand. The other kind of physical activities is the subject here. This kind—stretching, exercising—provides much-needed relaxation and variety for the young learner, for whom prolonged mental concentration can be tiring. At the same time, it enhances learning by reinforcing instruction or preparing learners for new instruction.

Activities should be appropriate for the space that learners are using for the radio lesson. Classrooms and community gathering places are often crowded and lack floor space for expansive or complicated movement. However, even simple activities such as Stand Up/Sit Down can provide a change of pace and contribute to learners' ability to listen to directions.

If the subject of a lesson is mathematics, physical activities might include counting, adding, subtracting, etc. In other subjects, physical activities can be used too—for example, to teach direction, parts of the room, or parts of the body; to improve physical coordination; and to develop motor skills.

It is helpful to use a special sound cue or piece of music to introduce physical-activity segments so that students can anticipate the coming change of pace. In a regular classroom the teacher can introduce a physical activity by taking children outside, telling them to put away their books, or simply announcing that it is time for a game. The radio lesson, in a similar way, should provide cues to prepare children for a new direction to the lesson.

All instructions for physical activities should be very clear so that children know exactly when to start and when to stop. Sometimes a sound cue, such as a cymbal, can be used to end an activity. Children soon learn the appropriate response to the sound.

Songs are an excellent form of relaxation for children. They can also be a strong device to help children remember language and information, and that makes them very useful for teaching readiness skills such as the letters of the alphabet, a sequence of numbers, and the days of the week.

Instructional segments are typically complete in themselves, although they relate to what has gone before and what will come after. They have their own beginning, which tells the listener something about what is going to take place in the segment. Then they tell the listener what to do to get ready. Of course, the major

*Understanding
Basic
Segment
Elements*

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part of the segment provides the instruction, usually through modeling and practice. Finally, the segment is brought to a close through reinforcement exercises, followed by a conclusion or a transition to the next segment.

Introductions

The introduction may consist of a short presentation, sometimes dramatized, that sets the scene for the segments to follow. A four-line introductory piece about a child and his grandfather taking a walk, for example, might precede a segment on the concepts of young and old.

Locator or Orientation Cues

Whether or not the segment begins with such preliminary material, study and practice should always be introduced by a series of "locator" or "orientation cues"—instructions to learners about how to get started—how to find the right place on a worksheet, say, and what to do when they find it.

The trick is to break the getting-ready process into the simplest, least ambiguous set of steps:

1. RADIO CHARACTER 1: Children, sit down again.
2. MUSIC 3
3. RADIO CHARACTER 2: Pick up your materials.
4. MUSIC 4
5. RADIO CHARACTER 1: Pick up your pencils. We're going to write!
6. PPR 3
7. RADIO CHARACTER 2: Now find box number 4 on your worksheets.
8. MUSIC: "NEXT BOX"
9. RADIO CHARACTER 1: Box 4 has three pictures.
10. RADIO CHARACTER 2: Look at the first picture.
11. PPR 2
12. RADIO CHARACTER 1: Children, what's in the picture?
13. PPR 3
14. FX FROG
15. RADIO CHARACTER 2: A frog.
16. RADIO CHARACTER 1: Now look at the lines under the picture of the frog.
17. PPR 2
18. RADIO CHARACTER 2: On those lines, write the word frog in cursive.
19. RADIO CHARACTER 1: In cursive, children, write the word frog.

Each step in the example is accompanied by an appropriate pause to allow time for learners to carry out the cued action.

Modeling

Sometimes learners more easily understand what is required of them if radio characters model or demonstrate it first:

1. RADIO CHARACTER 1: Children, let's do some drills.
2. RADIO CHARACTER 2: First, listen to Safiri [Radio Character 1] and me. Safiri will name something, and I will ask him what quantity there is.
3. RADIO CHARACTER 1: Water.
4. RADIO CHARACTER 2: How much water is there?
5. RADIO CHARACTER 1: Boats.
6. RADIO CHARACTER 2: How many boats are there?
7. RADIO CHARACTER 1: Food.
8. RADIO CHARACTER 2: How much food is there?
9. RADIO CHARACTER 1: Bottles.
10. RADIO CHARACTER 2: How many bottles are there?
11. RADIO CHARACTER 1: Sand.
12. RADIO CHARACTER 2: How much sand is there?
13. RADIO CHARACTER 1: Tables.
14. RADIO CHARACTER 2: How many tables are there?
15. RADIO CHARACTER 1: Now, children . . . you do it. Sand.
16. PPR 4
17. RADIO CHARACTER 1: Tables.
18. PPR 4
19. RADIO CHARACTER 1: Water.
20. PPR 4
21. RADIO CHARACTER 1: Boats.
22. PPR 4
23. RADIO CHARACTER 1: Food.
24. PPR 4
25. RADIO CHARACTER 1: Bottles.
26. PPR 4
27. RADIO CHARACTER 1: Moonlight.
28. PPR 4
29. RADIO CHARACTER 1: Clouds.
30. PPR 4
31. RADIO CHARACTER 2: Children, say, "How many clouds are there?"
32. PPR 4
33. RADIO CHARACTER 2: How much moonlight is there?
34. PPR 4
35. RADIO CHARACTER 2: How many bottles are there?
36. PPR 4
37. RADIO CHARACTER 2: How much food is there?
38. PPR 4
39. RADIO CHARACTER 2: How many boats are there?
40. PPR 4
41. RADIO CHARACTER 2: How much water is there?

42. PPR 4
43. RADIO CHARACTER 2: How many tables are there?
44. PPR 4
45. RADIO CHARACTER 2: How much sand is there?
46. PPR 4

In this example, reinforcement is provided but not immediately. Beginning at line 31, Radio Character 2 offers the correct response to each cue in reverse order of the original presentation.

Modeling is particularly useful in language teaching, in which learners must clearly understand the form of the required answer. In teaching a language (usually a second one for the learners) by interactive radio instruction, contextual modeling is also often used to provide a semantic context for practice. Following is an example. The example relies on the use of a child in each classroom of listeners, designated Owino, whom the local teacher has asked to respond to the directions. Instructions to designate a child to be Owino appear in the teacher's notes, which the teacher receives in advance of the broadcast.

1. RADIO CHARACTER 1: Teacher, please put a chair in a convenient place at the front of the room with the seat toward the children.
2. RADIO CHARACTER 2: Owino, come to the front.
3. FX TRAVEL MUSIC 4 [Music that plays while Owino moves forward]
4. RADIO CHARACTER 1: Children, listen to us for a minute.
5. RADIO CHARACTER 2: First, Safiri [Radio Character 1] will demonstrate. Safiri, stand behind the chair.
6. CAST: (GOOD ROBUST DELIVERY) He's standing behind the chair!
7. RADIO CHARACTER 2: Safiri, walk away from the chair.
8. CAST: He's walking away from the chair!
9. RADIO CHARACTER 2: Walk toward the chair.
10. CAST: He's walking toward the chair!
11. RADIO CHARACTER 2: Stand in front of the chair.
12. CAST: He's standing in front of the chair!
13. CASIOTONE: C MAJOR ARPEGGIO (4 NOTES, UP ONLY)
14. RADIO CHARACTER 1: Now . . . Owino and children . . . you do it.
15. PPR 1
16. RADIO CHARACTER 2: Owino, stand beside the chair.
17. PPR 5
18. RADIO CHARACTER 2: Walk around the chair.
19. PPR 6
20. RADIO CHARACTER 2: Stand in front of the chair.
21. PPR 5

22. RADIO CHARACTER 2: Walk away from the chair.
23. PPR 6
24. RADIO CHARACTER 2: Walk toward the chair.
25. PPR 6
26. RADIO CHARACTER 2: Stand behind the chair.
27. PPR 5
28. RADIO CHARACTER 2: Walk away from the chair.
29. PPR 6
30. RADIO CHARACTER 2: Walk toward the chair.
31. PPR 6
32. RADIO CHARACTER 2: Walk around the chair.
33. PPR 6
34. RADIO CHARACTER 2: Stand in front of the chair.
35. PPR 5
36. CASIOTONE: C MAJOR "TA-DAH"
37. RADIO CHARACTER 1: Good, children!
38. RADIO CHARACTER 2: Owino, go back to your desk.

Following are some hints about effective use of modeling:

1. Attract the learner's attention to the material being modeled. In this way, the learner is aware of what is being taught and knows what to focus on during the drill session.
2. Work from the known to the unknown. When modeling a new concept, be sure it is in a framework already known to the students. Be careful, for example, about using new vocabulary, except as a part of the new concept. Avoid teaching a new game or activity while modeling a new concept.
3. Make modeling relevant so that students understand immediately how the concept can be used in their own lives or in the framework of the subject they are studying.
4. Make the concept being modeled stand out clearly. Modeling is often most effective at the beginning of a drill session. It usually should not be part of a readiness or enhancement segment.
5. Have radio characters repeat the concept being modeled a number of times before inviting learners to join in. This helps to establish the pattern of the concept in the mind of the listener.
6. Use modeling in small doses with plenty of opportunity for practice.
7. Once material has been modeled and practiced within a lesson, use it again during that lesson.

Individual Learner Responses

Spoken choral responses are characteristic of interactive radio. But there are ways, with the help of a classroom teacher or other lesson supervisor, to call on individual learners to respond. In the preceding example, for instance, an individual learner is addressed by the name Owino, comes to the front of the classroom, and follows instructions. This is accomplished, as already explained, by asking the classroom teacher, in the teacher's notes that accompany a radio lesson, to appoint a learner to respond to a predesignated name during the lesson. This learner, in a sense, becomes a radio character for the duration of the broadcast.

Another way to elicit responses from individuals is to suggest to teachers that they call on an individual at the sound of a predesignated cue. In line 4 of the following example, the words of Radio Character 1, "One child," alert the classroom teacher that a question is coming and that a response should be sought from a child in the classroom. The question, "Which building is the hospital?" follows, and the single note played on the xylophone in line 5 serves as the cue for the classroom teacher to call on a child.

1. FX CAR IDLING UNDER AND HOLD
2. MAN: (OFF MIKE) Go down to the first street, there, and turn left. The building that has a big white door is the hospital!
3. FX FADE CAR
4. RADIO CHARACTER 1: One child . . . which building is the hospital?
5. XYLOPHONE: 1 NOTE
6. PPR 6
7. RADIO CHARACTER 1: The building that has a big white door.
8. RADIO CHARACTER 2: Children, which building is the hospital?
9. PPR 5
10. RADIO CHARACTER 2: The building that has a big white door. Again.
11. PPR 4.

Reinforcement

Immediate reinforcement of a correct or appropriate response is a basic principle in interactive radio instruction. In most cases a radio voice should provide a correct or appropriate response immediately after the learners' response pause.

1. RADIO CHARACTER 1: Children, what's three and two and one?
2. PPR 5

3. RADIO CHARACTER 2: Six. Three and two is five and one is six.
4. RADIO CHARACTER 1: What's five and one and two?
5. PPR 5
6. RADIO CHARACTER 2: Eight. Five and one is six and two is eight.

In this example, Radio Character 2 is reinforcing not only the correct answer (after allowing time for the learners' response) but also a method children can use to find the answer.

General concept reinforcement can be provided in a short summary at the end of each lesson:

1. RADIO CHARACTER 1: That is the end of today's mathematics lesson, children. We have practiced adding three numbers by finding the sum of the first two numbers and then adding the third number.

Reinforcement often comes from peers: When 90 percent of the class shout out the right answer, the 10 percent who are unsure or wrong get quick and strong feedback. Using peer reinforcement alone is best reserved for subjects or topics in which right answers are easily found—math, for example. It is not so reliable in language arts, in which learners are practicing speech acts—making certain noises in certain precise ways. Here reinforcement and repetition by a radio voice is important because learners cannot be relied on to provide accurate speech models and chorused speech blurs the contours of an utterance.

*Providing
Continuity
Between
Segments*

Segments are linked by means of continuity material—standard musical themes and very short vignettes or snatches of dialogue. They are intended to help focus and sustain learner interest and attention by providing the flow and unity that people expect of a media broadcast or a lesson of any kind.

Continuity means several things. First, it means congruity between segments, so that the music or the sound effect used at the end of one does not sound jarring or confusing when heard in conjunction with the beginning of the next. Continuity also means narrative consistency—that is, not telling listeners that a character has a cold and then having him well again five seconds later, or not asserting that a character sings poorly and then immediately having her sing a lovely song. Finally, continuity often means the use of a running theme or a continuity thread—a little story or vignette or idea or question to which the script returns during or between segments over the course of a broadcast.

Often a musical bridge is all that is needed for continuity. Learners recognize musical bridges as transition signals and get ready to respond appropriately—for example, by reaching for the first of the day's worksheets—because the various kinds of instruction occur at about the same points in each day's broadcast.

A musical bridge is used for transition out of a segment that does not end with a musical passage of its own. The musical bridge is often accompanied by a single line or a two- or three-line exchange. The whole transitional passage, including 4 seconds for the musical bridge, generally covers no more than 10-12 seconds of air time.

There are several types of continuity segments. They may consist simply of a musical bridge and a statement of the next activity:

1. MUSICAL BRIDGE NO. 1
2. RADIO CHARACTER: Children, it's time to read.

or

1. MUSICAL BRIDGE NO. 3
2. RADIO CHARACTER: Let's sing the "Clapping Song!"

Having communicated the next activity, a continuity segment may add instructions about how to prepare for it.

1. MUSICAL BRIDGE NO. 4
2. RADIO CHARACTER 1: It's time to write.
3. RADIO CHARACTER 2: Children, take your exercise books and pick up your pencils.
4. WRITING MUSIC UP 4, UNDER AND HOLD

Another type of continuity segment may combine this kind of preparatory dialogue with a modeling of material just practiced or about to be practiced.

Much can be done in continuity segments to turn radio characters into believable characters. A cautionary note is in order, however: Scriptwriters should scrupulously avoid the temptation to build continuity from the ground up, turning transitional passages into small independent dramas. Such temptations result from a misplaced desire to satisfy adult needs for plausibility. This kind of writing is deadly for learners generally and for children in particular. Transitions should always be as quick and as spare as possible.

***Coordinating
the
Script
with
Other
Instructional
Resources***

Although scriptwriting is the central writing task in interactive radio instruction, it is not by any means the only one. Even before scriptwriting begins, curriculum designers are constructing lesson frameworks and lesson plans (see Module 5, *Curriculum Design*). Then, as segments of scripts are written, student worksheets are prepared, and as scripts are completed and approved, teacher's notes are developed and formative evaluation materials are drafted. To facilitate the work of the people who write the support and evaluative materials, scriptwriters are encouraged to communicate ideas and observations to them. The physical format of the script (see the appendix to this module) makes that easy to do. On each page is a narrow right-hand column in which scriptwriters may record comments relevant to the text of the script.

***How
to
Evaluate
Scriptwriting***

The following questions may help the scriptwriter and others judge the quality of a script for interactive radio instruction:

- Have frequent pauses been included for student response?
- Has strong motivation been provided for response?
- Has sufficient time been allowed for each response—not so little that the broadcast resumes while learners are speaking, not so much that learners' attention is lost?
- Is there variety and balance among the segment types used?
- Are the segment types used appropriately?
- Is there variety and balance among basic segment elements and instructional strategies?
- Have basic segment elements and instructional strategies been used appropriately?
- Is there continuity between segments?
- Has the script been coordinated with other instructional resources—student worksheets, teacher's notes, and formative evaluation materials? Has the necessary information been communicated to the people who prepare these materials?

Appendix

Physical Format of the Script

Page Format

Page Header

A script's physical format is the way in which it is laid out on the page. All scripts in an instructional series should have the same format, to facilitate checking, producing, acting, and filing, and every member of the production team, as well as secretarial and clerical staff, should understand the format and use it. Although there is no absolutely right way to format an educational script, the model presented in Figure 1 has been found to be efficient.

Every page of a script should present certain vital information at the top. Providing a supply of paper with the headers preprinted on it helps to ensure that scriptwriters will include the necessary information on every page. The information in the left-hand block of the header sample relates to the individual segments of a script, the information in the right-hand block to the overall script.

Left-Hand Block

Writer. The name of the author of the individual segment goes in this space. In a large instructional-broadcasting project, scripts are usually written by more than one person. Scriptwriters often specialize in particular kinds of segments. If a portion of a script has to be returned for alteration, having the scriptwriter's name on every page makes it possible to identify him or her immediately.

Date of first draft. The date on which the first draft of the segment was written should be entered here. This provides a means of checking the sequencing of work in progress.

Scheme of work code. The number to be recorded in this space indicates the part of the curriculum to which the lesson refers. Usually a curriculum is laid out in a series of units or frames that divide the content over the broadcast year (see Module 5, *Curriculum Design*). Putting the scheme of work code at the top of the script provides an archival record of where a particular script fits into the year's overall plan.

Objective(s). The objective(s) of the lesson segment should be stated briefly and clearly, providing a record of what the segment is teaching and where it fits into the overall lesson. The statement of objectives also indicates to the producer and the actors what they should stress. When they understand what a segment is intended to teach, producers and actors have an easier time giving appropriate emphasis in their presentation.

**Figure 1
A RECOMMENDED FORMAT FOR A SCRIPT**

Writer _____	Date of first draft _____	Series title _____
Scheme of work code _____		Program title _____
Objective(s) _____	Grade _____	
Segment code: I () STM () LTM () A () E/R ()		Lesson no. ___ of ___
Segment no. ___ of ___	Duration _____	
Segment page ___ of ___		Script page ___ of ___

1. THEME MUSIC UP 10. FADE AND HOLD UNDER LINE 2
2. RADIO CHARACTER 1: Here is today's program of *Our World*, social studies for students in grade 3. This is lesson number 33.
3. THEME MUSIC UP 10. CUT
4. RADIO CHARACTER 2: Good morning, children.
5. PPR 5
6. RADIO CHARACTER 1: Good morning, children.
7. PPR 5
8. FX SOUND OF CHOPPING WOOD. HOLD 5. FADE UNDER LINE 9
9. RADIO CHARACTER 1: Children, listen. See if you know what this sound is.
10. FX SOUND OF CHOPPING WOOD. FADE UP 5
11. RADIO CHARACTER 1: Is that the sound of someone whistling or the sound of someone chopping wood?
12. PPR 5
13. RADIO CHARACTER 2: Someone chopping wood. That is the sound of someone chopping wood. Today we're going to find out about some of the things we can do with wood.

Segment code. Within each instructional program there are usually a number of segments, each with a different function. For all involved to understand clearly the function of each segment, it is helpful to have a coding system that indicates function and to display the appropriate code at the head of each page. Segment types may vary from series to series, depending on subject and grade level, but they often fall into one of the following categories:

I = Initial-teaching segment: a segment that teaches something not yet taught formally or directly in the series.

STM = Short-term maintenance segment: a segment that repeats, reinforces, or reviews material that has been taught recently—probably within the last week or two. Students need immediate opportunities to use concepts that have just been introduced.

LTM = Long-term maintenance segment: a segment that brings up again and reinforces material some time after it has been initially introduced, perhaps three to five weeks later. (It may provide enough detail to simply use *M* as the code for both short- and long-term maintenance segments.)

A = Application segment: a segment that calls for students to apply a concept or skill in a real-life context.

E/R = Enhancement or readiness segment: a segment, such as a game or a song, that is enriching but not intended for direct teaching or reinforcement, or that prepares learners for something they will study in detail at a later date. Such a segment might offer children physical or mental relaxation. Or it might teach them an alphabet song some weeks before they learn to write the letters of the alphabet.

Segment number (no.) ___ of ___. This part of the page header indicates the segment's position in a total sequence—1 of 5, 3 of 6, or whatever. The information makes it easier for producers and actors to understand the scope and sequence of the particular segment they are using. It also helps to provide a record of how a concept was introduced and taught. In many cases, material is taught over a sequence of programs, rather than introduced and taught in one lesson only. For example, a writer might be instructed to use six segments to introduce and teach a given concept.

Duration. In this space the scriptwriter should give the exact

running time of the segment, as timed by him or her. This lets the producer know how long the segment should last if the overall length of the program is to be correct.

Segment page ___ of ___. This indicates the page number within the segment and the total number of pages in the segment. Giving both these numbers ensures that a page is not accidentally lost at any point in the production cycle. If the producer finds that the page header indicates "Page 1 of 3" for a particular segment and only two pages are in the segment, he or she knows something is missing and does not produce an incomplete lesson.

Right-Hand Block

Series title. Here the writer enters the title of the series—the collection of programs (lessons) created to teach a given curriculum.

Program title. Sometimes individual programs (lessons) in a series have a title. If so, it is entered in this blank.

Grade. The grade level of the curriculum should appear here.

Lesson number (no.) ___ of ___. The information to be recorded here is the number of the lesson to which the segment belongs and the total number of lessons in the series.

Script page ___ of ___. When the segment has been integrated with other segments to form a script for a lesson, the page's number in the overall script should be recorded here, along with the total number of pages in the script.

Including the broadcast date of the lesson in this block may be useful. Alternatively the broadcast date may be written on the script's cover sheet (see Cover Sheet).

***Body
of
the
Script***

Left-Hand Column

The script itself appears in this column. Each production cue (e.g., "THEME MUSIC UP 10. FADE AND HOLD UNDER LINE 2") and each set of lines for a radio character (e.g., "RADIO CHARACTER 1: Here is today's program of *Our World*, social studies for students in grade 3. This is lesson number 33.") is numbered to make references to it easy. For example, a scriptwriter might want a particular sound effect held under the dialogue until a certain point in the script and can indicate that point by its line number. The numbering begins with "1" on each page.

Right-Hand Column

This column is reserved for notes from one member of the production team to another, usually from the scriptwriter to the

Cover Sheet

person producing the classroom teacher's notes or other related print; to the producer; or to whoever will be observing a class during the broadcast of the lesson. For example, the scriptwriter might alert the author of the teacher's notes that for this segment the teacher needs to write certain information on the chalkboard or request the students to have certain aids with them. Or the scriptwriter might suggest to the producer that if a certain sound effect is not possible, an alternative can be used. Or the scriptwriter might ask classroom observers to watch whether a new concept or a new method of presentation is effective in the classroom.

In an instructional series the script cover sheet is of great importance. It is the reference point, the table of contents, that provides immediate information about everything in the script. It gives the title of the series, the program (or lesson) number, the running time of the program, the date of broadcast, and a list of the contents. All of this information is important for archival purposes and to facilitate quick access to particular teaching points that may be included.

Other information on the cover sheet is of immediate value to the program producer: the characters to appear in the program; writers' or producer's notes; and spaces for reviewers to sign off before the script goes to the studio for production. Circumstances will vary from production unit to production unit, so other details may usefully be added—for example, suggested cuts or additions if the program runs over or under time.

A standard cover sheet with particular pieces of information already included can be created if the programs follow a standard format. For example, the cover sheet can indicate that segment types are always presented in a particular sequence and are always of a specified length. Figure 2 shows a sample cover sheet.

**Figure 2
A SAMPLE SCRIPT COVER SHEET**

English In Action
Standard Two

Lesson 102
Production date: May 28, 1983
Broadcast date: June 21, 1983

Pages	Block	Seg.	Type	SOW Code	Competency/Description	Seg. No.	Seg. Time	Running Time
1	A B	— —	E —	— —	Standard Opening Good Morning		1:05	1:05
2	C	SL 1	—	—	Continuity		:15	1:20
3, 4, 5, 6	—	2	M	A/13/A 1-2	Somebody, nobody, light	3+4/5		
7, 8, 9	—	3	M	A/13/B 1	Dark		4:30	5:50
10, 11, 12	—	4	M	—	Drill: lights, lit		1:15	7:05
13	D	1	—	—	Continuity		:10	7:15
14, 15	—	2	E	—	Clap once, twice		1:00	8:15
16	E	R 1	—	—	Continuity		:15	8:30
17-20	—	2	M	A/13/C 1	Story on blackboard	2/5	3:40	12:10
21	—	3	M/I	—	"Morning Words"		1:00	13:10
22-27	—	4	I	A/19/C 1	Worksheet 25	2/5	3:40	16:50
28	F	1	—	—	Continuity		:10	17:00
29	—	2	E	—	It's too heavy		1:00	18:00
30	G	SL 1	—	—	Continuity		:15	18:15
31-35	—	2	I	A/19/A 1	Short/shorter, tall/taller	2/5		
36-39	—	3	I	A/19/B 1	"His friend is tall"		5:00	23:15
40, 41, 42	—	4	I	—	Drill: short, tall, old-er		1:15	24:30
43	H	W 1	—	—	Continuity		:10	24:40
44, 45, 46	—	2	I/M	A/19/D 1	Big/bigger, small/smaller	2/5	3:00	27:40
					Happy, happier			
47	J	—	E	—	Standard Close		:50	28:30

CAST:

(X) Safiri (X) Musician
(X) Tina (X) _____
(X) Rono (X) _____
(X) Sara (X) _____

Content review: _____
Congruence review: _____
Production review: _____
Approved: _____

NEW VOCABULARY

PRODUCTION TIME: 28:30

Oral: somebody, nobody, light, lit, lamp, dark, middle,
day, night, every, sleepy, wake, woke, sweep, floor, breakfast,
porridge, remember, lift, heavy, than, young, happy
Reading: light, lit, lamp, dark
Sentence on b/b, 25
Worksheets: 25
Cut or add verses to D 2 or F 2 if necessary for timing.

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*Interactive
Radio
Instruction
Handbook*

*Studio
Production*

8

Studio Production

What Studio Production Is

The use of radio for instruction involves the recording of each lesson in a radio studio. This entails assembling and coordinating people and materials to create a high-quality product, usually under very tight time constraints and often with limited facilities. The script must be reviewed, actors chosen and rehearsed, sound effects selected and prerecorded, and music identified, cleared for use, and rehearsed. Performances must then go forward on a one-time basis but with opportunity for retakes as production proceeds and with some latitude for minor editing afterward.

In broadcasting, the person who manages overall production—personnel, technical backup, etc.—is known as the producer, and the person who oversees the dramatic aspects is called the director. In educational broadcasting, one person often fills both roles, under the title of producer. The producer must be fully conversant with the aims and objectives of the general project. An important general responsibility of the producer is to provide liaison between the production staff and other members of the project team. This requires that he or she keep in constant touch with the curriculum director and the scriptwriting staff to understand their aims and needs and to share production ideas and difficulties with them. Another major function of the producer is to work with the technician to achieve the highest-quality recording and reproduction. Perhaps the producer's hardest task is to ensure that enthusiasm, interest, and freshness are maintained throughout the busy daily schedule of rehearsal and recording, in order to create programs of excellence.

Why Studio Production Is Needed

Studio production is a particularly important part of the program cycle because it is the process by which a carefully planned and well-written lesson is transformed into instruction. Studio production translates material that the eye can absorb into material that the ear can receive. It gives material a form and a structure that can be communicated over the radio.

***How
Studio
Production
Is
Accomplished***

In a project that is producing five lessons a week for broadcasting, at the rate of one lesson a day, the pressure on all members of the team is constant. A very precise schedule must be maintained from the moment the curriculum is drawn up to the moment the lesson goes out over the air. Studio production time is almost always limited; very few educational radio projects have recording and editing facilities available full-time. It is therefore vitally important to institute a system of recording a whole program at one time. This means having everyone and everything ready to go, exactly as they will be needed, on the day scheduled for recording.

***Preproduction
Activities***

Preproduction activities include the following, all of which are the responsibility of the producer and his or her assistant:

1. Ensuring the production quality and the suitability of the script
2. Selecting and training the actors
3. Establishing and maintaining a rehearsal and recording schedule
4. Advising on and arranging for music and sound effects, in collaboration with the technician
5. Preparing a preproduction list of technical requirements, in collaboration with the technician
6. Verifying that everything is ready for the recording session.

Ensuring the Production Quality of the Script

The producer should review the script before the final typing to be certain of its quality from a production perspective and its suitability for radio broadcast. Among the important considerations are continuities of character (attributes and relationships), scene (location), and event (chronology, etc.) and the appropriateness of the content to the medium (e.g., sound effects). Any difficulties or inaccuracies that the producer detects should be taken up with the project administrator, the curriculum director, or the scriptwriters (depending on the line of command of the particular project).

Selecting and Training the Actors

The producer selects the actors and sees that the actors receive the scripts in time to read, mark, and rehearse them. Usually this means having all scripts for the next week in the actors' hands by

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the end of the weekly recording cycle. (Information on preparation of scripts by actors appears in Module 9, *Acting*.)

The producer must understand the learning objectives of the overall program and of individual segments and ensure that they are also understood by the actors. This is essential to producing a program that creates the right emphasis for the intended learning to take place. If any objectives are not clear, the producer should refer to the curriculum director for clarification.

Establishing and Maintaining a Rehearsal and Recording Schedule

The producer is responsible for ensuring that each program is fully and well rehearsed and faithfully taped. He or she should establish a precise and firm schedule for rehearsal and recording, and stick to it. All actors and other personnel should be notified of the date and time of each session. Scheduling studios and production equipment and ensuring their availability are essential, especially when facilities are shared.

Advising on and Arranging for Music and Sound Effects

The script will call for certain music and sound effects for each program. The producer judges their appropriateness to the listeners and the script, determines their availability, and clears their use, if necessary. He or she also sees that the items are located and that any special requirements before the program are handled. For example, sound effects may need testing with a sample audience, or the producer may have to hire and rehearse musicians to play selected music live. More information about these components of production appears in Module 11, *Music and Sound Effects*.

Usually, standard music pieces are used as themes for the program and for various regular segments within it. Occasionally, however, extra music is called for. It is important to remember that some music (especially the popular, modern variety) is protected by copyright and may not be used without permission from the copyright owner. In many countries the fines for using music in violation of a copyright are very heavy. Permission itself is often very costly. Therefore, it is generally better to select music "in the public domain," that is, not protected by copyright. Such music is available for use by anyone; no royalty fees are due. Typically, traditional songs and older music fall into this category. Of course, music that has been composed especially for the program will be free of copyright control by others, as specified in the project's contract with the composer.

Production Activities

Preparing a Preproduction List of Technical Requirements

Once the producer has arranged for music and sound effects, he or she prepares a preproduction list in collaboration with the technician. On the list are noted, in order, the items to be used in the program. Special needs are also included—for example, extracts from previously taped programs. Module 11, *Music and Sound Effects*, contains additional information on preparation of the preproduction list.

Verifying That Everything Is Ready for the Recording Session

Although preparing the studio, the equipment, and the preproduction tape or cartridges is the technician's job, the producer should make a last-minute check with the technician to be sure that all is ready.

Editing

There are two main types of editing: postproduction and stop-go. When postproduction editing is used, the work of making a program is divided into two tasks, recording and editing. During the recording session the actors' portion of the program is "laid down," or recorded. Then, in the postproduction session, the technician adds music, sound effects, and other missing segments, all of which have been prerecorded on separate pieces of tape and are spliced into the main tape or, in the case of multi-track recordings, are laid down on separate tracks. At the same time the technician cuts out any mistakes that were made during the recording of the actors. Postproduction editing also takes care of problems with program length by cutting portions if the program is running overtime or adding material if it is running short. Postproduction editing is time-consuming and laborious, and thus it is expensive.

The stop-go method of recording and editing is a much more efficient system. However, it requires considerable cooperation and concentration from everyone on the project team and careful monitoring by the producer during both rehearsal and recording. In stop-go editing, an attempt is made to produce the program as if it were being broadcast live. Everything (the music and sound effects) and everyone (the actors and the musicians) is rehearsed and ready to go on cue. A standard of quality is maintained, but it is a flexible one, allowing for minor discrepancies that are not significant enough to call for correction—a cough, a slight misreading of the script, an actor coming in a few seconds past his or her cue. When discrepancies do call for correction, stop-go editing allows the producer the luxury of stopping the tape,

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rolling it back, and rerecording a segment. If the actors are well trained and well prepared, this can be done quickly.

Stop-go editing puts especially heavy demands on the producer, who must have in his or her head a clear sense of what the program should sound like—a minimum acceptable standard. He or she must make judgments against this standard as the recording goes forward.

Another element to which the producer must give close attention in stop-go editing is timing. If a scriptwriter has seriously miscalculated time, that fact should be spotted during rehearsal, or at least during recording. As the recording proceeds, the producer should be roughly gauging how long each segment is running so that he or she knows whether the program is running long or short and can make adjustments in later segments. The producer should refer to the curriculum director or the project administrator before making cuts in or additions to major instructional segments; such consultation is not so critical when adjustments are being made in songs, drills, and other repetitive- or enhancement-type components. More information about timing appears in Module 10.

Rehearsing and Performing

If the actors have read and marked their scripts in advance, a rehearsal and performance schedule such as that in Figure 1 usually works well. It offers a comfortable time allowance for a 30-minute educational script. Recording time can be cut, but a half-day allowance for one program, including preproduction activities, recording, and editing, is usually necessary for a finished product of acceptable quality.

An 8:00 a.m. start by both the technician and the producer allows for resolution of minor technical problems that may arise. If such problems are detected early, they can often be corrected before recording is scheduled to begin. Having the producer arrive at 8:00 a.m. allows him or her time to help solve problems and to make decisions about rescheduling, should it be necessary.

Difficulties with script content that arise during rehearsal may have to be referred to the curriculum director or the project administrator for alteration. Whether the producer has authority to alter content depends on the type of segment involved and any preexisting understandings with the curriculum director, the project administrator, and the scriptwriters.

At the break, everyone should be encouraged to get out of the studio for 15 minutes. Studio recording requires considerable

concentration in an enclosed, confined space that is often far from comfortable. In many studios, for example, it is necessary to turn off the air conditioning during recording because of the noise. If the same people are expected to do an afternoon recording session, they should be given a good long break between sessions—preferably two hours. Back-to-back recording sessions can produce a tremendous strain on all concerned.

Figure 1
A SAMPLE REHEARSAL AND RECORDING SCHEDULE

8:00 a.m.	Technician arrives; sets up; checks and runs tones through equipment; loads cartridges or locates and threads preproduction tape; prepares for recording. Producer arrives. Technician, producer, or assistant producer sets out any "live" sound effects or musical instruments to be used in recording.
8:30 a.m.	Actors arrive with scripts prepared for rehearsal. Actors' questions about script are answered by producer. Producer allocates any special duties, such as sound effects to be done live by particular actors, extra musical interludes to be performed by musicians, etc., and ensures that appropriate actors and musicians mark these new duties in their scripts. If new song is to be included in program, producer, musicians, and actors rehearse it (unless special song-practice session is held at another time each week).
9:00 a.m.*	Rehearsal begins. Technician takes voice, sound-effects, and music levels and adjusts them as necessary. Recorded sound effects are played so that actors become accustomed to them.
10:00 a.m.	Break
10:30 a.m.*	Recording commences, using stop-go editing.
11:30 a.m. - 12:00 noon	Recording ends.

*If two lessons are to be recorded each day, the schedule might instead call for rehearsing and recording the first lesson from 9:00 to 10:00, the second lesson from 10:30 to 11:30.

Postproduction Activities

Several postproduction responsibilities fall to the producer:

1. Filing archival copies of the script and the tape
2. Ensuring that a copy of the producer's script is given to others who need it
3. Ensuring that the recorded program reaches the broadcast studio on time.

Filing Archival Copies of the Script and the Tape

A copy of the script and the tape of every lesson produced should be kept on file permanently, or at least during the time the project is on the air. More than one file copy may be required, depending on the nature of the project. The copy of the script that is to be filed is the producer's working script from which the final recording was made (complete with pencil marks, doodles, and comments). This means that the producer or the assistant producer must mark every change directly on the producer's script, including changes in words, and cuts or additions made to adjust the running time of the program. Thus, if questions arise about the content of a particular program and the tape of the broadcast is not completely clear, the file copy of the script should show exactly what was recorded.

Ensuring That a Copy of the Producer's Script Is Given to Those Who Need It

Certain production-team members require a copy of the script exactly as it was recorded in order to complete their work. They include the writers of print materials, such as teacher's notes and pupil worksheets, and the evaluators of the interactive radio instruction lessons.

Ensuring That the Recorded Program Reaches the Broadcast Studio on Time

To be certain that the recorded program will reach the broadcast studio before the scheduled broadcast date, the producer should allow at least two weeks' lead time, preferably more. This provides a cushion should production be delayed for some reason—a sick actor, an electrical failure, etc.

A reliable procedure should be established for obtaining the recording from the project office, delivering it to the studio, and returning it to the project office after the broadcast. The procedure will depend on the local broadcast structure. For example, a specific country's procedure may call for review of the program by state officials before it is aired.

*The
Producer
and
the
Program*

The tape that is delivered to the studio for broadcast should be a copy, not the master. The master should remain in the project office.

The preferred arrangement in creating and presenting informational and educational material by radio is that the producer and the writer be different people. If staff and money are short, the two positions may have to be held by the same person. In either case, clear guidelines should exist as to which aspects of the script may be changed by the producer at the time of recording and which may not.

The rule for educational materials should be to produce the script exactly as it is presented to the producer. This assumes that the script has been carefully planned, written, checked, and revised before it comes to the studio.

The reason for this rule is that an educational script, particularly one for interactive radio instruction, must be very carefully designed and constructed. Any deviation from or addition to the script can adversely affect the learning design. A certain drill segment may appear dull to an actor, or the repetition of a certain lesson over several days may be boring. In terms of instructional design, however, a particular approach may be represented that has been chosen for very good reasons, and altering it may very well affect its value.

A drill segment is written to a precise pattern, which can be ruined by the addition of words to any one sentence. Radio teachers (actors) may feel very constrained in not being able to give encouragement to their listening students, such as "Very good," "That was excellent," or similar phrases that classroom teachers frequently use. In many instances, however, this type of encouragement cannot be used because radio teachers cannot hear the actual responses of students. They might say, "That's right," after a student or a group of students has given the wrong answer. The tightly designed script for interactive radio instruction presents actors and producers alike with a challenge to retain their spontaneity, enthusiasm, and interest when they have little license for displaying their own character.

If a problem arises in the studio with regard to the words in a script, it should be referred to the curriculum director, the project administrator, or whoever has been given final authority over the script's content. No changes should be made in the script without this person's permission. Ideally the person in charge of the script makes the actual change right on the script and initials it.

*How
to
Evaluate
Studio
Production*

Generally a feeling of constraint and "sameness" is what prompts actors and producers to want to make changes. Certainly scriptwriters sometimes fall into the habit of doing things the same old way when the type of lesson they are writing does not necessarily call for it. Regular meetings of actors and scriptwriters and periodic visits to the studio by scriptwriters help both groups share ideas and understand the constraints under which programs are developed, written, and produced. The producer and the curriculum director (or whoever is in charge of the scriptwriting department) should work closely together all the time.

Following are some questions that may aid the producer and others in assessing the completeness and the effectiveness of the production effort:

- Has the script been reviewed, and have difficulties or inaccuracies been resolved?
- Have the actors been selected and trained?
- Have the scripts been sent to the actors far enough in advance to be read, marked, and rehearsed?
- Are the learning objectives of the overall program and the individual segments clear to the producer? Have they been made clear to the actors, the musicians, and the technician?
- Has a precise and firm schedule for rehearsal and recording been set and maintained?
- Has the schedule been communicated to the actors and other appropriate personnel?
- Have the music and sound effects for which the script calls been reviewed for appropriateness to the listeners and the script?
- Has the availability of the music and sound effects been determined?
- If any of the music is protected by copyright, has permission to use it been obtained, and have royalty fees been paid?
- Have the music and sound effects been located, and have any special needs been handled?
- Has the preproduction list been prepared?
- Has a last-minute check of readiness to record been made?

-
- ___ Has the performance held to the time specifications for the overall lesson and individual lessons? If not, have appropriate adjustments been made, and have they been cleared with the curriculum director or project administrator?
 - ___ Has the integrity of the script been maintained by actors and producers?
 - ___ Have the enthusiasm, interest, and freshness of production personnel been sustained?
 - ___ Has the producer's script been placed in the archival file?
 - ___ Have copies of the producer's script been distributed to people who need it to prepare other components of the instructional program?
 - ___ Has the recorded program reached the broadcast studio on time?
 - ___ Has an archival copy of the master tape been made?

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Acting

9

Acting

What Acting Is

Acting means playing the part of another person in such a way that the audience believes the actor is the other person. An actor has the ability to step into the role of another person convincingly by adjusting voice, personality, emotional range, and character interpretation. This ability can be increased with training. Not everyone is capable of being an actor, and many radio programs fail because the people presenting them on the air are unconvincing. A radio program has a greater chance of success if the presenter is a trained radio actor.

Why Actors Are Important

In instructional programming for schools, using classroom teachers as radio teachers may be tempting. Frequently, however, it is not effective. People who are inexperienced with radio presentation frequently sound stilted and artificial when they read printed material on the air. Classroom teaching is very different from teaching by radio, and the classroom teacher faced with transferring to radio commonly becomes uncomfortable and unnatural. A trained radio actor can play the part of a teacher well and can also deal easily with such radio conventions as pacing, timing, and emphasis. Radio instructional programs for schools often employ dramatized stories, games, and songs, and a trained actor can present these more convincingly than a person untrained in radio presentation.

Programs for adult information and education always require an effective presenter. Even if dramatic acting is not called for, radio presenters are usually more effective if they have had some radio training. Certainly in programs in which drama is being used, trained radio actors are essential.

How to Act on Radio

Certain characteristics are needed to be a good actor, on stage as well as on radio: observation, a good voice, reading fluency, audience awareness, an understanding of the medium, an understanding of the purpose of the program, a singing voice, and an ability to use a number of different character voices.

Characteristics of Good Actors

Observation

To give a believable portrayal of another person, an actor must truly understand human behavior and motivation. A good actor is a keen observer of others' actions. A good radio actor is also a good listener. The radio actor must portray all aspects of a personality through voice alone.

A Good Voice

A successful actor has a flexible voice. An actor's natural speech should be as free as possible of regional accent, so that under normal circumstances his or her voice can be accepted more widely. At the same time an actor should be able to produce a range of accents, both regional and foreign, in order to extend the number of characters that he or she can portray.

Reading Fluency

A radio actor must be able to read fluently. Stage actors can learn lines by having them read. Radio production does not allow actors time to learn lines. Radio is a much more immediate medium than stage. It is not uncommon for actors to receive their radio scripts the very day on which the recording will take place.

A good reader learns to look ahead constantly to the next few words while verbalizing the preceding ones. A good reader also understands the words being read and expresses that understanding through verbalization. Radio actors can practice presentation by reading aloud frequently and, if possible, tape-recording themselves so that they can play the tape back and listen to it critically.

Audience Awareness

A good actor pays close attention to the audience and knows in advance what kind of audience to expect. An audience of children, even in a theater, requires a different acting style than an audience of adults experienced in theater going.

In the theater, actors rely on audience feedback to help them adjust their performance. This feedback is not available to radio actors, who should therefore be very sure to understand just who their audience will be before they begin the performance.

Radio actors who are taking part in a series requiring them to perform frequently for the same audience are well advised to observe how their audience receives the programs in order to help them tailor their performance. Actors taking part in school programs, for example, should try to spend some time in classrooms observing how students react to their broadcasts.

It is especially important for actors presenting school programs to try to imagine their audience as they speak. Those who are unaccustomed to working with young children should spend some time with them to learn how they react to various ideas and presentations. Some actors working with school broadcasts find it helpful to imagine a particular young child during the program and act specifically to that child.

An Understanding of the Medium

Radio is a very intimate medium. The radio actor must underplay, rather than overplay the way a theater actor might. Some radio actors find it helpful to imagine that they are playing to a one-person audience.

Radio actors should understand the equipment with which they work—the sensitivity of the microphones, the sound ambience of the room in which they are performing, and the types of receivers on which their performance will be heard. Actors are also well advised to understand their own peculiarities with the microphone. A good producer will always call for “voice levels” before recording begins. However, an actor who knows, for example, that his strong voice requires his standing farther back from the microphone than the other actors, can save valuable time by informing the producer of this in advance.

An Understanding of the Purpose of the Program

In a program designed specifically for entertainment, the actor's aim should be to make the performance as believable as possible, even if certain words or phrases are not specifically heard. For example, in a drama about a person being attacked, the actor's line might be scripted like this: “Help, help, there is somebody after me. Somebody come and help me!” In performance the actor might omit certain words, so that the speech would come out more like this: “Help, help . . . somebody's after me. Somebody come . . . help me!” The omission of a few small words from the speech would have no adverse effect on the meaning.

In a program designed to teach English, however, it may be essential for the audience to hear every word in the program clearly. Alternatively the lesson may be stressing the use of the word *somebody*, in which case the actor should ensure that it is carefully and correctly used.

An actor who is unsure of the purpose of a particular program should check the program objectives with the producer before proceeding. Scripts for educational programs often include the program or segment objectives at the top of each page as a guide for the actors.

A Singing Voice and an Ability to Use Different Character Voices

If at all possible, a radio actor should be able to sing, particularly if he or she is to be involved in programming for children or in school broadcasts. Being a first-rate singer is not necessary, but having a basic understanding of music and such techniques as phrasing is very helpful. Another asset is at least three standard

Using the Script

speaking voices: the actor's own, the voice of a child or a young person, and the voice of an old person.

One of the most important tools of the radio actor is the script. Every radio actor should know certain procedures and considerations in using a script.

Script Preparation

Actors should have time to prepare their scripts before recording the program. Indeed, they should receive the script at least a day ahead of the taping. This is not always possible when the production cycle is tight, but it is strongly recommended.

To prepare a script, actors should first read it through completely to be sure that it generally makes sense and that all of the pages are there. Then they should mark the script for rehearsal and production by—

- Highlighting every speech they have in the script. This can be done by underlining only their name in front of the speech or underlining the whole speech, whichever is preferable.
- Noting the areas of the script where they have questions and discussing the questions with the producer before production begins.
- Circling or otherwise marking any sound effects for which they will be responsible in the studio. A technician will produce some sound effects from a tape or a recording; various members of the cast must create the others "live." Such an effect as the ringing of a bell, for example, can well be handled by an actor in the studio.
- Highlighting any emphases or pauses to which they must pay particular attention. This is usually best done by underlining or circling the appropriate words or phrases.
- Marking any sentences that need to be broken up in delivery. For example, a long sentence like the following would be very difficult to read smoothly without some breaks:

On this day, which was after all one of the most important days of the year—being, as it was, the President's birthday—the school children were accustomed to gather in the town square, near the town hall, for an early morning parade.

The careful radio actor will mark specific pauses in this sentence to make it easier to read. A double slash (//) is typically used to indicate a break. With the break marks in place, the sentence would look like this:

On this day // which was // after all // one of the most important days of the year // being, as it was, the President's birthday // the school children were accustomed to gather // in the town square // near the town hall // for an early morning parade.

- Circling any pauses for student or audience response that come immediately before one of their speeches, to ensure that the requisite time is left for the pause.
- Checking the time needed to read the script, to be sure that it is relatively close to the running time suggested by the writer.
- Writing their name at the top of every page of the script. This helps prevent losing pages during rehearsal.

Script Handling

Radio scripts are presented on sheets of paper, and the movement of paper in front of a microphone presents serious noise problems. The slightest rustle can sound like a fire crackling. Continuous noise from paper may seriously impair the clarity of the information being presented. Unnecessary paper noises can be cut down by—

- Keeping the script well clear of any objects such as the microphone stand or tables and chairs.
- Removing any pins, staples, etc., that hold the various pages together. Turning the front page to the back of the pile creates a lot of noise. With the pages separated, one page at a time can be moved with considerably less noise.
- Holding the pages of the script upright, rather than laying them on a table. This ensures that the actor's head is up rather than pointing down from the microphone while he or she is reading, and it allows the pages of the script to be moved noiselessly.
- Dropping a page to the floor once it has been read. The noise of its hitting the floor will not be picked up by the microphone. The noise of moving it from the front to the back of the pile is almost always heard. Obviously, actors who use this method will have trouble finding their pages

**Voice
and
Sound
Problems**

again if they have forgotten to write their name clearly on each page of the script.

Not all voices are naturally suited to radio. A voice may have a tone or a range that does not broadcast well. Certain voice difficulties can be overcome by training. The degree of change a voice needs can be determined by listening to it carefully many times.

The following voice qualities and sounds may cause difficulties in broadcasting. Most can be minimized or corrected:

1. The sibilant *s*, which creates a slight whistle every time a word in which it appears is pronounced. An actor can avoid this by carefully practicing words containing *s* until the sibilance is reduced. In severe cases the effect can be diminished by the actor's speaking slightly sideways across the microphone.
2. Plosive sounds such as *p*, *b*, *d*, and *t*, which are likely to create a heavy popping noise. The problem can be solved by the actor's reducing the amount of breath used to produce these sounds or speaking across the microphone rather than directly into it.
3. A voice so low in tone that it is hard to hear. A deep voice can be very attractive, but a voice that is too low may be difficult for the radio to broadcast clearly. An actor can overcome this difficulty by consciously "placing" the voice up into the area behind the nose known as the mask of the face.
4. A voice too thin or nasal. If anything, the radio will accentuate thinness and make it sound even worse. This problem can be addressed by consciously placing the voice into a lower register, imagining that it is coming from the chest. A considerable improvement in voice quality can be obtained by simply "thinking" the voice into the appropriate resonance area.
5. Indistinct vocalization. Some voices that have excellent tonal quality are nevertheless hard to understand when broadcast through an electronic medium. Because any electronic-reproduction device distorts the voice to some degree, exaggerating certain vocal aspects is often necessary to achieve clarity. This is frequently the case with final consonants, for both speech and singing. The actor should be sure to pronounce the final consonant but without so much value that it sounds overemphasized. A good radio actor always

**How
to
Evaluate
Acting**

leaves a very tiny "air space" between each word and the next. This space is not audible to listeners; they hear only well-enunciated speech. For actors whose vocal presentation lacks clarity, a good exercise is to practice reading with a deliberate—but slight—pause at the end of every word.

Readers may find the following questions helpful in evaluating their own and others' talent for radio acting:

- ___ Does the person, through his or her acting, show keenness in observing human behavior and motivation?
- ___ Does he or she also demonstrate good listening abilities?
- ___ Can the person adjust his or her voice to different volumes?
- ___ Is the person's natural voice free of regional accent?
- ___ Can the person nonetheless produce a range of accents with his or her voice?
- ___ Is the person a fluent reader?
- ___ Does the person evidence a sensitivity to his or her audiences?
- ___ Does the person understand radio as a medium and the implications for actors?
- ___ Does the person understand broadcasting equipment and facilities?
- ___ Is the person also familiar with his or her own peculiarities with the microphone?
- ___ Does the person make an effort to understand the purpose of a program in which he or she is performing and to relate his or her acting to that purpose?
- ___ Does the person have an acceptable singing voice?
- ___ Does the person have two stock voices other than his or her own?
- ___ Does the person prepare scripts for rehearsals and recording sessions by checking them for completeness and marking them according to his or her role and responsibilities?
- ___ Does the person handle scripts in such a way that noise is minimized?
- ___ Does the person give evidence of skill in overcoming broadcast difficulties such as sibilance, plosion, lowness or thinness of voice, and indistinct vocalization?

10

*Interactive
Radio
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Handbook*

Timing

10

Timing

*What
Timing
Is*

Timing in radio has several meanings:

- Fitting a program into its allotted broadcast time, which involves writing scripts to fit the time available, determining the length of time needed for pupil responses, and adjusting a program during production to take up more or less time, as necessary
- Pacing the delivery of a program, which entails "phasing" time so that a lesson or a segment gets faster as the audience's knowledge increases, emphasizing words and phrases with such techniques as air space, and pausing for listeners to make sense of what has been said.

*Why
Timing
Is
Important*

Timing is an important consideration in scriptwriting for two reasons: fit and pacing. A radio program is usually required to fit into an allotted broadcast time. Whole lessons as well as individual segments must conform to the time specifications laid down for them. At the same time they must allow for effective communication from radio actors to listeners and for interaction between them.

Pacing, the speed at which a radio program is presented, affects the response of listeners. Pacing must be varied to hold their attention, enhance their comprehension of the material, and emphasize words and phrases.

*How
Timing
Is
Accomplished*

A good program fits exactly into the allotted time. It does not force the continuity announcer to fill up dead air with music or other announcements. Fitting a program into its allotted time is the joint responsibility of the scriptwriter, the producer, and the announcer or actors.

*Fitting
a
Program
into
an
Allotted
Time*

Writing Scripts to Fit the Time Available

Good scriptwriters train themselves to know roughly how many written words fit into a spoken minute so that they have a rule of thumb to work with in creating a program. Obviously the time needed to deliver the written word in spoken form varies with the type of audience being addressed and the nature of the material being presented. Following are some guidelines for writing scripts to fit the time available.

1. Find out the exact length of time allowed for the program. If the slot is 30 minutes, only 28-1/2 of them may be available for actual programming, the other 1-1/2 being reserved for station identification or time announcements from the station's continuity announcer.
2. Clearly indicate the time allowed for music and sound effects so that the producer has a better chance of producing the program to the estimated length. For example, for 30 seconds of music, write "MUSIC 30." For a series of music and sound effects, give an exact time for each, as in the following example (in which FX is the abbreviation for sound effects):
 1. MUSIC 30
 2. FX COWS MOOING UP AND HOLD 5
 3. CROSS FADE TO FX DOGS BARKING 5
 4. FX DOGS BARKING UP AND HOLD 5. FADE UNDER MUSIC 15 TO END
3. To time a script, read it aloud. When a person reads silently, he or she tends to read more quickly than he or she would normally speak the same words.
4. If the script calls for more than one person to speak, allow a second or two between voices. There is always a short time gap between when one speaker stops and the next one begins. Consciously remember to count this time.
5. If you are writing a series of programs for the same presenters, listen to them on air so that you can hear their voices in your mind. You will soon learn to remember not only the sound of a voice, but also the speed at which it is presented. This will make it easier to time material for that voice accurately.
6. Designate sections of a script to be used if the program is running short in production and sections to be cut if the program is running long. Such material is referred to as optional additions or optional cuts ("opt adds" or "opt cuts").

Educational programs for children often include songs for either education or relaxation. Such programs can be lengthened by repeating a verse of a song or repeating the whole song. They can be shortened by decreasing the number of verses to be sung or by leaving out a song altogether.

Drama might include a number of speeches to be used or not, as appropriate. These can contribute nonessential

information but add color or atmosphere. For example, in the following excerpt, the nonessential speeches are italicized to indicate what could be omitted without affecting the main message and meaning of the drama.

1. MARIA: *Good morning, John.*
2. JOHN: *Good morning, Maria. Isn't it a beautiful day! I am so glad the rains have come at last. I always feel better when there has been a good rain storm. It makes me feel more energetic.*
3. MARIA: I have a problem, John. My husband has gone away to the city to work, and there is no one who can advise me on how to plant my maize.
4. JOHN: Perhaps I can help you. I am going to be planting my own maize very soon. In fact, the agricultural extension worker will be by next week to help me. I am sure he could give you some advice too.
5. MARIA: *Is that the young man who was here last month? The one who came on a big motor bike?*
6. JOHN: *Yes, that's the one.*
7. MARIA: *He was telling me that he once knew my father, a long time ago. He said they had worked together. It will be good for me to talk to him again.*
8. JOHN: He has already given us some good advice about how to prepare our ground for the maize planting. I can help you prepare your field, so that you will be ready for the next advice he will give us.
9. MARIA: *Thank you, John. You are a very good neighbor.*

Educational radio programs are made up of a number of segments, each with its own time limit. An educational program might be formatted like this:

<i>Segment</i>	<i>Time (mins. & secs.)</i>
Introduction and opening song	1:30
Review of yesterday's lesson	2:30
Initial-teaching segment: The long vowel <i>e</i>	3:30
Physical exercise (game)	2:00
Story time: "The Fox and the Crow"	5:00
Worksheet activities	5:00
Long-term maintenance: Differentiating sounds	2:30
Song: "Days of the Week"	3:00
Drill exercise: Alphabet	1:30
Closing song and goodbye	<u>2:00</u>
	28:30

If a program has a set format that is used consistently throughout a series, it is important that the writer of each segment maintain

as nearly as possible the time limit that has been given to the segment. To most beginning scriptwriters, this sounds like an impossible constraint, but a little practice will show that creating a segment to fit into an allotted time is not difficult to learn.

The same rules apply in writing a segment as in writing a whole program to a set time. However, in segment writing it is even more important that the writer listen to the program regularly to become accustomed to the speed at which the presenters deliver the lines and to recognize the slight time that elapses between one speaker and the next, or between the end of a piece of music and the commencement of the next speech. Remembering to count the time of these pauses in timing the finished script is also very important. Even if each pause is only three seconds long, 10 of them will add a half minute to the length of the segment. In timing scripts, scriptwriters frequently overlook counting hidden seconds such as these, which can make a vital difference in the running length of the program.

Timing Response Pauses

The technique of providing exactly the right amount of time for student response in interactive radio instruction needs very careful attention. Too long a pause allows listeners' minds to wander, creates dead air, and lessens momentum. Too short a pause does not give the learners adequate opportunity to interact and causes the response to overlap the resumption of the broadcast. Yet aptly timing pauses for pupil response is almost impossibly difficult. The interactive radio scriptwriter often writes for an enormous audience of learners. Interactive radio characteristically makes heavy use of choral responses, and classrooms and communities manifest a surprising variety of local styles in the speed of choral responses. As learners progress, response rates shorten; anticipating this is problematic. Also, the writer must often allow for an unknown quantity of "think time" in addition to actual performance time. In some cases, learners seem to need an extra second or two to be sure that the radio has finished cuing them.

Scriptwriters must simply use their experience and intuition in timing response pauses. Some scriptwriters devise elaborate, personal rules of thumb for timing various types of responses. "Read the line aloud, time it, add half again the total time, and take off 20 percent for each repetition" is a typically complicated rule. Scriptwriters who use such devices are forever tinkering with them because no rule of thumb can be perfectly satisfactory, and in any case one never holds true for long.

A practice that a scriptwriter might follow, rules or no rules, is (a) to speak the response aloud, trying to mimic a typical style of delivery for learners, and to time himself or herself with a stopwatch; and (b) add at least one second, and as much time in addition as learners might need to think about the answer, get ready for the next cue, or whatever.

How do scriptwriters get an idea of the typical style of delivery of their target learners? Ideally, they carry in their heads the sounds of their material in use, from regular visits to observation schools or communities. Without periodic opportunities for observation, apt timing of response pauses is virtually impossible.

Timing a Program in Production

Even when a script has been written "to time" very carefully, nothing guarantees that it will fit exactly into the allotted broadcast time. Predicting precisely how long a particular line will take to deliver is impossible even if the writer knows the speaker well. Unexpected hidden time such as excessively long pauses between words, paragraphs, or speeches, or even extra voice emphasis given to a word, can add unwanted seconds to a production. Or the program may run shorter than the writer estimated because the presenter speaks more quickly than expected.

The producer's job is to monitor the running time of the program as it is being produced and to make necessary adjustments, either during production or in the editing following production. When production time and facilities are limited, it is helpful to control time during production as much as possible and not to depend heavily on editing afterward.

With a program that is presented in segments, the producer can control the length by keeping a running tally of the time used for each segment. The educational program used earlier as an example provides another illustration:

<i>Segment</i>	<i>Allotted Time</i>	<i>Actual Time</i>
Introduction and opening song	1:30	1:30
Review of yesterday's lesson	2:30	3:00
Initial teaching lesson: The long vowel e	3:30	3:20
Physical exercise (game)	<u>2:00</u>	<u>2:25</u>
	9:30	10:15

With such a record the producer can see whether the program is running under, on, or over time. In the example, it is running 45 seconds too long. This is not serious and can be overcome by

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*Pacing
a
Program*

speeding up the production in the next segment or two—perhaps by cutting down theme-music time or by asking presenters to speed up their voice presentations slightly. If the timing can be put right at this stage, there will be no need for postproduction editing.

A producer must also remember that giving cues, or cuing, uses up time. A good three to four seconds are consumed from the moment the producer raises his or her hand to give a cue to the time the person being cued actually begins to speak. Remembering this is particularly important in interactive radio instruction, in which the pauses for student response have to be accurately measured. If the required pause time is five seconds, the producer should give the cue at the end of three or three-and-a-half seconds because by the time the presenter begins to speak again, a full five seconds will have elapsed.

Pacing is the speed at which a program is presented. It should be altered depending on the audience being addressed, the nature of the material being presented, and the need for emphasis within a program.

Suiting the Pace to the Audience and the Materials

An audience that is accustomed to listening to radio can generally accept a faster pace than one for which radio is a new experience. Similarly an audience can accept a voice it already knows at a faster pace than it can accept a voice it does not know. These generalizations apply as much to children as to adults. There is no evidence that programs for children must be delivered more slowly than programs intended for adults, if the children are experienced radio listeners.

The more difficult the material is for an audience to understand, the slower the pacing should be. Care should be taken, however, not to bore the audience with too slow a pace.

Educational material that the audience is expected to remember and act on needs to be more slowly paced than information that is intended solely for entertainment. The pacing of educational material should vary according to the students' familiarity with the material. The first time new material is introduced, it should be presented quite slowly and deliberately. As the students become conversant with the material, it may be presented to them at a more normal pace. Even within a particular drill lesson, pacing should increase from beginning to end. In the following example, taken from a radio mathematics lesson, students are

reviewing the process of adding three numbers together. The notation PPR stands for pauses for pupil response; they are a prominent feature of interactive radio instruction.

1. RADIO CHARACTER 1: Children, we're going to practice adding three numbers. We'll begin by adding the first two numbers and getting a total. Then we'll add the third number to that total.
2. RADIO CHARACTER 2: Let's try that, John [Radio Character 1]. Give me three numbers, and I will add them.
3. RADIO CHARACTER 1: All right, Jill [Radio Character 2]. The numbers are seven and three and four.
4. RADIO CHARACTER 2: Seven and three and four. All right. I'll start by adding seven and three. Seven and three is ten. Now I'll add the four. Ten and four is fourteen. The answer is fourteen.
5. RADIO CHARACTER 1: Fourteen. That's right, Jill. Now, children, you try it. I want you to add six and two and three. Start by adding six and two. What is six plus two?
6. PPR 2
7. RADIO CHARACTER 1: Eight. Now add three to eight. What is eight plus three?
8. PPR 2
9. RADIO CHARACTER 1: Eleven. We added the first two numbers, six and two, and that is eight. Then we added eight and three. And the answer is eleven.
10. RADIO CHARACTER 2: Children, try another one: three plus three plus four. Three plus three is?
11. PPR 3
12. RADIO CHARACTER 2: Six. Now add six and four. What is six plus four?
13. PPR 3
14. RADIO CHARACTER 2: Ten. Now try another one: one plus three plus four. See if you can do it alone, children. What is one plus three plus four?
15. PPR 5
16. RADIO CHARACTER 2: Eight.
17. RADIO CHARACTER 1: Here's another one: What is three plus two plus five?
18. PPR 5
19. RADIO CHARACTER 1: Ten. What is two plus two plus four?
20. PPR 5
21. RADIO CHARACTER 1: Eight.

**How
to
Evaluate
Timing**

Like all good drill segments, this one begins with explanation and demonstration, and as the students understand the process, the pace accelerates. Fewer words are used and the speed of presentation increases. If the initial pace were maintained throughout, the children would probably lose interest because they would be moving ahead.

Similarly, consecutive segments on the same topic that are presented over time (perhaps once a day for 10 days) should pick up in pace. The first segment should start slowly, and the pace should accelerate during subsequent segments until a normal speaking speed is reached.

Emphasizing Words and Phrases

Time, in the form of effective pauses, can also be used for emphasis. One of the most difficult tasks in radio presentation is emphasizing a word without sounding artificial. The tendency is to say the word louder than normal. This certainly provides emphasis, but it also sounds very unnatural. A more effective means of emphasis is the use of "air space," a fraction of time allowed before and after a word. In the following line, a presenter can give the word *two* needed emphasis by pausing very briefly before and after it: "Now we are going to add . . . two . . . numbers together." Using air space for emphasis requires experience. The audience must be unaware of the pause but aware that the word has special importance.

Pausing for Absorption

Another use of the pause for speech effect is to allow time for an audience to make sense of a sentence, not expecting a response. For example, a radio character might wait a moment between sentences in delivering the following lines: "Children, you should all have your work sheets in front of you now . . . Be ready for when I say 'start.'" A pause of this nature may be timed by the person reading the script; it does not have to be programmed by the scriptwriter or the producer. Usually the actor should allow a two-second count before continuing the speech.

The fit and the pacing of a script might be assessed by addressing these questions:

- Does the script clearly indicate the time to be allowed for various music and sound effects?
- Has the script been timed by the writer, and does it fit the specifications given? Have hidden seconds been counted?

-
- Has the scriptwriter included optional additions and optional cuts?
 - Have pauses been allowed for student response, and is the time allowed for them sufficient?
 - Has the program's running time in production been monitored, and have necessary adjustments been made in the process?
 - Has time been allowed for the producer to cue the actors?
 - Does the pace of the program suit the audience?
 - Does the pace of the program suit the material being presented?
 - Have appropriate words and phrases been given emphasis?
 - Have momentary pauses been provided for the audience to absorb instructions?

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***Interactive
Radio
Instruction
Handbook***

***Music
and
Sound
Effects***

11

Music and Sound Effects

What Music and Sound Effects Are

Music and sound effects are important components of most radio programming. The main uses of music are as follows:

- To provide an introductory theme. Just as readers identify familiar magazines by their covers, so listeners recognize radio programs or segments by their familiar theme music.
- To bridge parts of a program. The use of musical bridges is particularly necessary when there is no obvious connection between two parts. To avoid an uncomfortable jump in subject matter, the scriptwriter can call for a musical interlude that will allow the listener's mind to clear itself of one idea and prepare itself for another. Bridges also provide transitions between scenes and times in dramas.
- To create a mood, to establish a particular feeling in preparation for a coming subject. Just as a film may open on a foggy, dark scene to suggest a coming mystery, so a radio program may draw on eerie music. Sometimes such music is continued softly under the dialogue to enhance the desired mood.
- To cue learners that something familiar is about to happen. The same three or four musical tones might routinely precede the entrance of a particular character, for example, or a gong might regularly accompany frequently repeated instructions such as "Stand up," "Sit down," "Turn over your worksheets," and "Pick up your pencils."
- To cue learners to participate. If children are to listen to a story and respond to questions from time to time, the scriptwriter might use a musical cue—a drum roll or a guitar chord—to alert them to a temporary interruption of the story for questions and answers.
- To avoid dead air. If students are asked to write and are given, say, 20 seconds to complete the task, that long a silence on the radio may be uncomfortable. Learners may wonder whether the program has gone off the air. "Incidental listeners"—people who happen to tune in the radio lesson but are not part of the learner population—might be offended or confused. Also, in many countries broadcasting codes do not allow dead air for longer than a specific period, sometimes as few as 10 seconds. Soft background music can fill long response pauses.

**Why
Music
and
Sound
Effects
Are
Important**

Sound effects are used in instructional radio for a different purpose: to create a greater sense of reality. As an aural medium, radio must make its impact through sound alone. Replication of natural life sounds is a major strategy for achieving effect. For example, audiences find it easier to believe they are listening to an event taking place at sea if they hear the sound of waves and sea gulls than if an actor merely tells them the action is taking place on a ship.

The use of sound effects to enhance a lesson is an art. It requires study and care. Underuse may leave the listener with a sense of unreality; overuse may create confusion.

Music contributes substantially to instructional programming. It helps make programs distinctive and characters or procedures familiar. It ties the various parts of programs together, sets scenes, and establishes tone. Used well, it definitely promotes learning.

Judicious employment of sound effects can greatly enhance listening comprehension, particularly in the early stages of a series. With audiences that are not accustomed to radio instruction, however, great care should be taken to select sounds that are appropriate. As students become more accustomed to radio and more sophisticated in their listening habits and abilities, they can receive complex sound effects more comfortably.

**How
Music
and
Sound
Effects
Are
Integrated
into
a
Program**

Following are some general guidelines for the use of music in interactive radio instruction:

1. Suit the music to the learners, taking into account their age, cultural background, listening skills, and musical sophistication.
2. Suit the music to the subject. For example, lively march music would be a good choice to introduce a segment on learning the letters of the alphabet.
3. Use music with a purpose, and make the purpose as clear to the learners (even if only subjectively) as to the producer. Do not scatter music loosely throughout a program as decoration.
4. Avoid popular songs and other music of the day unless you have a specific purpose for them (and be certain to get permission to use them from the copyright owner). If learners are familiar with a tune, it may divert them from the

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Music**

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purpose of their lesson. To fill dead air or create background, rely on music that is not known to learners and does not have distracting effects such as a strong beat. Also, filler and background music is best played quietly.

5. Be sure that introductory themes for programs have a clear, easily remembered melodic line. Always start a program with the same theme. A song written especially for the program, possibly about the program, can help make the radio class more like a traditional one. The song becomes the lesson "entry"—rather like walking into the classroom; it gets everyone together and focuses attention. Having the radio teachers join the children in singing the song helps the students identify with the teachers. Be sure that songs and themes created specifically for a series are composed by a good musician who also knows the kind of music that learners will appreciate and understand. Songs and musical themes that are "in the public domain"—that is, not protected by copyright—can be adapted by writing new words. Current music is likely to be under copyright control and should not be used without authorization.
6. Use a standard theme for regular segments in a program and standard bridges for transitions between segments. Segment themes, like opening themes, should be melodic. Transition cues can be very short and do not need learners' attention drawn to them. They serve almost as subliminal cues in the same way that a classroom teacher's putting down one book and picking up another alerts children to a change in subject matter.
7. Take care that introductory music does not override or distract learners from the dialogue following it, and that mood music does not do the same to dialogue under which it is played. When a script calls for the music to fade under the next speech, fade it back far enough to ensure that the words will be dominant. At the same time, do not cut the volume abruptly before the speech simply to make sure that the words are clearly heard. When music is being used as a link, begin it softly behind the last few words of one scene, bring it up strongly between the two scenes, and fade it out under the opening words of the next scene.

Songs are a common device in educational radio programming for children. They combine a change of pace with a strong learning tool. Lyrics with a good clear melody are almost always easier for learners to recall than words without music. The power

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Sound
Effects*

of the musical jingle in advertising is clear evidence of this.

Children enjoy songs they know well. Overloading programs with too many new songs to learn is not wise. Old favorites are particularly useful for relaxation. If the content of a song is to be used as a learning device, it is usually necessary to teach the song formally. When the lyrics need not be learned exactly, a formal presentation is not required.

A good rule to remember is that music can enhance a program greatly if used well, but can ruin a program if used poorly.

Sound effects can be produced "live" in the studio, or they can be prerecorded on a tape or a disk. Certain effects can be created quite easily in the studio—for example, a door banging, a bell ringing, a drumbeat, footsteps, and heavy rain (made with a lot of small stones in a large can). For more difficult effects, commercial records are available containing as many as 100 different sounds.

Following are some suggestions and considerations related to sound effects. In the examples, as in regular scriptwriting, the term *sound effects* is abbreviated FX.

1. Make the request for a sound effect explicit, and indicate the length of time the effect is to be heard. To make sound effects easily discernible to the technician and the person who will provide them, they are usually capitalized and underlined in the script:

1. FX SEA GULLS CALLING 5

The "5" represents the duration of the sound in seconds. Noting the duration helps the scriptwriter and others gauge the overall running time of a segment.

2. Use only sounds that are normally detectable by the human ear. For example, the sound of an orange being peeled is not easily demonstrated (although the action does make some slight sound), so using it in a radio script would be ineffective.

Some sound effects, such as footsteps, should be handled carefully. Scriptwriters tend to request "FX FOOTSTEPS" every time someone moves from one place to another. Footsteps may not be audible in the situation being depicted. For example, the steps of a barefooted person walking on soft soil are not usually perceptible, particularly if people are talking at the same time. When the sound of footsteps is necessary, take care to reproduce it naturally. The tendency

is for someone to make the sound by stamping fairly heavily on a wooden board. Most people do not deliberately put each foot down heavily as they walk. Experiment with the sound, and listen to the result in the control room.

3. In areas where fringe or broken radio reception is a factor, be cautious about employing atonal sounds, such as hissing and scratching. Such sounds are not likely to be discernible through a bad transmission and may be perceived as "static."
4. If opening music at the beginning of a segment or story is to be followed by a sound effect, "cross fade" from the music to the sound effect so that an awkward pause does not occur between the two. Cross fading in this instance means slowly lowering the volume of the music while slowly bringing up the volume of the sound effect. The former fades out as the latter fades in. Instructions for such a cross fade are usually written like this:

1. THEME MUSIC UP 10. CROSS FADE TO FX DOGS BARKING
2. FX DOGS BARKING UP 5 AND UNDER NEXT LINE [or FADE OUT or CUT]

Instructions to fade from one sound effect to another are typically given this way:

1. FX DOGS BARKING UP 5. CROSS FADE TO FX CHICKENS CACKLING
2. FX CHICKENS CACKLING UP 5. CUT [or FADE]

The term *cross fade* is used only when crossing from music to a sound effect, from a sound effect to music, or from one sound effect to another. When music or a sound effect is to fade out behind a voice, this is indicated with the term *fade under*. Whether to fade a sound effect under a voice, fade it out, or cut it is determined by the nature of the script.

5. When using sound effects to set a scene, be careful not to remove them abruptly or too soon. Sometimes they should be maintained softly throughout. For example, if a scene is set in a market and the writer calls for "FX MARKET" at the beginning, cutting the sounds the moment the characters begin to speak would be unrealistic. Some sounds should continue, soft enough not to interfere with the voices but sufficiently audible to maintain the sense of market presence. The practice of numbering the lines on each script page beginning with "1" (discussed in the appendix to Module 7), makes it possible for the scriptwriter to indicate clearly

where the sound effects should end. For example:

1. THEME MUSIC UP 10. CROSS FADE TO FX MARKET
2. FX MARKET UP 5 AND UNDER TO LINE 26

This indicates that the market sounds are to be held under softly up to line 26 of the script. At this point, the writer indicates a fade-out or a cut of the sound effect:

26. FX FADE MARKET

6. Before using "live" sound effects on the air, play them into a microphone, and listen to them in the control room. The microphone can distort sounds. A sound that seems quite natural to the ear under normal conditions may not seem so when transmitted through a microphone.
7. Select commercial sound-effects records carefully. Some of the sounds on such records are culture-specific and not universally applicable. For example, an American frog makes a very different sound than an African frog makes.

*Storing
Music
and
Sound
Effects*

Music that is to be used repeatedly in a series of programs must always be ready. For this reason, more than one copy of standard themes and often-used interludes must be available. If theme music is selected from a standard disk recording, two copies should be taped immediately. One should be stored in the production cupboard, the other in the safe (if there is one) in the project director's office. Next, a production copy should be made by transferring the theme from the disk to a cartridge or a tape. The record should then be cleaned, a note should be appended to its cover indicating that a particular band has been reserved for this series, and the record should either be stored in the production cupboard or returned to the music library of the radio station (if it came from there).

Similar care should be taken with sound-effects recordings. The very first step to take with a new sound-effects recording is to tape-record a copy of it, before the recording has suffered even minimal dust or scratch damage. Then, if the recording does suffer damage or is lost at any stage, a backup copy is available. To protect copyrights, the taped copies should be destroyed when the series is completed.

*Preparing
Music
and
Sound-
Effects
Cartridges
or
Tapes*

When sound effects are to be made live in the studio, the appropriate materials must be collected and tried out in advance of recording time, and the producer must designate the person—actor or technician—who is to be responsible for the sound effects during recording. Whoever is so designated should mark his or her script with sound-effects cues, as should the producer, who will cue the performer at the appropriate time.

When prerecorded sound effects are to be used, it is even more important to locate and test them before recording time and then to store them in a convenient location. Locating and testing them is the responsibility of the producer or the assistant producer. He or she should first listen to them to ascertain that they are exactly what the script calls for. They should then be "logged" so that the technician can find them easily when they are needed. Logging can be done directly on the script, like this:

3. FX COW MOOING 5. (SIGNET #376/5, Band 4)

Or a log for the entire program can be prepared, showing music and sound-effects cues in the sequence in which they will be used, like this:

Social Studies for Schools

Program 32 June 27

Preproduction List

- | | |
|------------------------------|------------------------|
| 1. THEME MUSIC | Pr. Tape #1, Take 1 |
| 2. FX COW MOOING 5 | Signet #376/5, Band 4 |
| 3. FX CHICKENS CACKLING 15 | Signet #2243/1, Band 3 |
| 4. STORY MUSIC THEME | Pr. Tape #1, Take 4 |
| 5. STORY MUSIC BRIDGE | Pr. Tape #1, Take 5 |
| 6. STORY MUSIC END | Pr. Tape #1, Take 6 |
| 7. FX TRAIN ENTERING STATION | BBC #2008, Band 12 |

Music and sound effects can be added to the program during recording or in postproduction editing. When time is an important element, adding them during recording is much quicker—provided that they have been prepared in advance and can be included without holding up the production.

The use of a cartridge machine greatly enhances production. Each piece of music and each sound effect needed can be stored on a separate "cart" ready for use, with the exact time measured. The carts can then be numbered and stacked in sequence where the technician has easy access to them.

If no cartridge machine is available, the best approach is to have the technician prepare a preproduction tape, on which is recorded all music and sound effects for that program in the designated

**How
to
Evaluate
Music
and
Sound
Effects**

length and order. Although this means the loss of a generation (that is, the material being broadcast will already have been recorded and then rerecorded), the effect on broadcast quality is slight, and the time saved is worth the loss.

The technician must be given a script on which all cues for music and sound effects are underlined in red. This enables him or her to follow the script and have the appropriate music and sound effects standing by.

Following are some questions that may help staff evaluate the effectiveness of a program's music and sound effects:

- Is the music suited to the learners?
- Is the music suited to the subject?
- Has the music been used with a purpose?
- If popular music or other music of the day has been requested, does it have a specific purpose and is it being employed in such a way that it does not distract learners?
- Do musical themes have clear, easily remembered melodic lines?
- Have musical bridges been appropriately employed to ease transitions?
- Have songs been used judiciously?
- Have requests for sound effects been made explicit, and have their durations been specified?
- Have instructions for cross fading and fading under been employed to facilitate continuity between segments and sounds?
- Will the sounds called for be recognized by the listening audience? Will they be detected?
- Has care been taken with atonal sounds?
- Have music and sound effects been copied and stored for backup and safekeeping?
- Have materials for "live" sound effects been collected? Have live sound effects been tested before their use on the air? Does the reproduction sound natural?
- Have cartridges or tapes been prepared for production?
- Has a script on which cues for music and sound effects are marked been prepared for the technician?