DEVELOPMENT OF A COMPUTERIZED MANAGEMENT INFORMATION SYSTEM TO SUPPORT THE INTERNAL EVALUATION PROCESS

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The Project for Strengthening Health Delivery Systems
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1. INTRODUCTION TO THE COMPUTERIZED MODEL

This report has two main objectives. The first is to present guidelines for developing a computerized project information system which, due to its design, satisfies the project information requirements encountered in the four project phases of planning, implementation, documentation, and evaluation. Secondly, plans will be presented for the creation of an automated information system which is to supply data for the evaluation model discussed in the report entitled "Description and Application of the Internal Evaluation System Developed for the SHDS Project". This information system is currently under development.

1.1 Preliminary Considerations

There is a common tendency to equate computer-automated information with heightened data accuracy. However experience shows that without proper planning and organization, automated information will hold as little value for management as manually compiled information. Indeed, an organization can produce and manage accurate and useful information without the use of computers. Successfully transmitting manual information depends on, a) having a clearly defined system in place for directing that information from its sources to the decision-making levels of management, and; b) the quantity of information not being so great so as to preclude cost-effectiveness in a relatively labor-intensive system. Developing an information management plan is the necessary first step in creating any information system. Computers can be introduced into a system later, if it appears likely that automation will improve the speed and/or accuracy of data collection, analysis, and reporting.

A fundamental distinction exists between organization and planning on the one hand, and computers on the other. Whereas the former are management techniques, the latter is, of course, a technology. This simple distinction can be critical for international health care project managers to retain, in particular those whose projects call for computer-aided management, yet which operate in developing countries. In such cases there is a heightened need for reliable pathways for information transfer, but usually very few channels are open for this to occur. Persistent and often severe technical problems can arise when any computer technology is introduced into an environment not tailored to support it. These problems can be managed, however, by selecting appropriate equipment and, equally as important, by maintaining a supportive environment specifically suited for that equipment.

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Micro-computer technology has proved to hold several advantages as a tool for data collection, storage, and reporting under diverse and often harsh circumstances. It is relatively inexpensive and easily maintained, and has grown to become thoroughly exploitable using a very large and powerful array of institutional software options. When used to its maximum potential this technology can improve the efficiency of management of even the meagerest of resources.

2. ORGANIZATION OF THE MODEL

The information system proposed in this report was created as a model to supply the data for the internal evaluation process developed under the Drew sub-contract. This is expressed within the system as its capacity to report on comparisons of planned and completed project related activity. Its design also incorporates the ability to furnish the project managers with management data. This function is achieved as a result of the structured monitoring process, which will be discussed in detail below.

2.1 Information Structure

In order to monitor both global project performance and specific project components, the MIS consists of a structured network of project data interfaces. This structure has two major features. The first compares all planned project related activity and expenses to actual events. The second feature reorganizes detailed data on planned and actual project-related activities and expenses into larger categories so as to eventually produce global project status reports.

2.2 Information Components and Flow

The system produces standard plans, reports, variance reports and global status reports. In addition, special reports may be produced when needed. Plans are projections of project activity, personnel utilization, expenditures, etc. which are based upon planning data provided by the project executives. Reports, on the other hand, describe actual activities, personnel utilization and expenditures. Variance reports compare plans with what actually takes place. Global status reports summarize the data from these more detailed reports to provide an overview for the Chief Executive Officer. Special reports can also be generated whenever information which is not contained in the standard reports is required.

2.2.1 Standard Plans and Reports

Data on the separate components spanning all project activities are recorded by the system in the form of standard plans and reports (see Table #1).

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2.2.2 Variance Reports

Reports can be generated to assess and compare planned and actual figures for specific project activities or sub-activites without giving gross results for the entire project. These reports are known within the system as Variance Reports. They compare the Work Plan and Work Flow Report, or the Expenditure Plan and Expenditure Report, or the Quality and Satisfaction plans and reports without reducing the amount of detail found in the source documents. They can be particularly useful to mid or top-level level management for detailed monitoring when required (see Table #1).

2.2.3 Status Reports

The information system produces four types of global project status reports These are:

3) The Financial Status report
1) The Work Status report
2) The Quality Status report
4) The Satisfaction Status report (see Table #1)

Each project status report is derived from the figures collected by comparing plans with progress. Thus a Work Status Report is derived from a comparison of the Work Plan and the Work Flow Report. Similarly, the Financial Status report is derived from two sub-reports, the Expenditure Plan and the Expenditure Report. An Activity Quality Status report and an Activity Satisfaction Status report are generated in the same fashion.

Each of these reports provides critical information needed for periodic internal evaluations, and is the primary source of project data for top-level management and funding agencies. An advantage to establishing a single source of project data is that managers will have access to the same information that is eventually used by evaluators. This permits management to adjust the work plan, or re-allocate resources in response to the latest progress statistics.

2.2.4 Special Reports

Special reports may be required from time to time that provide information not available in the standard reports above. For example, in a project such as SHDS that conducts many training activities, there may be a need for periodic reports listing workshops and courses, as well as facilitators and participants. Formats for producing reports of this type have already been developed and are part of the current SHDS Project Information System.

3. RELEVANCE TO THE INTERNAL EVALUATION SYSTEM

The design of this information system allows it to be used directly in evaluating program results. The evaluation model monitors five categories of results. The information system provides the data needed for evaluation of each of these five result areas as discussed below. Table #1 also illustrates the relationship between the information system and the internal evaluation model.

3.1 Scope

Data on types of activities and performance is needed to assess project "scope". The data needed is found in the Work Plan and the Work Flow Report.

3.2 Productivity

Productivity can be assessed by determining quantity of activities performed and then dividing quantity by amount of staff time orFTE's used to produce the activities. Information on quantity of activities is found in the Work Flow report. Information on amount of staff utilization per activity is found in the Personnel Utilization Report. Using the guidelines set forth by the internal evaluatiom system, productivity measures can be obtained from this information.

3.3 Quality

The report "Description and Application of the Internal Evaluation System developed for the SHDS Project" outlines the types of data to be gathered by the information system that can be used to evaluate quality and satisfaction.

3.4 Cost

Cost information can be found in the Expenditure Plan, the Expenditure Report, the Cash Flow Projection, the Cash Flow Report, and the Financial Status Report.

3.5 Satisfaction

See above paragraph on Quality.

4. LOGISTICS AND GUIDELINES FOR AUTOMATION

One should consider it a given that at the outset of any project it is impossible to accurately predict all of its information variables (i.e. data types, quantity, sources, and especially report formats and frequencies). Therefore it is important that the project's staff possess hardware and software which is flexible enough to adapt to changing information demands during the course of the project. This next section will review the tools necessary to standardize the flow of information in a complex project.

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4.1 Hardware

4.1.1 Considerations for Selecting Hardware

The selection of computer hardware in an international setting is a critical part of project planning. There are several factors to be used in judging the many market options. These are: 1) serviceability, 2) operating system and memory capacity, 3) networking capacity, and 4) cost. Operating conditions in most developing environments are harsh and must be planned for in advance. Even where servicing is available, spare parts can be difficult to obtain. Therefore it is important to develop an internal capacity to service frequent problems such as chip failure. Among other things, this requires that a stock of spare parts be maintained, and that the staff be trained in such simple servicing procedures. Compatability and software options are determined by the second set of factors. If the project has to exchange data with funding or other outside agencies, compatability (format) becomes critical. Also, certain powerful software packages require at least 256K bytes of Random Access Memory, and for a large project access to high volume storage devices such as hard disks is usually necessary. Thirdly, the success of an information system in an organization is largely determined by the amount of routine use it receives. Networking the system by installing several "work stations" facilitates access to it, and can help establish it as a routine office device. The final consideration, cost, will vary greatly with the particular project; it should, however, always be measured against the other three variables.

4.1.2 Current Hardware

The model being developed employs IBM-XT compatible hardware. This choice was made for the advantages related to IBM's wide use, resulting in a high degree of transferrability to other users of IBM equipment. Serviceability and cost were not factors in the selection of equipment during development of the system. They normally would be important factors for an actual system.

4.2 Software

4.2.1 Considerations for Selecting Software

A competent Management Information System consists of four types of software: accounting (spreadsheet), word processing, data base management, and project management. An optional fifth type, graphics, is suggested when it is not an integrated function of any of the first four. (Some software packages, called "integrated software", combine all of these features into a single program. In some cases the integrated

package may not provide all of the enhanced functions of specialized packages.)

The information system should not be restricted to only one of the above types of software. In fact, given the inherent restrictions of most packaged software, very few projects could depend entirely on only one applications package. Using several types of software reduces the risk of over-reliance on a single type, and increases the number of possible applications. Another constraint to avoid when choosing software is the inability of certain programs to exchange data with other project software. This will effect the system's ability to generate punctual reports whose formats and information are relevant to management's expectations and needs.

The first type of software, spreadsheet, can be used for budget planning and expense monitoring. Its features usually include the ability to list all project expenses and perform any number of calculations with them. Word processing software can be used to generate text reports of all types. Data base management software enables the user to build complex project data bases, and should also enable him to generate reports to any needed specification. Data base management software is especially useful in providing customized reports that the next type of software, project management, may not be capable of providing. Project management software is used primarily by management to plan and monitor project status. It can, depending on the program, provide the user with project diagrams, including schedules, Critical Path lines, GANTT charts, PERT charts, and certain costs/resources monitoring features. Finally, graphics software can be used to enhance the presentation of the outputs from any of the above.

4.2.2 Current Software

The software chosen for this model includes all four types, in addition to the optional graphics package. These choices are: Lotus 1-2-3 for spreadsheets, Wordstar (or comparable program) for word processing, dBase III plus for data base management, and Harvard Total Project Manager and Harvard Presentation Graphics as the last two types. Working examples were generated using dBase III plus, the two Harvard Software packages, and, of course, the word processor for this report.

5. SYSTEM ILLUSTRATION

This section will illustrate the steps required to manipulate each of the five types of data listed above using the software described earlier. The system, which is still under development, provides a working model for one of the four SHDS objectives. For other areas still being developed, the

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report will elaborate on one or more methods of building a working model using the software available to us.

5.1 System Data on Scope and Quantity

5.1.1 Standard Plans and Reports

Standard plans and reports for information concerning the project's scope include the Work Plan and the Work Flow Report. The system presently accomodates both of these documents. The Work Plan, which is the project's basic agenda, is recorded in two different ways. The software employed for this are of two types: Project Management and Data Base Management.

5.1.2 Project Management Software

Harvard Total Project Manager allows the user to schedule the project's work load and display it in several helpful formats. Figure #1 shows a portion of the Strengthening Health Delivery Systems 1983 work plan. This graph is called a project roadmap. It can display all or part of any project, and clearly illustrate the network of tasks and milestones which the project intends to achieve.

The Work Flow is monitored by HTPM by the inclusion of an "actual start date" data field which is entered by the user in the same location in the program as the planned dates are entered. From this information, the lag throughout the project is calculated by the program. The program then calculates the Work Done percentage by, "adding together the products of each task's planned duration and its percent complete, and dividing the result by the sum of all the tasks."[1]

Figure #2 shows the segment's schedule for 1983. This display shows the activities for the entire year. The software allows the scope of the schedule to be determined by the user. Therefore, a weekly display could also be generated if so desired, or the display could be presented on the schedule organized by activity. The schedule function allows staff or management to keep informed at all times as to what should be phased in or phased out over the entire project.

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[1]Total Project Manager - Version 1.0 Harvard Software Incorporated page 14-4.

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5.1.3 Data Base Management Software

There is a second option within the system for storing data on Scope and Quantity. This is using the DBMS software, which in this case is dBase III plus. This software allows the user to program data entry methods, conduct a full range of manipulations to that data, and then produce reports in any format desired. The advantage this software type has over the previous option is that it is by far the more flexible of the two. The relative disadvantage is that the program requires the acquisition of a certain level of expertise to comoletely exploit its many powerful features. The makers of dBase III plus have recently addressed this disadvantage, however, and now there are many built-in functions in the program which did not exist in the earlier versions.

In the present system, dBase has been used to generate a single data-entry form to record both planning and actual data on personnel utilization (see figure #3). A print-out of the source program which generates this form follows figure #3. The data for this form is entered on all concerned personnel on a weekly basis. (Currently under development is a monthly entry feature.) The program records the identification code for the individual, and can keep track of the hours spent on up to five activities per form. At the end of each month, the program will tally these figures and present the mangager with a report on the person's activities. He or she can then compare that to the work plan. If the planning is done using this program as well, then the percentage of intended work done can easily be calculated by incorporating a procedure similar to that which calculates percentage work done in the HTPM program reviewed above.

5.1.4 Variance Reports on Scope and Quantity Data

Variance Reports show discrepancies between activities planned and activities performed.

The HTPM program calculates the variance by calculating the percentage of work done - which is a measure of variance from 100% - by using the method described in the previous section. The program organizes this data for all of the project's tasks in a "Task Progress Report Form."

The DBMS software, if programmed to do so, can present a similar report as described above. This would require that the target dates for each task be recorded using the program. Provided with this data, the program can be easily modified to present detailed figures or graphs depicting any discrepancies.

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5.1.5 Status Reports Using Scope and Quantity Data

Project Status Reports summarize project progress into a single measure per project activity (in the case of the SHDS, project activity would be equal to Objective) without separate task detail. These reports are sometimes necessary when a global indicator of status is desired, either by an executive or a funding agency. Producing reports which summarize project progress are instances when graphics software becomes convenient. The HTPM program does not output gross project indicators to the exclusion of detailed task data. This leaves the information system user with three options: a) to manually compile status data on project tasks and reorganize them using a graphics package into a summarized form; b) to use HTPM's "DIF" format output function which transfers task status data to other programs in a format which can be converted to global figures and then be fed into graphics software for illustration, or; c) to employ a flexible HTPM feature. HTPM allows the user to nest sub-projects into a "super project". Thus, SHDS's Objective III could be one of four tasks in a super project (Objectives I,II III, &IV), which in turn consists of sub-projects unlimited, except by disk storage capacity, in their number and complexity. Therefore all of the tasks in the project's Objective III could be considered together as one task. Producing a Task Progress Report Form for the super project would in effect give global project activity status figures.

5.2 System Data on Productivity

5.2.1 Standard Plans and Reports

Standard plans and reports providing information that can be used in calculating productivity include the Personnel Utilization Plan and the Personnel Utilization Report. The Personnel Utilization Plan is simply a schedule for each of the project's technical staff to follow for each activity-task. The plan can extend for any time period, but would normally be organized in monthly segments. The Personnel Utilization Report, on the other hand, is simply a compilation of actual time spent on each activity task by the technical staff members. Time units for both of these documents must be uniform. Full Time Equivalents, a measure of time distribution, could then be calculated based upon comparing time units scheduled versus time units actually devoted to a task. Computer-generated versions of these documents have been prepared in Figure #3.

5.2.2 Harvard Total Project Manager

The HTPM program incorporates the scheduling features needed to produce the Personnel Utilization Plan. HTPM includes a

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section on Resource Management, the purpose of which is to allocate and schedule resources to a project's separate tasks. Once entered, this information can be displayed in either of two ways. The first arrangement displays an "Allocation Graph", which is a Gantt chart showing the schedule for a single resource across all of the project's

tasks over a specified period of time. The second format lists all the resources used in a project. In the case of the Personnel Utilization Plan, these resources in question are only human resources; however, HTPM can keep track of the entire set of a project's resources.

HTPM's resource list can also be made to display the actual duration of each resource use per task. This can be displayed on the same document as the scheduled-use list, and thus a quick variance check can be performed.

5.3 System Data on Quality and Satisfaction

The data format for all plans and reports on activity quality and satisfaction is highly project-specific, and therefore does not come as a featured element in the HTPM program. Annexes 2, 3, and 4 of the report "Description and Application of the Internal Evaluation System Developed for the SHDS Project" give examples of survey methods for assessing program quality or effectiveness and the satisfaction of those providing and receiving services related to the project. The dBase III plus program can be used to emulate these surveys. Forms design becomes critical to the successful computerization of such data. The rating system illustrated on page 19 of annex 2 (Evaluation of Objective II-Anglophone Nursing) provides a good example of a form employing a quantifiable method of data collection for this type of data. A program can be made to include Variance Report and Status Report generators.

5.4 System Data on Cost

5.4.1 Standard Plans and Reports

The information system's financial segment includes expenditure and cash flow data. There are separate plans and reports for both expenditures and cash flow. The Expenditure Plan is a project-wide budget, detailing cost figures for all activities and tasks. The Report is simply the ledger of expended funds for each task. Cash Flow figures record the planned and actual expenses from fixed sources, thereby providing projected and actual net figures on the real amount of funds available from each source at any one time.

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5.4.2 Expenditure Data

HTPM allows the project planner to input cost information during the initial resource scheduling procedure described in the Productivity section above. The program automatically calculates projected costs from the resource allocation data and the task duration figures. This data is reported in the Project Resource List which in effect is the Expenditure Plan for the entire project, or any portion thereof. Actual costs are recorded by entering the actual cost of a resource and adding that amount to any other costs. This can be done in the Roadmap section of the program for each specific task. The program automatically adds the two actual cost figures and provides a total actual cost figure for each project activities task.

5.4.3 Cash Flow Data

Cash Flow manipulations require spreadsheet software. This type of software, such as Lotus 1-2-3, is capable of keeping up-dated cash figures for all project funding sources. The only requirement is that all transactions be entered on an immediate basis to give accurate results.

5.4.4 Variance Reports on Cost Data

Expenditure variance reports compare planned expenditure with actual costs. This information is contained in the "Task Detail" report in the HTPM program. It can also be sent to a graphics program to appear as a bar chart, or line graph. Cash Flow variance can be done on a spreadsheet program in regular text form, or the data can be sent to a graphics package as well.

5.4.5 Financial Status Report

Financial Status Reports provide a general financial picture for the entire project, or for each of its major activities. Such reports are generated in graphic form using HTPM, and are called Project Cost Graphs (see figure #4). This bar chart displays planned costs versus actual costs, showing for each the portion of resource cost and added costs. The graph can be modified to display this information on a cost/time interval basis, or as cumulative costs over the length of the project. This graph is generated using the same data originally entered while allocating resources and entering actual costs per task.

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STANDARD REPORTS

TABLE #1

BASIC PLANS & REPORTS	VARIAN E REPORTS (OPTIONAL) FOR CEO*	STATUS REPORTS FOR CEO	TYPE EVAL INFO PROVIDED
Work Plan Work Flow Report	Work Variance Report	Work Status Report	Scope & Quantity
(Work Plan) Personnel Util. Plan Personnel Util. Report	Personnel Util. Variance Report		Productivity
Activity Quality Plan (Standards) Activity Quality Report	Quality Variance Report	Quality Status Report	Quality
Expenditure Plan Expenditure Report	Expenditure Variance Report	Financial Status Report	Cost
Cash Flow Plan Cash Flow Report	Cash Flow Variance Report		
Activity Satisfaction Plan (Standards) Activity Satisfaction Report	Satisfaction Variance Report	Satisfaction Status Report	Satisfaction

*Chief Exec. Officer

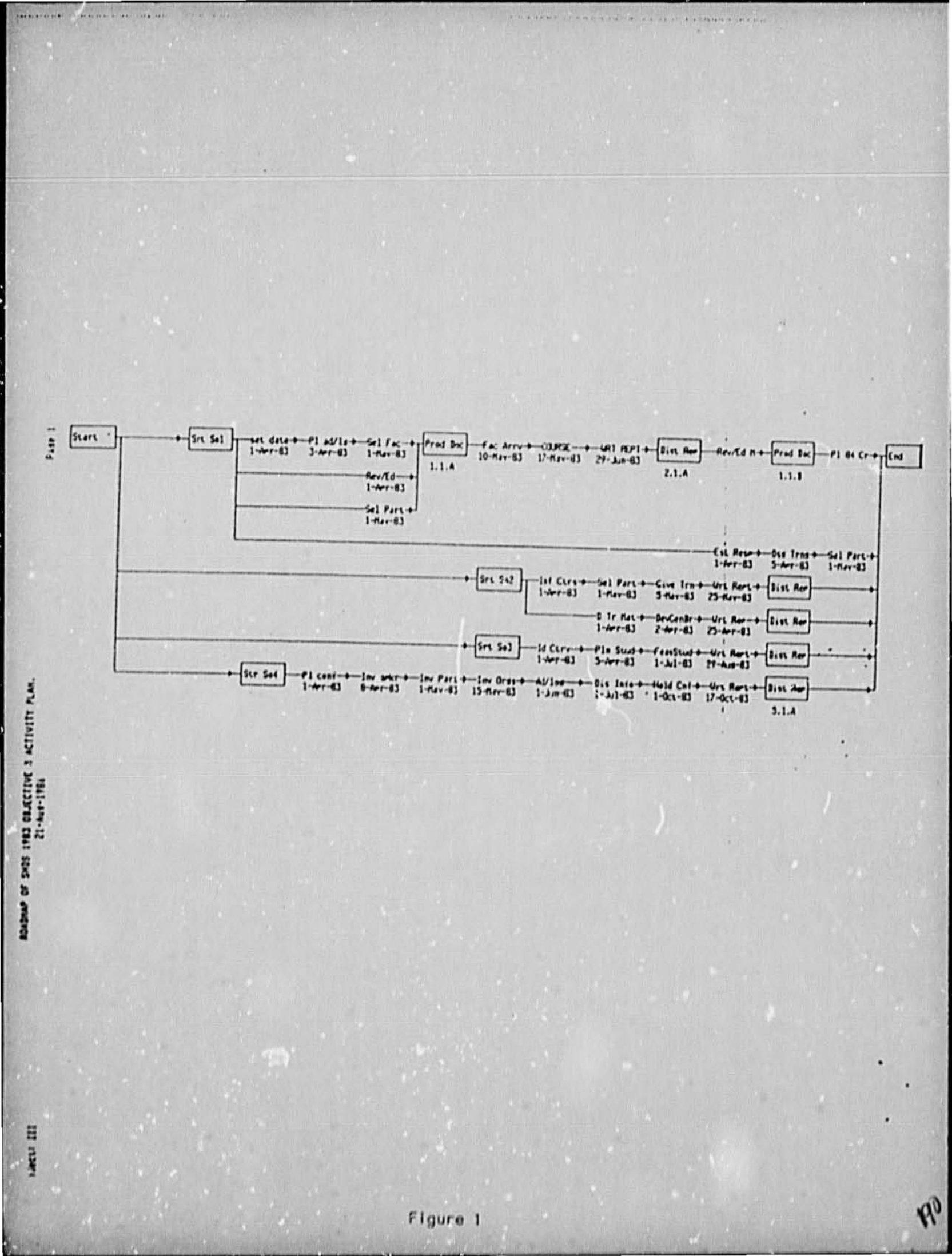

Page 1
Start
Srt Sa1
set date 1-Apr-83
Pl ad/ls 3-Apr-83
Sel Fac 1-May-83
Rev/Ed 1-Apr-83
Sel Part 1-May-83
Prod Doc 1.1.A
Fac Arrv 10-May-83
COURSE 17-May-83
WRT REPT 29-Jun-83
Dist Rep 2.1.A
Rev/Ed M
Prod Doc 1.1.B
Pl 84 Cr
End
Est Resp 1-Apr-83
Dsg Trng 5-Apr-83
Sel Part 1-May-83
Srt Sa2
Inf Ctrs 1-Apr-83
Sel Part 1-May-83
Give Trn 5-May-83
Wrt Rept 25-May-83
Dist Rep
D Tr Mat 1-Apr-83
DevCenBr 2-Apr-83
Wrt Rep 25-Apr-83
Dist Rep
Srt Sa3
Id Ctrv 1-Apr-83
Pln Stud 5-Apr-83
FeasStud 1-Jul-83
Wrt Rept 29-Aug-83
Dist Rep
Str Sa4
Pl conf 1-Apr-83
Inv smkr 8-Apr-83
Inv Part 1-May-83
Inv Orgs 15-May-83
Ad/Ins 1-Jun-83
Dis Info 1-Jul-83
Hold Cnf 1-Oct-83
Wrt Rept 17-Oct-83
Dist Rep 5.1.A
ROADMAP OF SMOS 1983 OBJECTIVE 3 ACTIVITY PLAN.
21-Aug-1984
Sheet III

Figure 1

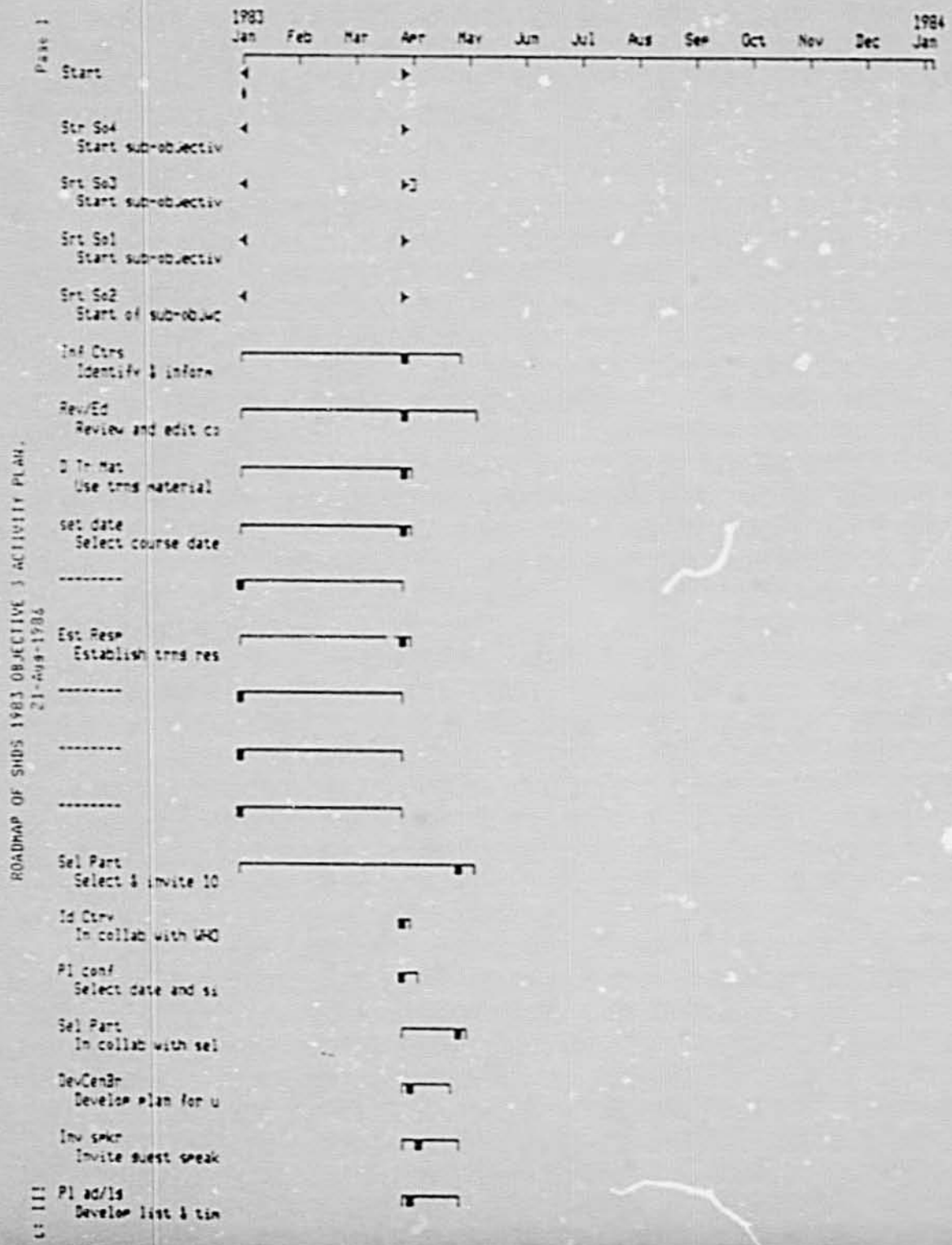

ROADMAP OF SHDS 1983 OBJECTIVE 3 ACTIVITY PLAN.
21-Aug-1986
Page 1
1983
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
1984
Jan
Start
Str So4
Start sub-objectiv
Srt So3
Start sub-objectiv
Srt So1
Start sub-objectiv
Srt So2
Start of sub-objec
Inf Ctrs
Identify & inform
Rev/Ed
Review and edit co
D Tr Mat
Use trng material
set date
Select course date
Est Resp
Establish trng res
Sel Part
Select & invite 10
Id Ctry
In collab with WHO
Pl conf
Select date and si
Sel Part
In collab with sel
DevCenBr
Develop plan for u
Inv spkr
Invite guest speak
Pl ad/ls
Develop list & tim

Figure 2

ROADMAP OF SHDS 1983 OBJECTIVE 3 ACTIVITY PLAN.
21-Aug-1986

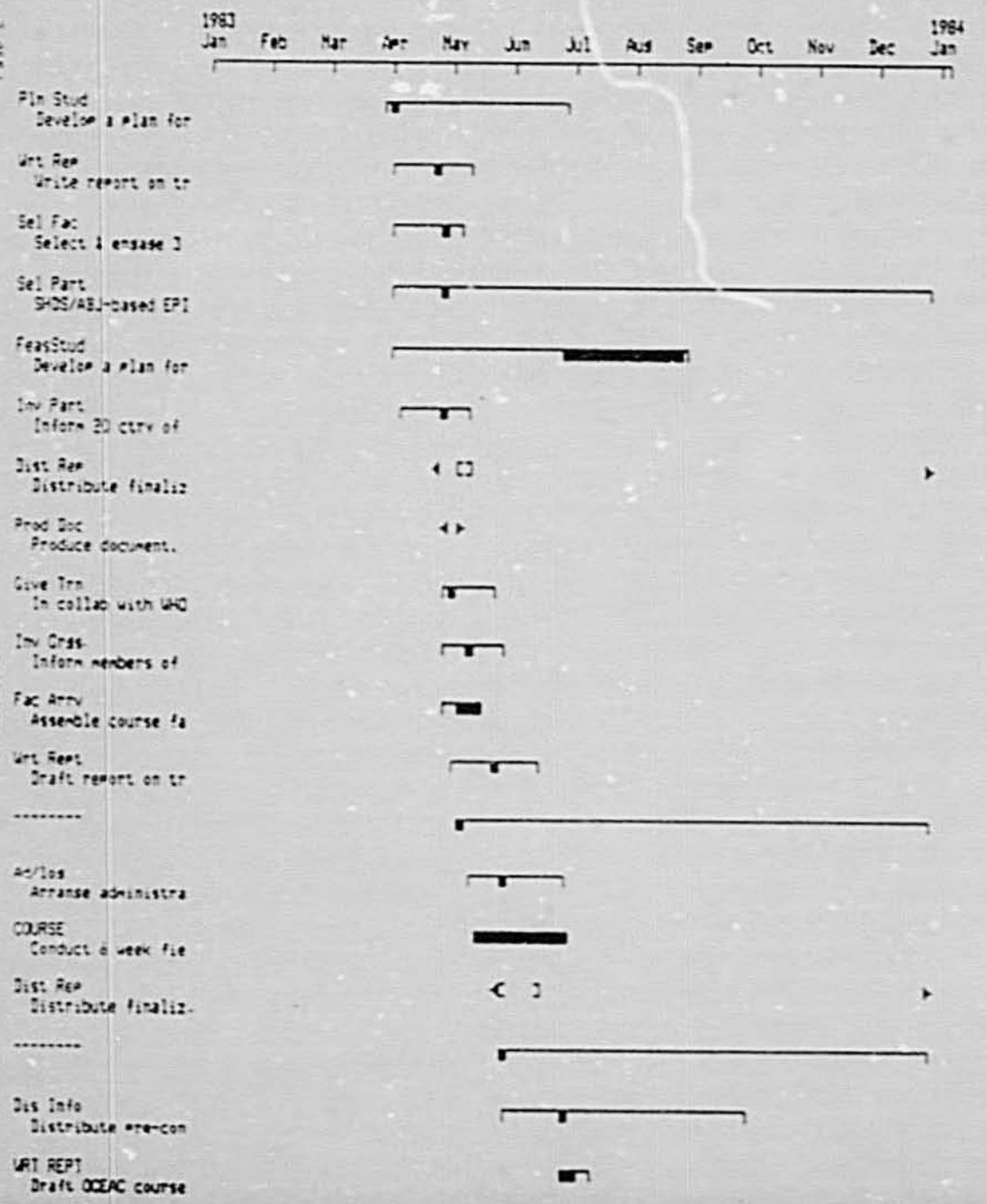


Figure 2 cont'd

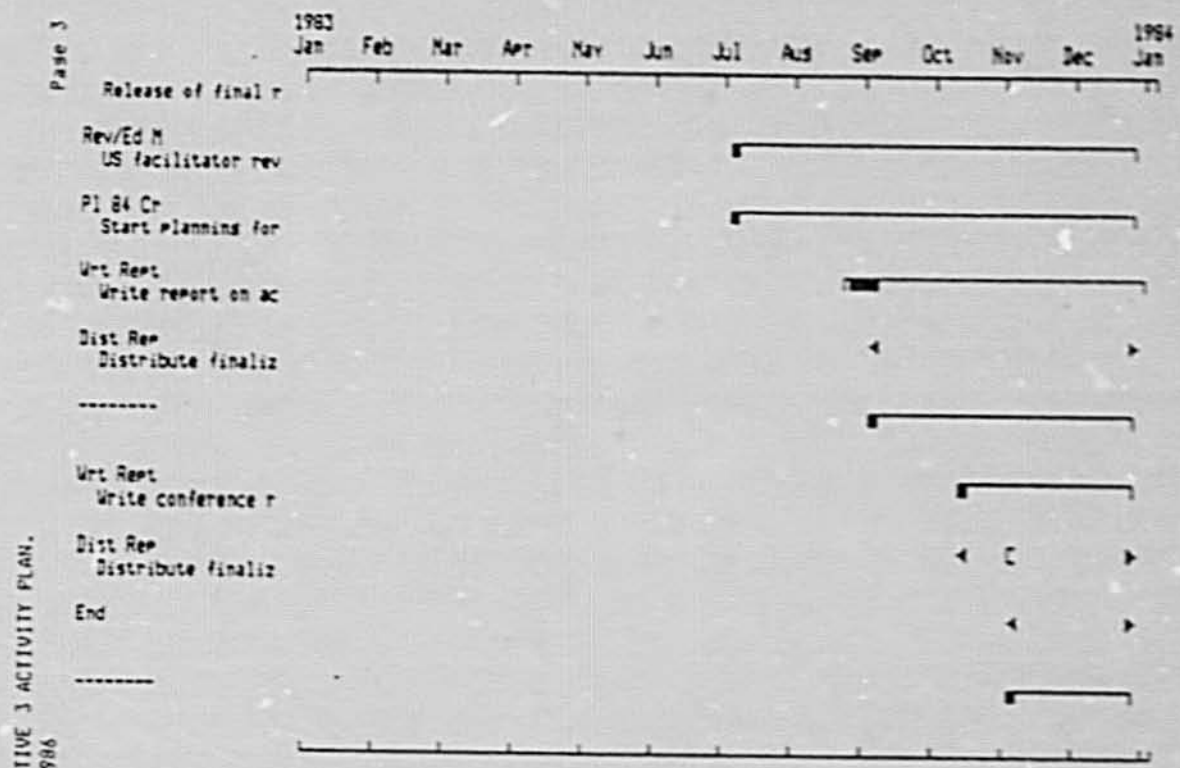


Figure 2 cont'd

D A I L Y P E R S O N N E L - A C T I V I T Y
A S S I G N M E N T S

Week Beginning : MM/DD/YY

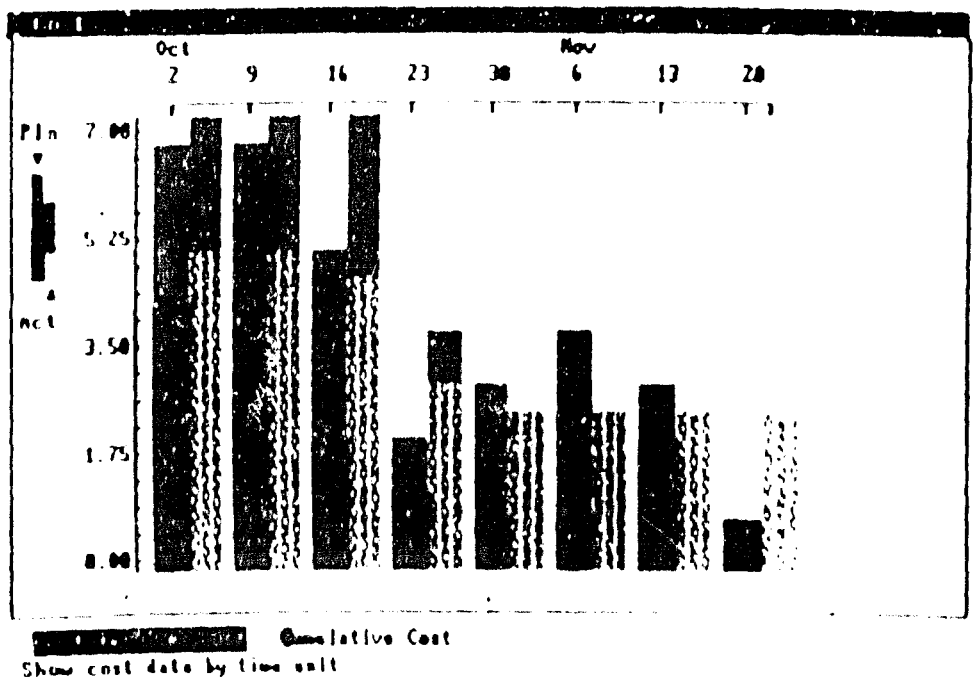
Name : _____ _____ (I)
(Last) (First)

Activity Code	Day of Week Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
0.0.0.0.1	00.00	00.00	00.00	00.00	00.00	00.00	00.00	00.00
0.0.0.0.2	00.00	01.00	01.00	00.00	01.00	00.00	00.00	03.00
0.0.0.0.3	00.00	01.00	02.00	01.00	01.00	01.00	00.00	06.00
0.1.0.0.1	00.00	01.00	01.00	01.00	01.00	01.00	00.00	05.00
0.0.1.0.0	00.00	02.00	01.00	01.00	01.00	00.00	01.00	06.00
	00.00	05.00	05.00	03.00	04.00	02.00	01.00	

Figure 3

The project cost graph shows the cost of the project, either per unit time or cumulative, as a function of time. It breaks costs down both into planned and actual costs and into resource and other costs. Overhead costs from the project form are distributed evenly across the time scale intervals of the project.

To get to the project cost graph, get a project in the project list and then select **cost** in the command line.



15-6. Project Cost Graph

If you have a color monitor, light blue shows planned resource costs, dark blue shows planned other costs, light green shows actual resource costs, and dark green shows actual other costs.

Planned costs are to the left, actual to the right. Resource costs are above, other costs are below.

The vertical scale shows dollars, thousands of dollars, or millions of dollars, whichever is appropriate.

Project Cost Commands

Per time unit Displays the cost of the project for each interval unit of the time scale.

Cumulative Displays the cumulative cost of the project over the time scale.

To leave the project cost graph, press **Esc**. HIPM returns you to the project list.

```
* Personnel Weekly Activity Plan Entry
*
*                                  *****
*                        Initialize Variables
*                        --------------------
*
store 0 to lne                              / Line Counter
store space(2) to midnum                    / Employee I.D. Number
store space(25) to mlname, mfname           / Employee Last Name;
                                              Employee First Name
store space(1) to miname, opt               / Employee Middle Initial;
                                              Other I.D. Selector
store space(8) to mwsdte                    / Starting Date of Week
store space(15) to mactcode                 / Activity Code Number
*
*                                  *****
*                 Intialize Entry Form and Procedure
*                 ----------------------------------
*
do mcon002.fmt
store .T. to perentry

do while perentry
 @ 5,21 get mwsdte function "¼D¶"
 read
*
*                                  *****
*                      Check for Proper Date Entry
*                      ---------------------------
*                      If no date is entered,
*                      turn off program continuation
*                      flag, exit from programm.
*
 if substr(mwsdte,1,2)  "  "
  store .F. to perentry
  release midnum, mlname, mfname, lne
  release miname, con, mwsdte, mactcode
  return
 endif
*
*                                  *****
*                      Identify Activity Performer
*                      ---------------------------
*        If activity performer is not identified, quit from
*        program else determine if additional performer
*        identification is required.  If additional identification
*        is required, get it.
*
 @ 7,1 say "  Employee I.D. Number : "
 @ row(),col()+2 get midnum
 read
 if midnum  "  "
  store .F. to perentry
  release midnum, mlname, mfname, lne
  release miname, con, mwsdte, mactcode
```

```
  return
 else
  @ 7,1 say "  Other Identification Required ? (Y/N)[N] "
  @ row(),col()+2 get opt picture "!"
  read
  if opt = "Y"
 @ 7,1 say "   Name : ____________________ ____________________ _"
 @ 8,1 say "                (Last)                (First)          (I)"
   @ 7,12 get mlname
   @ 7,37 get mfname
   @ row(),col()+3 get miname
   read
   if substr(mlname,1,1) = " "
    store space(25) to mlname
    store .F. to perentry
   endif
  else
   @ 7,1 say "  Employee I.D. Number  :  " + midnum + "
  endif
 endif
 store mwsdte + midnum + substr(mlname,1,9) to mlatch
 store "ACASREC.NDX" to ndxfle1
*
*                              *****
*                  Initialize appropriate files
*                  ----------------------------
*
 if file(ndxfle1)
  select A
  use mcon002a index acasrec
 else
  select A
  use mcon002a
  index on dtoc(WBEGIN) + midnum + substr(MLNAME,1,9) to acasrec
 endif
 release ndxfle1
 append blank
*
*                              *****
*                 Initialize Data Entry Variables
*                 -------------------------------
*
 store .T. to actentry
 store 0 to dentry
 store space(35) to mhzarry1, mhzarry2, mhzarry3, mhzarry4, mhzarry5
 store 0 to tot1, tot2, tot3, tot4, tot5, tot6, tot7
 store 13 to lne
 store 1 to actcntr
 do while actentry
```

```
*
*                                *****
*                    Input Activity Code Number
*                    --------------------------
*                    If no activity identification
*                    is entered, return to preceeding
*                    step.
*
  @ lne+1,1 get mactcode picture "9.9.9.9.9"
  @ row(),col()+12 say "Press Return to confirm "
  @ row(),col()+2 get con
  read
  @ lne+1,15
  if substr(mactcode,1,1) = " " .or. actcntr = 6
   store .F. to actentry
  else
   store "ACT" + str(actcntr,1) + "CODE" to actcdvar
   store "ASSIG" + str(actcntr,1) to actasvar
*
*                                *****
*                Save the previously entered data
*                --------------------------------
*
   replace WBEGIN with ctod(mwsdte), EMPLNAME with mlname
   replace EMPFNAME with mfname, EMPMI with miname
   replace EMPNUM with midnum
   replace &actcdvar with mactcode, LATCH with mlatch
   release gets
   store 18 to clmn
   store 1 to daycntr
   store 0 to lnetot
*
*                                *****
*                         Weekly Data Entry
*                         -----------------
*            Enter the Work Time Input Required by this
*            Particular Activity Performer for the
*            Identified Activity
*
   do while daycntr <= 7
    store "mhzarry" + str((lne-12),1) to hzarry
    store "tot" + str(daycntr,1) to vtarry
    @ lne+1,clmn+4 get dentry picture "99.99"
    read
    store (trim(&hzarry)) + str(dentry) to &hzarry
    store (lnetot + dentry) to lnetot
    store &vtarry + dentry to &vtarry
    @ (lne + 1),65 say lnetot picture "99.99"
    @ 21,clmn+4 say &vtarry picture "99.99"
    store (clmn + 6) to clmn
    store (daycntr + 1) to daycntr
    store 0 to dentry
    replace &actasvar with lnetot
    store space(len(mactcode)) to mactcode
   enddo
```

```
  endif
  store (lne + 1) to lne
  store (actcntr + 1) to actcntr
 enddo
 store space(len(mlname)) to mlname
enddo
*
*                        Close Data Files
*                        ----------------
*
use
```

```
 * MCON002.FMT
 * Time Activity Plan
 *  - By Operative/Employee
 *
 *
 CLEAR
 SET TALK OFF
 SET BELL OFF
 *
? "=============================================================================="
? "              D A I L Y   P E R S O N N E L - A C T I V I T Y "
? "                          A S S I G N M E N T S"
? "==============================================================================="
? "   Week Beginning :  XX/XX/XX "
?
?
?
?
? "------------------------------------------------------------------------------"
? "                                          Day of Week"
? "  Activity Code        Sun   Mon   Tue   Wed   Thu   Fri   Sat   Total  "
? "------------------------------------------------------------------------------"
?
close format
return
```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