

Report No. FHWA/RD-74-7

PB 244 825

PROJECT MANAGEMENT SYSTEM (PMS) THROUGH THE USE OF THE CRITICAL PATH METHOD (CPM)

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**Final Report
Electronic Computer Program
March 1974**

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**FEDERAL HIGHWAY ADMINISTRATION
Offices of Research & Development
Washington, D.C. 20590**

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1. Report No. FHWA-RD-74-7		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle PROJECT MANAGEMENT SYSTEM (PMS) THROUGH THE USE OF THE CRITICAL PATH METHOD (CPM)				5. Report Date March 1974	
				6. Performing Organization Code	
7. Author(s) Douglas M. Reid				8. Performing Organization Report No.	
9. Performing Organization Name and Address Implementation Division (HDV-21) Federal Highway Administration Washington, D.C. 20590				10. Work Unit No. (TRAI5) FCP 27B1-234	
				11. Contract or Grant No.	
12. Sponsoring Agency Name and Address Federal Highway Administration U.S. Department of Transportation Washington, D.C. 20590				13. Type of Report and Period Covered Final Report Electronic Computer Program	
				14. Sponsoring Agency Code	
15. Supplementary Notes This report supersedes Report FHWA-RD-73-6, "Project Management System (PMS) Through the Use of the Critical Path Method (CPM)," February 1973, listed by NTIS as PB-222-009.					
16. Abstract This report provides scheduling, cost and resource control, and information handling convenience for individual and multi-project scheduling; but it does not design a network, or plan out a project. PMS functions as a handler, computer selector, and displayer of information which will increase the abilities of the project planner. This report includes an introduction to PMS through CPM, CPM program documentation, user instruction, and source computer program listings.					
17. Key Words Project Management System Critical Path Method			18. Distribution Statement No restrictions. This document is available to the public through the National Technical Information Service, Springfield, Virginia 22151.		
19. Security Classif. (of this report) Unclassified		20. Security Classif. (of this page) Unclassified		21. No. of Pages	22. Price

PREFACE

This computer program was originally developed by Mr. R. C. Tennent for an IBM 7094. This was published in a report titled "Critical Path Method," BPR Computer Program A-4, dated 1964. In 1966 this program was improved by the author but never published.

The present program was modified, converted and tested by Mr. Douglas Reid for use on an IBM 360.

Special thanks to Antoinette Wilbur of the Engineering Services Division who incorporated multi-project scheduling capabilities into the system.

TABLE OF CONTENTS

	Page
Introduction to CPM.....	1
Critical Path Method Command Language.....	13
References.....	27
Appendix A Network Diagraming.....	28
Appendix B Crashing Critical Activities.....	38
User's Instructions.....	41
Input Data Formats.....	57
Sample Output Report.....	70
Source FORTRAN LISTING.....	107

INTRODUCTION TO CPM

In the transportation field, the job of planning, designing, constructing and maintaining highways has evolved from a relatively simple task to a major undertaking requiring the highly coordinated efforts of all resources for proper accomplishment. Today's multi-million dollar highway program has created situations that were previously unknown and has made the solution of previously uncomplicated problems more difficult.

County, City and State highway engineers, in their efforts to provide the public with the type and quality of facilities that are necessary for the proper serving of the current and future traffic needs, have become increasingly concerned that management tools once satisfactory for controlling and monitoring programs are no longer adequate.

There has been a concerted effort on the part of management and operations-research specialists to develop more effective techniques for planning, organizing and controlling projects.

Within the past several years, a number of techniques have been developed to aid management. One of the most successful of these is the Critical Path Method, or CPM. To date, it has gained wide acceptance and represents an excellent management planning and control tool for defining, integrating and monitoring what must be done to accomplish program objectives on time.

In the field, CPM has been used in the following areas: planning, construction, design, long-range planning and programming, maintenance, management and research projects.

There are many excellent results that have been realized through the use of the Critical Path Method. Numerous highway departments and contractors have reported widespread success in savings of time and money through its use and all state highway departments have explored its usefulness for some phase of planning and scheduling.

So today's highway engineer has at his disposal a new management tool, which will help him make decisions. These decisions based on CPM will help the contractor overcome project management weaknesses as well as afford him such side benefits, as collection, storage, and maintenance of historical data files, and the utilization of this collected data for estimating and scheduling future projects.

CRITICAL PATH METHOD

Basic Concepts

The Critical Path Method is a recent development which provides management with a rational basis for planning, scheduling, estimating and controlling construction projects. The method is applicable to any situation which involves scheduling.

Network Diagram 1/

The first or planning phase of CPM which graphically outlines the project with a network diagram, sometimes referred to as an arrow diagram, illustrates the required operational sequence. It also indicates which operations are concurrent and which operations must be completed before subsequent procedures can be initiated. In CPM operations or items of work are referred to as "activities." These activities are represented by arrows in the diagram. The arrows have no significance with regard to direction or scale and need not be straight lines. The sequence of arrows is determined by the requirement that activities cannot start until all preceding activities joining the tail of the arrow have been completed. Thus, the diagram indicates the activity sequence and plots all of the activity relationships in the entire project.

The junctions of activities are called "events" and are usually numbered for reference, as well as for computer application. An event is a point in time in the progress of the project. Sometimes it is necessary to employ the use of "dummy" activities in order to keep the proper sequence. Dummy activities are imaginary and have zero time and zero cost. Dummies are used to

1/ See Appendix A for a more detailed discussion.

prevent the inclusion of imposing diagrammatic restrictions which do not exist in the actual project.

Physical requirements dictate certain sequences while crew sizes or equipment considerations dictate other sequences. A third sequence is necessitated by the management requirement that an activity be performed in a certain way. These requirements are generally referred to as "physical, crew, and management restraint." Crew and management restraints can be altered to decrease time.

To construct an arrow diagram it is necessary to compose a list of all activities required for completion of the project. The list should adhere to the sequence of activity performance. The list should also include all restraints that determine the sequence of activities such as material delivery, approvals, inspections, etc. The activities are represented by arrows according to the following criteria:

1. What activities can be concurrent with this activity.
2. What immediately precedes this activity.
3. What activities immediately follow.

The tail of the arrow indicates the beginning of the activity and the arrowhead indicates the completion of that activity. Satisfactory preparation of the arrow diagram depends on practical knowledge and common sense.

In preparing a diagram, consultation with the construction superintendent is essential so that all crew and equipment restraints are properly represented.

THE CRITICAL PATH

The next phase of CPM furnishes time estimates for each activity. Since CPM analysis produces no better results than the information supplied, it is most important to obtain good time estimates. On

construction projects time estimates are generally given to the nearest day. The time duration of activities along all paths in the network can be used to calculate the earliest and latest completion times of each event. This method will then show the continuous path of activities that are critical to the project completion date. This path establishes the project duration and is called the "critical path."

Float

There are other activities on the arrow diagram that are semi-critical. A measure of how close an activity is to being critical or how much scheduling leeway is available is a quantity called "float."

There are several types of float. Total float is a measure of how much the leeway time for each activity can be increased without delaying the completion of the project provided all other activities are completed in their normal time. It is the extra or leeway time available if all preceding activities are completed as early as possible. All activities which have zero float are critical activities.

Free float is a measure of how much the leeway time of an activity can be increased without changing the earliest starting times of all activities immediately following, provided all preceding activities are completed in their normal time. Free float can be used up without affecting the activities which follow it.

Independent float is the leeway time available regardless of where preceding or following activities are placed within their intervals of float. Independent float is so rare that many computer programs do not calculate it. Activities can be accomplished in less than normal time by using larger crews or working overtime. This reduced time is called "crash" time and it involves higher costs. CPM calculations indicate which activities should be expedited and how much time they should be allotted in order to get completion dates at the lowest cost.

Scheduling

Scheduling is the act of translating the arrow diagram into a time table of calendar days. This can be accomplished by the day-date table. Conversion from working days to calendar days also is advantageous since it permits inclusion of weekends, holidays, weather and other lost time. The CPM schedule indicates the relationships of the operations and shows leeway limitations. All key deliveries and activities should be checked with the day-date table. All crew and management restraints along the critical path should also be examined. The restraints should be adjusted to give satisfactory project completion date. Non-critical activities can be scheduled to more efficiently utilize manpower and available resources.

The use of CPM for job control gives management an entirely new and reliable system for spotting job trouble within days instead of months. Progress along the arrow diagram will show the status of the project at any time, indicate which activities can be started, and pinpoint the cause of delays.

To obtain the complete benefits of CPM, job control should be coordinated with cost control. Cost control should be set up to correspond with activities. The diagram should be updated periodically to account for; (1) time discrepancies, (2) deliveries, (3) weather, (4) change orders, and (5) unexpected conditions. Updating of the diagram should be based on the number of days the project is off schedule.

Crashing Critical Activities 2/

Crashing is the method by which activities are expedited in order to meet a deadline at the lowest cost. Only limited use of crashing has been made. One reason for this is that contractors claim they do not have sufficiently accurate time-cost information. However, with CPM even poor estimates will give better results than those without the use of CPM. The most economical project duration lies somewhere between "normal" time and "crash" time.

2/ See Appendix B for a more detailed discussion.

Normal time is that time required to finish the activity without extra direct costs. Crash time is the fastest possible time of completing the activity. Direct costs will be minimal for normal time and maximal for crash time. Indirect costs decrease as the activity time is shortened. Such indirect costs as insurance, value of releasing key personnel for other projects, field office, overhead, and early completion bonus are lowest at crash time and highest at normal time. It is usually assumed that the sooner an activity can be completed the lower its costs will be. However, there is a point at which reduction in time increases costs. CPM shows just where this critical point lies. Indirect costs, such as overhead, bonuses, and depreciation are most important to the contractor and a prime reason for obtaining time cost curves.

Whenever an activity is crashed and time is reduced, the network should be studied to determine if a new critical path has occurred.

CPM APPLICATION

The critical path method planning and scheduling is far superior to other existing methods. Some contractors are so completely satisfied with the results obtained from these two phases that they fail to carry this method further. This is because they lack confidence in their current cost control system. The application of cost analysis and the crashing phase can obtain far greater benefits for the contractor. The adoption of a cost control system orientated to activities can give the contractor an intelligent analysis of various choices for accomplishing a given quality of work.

Financing

This new management tool can be an asset to contractors in their business dealings with their banker, bonding company, and insurance company. By means of the arrow diagram the contractor can present a visual picture of his entire operation which shows he has clear understanding of the work to be done. He can show that he has logically planned and scheduled all of his jobs so that his organization has not exceeded its capabilities. CPM also can show when the contractor can profitably take on additional work and the amount that can be undertaken. This additional work might be bid at less than normal cost because it ties into the overall plan and schedule through more efficient utilization of manpower and equipment. Deliveries of materials can be pinpointed so as to obtain maximum efficiency and economy.

The banker will certainly have more confidence in a contractor with a rational approach. The financial needs required by the contractor will be based on good financial planning and a better understanding of the work.

The bonding and insurance companies also will be able to better understand the contractors' operation. No other planning and scheduling method can so clearly show the capabilities for undertaking numerous contracts simultaneously and the inter-relations of each. The assurance that a contractor can complete the project in the specified time and expedite certain activities at the most economical cost should afford additional bonding power and lower insurance rates.

Bidder Qualification

CPM offers a more realistic approach to "Bidder Qualification." Under existing practices, a contractor cannot submit a bid on a project if his qualification, based on a monetary value, is exceeded. It is easy to see that CPM can show how a contractor could take on an additional volume of work and still make his operation more efficient. In addition - he could, and probably would, bid the additional work at a lower cost since his indirect cost for that particular work would be much less. Qualification latitude therefore can more logically be based on the type of work planned and scheduled by CPM rather than the dollar value under contract.

Management Tool

As a management tool, CPM will permit the contractor more selectivity in bidding. Construction management is able to select those projects which best conform to its "Equipment Availability" as well as manpower and material resources. In addition, the volume of work most suitable to the contractors' capabilities can be determined. The unnoticed pitfalls that are likely to occur are brought into focus by the application of CPM.

The simple fact that CPM forces the contractor to more thoroughly understand his work, gives him a competitive advantage and can easily elevate the 4th or 5th place bidder into the 1st and 2nd positions. The contractor will be aware of the small but critical activities which could otherwise be overlooked. He has a realistic pictorial approach for balancing manpower and equipment within a particular project and for interproject scheduling of the same manpower and equipment.

In evaluating "Equipment Availability" he can weigh the use of rental equipment against the purchasing of new or used equipment. At the same time equipment size and capabilities can be investigated.

Intelligent CPM application creates a more harmonious relationship between contractor and engineer when both have a thorough understanding of the method. The ability to predetermine critical activities and their relationships and to understand the logic in planning and scheduling creates a healthier relationship. CPM can be used as a justification for time extensions due to change orders involving additional work affecting activities on the critical path. Also semi-critical activities could be affected by change orders which could make them critical and create a justified time increase. By the same token CPM can show that time extension is not justified because the change occurs in activities which have sufficient float so as not to affect the project duration. Any adjustment in time which results in lengthening of project duration should always recognize the factor of weather. For example - an additional week's work in mid-August might be equivalent to two or three weeks in January.

The value of CPM in resolving legal disputes should not be overlooked. It has been successfully used to validate liquidated damage payments.

Field Application

Another application, which should not be underestimated, is the use of CPM in the field and in conjunction with all subcontracts. Only through the full cooperation of the field organization as well as all subcontractors can management realize the optimum benefits of the method. Employee relations are improved because unnecessary lay-offs are eliminated. The field force and subs have a clear picture of how their work fits into the entire project. Another important by-product of CPM is the standard of achievement it provides for the field organization. The realization that a certain activity has a definite completion date which must be met to avoid delaying the entire project,

creates an incentive for meeting that deadline. All management realizes that incentive is a primary requisite for faster and better workmanship. Frequently management is unable to move key personnel because of the confusion involved. Where CPM is used by the field organization, management can have smooth transitions when superintendents or key personnel are replaced. Thus management has more freedom in utilizing specialists and can increase the productivity of these high-salaried personnel.

Updating CPM provides a realistic basis for establishing more accurate estimates which can be activity oriented for future bidding. When unforeseen delays occur and the actual work progress differs from the planned progress, the network should be updated. This permits monitoring of progress and shows when and where necessary expediting should be done, thus providing management with continuing control of the project. The common tendency to increase manpower, equipment, and overtime on all activities in order to get back on schedule is eliminated. Attention is focused on only those activities which are critical and should be expedited. Generally these critical activities make up only about 10 percent of the entire project.

CONCLUSION

Many contractors have become disillusioned because of misconceptions in the CPM approach. There are certain simple rules to be followed, assumptions to be made, techniques to adopt, and limitations to be understood in order to properly apply CPM. However, the method is very simple and requires only grade school mathematics. Computers are used only to process the data and not to develop the data. It becomes practical to use a computer on large projects for updating the network and when applying time-cost estimates in the crashing phase in order to obtain the spectrum of schedules between normal and crash. A better understanding of the project also will be obtained and a more accurate diagram can be made which incorporates only the necessary dummy arrows if hand methods are used through the scheduling phase.

This new management tool is not a "cure-all" and it will not solve all of the contractor's problems. The results of the method are only as good as the data supplied. It must be used with common sense, construction "know-how", and experience. With this approach CPM will pull the construction industry out of the dark ages as far as "Management Control" is concerned.

The ultimate use of CPM with a well-developed system of cost control and estimating will introduce accuracy which will make contracting and construction procedures even more predictable and dependable. Where CPM is applied it is a certainty that the contractor understands the work, that he has logically planned and scheduled the project and consequently submitted a realistic bid. CPM, in conjunction with good cost control, will produce a stable and secure industry which will produce better construction and lower costs.

CRITICAL PATH METHOD COMMAND LANGUAGE

CRITICAL PATH METHOD COMMAND LANGUAGE

The development of the problem-oriented language for the Critical Path Method grew from the basic premise that the USER should be able to control the procedure and select the desired output. In effect, this relieves the user from having to use a middle man to communicate his desire for a solution.

Having defined the class of problem as CPM, the next step was the development of a source language and the computer programs necessary to translate and execute the source language. The source language is called CPMCL (Critical Path Method Command Language) and, as the name implies, makes use of commands to define the procedure to be followed in calculating solutions. The command language covers the principle areas of CPM, that is planning, scheduling, updating and monitoring, and the commands necessary for the system to operate. Table 1 lists the commands by the principle area of use and a brief description of the action performed. A description of each command by area of use is discussed in subsequent sections.

The computer system developed to support the source language consists of a translator to interpret the commands and the computer programs which perform the desired actions. The CPMCL TRANSLATOR is interpretive in nature as opposed to a compiler which can be interpretive or generative. The generative mode is the case where a procedure is developed based on the source language and then executed. On the other hand, the interpretive mode reads each command and executes fixed routines based on the command. The CPMCL TRANSLATOR carries out the following functions: read and interpret the command card, encode any data on the command card, call the necessary subroutine to fulfill the command; and upon returning from the subroutine, check for any errors in processing. Possible activity errors are shown in Report 1. The CPMCL TRANSLATOR also contains the necessary statements to carry out the system commands.

TABLE 1

Critical Path Method Command Language (CPMCL)

Area/Command	Action
System	
TODAY'S DATE	Provide the date to the system
BEGIN	Initialize for new problem
END OF RUN	Terminate computer run
CREATE MASTER FILE	Set aside a CPM master file
Planning and Scheduling	
CALCULATE NETWORK	Calculate starts, finishes and project duration
CALENDAR DATE	Convert starts and finishes to dates.
TIME-SEQUENCE PLOT	Plot activities in time-sequence
RESOURCE PLOT	Plot required resources
PROJECT COST PLOT	Plot planned project cost
CRITICAL ACTIVITIES	Tabulate the critical activities
Updating and Monitoring	
RESERVE SCHEDULE	Add Schedule to master file
DELETE SCHEDULE	Delete schedule from master file
UPDATE SCHEDULE	Update status of each activity
STATUS REPORT	Tabulate status of all activities
EXCEPTION REPORT	Tabulate status of critical activities
PREPUNCH CARDS	Produce prepunched cards for updating
Multi-project scheduling	
MULTI-PROJECT	Calls the multi-project program
TOTAL	Concatenates any number of projects
STOP	Stops the multi-project procedures

1. NUMBER OF ACTIVITIES EXCEEDS 675
2. ACTIVITY IIII - JJJJ, HEAD LESS THAN TAIL
3. ACTIVITY IIII - JJJJ, HEAD OUT OF SEQUENCE WITHIN
TAIL IIII
4. ACTIVITY IIII - JJJJ, NO ACTIVITY STARTING WITH JJJJ
5. ACTIVITY IIII - JJJJ, OUT OF SEQUENCE WITH PREVIOUS
ACTIVITY IIII-JJJJ
6. ACTIVITY IIII - JJJJ, NO ACTIVITY ENDING IIII

Report 1

The computer programs to satisfy the planning and scheduling and the updating and monitoring commands have been developed in subroutine form. Where possible, a subroutine has been designed to carry out more than one command. In the updating and monitoring commands, RESERVE SCHEDULE and DELETE SCHEDULE are contained in the same routine due to the similarity of operations. However, in the planning and scheduling commands, each command has its own subroutine to perform the necessary action.

SYSTEMS COMMANDS

In any programming language it is necessary to have certain instructions, statements, or commands which provide information to the system. Problem-Oriented Languages, even though they are a higher level language, are no exception. In CPMCL the following system commands are used to initiate action and to provide information. For examples of input - see section on Input Data Formats.

TODAY'S DATE

This command, as it implies, is used for supplying the date to the system in order that the date of run may be available to any of the computer programs. The command is used only once and is the first one for an entire computer run. The data associated with the command are: Month, Day and Year. As previously stated, the command is entered beginning in card column 1 and the data are entered on the command card beginning after card column 19.

BEGIN

The BEGIN command indicates the start of a new problem for the solution of a desired Critical Path Method problem. On the command card, the data to be entered is the user's name and any other descriptive information. The BEGIN command is necessary for each problem because whenever an error in processing the commands is encountered, the CPMCL TRANSLATOR searches for the next BEGIN command and then starts processing the new problem.

END OF RUN

The last command card of a computer run is the END OF RUN command. This command follows all CPM problems and indicates to the CPMCL TRANSLATOR that the computer run is to be terminated.

CREATE MASTER FILE

When the system is put into use and it is desired to save CPM calculations for the first time, it is necessary to set aside a magnetic tape as a CPM Master File. The CPM Master File will be used to retain all further results for the subsequent planning and scheduling or updating and monitoring commands. The setting aside of the master file is accomplished by this command.

PLANNING AND SCHEDULING COMMANDS

In planning and scheduling a project, it is necessary to have information describing the requirements for time, money, and resources. In CPMCL, the following commands are used to determine these requirements.

CALCULATE NETWORK

The use of the CALCULATE NETWORK command causes the calculations of the early start and finish, late start and finish, total float for each activity in the network, and the project duration. The data for this command consists of the project starting date, a network title card, activity cards, and resource description cards. The project starting date is included on the command card and is the desired date the project is to start.

The network title card contains information which describes the project. The activity cards are used to describe each activity of the network and provide data on time, cost, and required resources. The resource description cards contain the information necessary to describe a particular resource, such as a chief engineer.

An example of the input for the command is shown in Report 2. The output produced from the CALCULATE NETWORK command is shown in Report 3.

CALENDAR DATE

Whenever a network is calculated and the starts and finishes are expressed in days, it is difficult to convey a starting date of an activity as so many days from a particular date. For this reason, it has been necessary to provide a method for converting working days to calendar dates. The CALENDAR DATE command is used to convert working days to calendar dates.

Details of the calendar dating operation are described under activity work option. However, the method was modified to allow for the omission of non-work days. The conversion of a non-work day, such as Saturday, Sunday, holidays or weather days, is accomplished through the activity work option code.

The output produced from the CALENDAR DATE command is shown in Report 4.

TIME-SEQUENCE PLOT

Whenever computer solutions are used to carry out CPM calculations, there is a possibility that the interrelationships depicted in the arrow diagram will be neglected. Therefore, it is desirable to provide a substitute for the arrow diagram. The method used in this CPM system is to fall back on the bar chart which was an acceptable method before CPM. However, the bar chart has been revised to show the graphical interrelationships of the activities in time and to indicate the amount of total float for each activity. The command used to produce this result is TIME-SEQUENCE PLOT.

An example of the result of a TIME-SEQUENCE PLOT command is shown in Report 5.

PROJECT COST PLOT

In the planning of any project it is desirable to have a planned rate of expenditure. The Critical Path Method has such a capability when the direct costs are associated with the individual activities. It has the capability because the activities are scheduled to finish at either an early or late date. Choosing either the early finish or late finish as the date of finish, the costs of the planned activities can be accumulated on any time base, such as a week or month, and plotted as a graph of accumulated cost versus time.

In CMPCL, the command `PROJECT COST PLOT` is used for obtaining a graph of the planned cost. This program assumes each activity to finish at its early finish date and the estimated costs are accumulated on a weekly basis. A week is defined as ending on Sunday, since most activities do not use Sunday as a work-day.

The result of a `PROJECT COST PLOT` command is shown in Report 6.

RESOURCE PLOT

Another factor of importance in the planning of a project is the requirement for resources. Whenever a project is in the planning stages, it is necessary to have estimates of required resources in order to determine how the resource requirements will be met. In the case of manpower, it may require that additional men be hired, that they be shifted from another project to work on the new one, or that the new project be delayed or rescheduled due to a shortage of a specific manpower. When the resources is equipment, the decision has to be made as to whether the equipment will be available from other projects, rented or purchased.

The `RESOURCE PLOT` command is used to provide a graphical representation of the required resources for a project. It is able to provide this information when the resources for each activity are provided as part of the data. The result is a histogram plot on a calendar day basis of each of the individual resources used on a project from a specified starting date to the specified finishing date

The input data required for this command is the desired type of plot and the desired period of plot. The type of plot provides for three different types of output; namely, 1) plot each of the individual resources; 2) plot a summary of all the resources required, or 3) both of the above plots. A starting and finishing date are provided in order to allow the user to obtain a plot of any desired period of time.

An example of the results produced by using the RESOURCE PLOT command is shown in Report 7.

CRITICAL ACTIVITIES

When using the Critical Path Method one of the most beneficial results is the identification of the critical activities. On any project it is desirable to have a tabulation of the critical activities in order to be able to manage these activities closely. In a computer system, the identifying of the critical activities can be done on either the working day schedule or zero float. However, it is desirable to have the critical activities separated and listed.

In the CPMCL, the command CRITICAL ACTIVITIES is used to obtain a tabulation of the critical activities and their scheduled start and finish calendar dates. An example of the results produced by the command are shown in Report 8.

UPDATING AND MONITORING COMMANDS

In any project control system, it is necessary that accurate and up-to-date information be gathered on the actual progress of the project. This is essential for a number of reasons; 1) it allows for evaluating the progress as of a particular date, 2) planned versus actual costs can be evaluated, 3) decisions as to the scheduling of the project to completion can be made, and 4) the data provides valuable historical information for possible future uses.

The development of a project control system, using CPM as the framework, can provide for very powerful updating and monitoring of a project once it has been planned and scheduled. This is

possible because the starting and finishing of activities can provide the information necessary for projecting the project completion date. Reporting of cost data can be compared with the planned value and a large historical file of time and cost data can be developed. The one thing the system cannot do is make decisions, however, it can provide information that can lead to better decisions.

In the Critical Path Method Command Language (CPMCL), a start has been made toward building a powerful system for providing information on project status. This part of the language, while not as complete as the planning and scheduling commands, has the basic elements necessary for future development. The following commands are used for updating and monitoring.

RESERVE SCHEDULE

Whenever a calendar dated schedule has been decided upon, it is desirable to retain the schedule for future reference. In CPMCL, the RESERVE SCHEDULE command adds the designated schedule to the existing CPM master file. To be able to identify any particular schedule on the CPM master file, it is necessary to assign a unique project number and identification to each new project reserved. In order for any subsequent updating or monitoring of a project to take place, this command must have been used to reserve the particular calendar dated schedule.

DELETE SCHEDULE

In the updating of a file there are three basic operations that the system must be capable of doing. They are; 1) adding information, 2) deleting information, and 3) changing information. In a CPM system, the adding of information would be the addition of activities to the current network, deleting information would be the deletion of an activity from the current network, and changing information would involve changing any of the basic input data.

Updating a schedule in CPMCL is accomplished through the use of update verbs. The update verbs are:

1. STARTED ACTIVITY
2. COMPLETED ACTIVITY
3. RESOURCE CHANGE
4. COST CHANGE
5. DURATION CHANGE
6. WORK OPTION CHANGE
7. DELETE ACTIVITY
8. ADD ACTIVITY
9. END OF UPDATE

The update verbs are used immediately following an UPDATE SCHEDULE command and each update verb requires a card of its own. The verbs STARTED ACTIVITY and COMPLETED ACTIVITY are used for reporting the actual starting and finishing dates of the activities and supplies the information for status reports. The other verbs make the necessary changes, deletions or additions. However there is additional development necessary to have the changes reflect a revision in the calendar dates for the activities to be completed.

An example of the use of the UPDATE SCHEDULE and some of the update verbs is shown in Report 2.

STATUS REPORT and EXCEPTION REPORT

In the description of the updating the monitoring commands, it was stated that one of the reasons for the data was to enable the evaluation of progress at a particular date. There are many times in the life of a project when it is necessary to provide a report as to the status of the project and/or some of its major sections. Status reports can be based on time, cost, or any other acceptable criteria. They can report the progress in percentages or by portions of the work which are completed or in progress.

In CPM, with agreement on a particular schedule, there have been established scheduled starts and finishes for each activity. From the time the project is started to the time the project is completed, it is necessary to know the status of the project. However, the status of the project is dependent on the activities comprising the project and more specifically on the critical activities.

When the command STATUS REPORT is given, the actual starting and finishing dates of each activity, excluding dummies, is compared with today's date and the scheduled start and finish dates. From this comparison, the status of each activity is determined and the appropriate status message printed. The status messages are:

1. Completed
2. In Progress
3. Past Early Finish
4. Delaying Project
5. Late Starting
6. Not in Progress

Status messages 1, 2 and 6 are self-explanatory. Messages 3 and 5 are warning messages meaning that the scheduled early start or early finish has elapsed without the actual start or completion being reported.

Status message number 4 is printed when; 1) a critical activity has not been reported as started and the scheduled start date has passed, 2) a critical activity has not been reported as finished and the scheduled finish date has passed, and 3) a non-critical activity has not been reported as finished and the late finish date has passed. An example of a status report is shown in Report 9.

The EXCEPTION REPORT command is basically the same as STATUS REPORT except that the status is only reported on the un-completed critical activities. The command also causes any previously non-critical activities to be added to the list and identified. The phrase "NEW" is used to identify these previously non-critical activities. An example of an exception report is shown in Report 10.

Either one of the reports is obtainable by placing, on the command card, the desired command and the project number and identification assigned to the project by the RESERVE SCHEDULE command.

PREPUNCH CARDS

In the reporting of the starting and finishing dates of activities with the UPDATE SCHEDULE command, it was necessary to enter an update verb card with the verb STARTED ACTIVITY or COMPLETED ACTIVITY and the actual starting or finishing date. Rather than have this information being recorded on a form, pieces of paper or some other media, the command PREPUNCH CARDS has been included in CPMCL. This provides an easy method for the reporting of the activity starting and completion dates. The result is two prepunched cards for each activity in the network, except for dummy activities, which are used in subsequent updating operations. Each card contains one of the update verbs, the activity numbers, the activity description (for identification only) and the project number. When an activity starts or is completed, the date is written on the appropriate card and turned in.

MULTI-PROJECT SCHEDULING

In planning and scheduling projects that use a common network, you have the capability of totaling or concatenating these projects together and producing a report for multi-cost and multi-resources. The multi-resource plot is a very handy tool used in man-power leveling.

This subroutine is used to estimate the resources and costs associated with two or more related projects which will be active during the same time period. Output from this routine includes two types of plots. The first is a PROJECT COST plot which plots

a graph of accumulated costs versus time. This program assumes each activity to finish at its early finish date and estimated costs are accumulated on a weekly basis. A work week is defined as ending on Sunday. The results of a multi-project cost plot are shown in Report 11.

In addition, this routine produces a RESOURCE PLOT showing combined resource requirements for two or more projects. This plot is in the form of a histogram on a calendar day basis for each individual resource used on a project. Three types of plots are available:

1. Plot each of the individual resources.
2. Plot a summary of all resources required.
3. Plot individual resources and summary.

A multi-project run may be made in conjunction with a regular CPM run containing several projects. In this case, output for each project is followed by plots showing combined costs and resources for all projects in the run. If a master file containing several projects has been created by a previous run, multi-project scheduling will output only the combined cost and resource plots. In both cases, the MULTI-PROJECT command and its associated data cards are placed at the end of the input data deck, followed only by the END OF RUN command card.

TOTAL

The use of the TOTAL command is to identify the projects you want totaled together or concatenated. It can only be used after projects have been stored on disk by using the reserved schedule command.

FUTURE DEVELOPMENTS

It has been recognized throughout the development of the problem-oriented language for the Critical Path Method that it would be impossible for one person to develop, program, test and evaluate an entire system in a short period of time. However, it has been possible to pinpoint the need for additional effort on certain portions of the system.

The planning and scheduling commands could be expanded to incorporate commands such as COST OPTIMIZATION and LEVEL RESOURCES. A command such as COST OPTIMIZATION would allow for the scheduling to take into account the cost of the activities. A command LEVEL RESOURCES would schedule the project based on prescribed levels of resources.

The major effort required in the updating and monitoring commands would be the implementation of the full updating command. This would cause the schedule to be recalculated whenever a change in activity duration or work option is reported, an activity is deleted, or activities are added to the network. Also, there would be a need for commands to analyze costs, computer differences between actual and estimated costs or actual and estimated time estimates.

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APPENDIX A

Network Diagraming

The development of the project network model is one of the most important responsibilities in applying the Critical Path Method. Before this model can be constructed, it is necessary that the planner set down all the factors in the project to be considered.

If all activities required for the completion of a specific project can be listed, then the activities can be arranged logically in order of performance and represented graphically. Necessary constraints such as material or equipment lead-time should be included. In network planning, activities are represented by arrows, the length and direction of which are meaningless. The general flow of the arrow or network diagram is from left to right. However, an individual activity arrow may go up or down or from left to right. Each activity must be analyzed in relation to other activities and the following questions answered:

1. "What other activity (activities) must be completed before this activity can start?"
2. "What other activity (activities) can be accomplished at the same time that this activity is being performed?"
3. "What activity (activities) cannot start until this activity is completed?"

Figure One shows the graphic means for representing an activity. The tail of the arrow (i) represents the beginning of the activity and the arrow head (j) represents the completion of the activity. Each activity will have i and j numbers different from

all other activities in the network. This provides a means of identification for the activity arrow.



FIGURE 1

Keeping in mind that project activities are defined as time-consuming tasks, it is sometimes necessary, in order to maintain a logical sequence in the network, that a non-time-consuming "activity" be introduced. This type of activity, known as a dummy, is represented by a dashed arrow (See Figure 2) and indicates an interdependency rather than performance of a time-consuming task.



FIGURE 2

The beginning or completion of one or more activities is marked by an event which is depicted by a circle (or node). The i and j numbers for the activity are placed, when possible, inside the event circle.

In CPM, an event is merely a point in time and does not represent work. An event cannot occur until all activities ending at that node are completed. Furthermore, no activities beginning from an event may start until the event has occurred.

In Figure Three, activity B must be complete before event number 3 occurs, at which time activity C may begin. Activities A and C both

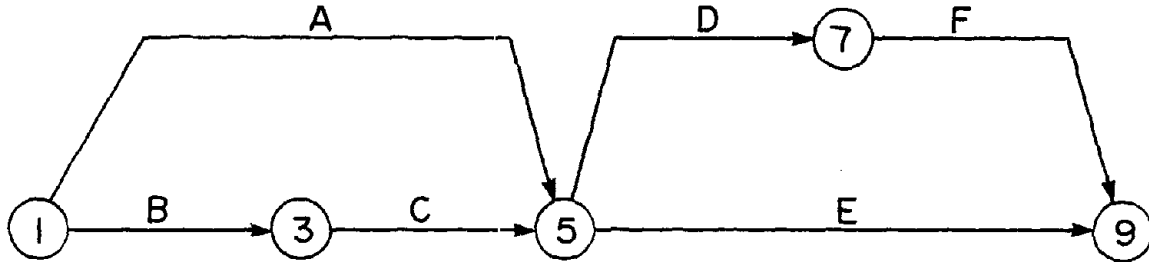


FIGURE 3

must be complete before event 5 can occur and activities D and E may begin. Activity F cannot start until activity D has been completed and event 7 occurs. When both events E and F have been completed, event 9 occurs and the project is ended.

An activity is defined by the numbers assigned to its beginning event (i number) and ending event (j number). In Figure Three, activity A is denoted by its i-j number 1-5, activity B is 1-3, activity D is 5-7, and so on. Each activity arrow must have a separate and unique i-j number. When there are two or more arrows between the same two nodes, dummies must be used to separately identify each activity. This application is illustrated in Figure Four.

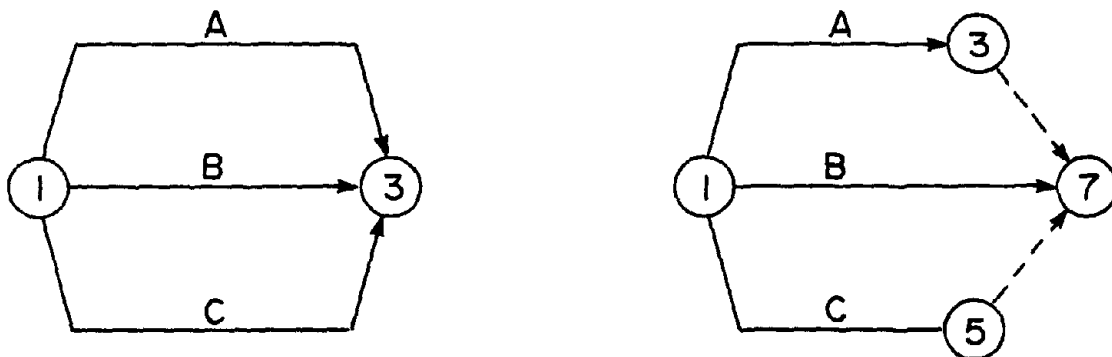


FIGURE 4

Figure Four (a) shows three activities with the same i-j number, that is 1-3. To eliminate this undesirable situation, dummy activities are inserted on activity paths A and B and each activity's i-j number becomes unique as shown in Figure Four (b).

In addition to numbering, activities are identified by a brief description of the work to be performed. This description is normally placed immediately above the activity arrow. Later, when time requirements are determined and assigned to each activity, they will be represented by a number indicating a time value such as days, or weeks. This number is positioned immediately under the activity arrow.

Figure Five represents a typical activity identified in the manner just described. The activity involves the setting of forms, its number is 1-2 and its duration is three days.

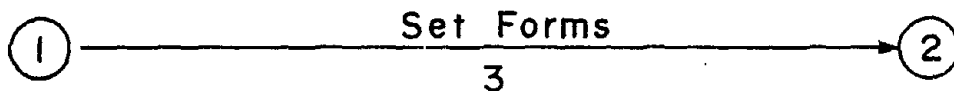


FIGURE 5

The examples on the following pages illustrate the interrelationship of activities and the logic involved in their sequencing and graphic representation.

Case I - Activity B depends only upon completion of Activity A.

Network

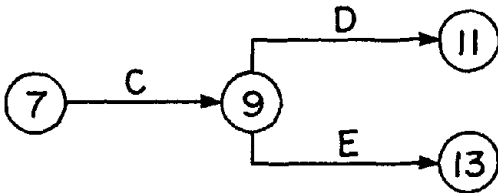


Explanation

Activity B (3-5) cannot start until Activity A (1-3) is completed.

Case II - Both Activities D and E depend upon completion of Activity C.

Network

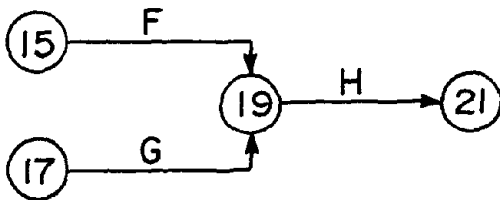


Explanation

Activities D (9-11) and E (9-13) cannot start until Activity C (7-9) is completed.

Case III - Activity H depends upon the completion of two activities, F and G.

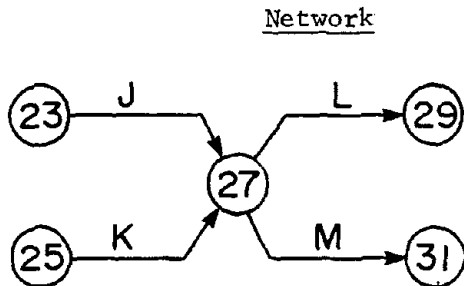
Network



Explanation

Activity H (19-21) cannot start until Activities F (15-19) and G (17-19) are both completed.

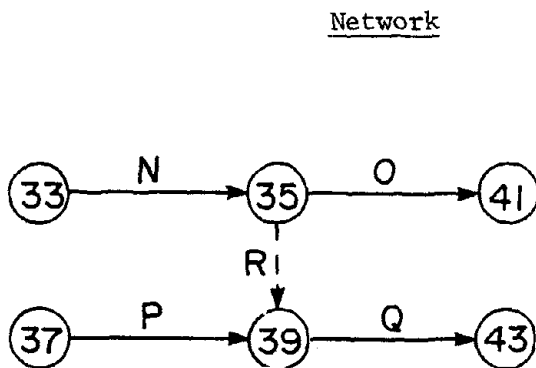
Case IV - Activities L and M both depend upon the completion of Activities J and K.



Explanation

Activities L (27-29) and M (27-31) cannot start until Activities J (23-27) and K (25-27) are both completed.

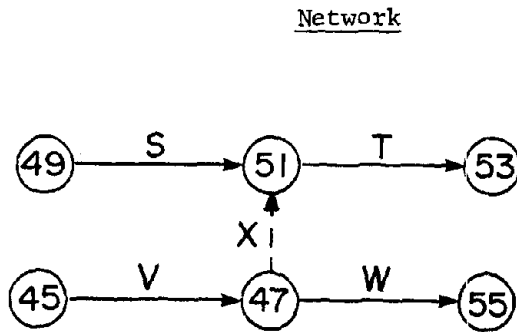
Case V - Activity O depends only upon the completion of Activity N.
Activity Q depends upon the completion of Activities N and P.



Explanation

Activity O (35-41) cannot start until Activity N (33-35) is completed. Activity Q (39-43) cannot start until Activities N (33-35) and P (37-39) are both completed. Activity R (35-39) is a dummy activity which rectifies the logic by restraining the start of Activity Q (39-43) until Activity N (33-35) is completed.

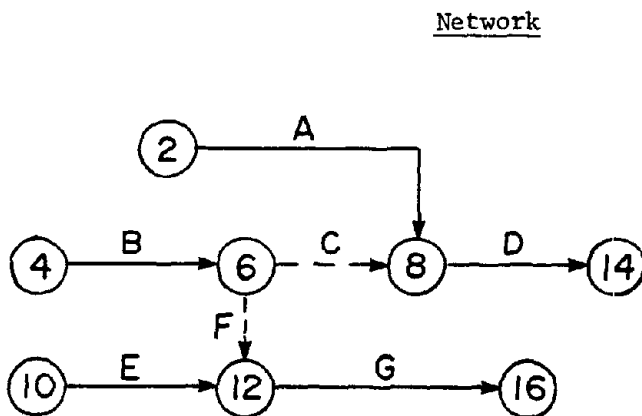
Case VI - Activities W and T both depend upon completion of Activity V.
Activity T also depends upon completion of Activity S.



Explanation

Activity W (47-55) cannot start until Activity V (45-47) is completed. Activity T (51-53) cannot start until Activities V (45-47) and S (49-51) are completed. Activity X (47-51) is a dummy activity which rectifies the logic by restraining the start of Activity T (51-53) until Activity V (45-47) is completed.

Case VII - Activity D depends upon the completion of Activities A and B.
Activity G depends upon the completion of Activities B and E.



Explanation

Activity D (8-14) cannot start until Activities A (2-8) and B (4-6) have been completed. Activity G (12-16) cannot start until Activities E (10-12) and B (4-6) have been completed. G's depending upon B is shown by dummy F (6-12). Since Activity G is not dependent upon completion of Activity A, it is isolated from A by use of the dummy C (6-8).

The following series of statements constitute a logic problem that can be represented by a network diagram. Utilizing the criteria developed thus far, it is suggested that persons with little or no previous CPM experience perform the problem and develop the network diagram in order to have a better understanding of the technique.

1. At the start of the project, A and B are initial activities and are to be performed concurrently.
2. C, D and E cannot start until A is finished.
3. B must be complete before F and H can start. F also depends upon the completion of A.
4. G cannot start until E and F are complete.
5. J depends upon the completion of D and G.
6. K follows H.
7. L follows K and also depends upon the completion of D and G.
8. M, the final activity, depends upon the completion of C, J and L.

One of the several possible solutions for the logic problem is shown in Figure Six.

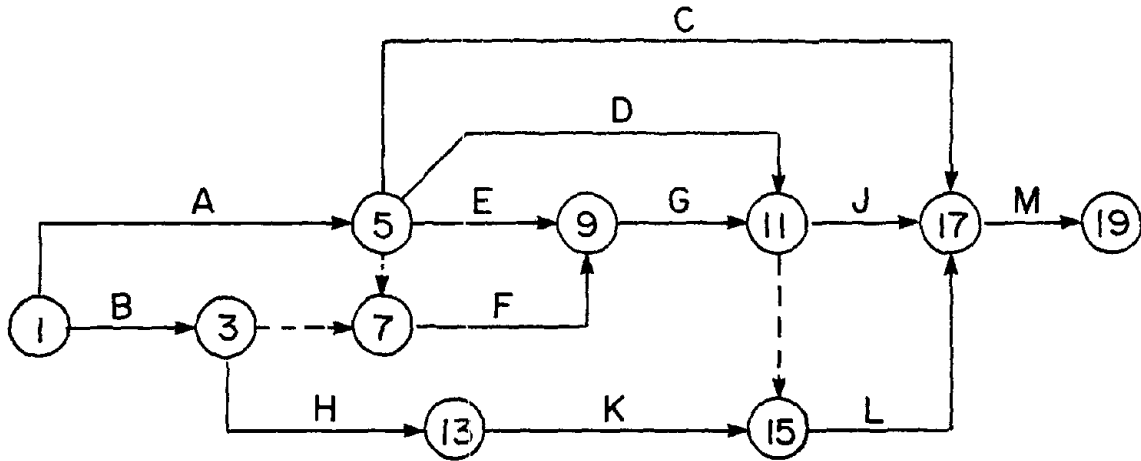


FIGURE 6

All solutions should have the same flow of logic, regardless of the appearance of the network. When a network such as the one above has been developed, it is necessary that it be analyzed with regard to the proper presentation of logic. The beginning of each activity emanating from an event depends upon the completion of all activities flowing into the same event.

To review a completed network for accuracy of logic, one must begin at the final event in a project and work backwards toward the start, going from event to event, asking the following questions about each activity:

1. Does each activity beginning at the event depend upon all activities leading into the event?

2. Do all activities, upon which the one in question must depend, lead into the event?

If the answer to both questions is yes, and if all activities have been taken into account, the network diagram is complete and represents the logical flow of work for the accomplishment of the specified project.

APPENDIX B

Crashing Critical Activities

In order to determine an optimum schedule in terms of project cost, it is necessary that a minimum time also be determined for the completion of a given activity. This minimum time implies the use of more manpower and/or equipment in order to accomplish the activity in the shortest possible time. Beyond this point, the employment of an additional manpower and/or equipment will result only in an increase in cost with no corresponding decrease in time. This expedition or "crashing" of activities naturally results in a greater cost for an activity than that involved in performing the activity in the normal time.

The only way to expedite a project is by crashing critical activities. The importance of this point cannot be over-emphasized since herein lies much of the value of the Critical Path Method. Too often in the past when a project has fallen behind schedule, management has crashed the entire project in order to expedite completion. Obviously this is not necessary since only those activities that are critical need be crashed in order to reduce project duration. Therefore, in order to avoid a useless expenditure of resources in crashing non-critical activities, care must be exercised in selecting the activities to be expedited.

From the normal and minimum time/cost estimates, the activity time/cost relationship can be represented graphically as shown in Figure Seven. The point at the extreme left of the activity time/cost curve represents the "crash" condition and the point on the extreme right of the curve represents the "normal" condition. Several additional points have been plotted between the two extremes in order to show that the time/cost relationship is not necessarily linear. In most cases, however, the relationship can best be approximated by assuming that a straight line situation exists between the normal and crash points. The linear relationship method is recommended when the network analysis is to be performed manually. However, if the schedule is to be prepared by electronic computer, it may be desirable to include additional time/cost estimates for some or all activities, since computer programs are available which will consider individual increments of the time/cost curve.

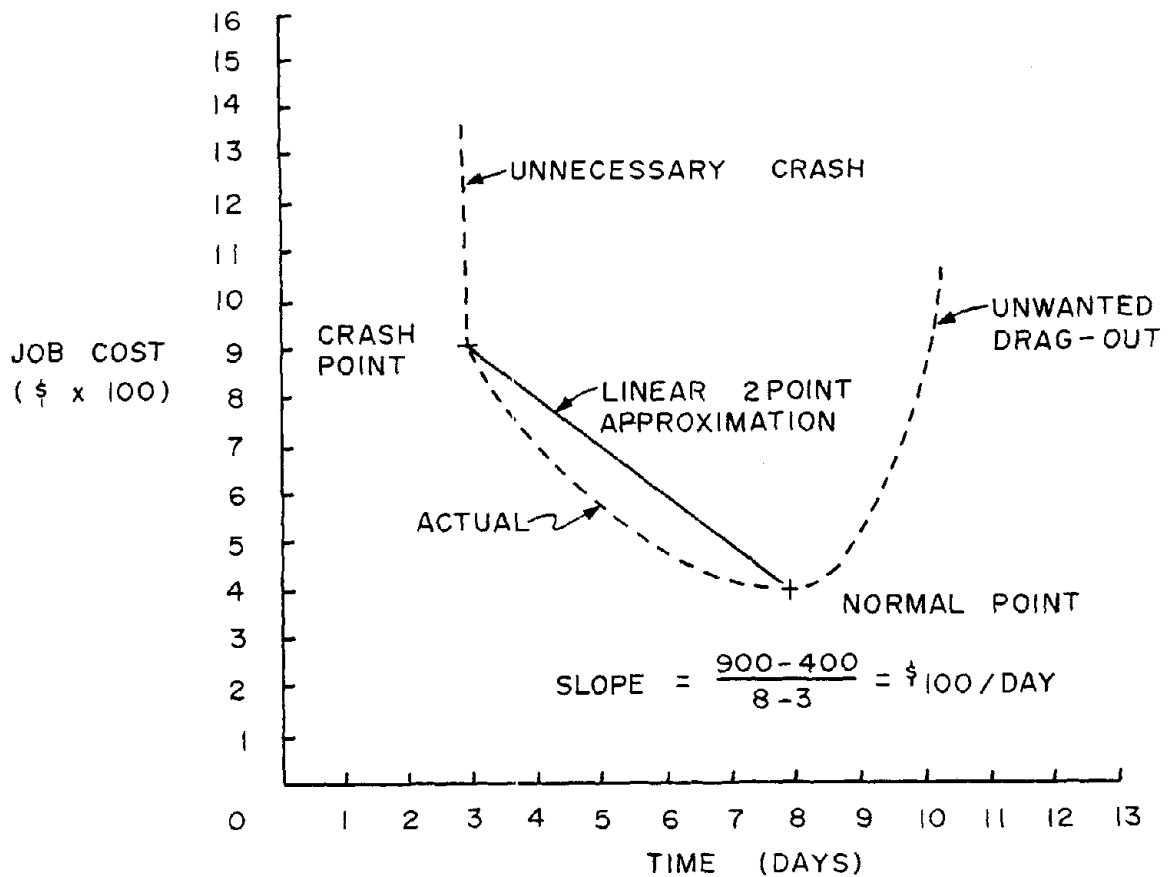


FIGURE 7

Referring again to Figure Seven, it is readily apparent that the slope of the time/cost curve can be calculated between the crash and normal points. This slope represents the cost in dollars per day to expedite a given activity and is calculated in the following fashion:

$$\text{SLOPE} = \frac{\text{CRASH COST minus NORMAL COST}}{\text{NORMAL TIME minus CRASH TIME}}$$

The usefulness of the slope of the activity time/cost curve is obvious. Once it is decided that a project must be completed in less than the summation of all normal time, the activities that are least expensive to expedite can be determined by comparing the slopes of the time/cost curves for all activities. When possible, these least expensive (lowest cost per unit of time) activities should be expedited first.

The expediting of activities on the critical path will eventually cause concurrent activities with small values of float to become critical. When such a condition is reached, it then becomes necessary to crash both the previously critical and new critical activities in order to further expedite the project.

USER'S INSTRUCTIONS

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CPMCL Rules

The following rules listed below will help to minimize the number of errors when using CPMCL.

1. The deck consists of CPMCL commands and the data associated with each command.
2. The first command of each CPMCL problem must be 'BEGIN'. The data for this command consists of the user's name and the name of the problem to be run.
3. Following the 'BEGIN' command, the commands and the associated data as described in this manual, are used.
4. Key punching of command cards and data are as follows: 3/
 - A. One CPMCL command is keypunched in a card.
 - B. The command phrase must begin in card column 1 and must be spelled as indicated in this manual.
 - C. The data, if necessary for the command, is keypunched in card column starting after CC-19 and can extend through CC-72 except as noted in the command descriptions.
 - D. Comments may be keypunched after the last piece of data for the command. However, at least 1 blank must be between the last piece of data and the comment.
5. Any number of CPMCL problems may be run at any one time, the only requirement is that each new problem start with a 'BEGIN' command. This is necessary due to the deletion of a problem when errors are encountered in processing the commands.

3/Refer to section on Input Data Formats

CPMCL Command Descriptions

The structure of CPMCL can be divided into three broad areas of use. They are:

1. System commands
2. Planning and scheduling commands.
3. Updating and monitoring commands.

1. SYSTEM COMMANDS

- A. COMMAND . . TODAY'S DATE
DATA . . . The date of run; month, day, year
PURPOSE . . To provide the system with the date of the run and to initiate the procedures for the run. This card is used only once for each run and is the first card of the entire set of problems.
- B. COMMAND . . BEGIN
DATA . . . User's name and descriptive information
PURPOSE . . To indicate the start of a new problem of critical path method calculations and reports.
- C. COMMAND . . END OF RUN
DATA . . . None
PURPOSE . . To indicate that the entire set of problems are completed and to terminate the computer run.
- D. COMMAND . . CREATE MASTER FILE
DATA . . . None
PURPOSE . . To set aside a disk file to be used for maintaining a CPMCL master file for storing results.

2. PLANNING AND SCHEDULING COMMANDS

- A. COMMAND. . CALCULATE NETWORK

DATA . . . Starting date of project; month, day, year
Following the command card, are the data
necessary for describing the network and
its associated data. The data consists of
a title card, activity cards and resource
cards.

- (1) Network Title Card.. Any information necessary to identify the CPM network. The first character must be the digit 1. This digit is used to position the paper in the printer so that the network title will be printed at the top of the page.
- (2) Activity Cards.. One card is prepared for each activity of the network, including dummy activities. The following information is on an activity card...

Tail Event Number
Head Event Number
Activity Duration
Activity Cost (optional)
Activity Description
Activity Work Option
Resource Functional Area (optional)
Resources Required (optional)

- (A) Tail Event Number - right justified in card columns (CC) 2-5. The tail event number is the number of the event at the tail of the activity as shown on the arrow diagram.
- (B) Head Event Number - right justified in CC 7-10. The head event number is the number of the event at the head of the activity as shown on the arrow diagram. For this program, it is necessary that the head event number be larger than the tail event number.

- (C) Activity Duration - right justified in CC 14-16.
The activity duration is the time that is required to complete a particular activity. The time unit may have any base desired, such as working day, calendar day, week or month. However, for this program, it is necessary that the time unit be a working or calendar day (see activity work option).
- (D) Activity Cost - right justified in CC 17-24.
The activity cost is that direct cost incurred in completing a particular activity.
- (E) Activity Description - anywhere in CC 28-57.
The activity description is the information necessary to identify the activity. The information can be any combination of alphabetic and numeric characters.
- (F) Activity Work Option - CC 61.
The activity work option provides a means whereby changes can be made in the calendar dating of an activity. The calendar dating is based on work days and non-work days, such as holidays, weather days, Saturdays and Sundays.
Through the following work option codes, the non-work days can be converted to work days for each particular activity...

CODE	DESCRIPTION
0	Use work days as specified in calendar
1	Disregard all non-work days
2	Disregard all holidays
3	Disregard all weather days
4	Disregard all Saturdays
5	Disregard all Sundays
6	Disregard all holidays and weather days
7	Disregard all holidays and Saturdays
8	Disregard all holidays, Saturdays and Sundays

(G) Resource Functional Area - CC 74

The resource functional area is used for classifying different types of resources which are related to each other, such as the resource area of engineers. Each classification or functional area is assigned a number and the particular resource area for the activity is keypunched.

(H) Resources Required - CC 75-80

Each resource functional area is further broken down into the individual resources associated with the functional area. For example, the functional area of engineers could be broken down into civil, electrical, mechanical and chemical. Each individual resource is assigned a number within the functional area starting with the number 1 and consecutively through the number 6. It should be noted that exactly 6 card columns are provided for the resources. The six card columns represent the six possible resource levels of a functional area. In each card column is entered the required number of a particular resource for the activity. If the activity does not require all the possible levels (6) or any at all, the digit zero should be entered in the unused card columns. For example, if the functional area code of engineers is 2 and the above breakdown of engineers is used, with the requirement for 3 civil engineers, 1 electrical, 2 mechanical and 0 chemical engineers, would be coded as follows

Functional Area	Resources Required
2	312000

(I) Network Completion - CC 4-5

When an activity card has been completed for each activity of the network, it is necessary to provide one additional card. This card is used to indicate that there are no further activity cards for the network. To do this, a tail event number of minus nine (-9) is entered in the card. It is a must that

this card be used as a last card.

- (J) In Submitting the activity cards for processing by this program, the cards must be in a definite sequential order. The order is, the tail event numbers of the activities must be in ascending order and in cases where the same tail event number, the head event numbers must be in ascending order. As an example

Tail Event No.	Head Event No.
1	2
2	3
2	5
3	8
3	10
3	24
.	.
.	.

- (3) Resource Description Cards . . One card is prepared for each individual resource. The following information is in a resource description card:

- (A) Resource Functional Area - CC 1.
The functional area to which the resource is associated, the value may be from 1 through 9.
- (B) Resource Number CC 2.
The resource number assigned to each resource within a functional area, may have a value of 1 through 6.
- (C) Resource Description - anywhere in CC 6-29.
The resource description is the information necessary to describe a particular resource, such as chief accountant. The information can be any combination of alphabetic and numeric characters. Referring to the previous example, the engineers would be described in the following way

Resource Area No.	Resource Description
21	Civil Engineer
22	Electrical Engineer
23	Mechanical Engineer
24	Chemical Engineer

(D) Cost Per Resource - CC 30-39

(E) In submitting the resource description cards, it is necessary to place one blank card following the descriptions to indicate the end of the resource description cards.

(4) Input Data Sequence . . The data is assembled with the title card first, followed by the activity cards and then the resource description cards.

B. COMMAND . . CALENDAR DATE

DATA . . . To convert the starts and finishes from days to calendar dates based on the project starting date and the individual activity work option.

RESTRICTION..This command can be used only after a 'CALCULATE NETWORK' command has been given for the same problem. Calendar is limited to five years.

C. COMMAND . .TIME-SEQUENCE PLOT

DATE . . None

PURPOSE . .To provide a graphical representation of the interrelationships of the activities in a CPM network. The result is a bar graph plot on a calendar day basis of the activity duration from scheduled early start to scheduled early finish and the amount of total float.

RESTRICTION..This command can be used only after a 'CALCULATE NETWORK' command has been given for the same problem. However, this command and a 'CALENDAR DATE' command can both follow the same 'CALCULATE NETWORK' command.

D. COMMAND . .PROJECT COST PLOT
DATA . .None
PURPOSE . .To provide a graphical representation of the project cost for the planned project. The result is a graph of accumulated project cost for each week based on each activity completing by its early finish date.
RESTRICTION..This command can be used only after a 'CALENDAR DATE' command has been given for the same problem.

E. COMMAND . .RESOURCE PLOT
DATA . . .Type of plot, starting date of plot and finishing date of plot, plot month, day, year, month, day, year

- (1) The type of plot is a code number used for specifying the type of desired output. The code is the following . . .
 - 0 - Plot each of the individual resources
 - 1 - Plot a summary of all resources
 - 2 - Plot individual resources and summary
- (2) The starting date and finishing date are provided in order to permit the user to obtain a plot of any desired period of time.

PURPOSE..To provide a graphical representation of the required resources in a CPM network. The result is a histogram plot on a calendar day basis of each of the individual resources used on a project from the specified starting date to the specified finishing date.

RESTRICTION..This command can be used only after a 'CALENDAR DATE' command has been given for the same problem.
A maximum period of time of 731 calendar days for the plotting period with a limit of 12 individual plots.

F. COMMAND . .CRITICAL ACTIVITIES
DATA . . .None
PURPOSE . .To identify the activities which are critical to the completion of the project. The result is a tabulation of the activities scheduled calendar start and finish dates and the resources required for the individual activities.
RESTRICTION..This command can be used only after a 'CALENDAR DATE' command has been given for the same problem.

3. UPDATING AND MONITORING COMMANDS

A. COMMAND. .RESERVE SCHEDULE

DATA . . Project number and identification.

- (1) Project Number - CC 20-25
The project number is any combination of up to six digits which are used for identifying the project.
- (2) Project Identification - anywhere in CC 26-72.
The project identification is any combination of letters and numbers which will identify the project.
- (3) The combination of the project number and identification must be unique for each CPM project. This is necessary due to the projects being filed by this number and identification.
- (4) It is suggested that once a project number and identification have been assigned, that duplicate cards be made containing the information in CC 20-72.

PURPOSE To add the calendar dated schedule of the project to the existing CPM master file. The reserving of a schedule makes it available for any subsequent updating and monitoring commands.

RESTRICTIONS..This command can be used only after a 'CALENDAR DATE' command has been given for the same problem.

B. COMMAND. .DELETE SCHEDULE

DATA . . .Project number and identification

- (1) The project number and identification are the same as described under the 'RESERVE SCHEDULE' command.

- (2) For this command to be successful in deleting a project, it is necessary that the number and identification given with this command agree exactly with a number on the CPM master file.

PURPOSE.. To remove the specified project from the CPM master file. This action could be taken once a project is completed or if a new schedule is to be calculated for the same project.

C. COMMAND.. UPDATE SCHEDULE

DATA .. Project number and identification.

- (1) The project number and identification are the same as described under the 'RESERVE SCHEDULE' command.
- (2) The following update verbs are used to update an existing project reserved on the CPM master file

(A) VERB. . . STARTED ACTIVITY

DATA . . Activity event numbers and
the actual start date, tail,
head, month, day, year

PURPOSE . To provide information on the
actual starting dates of the
individual activities.

(B) VERB. . . COMPLETED ACTIVITY

DATA . . Activity event numbers and
actual completion date, tail,
head, month, day, year, cost

PURPOSE . To provide information on the
actual completion dates and
cost of the individual activities.

(C) VERB. . . RESOURCE CHANGE

DATA . . Activity event numbers, functional
area and required individual resources;
tail, head, functional-area,
required-resources (6)

- PURPOSE To provide information on the revised requirements of resources. The verb can be used to correct errors or to reflect a revised estimate of resource requirements.
- (D) VERB. . . COST CHANGE
 DATA . . Activity event numbers, and cost; tail, head, cost.
 PURPOSE . To provide information on the revised cost requirement for an activity. The verb can be used to correct errors or to reflect a revised estimate of the activity cost.
- (E) VERB. . . DURATION CHANGE
 DATA . . Activity event numbers and duration; tail, head, duration.
 PURPOSE . To provide information on the revised work option requirement for an activity. The verb can be used to correct errors or to reflect a revised estimate of the activity work option.
 RESTRICTION..The verb does not initiate the necessary calculations to re-schedule the project.
- (F) VERB. . . WORK OPTION CHANGE
 DATA . . Activity event numbers and work option; tail, head, option.
 PURPOSE . To provide information on the revised work option requirement for an activity. The verb can be used to correct errors or to reflect a revised estimate of the activity work option.

RESTRICTION..The verb does not initiate the necessary calculations to reschedule the project.

- (G) VERB. . . DELETE ACTIVITY
DATA . . Activity event numbers; tail, head.
PURPOSE . To provide for the deletion of any activity from the network. The result is to revise the reserved network to reflect changes in plans or to correct the sequence of activities.

RESTRICTION..The verb does not initiate the necessary calculations to reschedule the project.

- (H) VERB. . . ADD ACTIVITY
DATA . . All activity data required for the original calculation of the network.

- (1) The data is discussed under the 'CALCULATE NETWORK' command.
- (2) Due to the large amount of information for this verb, a specific format for presenting the data on the verb is necessary.
- (3) The format is

DATA	CARD COLUMN
Tail Event No.	20-23
Head Event No.	24-27
Activity Duration	28-31
Activity Cost	32-39
Activity Description	40-69
Activity Work Option	70
Resource Function Area	71
Required Resources (6)	72-77

PURPOSE..To provide for the addition of an activity to the network. The result is to revise the reserved network to reflect changes in plans or to correct the sequence of activities.

RESTRICTION..The verb does not initiate the necessary calculations to reschedule the project.

(I) VERB. . . END OF UPDATE
DATA . . None
PURPOSE . To indicate to the updating operation that all update verb cards have been processed.

D. COMMAND. . STATUS REPORT
DATA . . Project number and identification
(1) The project number and identification are the same as described under the 'RESERVE SCHEDULE' command.
PURPOSE . To provide a status report for all activities in the project. The result is a tabulation of each activity consisting of the scheduled and actual start date, scheduled and actual completion date and the activity status. The status is indicated by one of the six phrases which follow:

(A) Completed
(B) In progress
(C) Past early finish
(D) Delaying project
(E) Late starting
(F) Not in progress

E. COMMAND. . EXCEPTION REPORT
DATA . . Project number and identification
PURPOSE . To provide a status report for the critical activities in the project. The result is a tabulation of each critical activity that has not been completed and for any previously noncritical activity that is delaying the project. The status phrases

shown under the 'STATUS REPORT' command are used as well as the phrase 'NEW' which identifies the previously non-critical activities delaying the project.

F. COMMAND . .PREPUNCH CARDS

DATA . . .Project number and identification

- (1) The project number and identification are the same as described under the 'RESERVE SCHEDULE' command.

PURPOSE . .To provide an easy method for the reporting of the activity starting and completion dates. The result is two prepunched cards for each activity in the network, except for dummy activities, which are used in subsequent updating operations. The card contains . . . either the update verb 'STARTED ACTIVITY' or 'COMPLETED ACTIVITY', the event numbers, the activity description, for identification only and the project number.

G. COMMAND . .MULTI-PROJECT

DATA . . .Type of plot, starting date of plot and finishing date of plot, plot month, day, year, month, day, year

- (1) The type of plot is a code number used for specifying the type of desired output. The code is the following . . .
 0. Plot each of the individual resources
 1. Plot a summary of all resources
 2. Plot individual resources and summary
- (2) The starting date and finishing date are provided in order to permit the user to obtain a plot of any desired period of time.

PURPOSE . .To provide a graphical representation of two or more common networks. The result is a histogram plot on a calendar day basis of each of the resources used on two or more projects from the specified starting date to the specified finishing date.

RESTRICTION . .This command can be used only after a
'RESERVE SCHEDULE' command has been given
for the two or more problems. A maximum
period of time of 731 calendar days for
the plotting period with a limit of 12
individual plots.

H. COMMAND . .TOTAL

DATA . . .Project number and identification. The
project number and identification are
the same as described under the 'RESERVE
SCHEDULE' command. It requires one of
the cards for each project you totaled
or concatenated into a multi-project
report.

PURPOSE . .Same as described under the 'MULTI-
PROJECT' command.

RESTRICTION . .Same as described under the 'MULTI-
PROJECT' command.

I. COMMAND . .STOP

DATA . . .None

PURPOSE . .To indicate that the entire set of
'MULTI-PROJECT' problems are completed
and to terminate the computer run.

SYSTEM COMMANDS

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

MULTIPLE LAYOUT FORM

Program Name	CPM	By	D.REID	Program No.	Date	Sheet No.
						1

MONTH DAY YR

TODAY'S DATE

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

XX XX XX XX

USER NAME AND DESCRIPTIVE INFORMATION

BEGIN

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

END OF RUN

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

CREATE MASTER FILE

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

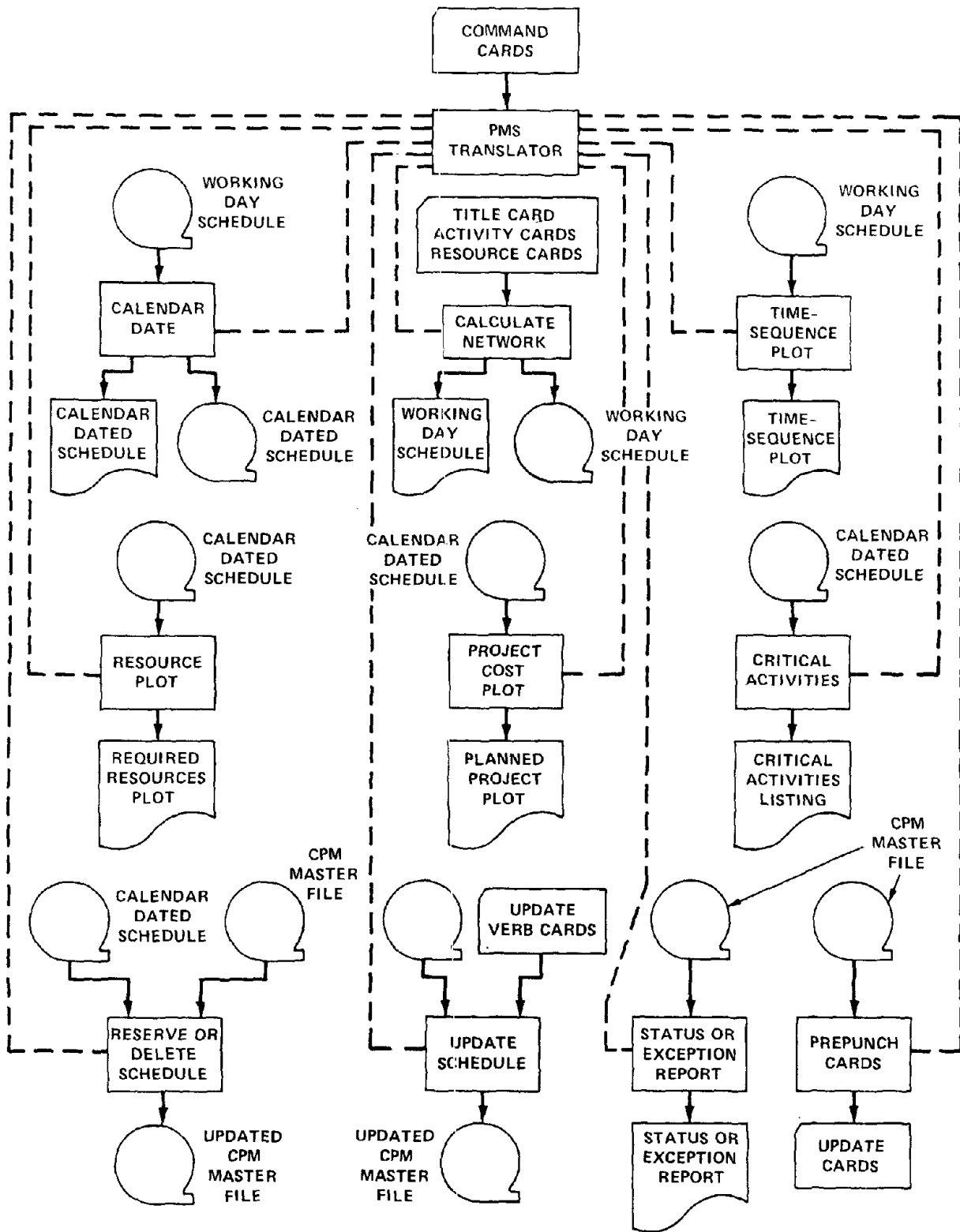
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

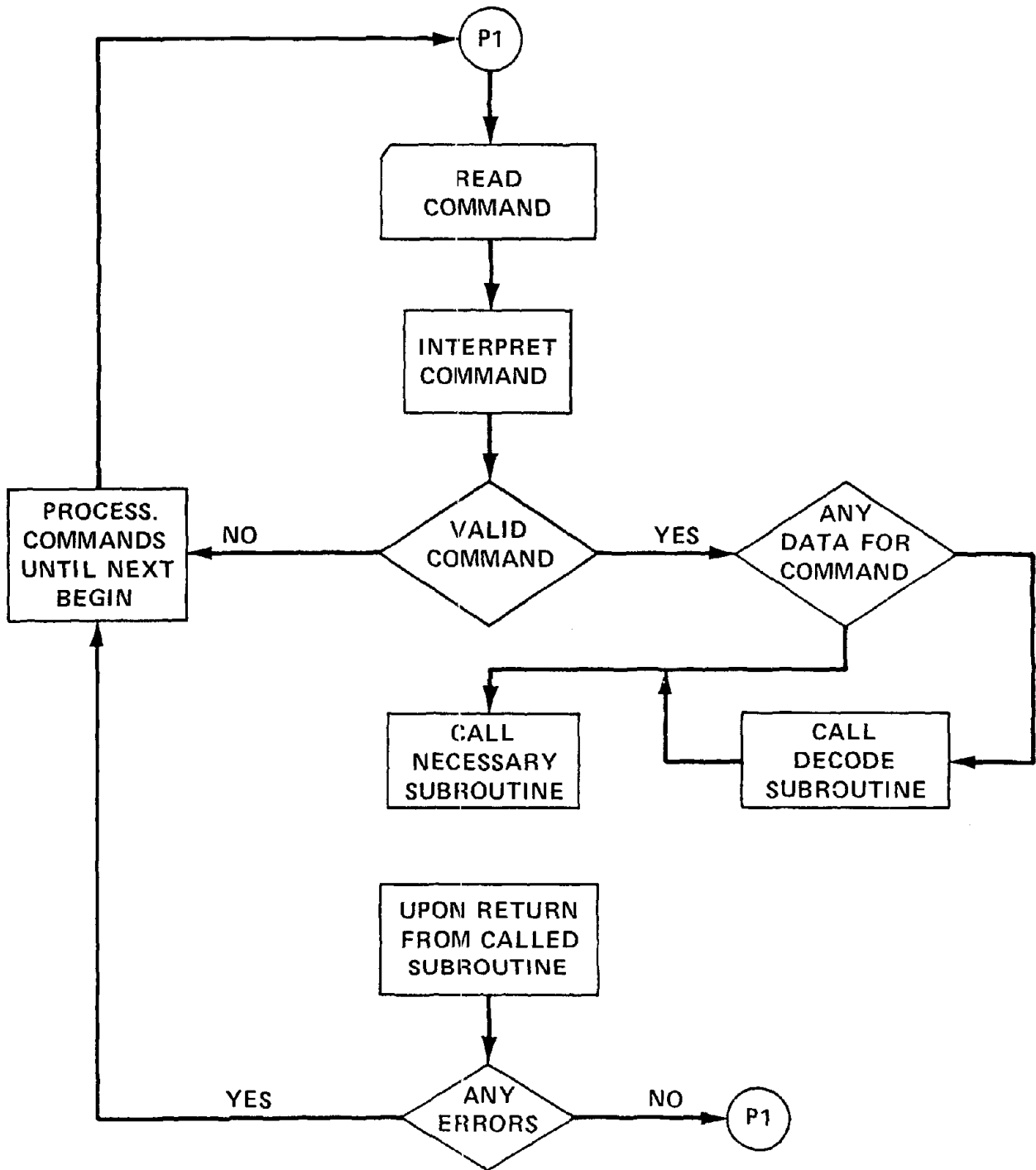
PLANNING AND SCHEDULING COMMANDS

MULTIPLE LAYOUT FORM		U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION	
Program Name	By	Program No.	Date
CPM			Sheet No. 3
CALENDAR DATE			
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80			
TIME-SEQUENCE PLOT			
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80			
PROJECT COST PLOT			
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80			
RESOURCE PLOT			
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80			
CRITICAL ACTIVITIES			
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80			

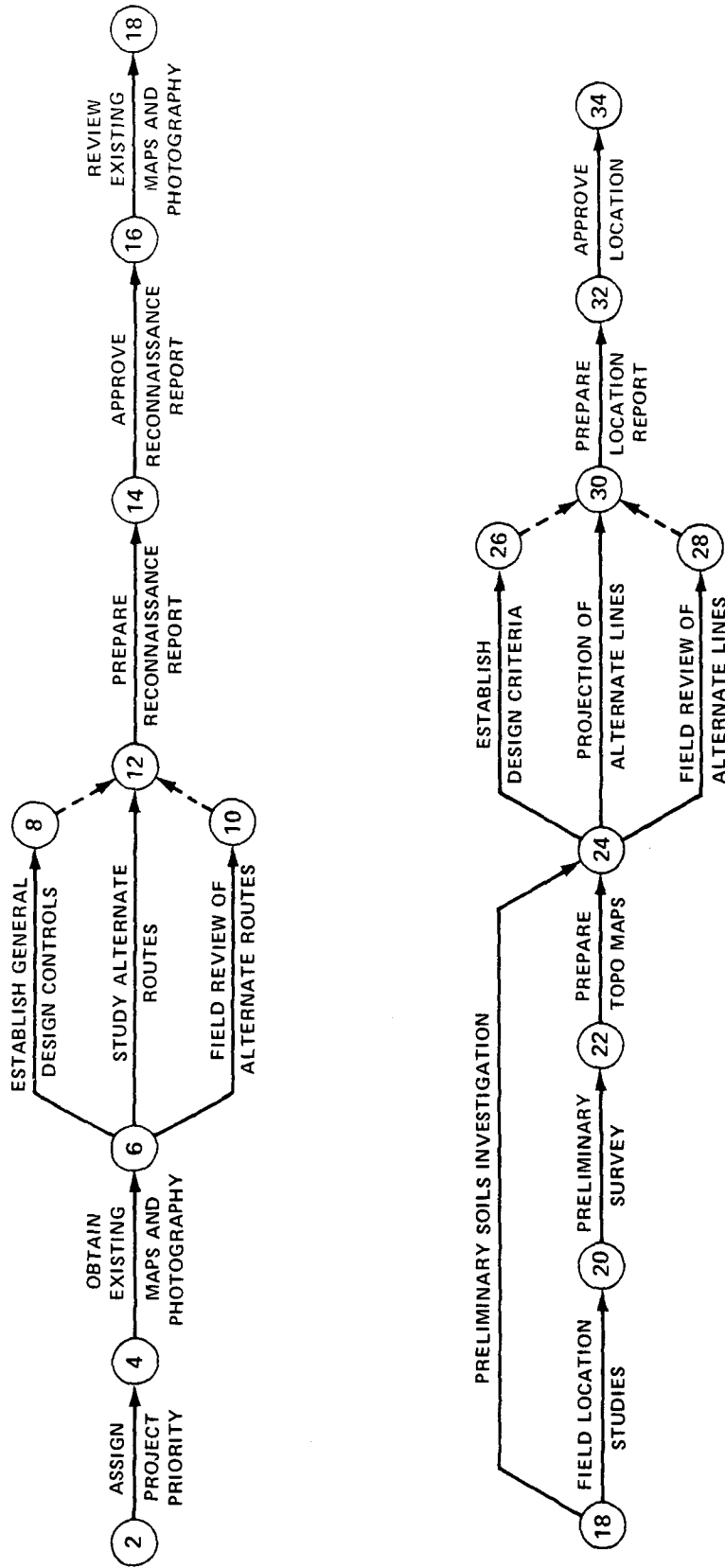
MAX PLOT IS 731 DAYS



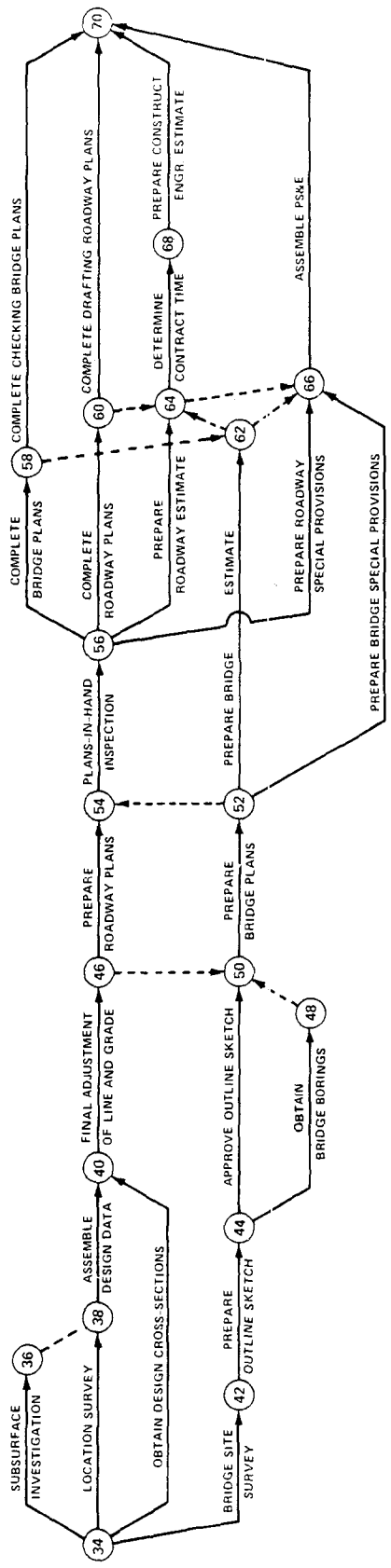
**PROJECT MANAGEMENT SYSTEM
COMMAND LANGUAGE SYSTEM FLOWCHART**



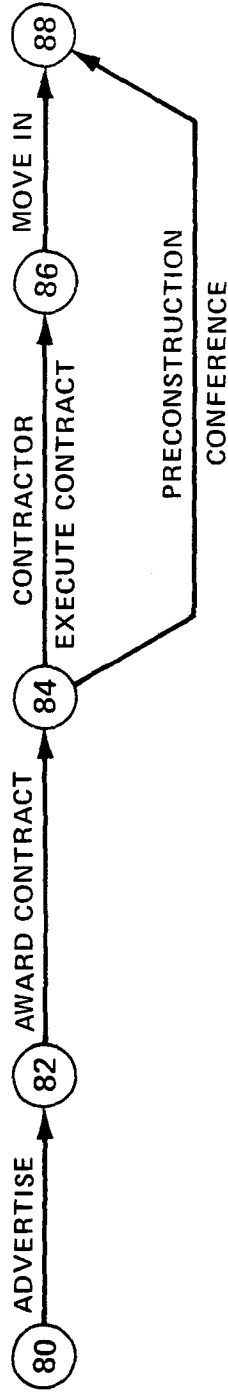
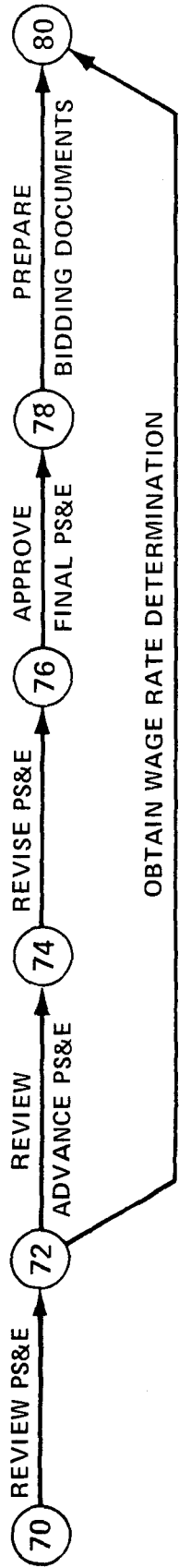
PMS TRANSLATOR FUNCTION



HIGHWAY LOCATION, DESIGN, P.S. AND E., AND CONTRACT AWARD



HIGHWAY LOCATION, DESIGN, P.S. AND E., AND CONTRACT AWARD



HIGHWAY LOCATION, DESIGN, P.S. AND E., AND CONTRACT AWARD

PROJECT MANAGEMENT SYSTEM
HIGHWAY LOCATION, DESIGN, PS and E, and CONTRACT AWARD

Fail Event No.	Head Event No.	Duration Days	Cost \$	Activity Description	Work	Res. Fund	Resources												
					Option 0 - 8	Area 1 - 9	Required 1 2 3 4 5 6												
2	4			Assign Project Priority															
4	6			Obtain Existing Maps and Photo- graphy															
6	8			Establish General Design Controls															
6	10			Field Review of Alternate Routes															
6	12			Study Alternate Routes															
8	12			Dummy															
10	12			Dummy															
12	14			Prepare Reconnaissance Report															
14	16			Approve Reconnaissance Report															
16	18			Review Existing Maps and Photo- graphy															
18	20			Field Location Studies															
18	24			Preliminary Soils Investigation															
20	22			Preliminary Survey															
22	24			Prepare Topo Maps															
24	26			Establish Design Criteria															
24	28			Field Review of Alternate Lines															
24	30			Projection of Alternate Lines															
26	30			Dummy															
28	30			Dummy															
30	32			Prepare Location Report															
32	34			Approve Location															
34	36			Subsurface Investigation															
34	38			Location Survey															
34	40			Obtain Design Cross-sections															
34	42			Bridge Site Survey															
38	40			Assemble Design Data															
40	46			Final Adjustment of Line and Grade															
42	44			Prepare Outline Sketch															
44	48			Obtain Bridge Borings															
46	50			Dummy															
46	54			Prepare Roadway Plans															
48	50			Dummy															
50	52			Prepare Bridge Plans															
52	52			Dummy															
52	62			Prepare Bridge Estimate															
52	66			Prepare Bridge Special Provisions															
54	56			Plans-in-hand Inspection															
56	58			Complete Bridge Plans															
56	60			Complete Roadway Plans															
56	64			Prepare Roadway Estimate															
56	66			Prepare Roadway Special Provisions															
58	62			Dummy															
58	70			Complete Checking Bridge Plans															
60	64			Dummy															
60	70			Complete Drafting Roadway Plans															
62	64			Dummy															
62	66			Dummy															
64	66			Dummy															
64	68			Determine Contract Time															
66	70			Assemble PS&E															
68	70			Prepare Construction Engineers Estimate															
70	72			Review PS&E															
72	74			Review Advance PS&E															
72	80			Obtain Wage Rate Determination															
74	76			Revise PS&E															
76	78			Approve Final PS&E															
78	80			Prepare Bidding Documents															
80	82			Advertise															
82	84			Award Contract															
84	86			Contractor Execute Contract															
84	88			Preconstruction Conference															
86	88			Move In															

TODAYS DATE 03 30 73
 BEGIN 000001 PMS-CPM HIGHWAY LOCATION RUN DOUG REID

CREATE MASTER FILE

CALCULATE NETWORK 03 30 73
 1000001 PMS-CPM HIGHWAY LOCATION RUN DOUG REID

2	4	1	ASSIGN PROJECT PRIORITIES	0	1001000
4	6	2	OBTAIN EXIST MAPS AND PHOTOS	0	1000011
6	8	2	EST GENERAL DESIGN CONTROLS	0	1110000
6	10	1	FIELD REVIEW ALTERNATE ROUTES	0	1000111
6	12	2	STUDY ALTERNATE ROUTES	0	1000011
8	12		DUMMY		
10	12		DUMMY		
12	14	2	PREPARE RECON REPORT	0	1000011
14	16	1	APPROVE RECON REPORT	0	1001100
15	18	2	REVIEW EXIST MAPS AND PHOTOS	0	1000011
18	20	5	FIELD LOCATION STUDY	0	2111110
18	24	7	PRELIM SOILS INVESTIGATION	0	2111110
20	22	9	PRELIM SURVEY	0	2111110
22	24	5	PREPARE TOPO MAPS	0	2110010
24	26	7	ESTABLISH DESIGN CRITERIA	0	1110000
24	28	2	FIELD REVIEW ALTERNATE LINES	0	1000111
24	30	2	PROJECT ALTERNATE LINES	0	2110010
26	30		DUMMY		
28	30		DUMMY		
30	32	2	PREPARE LOCATION REPORT	0	1000011
32	34	1	APPROVE LOCATION REPORT	0	1001100

-4

11	HW ENGR WASH OFFICE	117
12	HW ENGR REGIONAL	98
13	HW ENGR DIVISION	83
14	HW ENGR DISTRICT	68
15	HW ENGR AREA ENGR	57
16	HW ENGR TRAINEE	48
21	TECH TRANSIT MAN	43
22	TECH ELECTROTAPE	33
23	TECH RODMAN	32
24	TECH TAPEMAN	31
25	TECH BOOKKEEPER	30
26	TECH BRUSH CUTTER	25

END RESOURCES

CALENDAR DATE
 CRITICAL ACTIVITIES
 TIME-SEQUENCE PLOT
 PROJECT COST PLOT

RESOURCE PLOT	2	03	30	73	05	24	73
RESERVE SCHEDULE	000001	PMS-CPM	HIGHWAY	LOCATION RUN	DOUG REID		
TODAYS DATE	4	10	73				
BEGIN	000001	PMS-CPM	HIGHWAY	LOCATION RUN	DOUG REID		
UPDATE SCHEDULE	000001	PMS-CPM	HIGHWAY	LOCATION RUN	DOUG REID		
STARTED ACTIVITY	2	4	3	30	73		
COMPLETED ACTIVITY	2	4	4	02	73		
STARTED ACTIVITY	4	6	4	2	73		
COMPLETED ACTIVITY	4	6	4	5	73		
STARTED ACTIVITY	6	8	4	5	73		
COMPLETED ACTIVITY	6	8	4	11	73		
STARTED ACTIVITY	6	10	4	6	73		
COMPLETED ACTIVITY	6	10	4	12	73		
STARTED ACTIVITY	6	12	4	5	73		
END OF UPDATE							
STATUS REPORT	000001	PMS-CPM	HIGHWAY	LOCATION RUN	DOUG REID		
EXCEPTION REPORT	000001	PMS-CPM	HIGHWAY	LOCATION RUN	DOUG REID		

TODAYS DATE 3 13 73
 BEGIN 000002 PMS-CPM HIGHWAY LOCATION RUN MD STYGAR
 CALCULATE NETWORK 03 13 73
 1000002 PMS-CPM HIGHWAY LOCATION RUN MD STYGAR

2	4	1	ASSIGN PROJECT PRIORITIES	0	1001000
4	6	2	OBTAIN EXIST MAPS AND PHOTOS	0	1000011
6	8	2	EST GENERAL DESIGN CONTROLS	0	1110000
6	10	1	FIELD REVIEW ALTERNATE ROUTES	0	1000111
6	12	3	STUDY ALTERNATE ROUTES	0	1000011
8	12		DUMMY		
10	12		DUMMY		
12	14	2	PREPARE RECON REPORT	0	1000011
14	16	1	APPROVE RECON REPORT	0	1001100
16	18	2	REVIEW EXIST MAPS AND PHOTOS	0	1000011
18	20	5	FIELD LOCATION STUDY	0	2111110
18	24	7	PRELIM SOILS INVESTIGATION	0	2111110
20	22	10	PRELIM SURVEY	0	2111110
22	24	5	PREPARE TOPO MAPS	0	2110010
24	26	7	ESTABLISH DESIGN CRITERIA	0	1110000
24	28	2	FIELD REVIEW ALTERNATE LINES	0	1000111
24	30	2	PROJECT ALTERNATE LINES	0	2110010
26	30		DUMMY		
28	30		DUMMY		
30	32	2	PREPARE LOCATION REPORT	0	1000011
32	34	1	APPROVE LOCATION REPORT	0	1001100

-9

11	HW ENGR WASH OFFICE	117
12	HW ENGR REGIONAL	98
13	HW ENGR DIVISION	83
14	HW ENGR DISTRICT	68
15	HW ENGR AREA ENGR	57
16	HW ENGR TRAINEE	48
21	TECH TRANSIT MAN	43
22	TECH ELECTROTAPE	33
23	TECH RODMAN	32
24	TECH TAPEMAN	31
25	TECH BOOKKEEPER	30
26	TECH BRUSH CUTTER	25

END RESOURCES

CALENDAR DATE

CRITICAL ACTIVITIES

TIME-SEQUENCE PLOT

PROJECT COST PLOT

RESOURCE PLOT

2 03 13 73 05 9 73

RESERVE SCHEDULE 000002 PMS-CPM HIGHWAY LOCATION RUN MD STYGAR

MULTI-PROJECT 2 3 13 73 5 29 73

TOTAL 1000001 PMS-CPM HIGHWAY LOCATION RUN DOUG REID

TOTAL 1000002 PMS-CPM HIGHWAY LOCATION RUN MD STYGAR

STOP MULTI-PROJECT 000001 AND 000002

END OF RUN

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1000001 PMS-CPM HIGHWAY LOCATION RUN DOUG REID

DATE OF REPORT 3/30/73

ACTIVITY	ACTIVITY COST	ACTIVITY DESCRIPTION	EARLIEST START	EARLIEST FINISH	LATEST START	LATEST FINISH	TOTAL FLOAT	FUNC AREA	RESOURCE TYPES	REQD
1	0.	ASSIGN PROJECT PRIORITIES	0	1	0	1	0	1	1 2 3 4 5 6	0 0 0 0 0 0
2	43.	OBTAIN EXIST MAPS AND PHOTOS	1	3	1	3	0	1	0 0 0 0 1 1	0 0 0 0 1 1
4	210.	EST GENERAL DESIGN CONTROLS	3	5	3	5	0	1	1 1 0 0 0 0	0 0 0 0 0 0
6	430.	FIELD REVIEW ALTERNATE ROUTES	3	4	4	4	1	1	0 0 0 1 1 1	1 1 1 1 1 1
10	173.	STUDY ALTERNATE ROUTES	3	5	3	5	0	1	0 0 0 0 1 1	1 1 0 0 0 0
12	210.	DUMMY	5	5	5	5	0	0	0 0 0 0 0 0	0 0 0 0 0 0
8	0.	DUMMY	5	5	5	5	0	0	0 0 0 0 0 0	0 0 0 0 0 0
10	0.	DUMMY	4	4	4	4	1	0	0 0 0 0 0 0	0 0 0 0 0 0
12	210.	PREPARE RECON REPORT	5	7	5	7	0	1	0 0 0 0 1 1	1 1 0 0 0 0
14	151.	APPROVE RECON REPORT	7	8	7	8	0	1	0 0 0 0 1 1	0 0 1 1 0 0
15	210.	REVIEW EXIST MAPS AND PHOTOS	8	10	8	10	0	1	0 0 0 0 1 1	1 1 0 0 1 1
16	845.	FIELD LOCATION STUDY	10	15	10	15	0	2	1 1 1 1 1 1	1 1 1 1 1 1
18	1183.	PRELIM SOILS INVESTIGATION	10	17	10	17	0	2	1 1 1 1 1 1	1 1 1 1 1 1
20	22	PRELIM SURVEY	15	24	15	24	0	2	1 1 1 1 1 1	1 1 1 1 1 1
22	24	PREPARE TOPO MAPS	24	29	24	29	0	2	1 1 0 0 1 0	1 1 0 0 1 0
24	26	ESTABLISH DESIGN CRITERIA	29	36	29	36	0	1	1 0 0 0 1 1	1 0 0 0 1 1
24	28	FIELD REVIEW ALTERNATE LINES	29	31	29	31	5	1	0 0 0 1 1 1	0 0 0 1 1 1
26	30	PROJECT ALTERNATE LINES	29	31	29	31	5	2	1 0 0 1 0	1 0 0 1 0
28	30	DUMMY	36	36	36	36	0	0	0 0 0 0 0 0	0 0 0 0 0 0
30	32	DUMMY	31	31	31	31	5	0	0 0 0 0 0 0	0 0 0 0 0 0
32	34	PREPARE LOCATION REPORT	36	38	36	38	0	1	0 0 0 0 1 1	1 0 0 0 1 1
		APPROVE LOCATION REPORT	38	39	38	39	0	1	0 0 1 1 0 0	0 0 1 1 0 0

PROJECT COST \$180. PROJECT COMPLETION 39

1000001 PMS-CPM HIGHWAY LOCATION RUN DOUG REID

FUNC AREA	RESOURCE	DESCRIPTION	COST/DAY
1	1	HW ENGR WASH-OFFICE	117
1	2	HW ENGR REGIONAL	94
1	3	HW ENGR DIVISION	83
1	4	HW ENGR DISTRICT	68
1	5	HW ENGR AREA ENGR	57
1	6	HW ENGR TRAINEE	48
2	1	TECH TRANSIT MAN	43
2	2	TECH ELECTROTape	33
2	3	TECH RODMAN	32
2	4	TECH TAPEMAN	31
2	5	TECH BOOKKEEPER	30
2	6	TECH BRUSH CUTTER	25

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1000001 PMS-CPM HIGHWAY LOCATION RUN 0006 REID

ACTIVITY	J	DUR	ACTIVITY COST	ACTIVITY DESCRIPTION	WORK OPT.	5 DAY WORKWEEK					TOTAL FLOAT	RESOURCE						
						DATE OF REPORT	3/30/73	EARLIEST	FINISH	START		LATEST	FINISH	START	AREA	1	2	3
1	4	1	43.	ASSIGN PROJECT PRIORITIES	0	3/30/73	4/ 2/73	3/30/73	4/ 2/73	4/ 2/73	0	1	0	0	0	0	0	0
2	6	2	210.	OBTAIN EXIST MAPS AND PHOTOS	0	4/ 2/73	4/ 4/73	4/ 2/73	4/ 4/73	4/ 4/73	0	1	0	0	0	0	0	0
3	8	2	430.	EST GENERAL DESIGN CONTROLS	0	4/ 4/73	4/ 6/73	4/ 4/73	4/ 6/73	4/ 6/73	0	1	1	0	0	0	0	0
4	10	1	173.	FIELD REVIEW ALTERNATE ROUTES	0	4/ 4/73	4/ 5/73	4/ 4/73	4/ 5/73	4/ 6/73	1	1	0	0	0	1	1	1
5	12	2	210.	STUDY ALTERNATE ROUTES	0	4/ 4/73	4/ 6/73	4/ 4/73	4/ 6/73	4/ 6/73	0	1	0	0	0	0	0	0
6	12	0	0.	DUMMY														
7	10	2	0.	DUMMY														
8	12	2	210.	PREPARE RECON REPORT	0	4/ 6/73	4/10/73	4/ 6/73	4/10/73	4/10/73	0	1	0	0	0	0	0	0
9	14	1	151.	APPROVE RECON REPORT	0	4/10/73	4/11/73	4/10/73	4/11/73	4/11/73	0	1	0	0	0	0	0	0
10	16	2	210.	REVIEW EXIST MAPS AND PHOTOS	0	4/11/73	4/13/73	4/11/73	4/13/73	4/13/73	0	1	0	0	0	0	0	0
11	18	2	845.	FIELD LOCATION STUDY	0	4/13/73	4/20/73	4/13/73	4/20/73	4/20/73	0	2	1	1	1	1	1	1
12	20	5	845.	PRELIM SOILS INVESTIGATION	0	4/13/73	4/24/73	4/13/73	4/24/73	4/24/73	12	2	1	1	1	1	1	1
13	24	7	1183.	PRELIM SURVEY	0	4/20/73	5/ 3/73	4/20/73	5/ 3/73	5/ 3/73	0	2	1	1	1	1	1	1
14	22	4	1521.	PREPARE TOPG MAPS	0	5/ 3/73	5/10/73	5/ 3/73	5/10/73	5/10/73	0	2	1	1	0	0	0	0
15	24	5	530.	ESTABLISH DESIGN CRITERIA	0	5/10/73	5/21/73	5/10/73	5/21/73	5/21/73	0	1	1	0	0	0	0	0
16	26	7	1505.	FIELD REVIEW ALTERNATE LINES	0	5/10/73	5/14/73	5/10/73	5/14/73	5/14/73	5	1	0	0	0	0	0	0
17	24	2	346.	PROJECT ALTERNATE LINES	0	5/10/73	5/14/73	5/10/73	5/14/73	5/14/73	5	2	1	0	0	0	0	0
18	30	2	212.	DUMMY														
19	25	0	0.	DUMMY														
20	28	0	0.	DUMMY														
21	30	2	210.	PREPARE LOCATION REPORT	0	5/21/73	5/23/73	5/21/73	5/23/73	5/23/73	0	1	0	0	0	0	0	0
22	32	2	151.	APPROVE LOCATION REPORT	0	5/23/73	5/24/73	5/23/73	5/24/73	5/24/73	0	1	0	0	0	0	0	0
23	34	1	151.	APPROVE LOCATION REPORT	0	5/23/73	5/24/73	5/23/73	5/24/73	5/24/73	0	1	0	0	0	0	0	0

PROJECT COST 8140.

1000001 PMS-CPM HIGHWAY LOCATION RUN 0006 REID

FUNC AREA	RESOURCE	DESCRIPTION	COST/DAY
1	1	HW ENGR WASH OFFICE	117
1	2	HW ENGR REGIONAL	98
1	3	HW ENGR DIVISION	83
1	4	HW ENGR DISTRICT	68
1	5	HW ENGR AREA ENGR	57
1	6	HW ENGR TRAINEE	48
2	1	TECH TRANSIT MAN	43
2	2	TECH ELECTRICIAN	33
2	3	TECH RODMAN	32
2	4	TECH TAPEMAN	31
2	5	TECH BOOKKEEPER	30
2	6	TECH BRUSH CUTTER	25

1000001 PMS-CPM HIGHWAY LOCATION RUN 0000 R410

ACTIVITY	ACTIVITY	ACTIVITY	ACTIVITY	ACTIVITY	ACTIVITY
1	2	3	4	5	6
1	430	210	430	173	210
2	430	210	430	173	210
3	430	210	430	173	210
4	430	210	430	173	210
5	430	210	430	173	210
6	430	210	430	173	210
7	430	210	430	173	210
8	430	210	430	173	210
9	430	210	430	173	210
10	430	210	430	173	210
11	430	210	430	173	210
12	430	210	430	173	210
13	430	210	430	173	210
14	430	210	430	173	210
15	430	210	430	173	210
16	430	210	430	173	210
17	430	210	430	173	210
18	430	210	430	173	210
19	430	210	430	173	210
20	430	210	430	173	210
21	430	210	430	173	210
22	430	210	430	173	210
23	430	210	430	173	210
24	430	210	430	173	210
25	430	210	430	173	210
26	430	210	430	173	210
27	430	210	430	173	210
28	430	210	430	173	210
29	430	210	430	173	210
30	430	210	430	173	210
31	430	210	430	173	210
32	430	210	430	173	210
33	430	210	430	173	210
34	430	210	430	173	210

TIME SEQUENCE LEGEND
 *** CRITICAL ACTIVITY DURATION
 +++ NON-CRITICAL ACTIVITY DURATION
 ... AMOUNT OF TOTAL FLOAT
 S SATURDAY OR SUNDAY+NO WORK
 H LEGAL HOLIDAY+NO WORK
 W WEATHER DAY+NO WORK

1000001 PMS-CPM HIGHWAY LOCATION RUN DOUG REID

7824

6846

P 5868

R

O

J 4890

E

C

T 3912

Report 6
75

C

O 2934

S

T

1956

978

0

↓ APR 01

↑ APR 08

↑ APR 15

↑ APR 22

↑ APR 29

↑ MAY 06

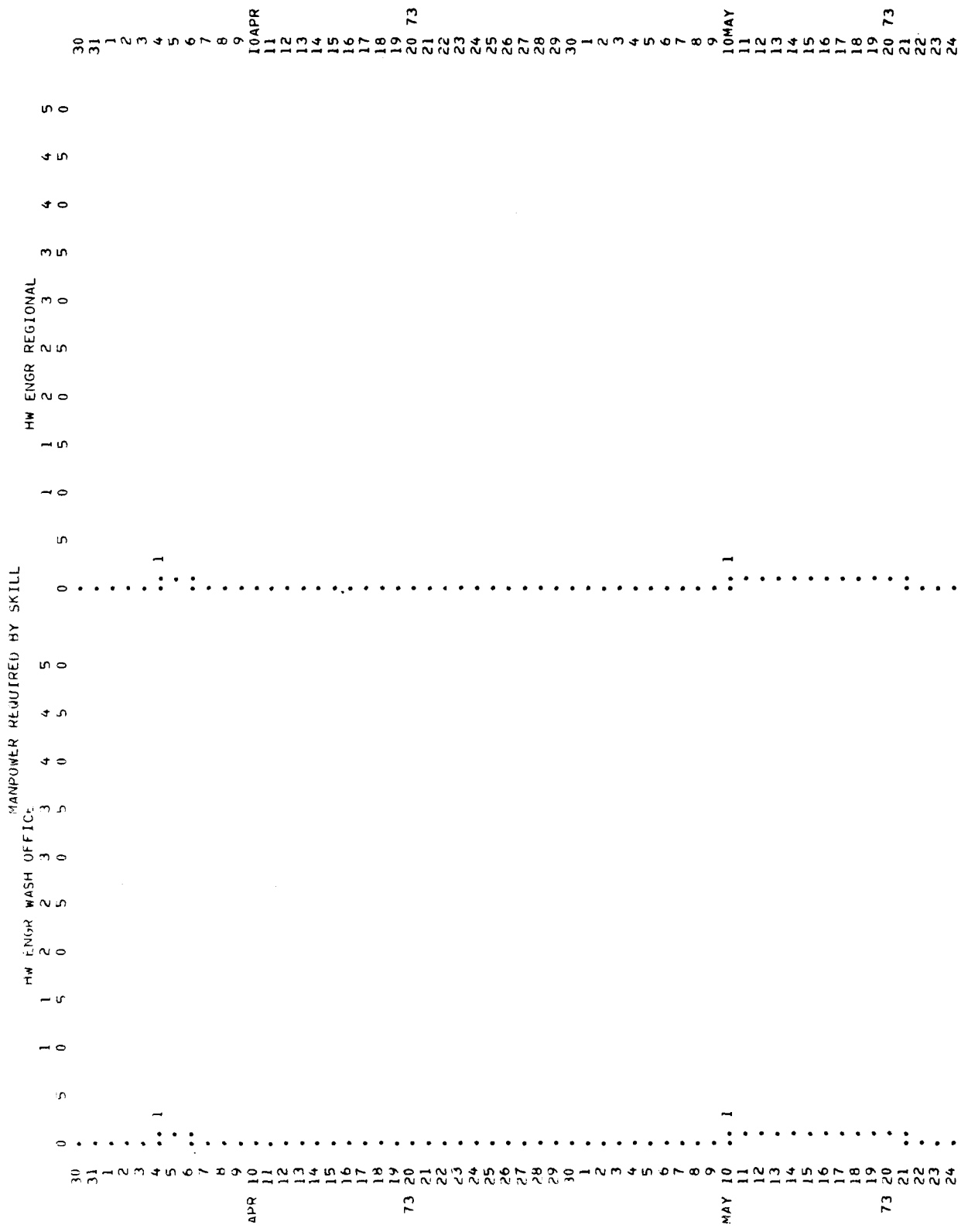
↑ MAY 13

↑ MAY 20

↑ MAY 27

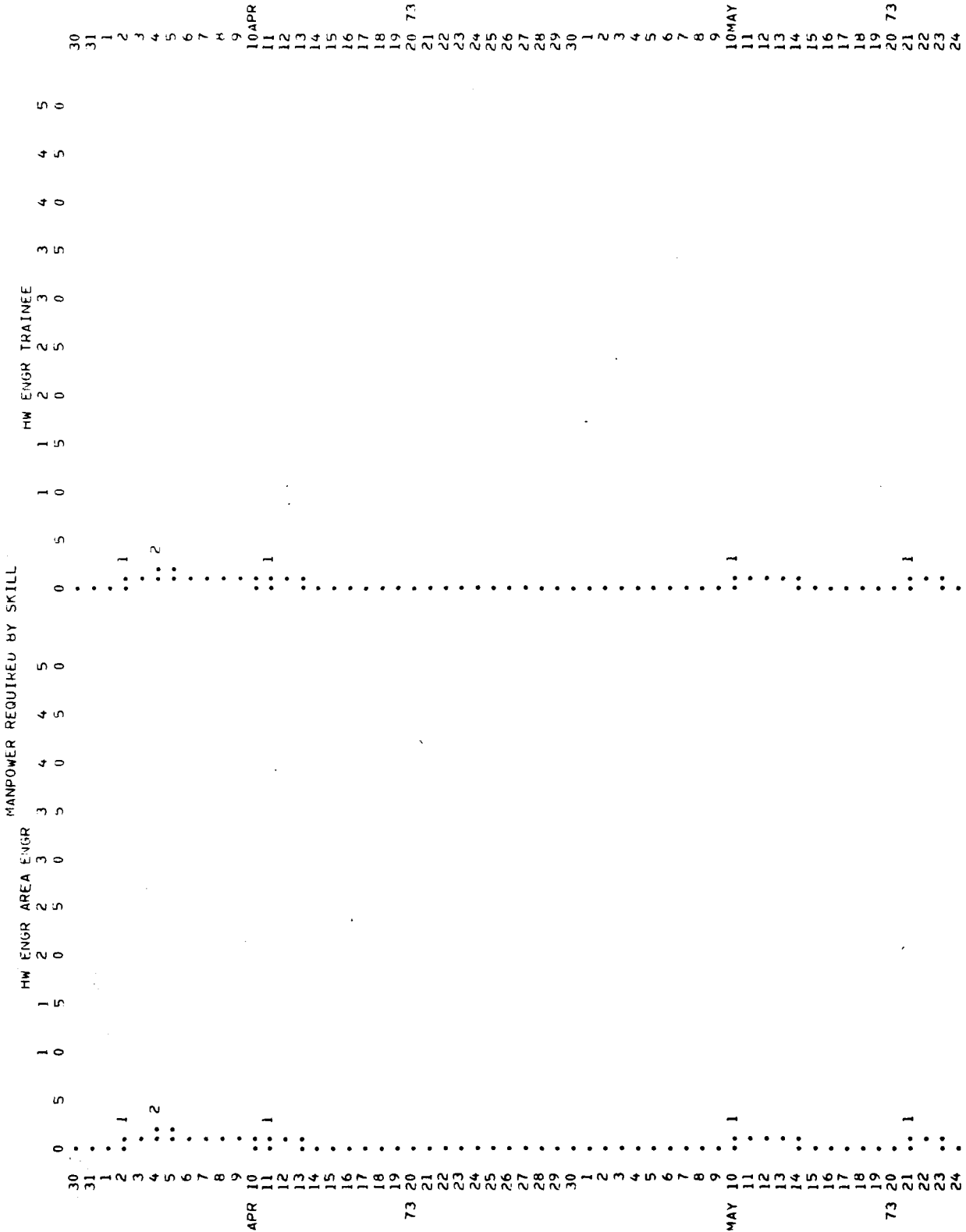
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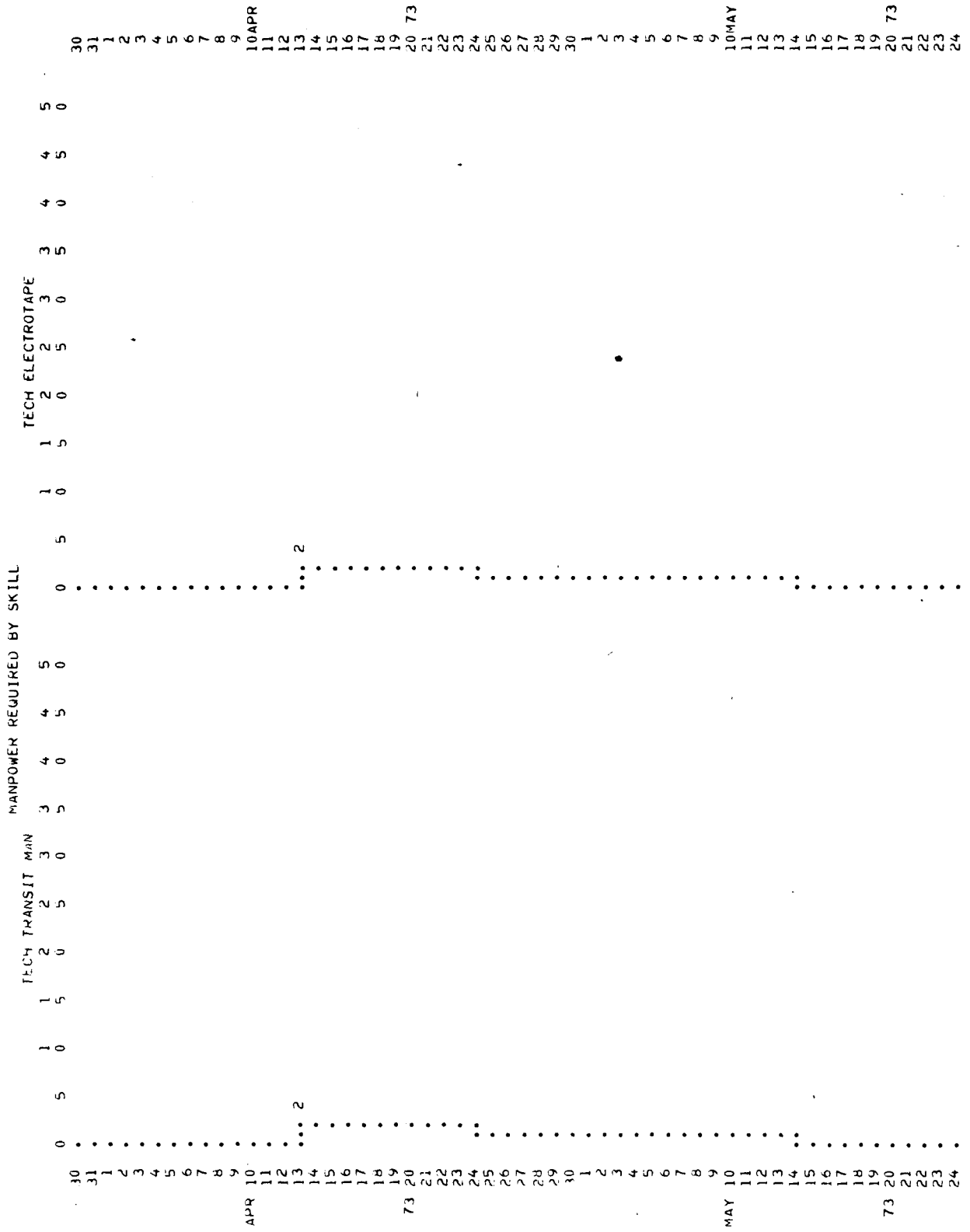
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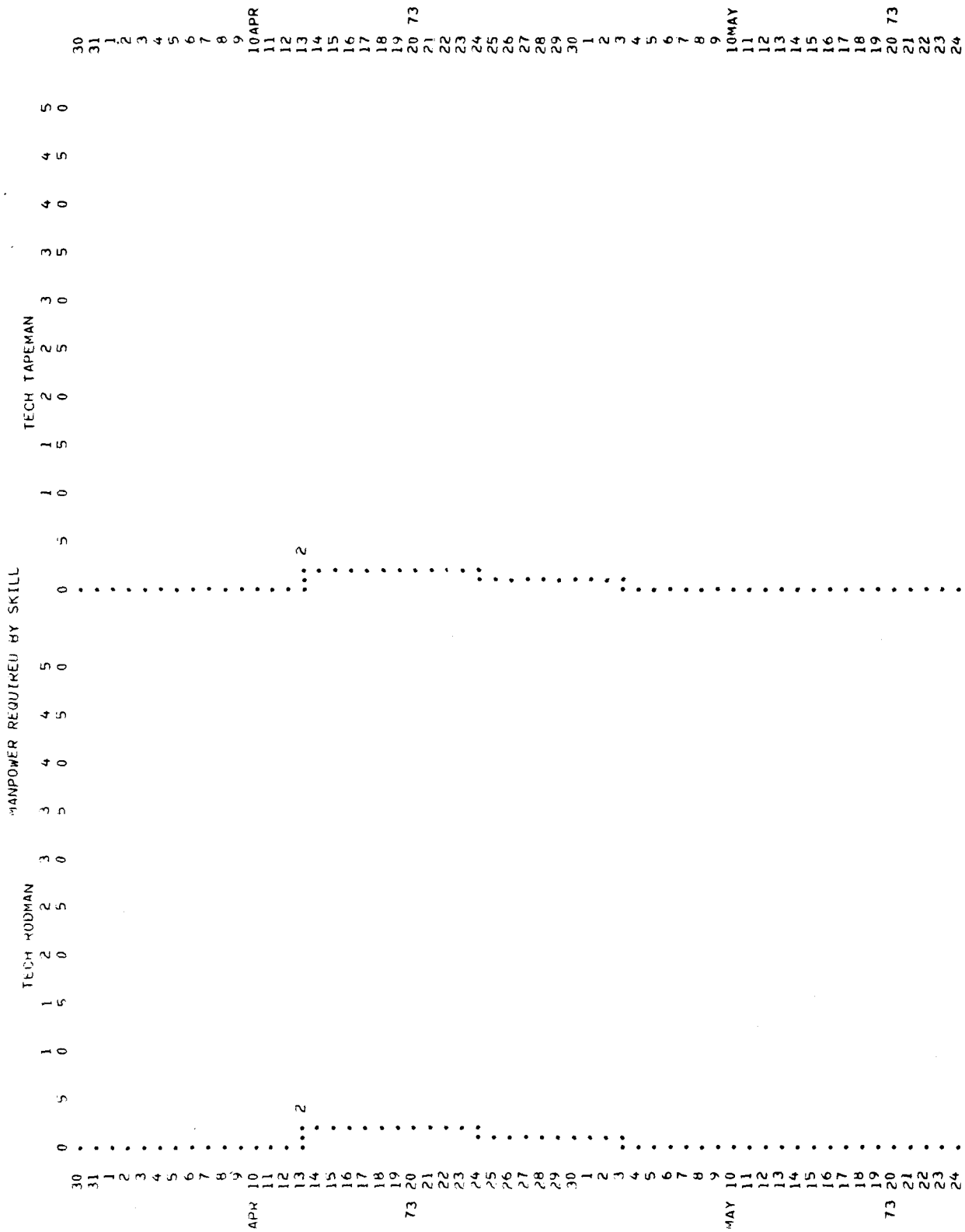


Date	HW ENGR DIVISION					MANPOWER REQUIRED BY SKILL					HW ENGR DISTRICT				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
30	0					0					0				
31	0					0					0				
1	0					0					0				
2	0					0					0				
3	0					0					0				
4	0					0					0				
5	0					0					0				
6	0					0					0				
7	0					0					0				
8	0					0					0				
9	0					0					0				
10	0					0					0				
11	0					0					0				
12	0					0					0				
13	0					0					0				
14	0					0					0				
15	0					0					0				
16	0					0					0				
17	0					0					0				
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19	0					0					0				
20	0					0					0				
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30	0					0					0				
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3	0					0					0				
4	0					0					0				
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20	0					0					0				
21	0					0					0				
22	0					0					0				
23	0					0					0				
24	0					0					0				

MANPOWER REQUIRED BY SKILL





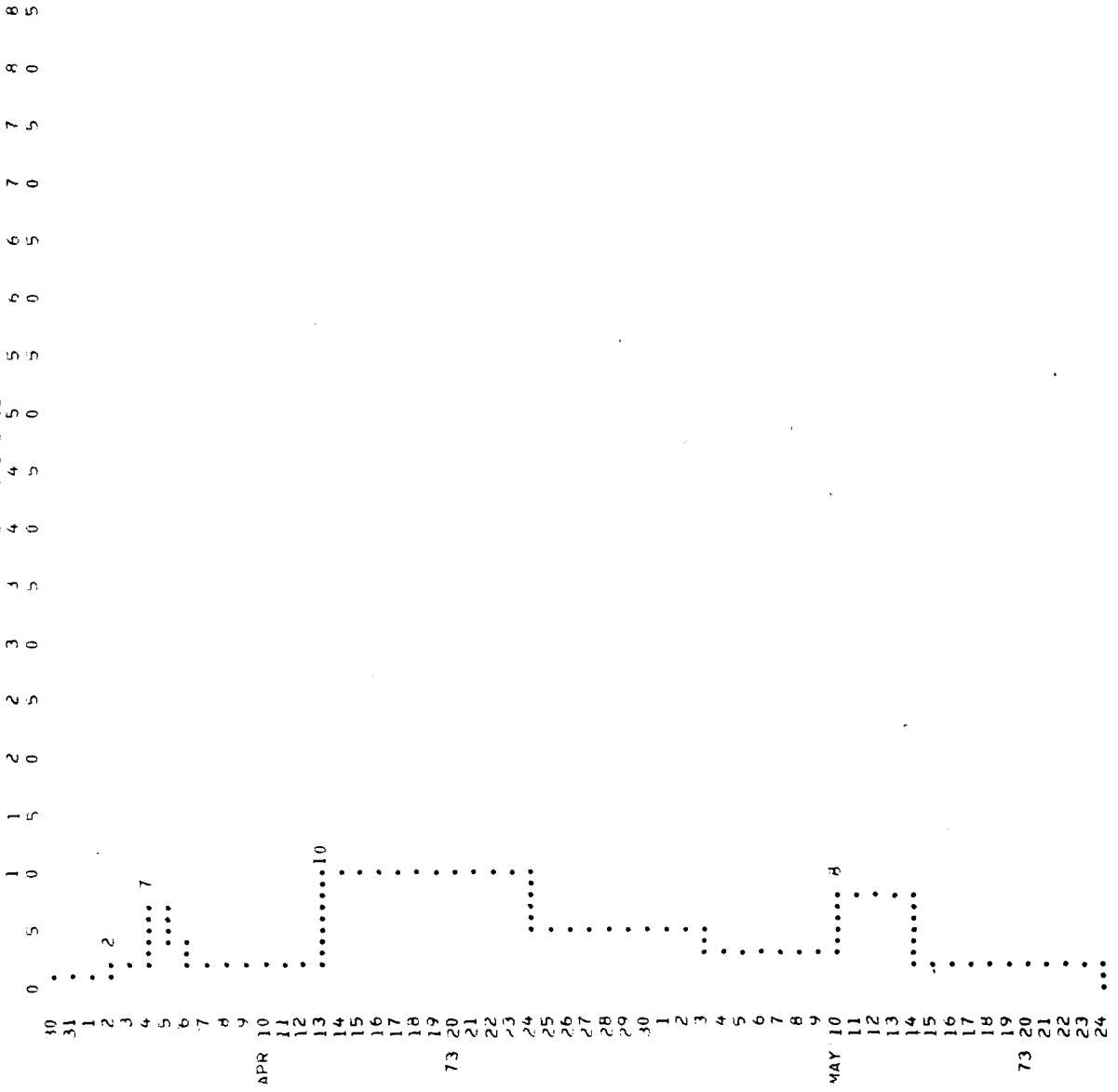


MANPOWER REQUIRED BY SKILL

Date	TECH BOOKKEEPER					TECH BRUSH CUTTER				
	1	2	3	4	5	1	2	3	4	5
30	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0

1000001 PMS-CPM HIGHWAY LOCATION RUN DOUG REID

MANPOWER REQUIRED FOR ALL ACTIVITIES



1000001 PMS-CPM HIGHWAY LOCATION RUN DUUG REID

C H I T I C A L A C T I V I T I E S L I S T

DATE OF REPORT 3/30/73

ACTIVITY J	ACTIVITY DUK	ACTIVITY COST	ACTIVITY DESCRIPTION	WORK OPT.	EARLIEST START	FINISH	LATEST START	FINISH	TOTAL FLOAT	FUNC AREA	RESOURCE TYPES REQD
1	1	83.	ASSIGN PROJECT PRIORITIES	0	3/30/73	4/ 2/73	3/30/73	4/ 2/73	0	1	0 1 0 0 0
2	2	210.	OBTAIN EXIST MAPS AND PHOTOS	0	4/ 2/73	4/ 4/73	4/ 2/73	4/ 4/73	0	1	0 0 0 0 1 1
4	6	430.	DST GENERAL DESIGN CONTROLS	0	4/ 4/73	4/ 6/73	4/ 4/73	4/ 6/73	0	1	1 1 0 0 0 0
6	8	210.	STUDY ALTERNATE ROUTES	0	4/ 4/73	4/ 6/73	4/ 4/73	4/ 6/73	0	1	0 0 0 0 1 1
12	2	210.	PREPARE RECON REPORT	0	4/ 6/73	4/10/73	4/ 6/73	4/10/73	0	1	0 0 0 0 1 1
14	1	151.	APPROVE RECON REPORT	0	4/10/73	4/11/73	4/10/73	4/11/73	0	1	0 0 1 1 0 0
16	18	210.	REVIEW EXIST MAPS AND PHOTOS	0	4/11/73	4/13/73	4/11/73	4/13/73	0	1	0 0 0 0 1 1
18	20	845.	FIELD LOCATION STUDY	0	4/13/73	4/20/73	4/13/73	4/20/73	0	2	1 1 1 1 1 0
20	22	9	PRELIM SURVEY	0	4/20/73	5/ 3/73	4/20/73	5/ 3/73	0	2	1 1 1 1 1 0
22	24	530.	PREPARE TOPO MAPS	0	5/ 3/73	5/10/73	5/ 3/73	5/10/73	0	2	1 1 0 0 1 0
24	26	1505.	ESTABLISH DESIGN CRITERIA	0	5/10/73	5/21/73	5/10/73	5/21/73	0	1	1 1 0 0 0 0
30	32	210.	PREPARE LOCATION REPORT	0	5/21/73	5/23/73	5/21/73	5/23/73	0	1	0 0 0 0 1 1
32	34	151.	APPROVE LOCATION REPORT	0	5/23/73	5/24/73	5/23/73	5/24/73	0	1	0 0 1 1 0 0

1000001 PMS-CPM HIGHWAY LOCATION RUN DUUG REID

FUNC AREA	RESOURCE CODE	DESCRIPTION	COST/DAY
1	1	HW ENGR WASH OFFICE	117
1	2	HW ENGR REGIONAL	95
1	3	HW ENGR DIVISION	83
1	4	HW ENGR DISTRICT	68
1	5	HW ENGR AREA ENGR	57
1	6	HW ENGR TRAINEE	48
2	1	TECH TRANSMIT MAN	43
2	2	TECH ELECTRICIAN	33
2	3	TECH RODMAN	32
2	4	TECH TAPMAN	31
2	5	TECH BOOKKEEPER	30
2	6	TECH BRUSH CUTTER	25

1000001 PMS-CPM HIGHWAY LOCATION RUN DOUG REID

STATUS REPORT ON ALL ACTIVITIES

ACTIVITY I	ACTIVITY J	ACTIVITY COST	ACTIVITY DESCRIPTION	DATE OF WORK OPT	EARLY START	ACTUAL START	LATE FINISH	ACTUAL FINISH	CRIT. ACT.	ACTIVITY STATUS	FUNC AREA	RESOURCE TYPES	REDD
2	4	1	93. ASSIGN PROJECT PRIORITIE	0	3/30/73	3/30/73	4/2/73	4/2/73	***	COMPLETED	1	1 2 3 4 5 6	0
4	6	2	210. OBTAIN EXIST MAPS AND PH	0	4/2/73	4/2/73	4/4/73	4/5/73	***	COMPLETED	1	0 0 1 0 0 0	0
6	8	2	430. EST GENERAL DESIGN CONTR	0	4/4/73	4/5/73	4/6/73	4/11/73	***	COMPLETED	1	0 0 0 0 1 1	1
6	10	1	173. FIELD REVIEW ALTERNATE R	0	4/4/73	4/6/73	4/6/73	4/12/73	***	COMPLETED	1	1 0 0 0 0 0	0
6	12	2	210. STUDY ALTERNATE ROUTES	0	4/4/73	4/5/73	4/6/73	0/0/0	***	DELAYING PROJEC	1	0 0 0 0 1 1	1
12	14	2	210. PREPARE RECON REPORT	0	4/6/73	0/0/0	4/10/73	0/0/0	***	DELAYING PROJEC	1	0 0 0 0 1 1	1
14	16	1	151. APPROVE RECON REPORT	0	4/10/73	0/0/0	4/11/73	0/0/0	***	NOT IN PROGRESS	1	0 0 1 0 0 0	0
16	18	2	210. REVIEW EXIST MAPS AND PH	0	4/11/73	0/0/0	4/13/73	0/0/0	***	NOT IN PROGRESS	1	0 0 0 0 1 1	0
18	20	5	845. FIELD LOCATION STUDY	0	4/13/73	0/0/0	4/20/73	0/0/0	***	NOT IN PROGRESS	2	1 1 1 1 1 0	0
18	24	7	1183. PRELIM SOILS INVESTIGATI	0	4/13/73	0/0/0	5/10/73	0/0/0	***	NOT IN PROGRESS	2	1 1 1 1 1 0	0
20	22	9	1521. PRELIM SURVEY	0	4/20/73	0/0/0	5/3/73	0/0/0	***	NOT IN PROGRESS	2	1 1 1 1 1 0	0
22	24	5	530. PREPARE TOPO MAPS	0	5/3/73	0/0/0	5/10/73	0/0/0	***	NOT IN PROGRESS	2	1 1 0 0 1 0	0
24	26	7	1505. ESTABLISH DESIGN CRITERI	0	5/10/73	0/0/0	5/21/73	0/0/0	***	NOT IN PROGRESS	1	1 1 0 0 0 0	0
24	28	2	346. FIELD REVIEW ALTEPNATE L	0	5/10/73	0/0/0	5/21/73	0/0/0	***	NOT IN PROGRESS	1	0 0 0 1 1 1	0
24	30	2	212. PROJECT ALTERNATE LINES	0	5/10/73	0/0/0	5/21/73	0/0/0	***	NOT IN PROGRESS	2	1 1 0 0 1 1	0
30	32	2	210. PREPARE LOCATION REPORT	0	5/21/73	0/0/0	5/23/73	0/0/0	***	NOT IN PROGRESS	1	0 0 0 0 1 1	0
32	34	1	151. APPROVE LOCATION REPORT	0	5/23/73	0/0/0	5/24/73	0/0/0	***	NOT IN PROGRESS	1	0 0 1 1 0 0	0

1000001 PMS-CPM HIGHWAY LOCATION RUN DOUG REID

FUNC AREA	RESOURCE CODE	DESCRIPTION	COST/DAY \$
1	1	HW ENGR WASH OFFICE	117
1	2	HW ENGR REGIONAL	96
1	3	HW ENGR DIVISION	83
1	4	HW ENGR DISTRICT	68
1	5	HW ENGR AREA ENGR	57
1	6	HW ENGR TRAINEE	48
2	1	TECH TRANSIT MAN	43
2	2	TECH ELECTROTAPE	33
2	3	TECH RODMAN	32
2	4	TECH TAPEMAN	31
2	5	TECH BOOKKEEPER	30
2	6	TECH BRUSH CUTTER	25

1000001 PMS-CPM HIGHWAY LOCATION RUN DOUG REID

E X C E P T I O N R E P O R T O N C R I T I C A L A C T I V I T I E S

ACTIVITY I	J	DUR	ACTIVITY COST	ACTIVITY DESCRIPTION	DATE OF WORK OPT	STATUS REPORT		FINISH		CRIT. ACT.	ACTIVITY STATUS	RESOURCE					
						EARLY	LATE	ACTUAL	ACTUAL			FUNC AREA	1	2	3	4	5
6	12	2	210.	STUDY ALTERNATE ROUTES	0	4/ 4/73	4/ 5/73	4/ 6/73	0/ 0/ 0	0	DELAYING PROJEC	1	0	0	0	1	1
12	14	2	210.	PREPARE RECON REPORT	0	4/ 6/73	0/ 0/ 0	4/10/73	0/ 0/ 0	0	DELAYING PROJEC	1	0	0	0	1	1
14	16	1	151.	APPROVE RECON REPORT	0	4/10/73	0/ 0/ 0	4/11/73	0/ 0/ 0	0	NOT IN PROGRESS	1	0	0	1	0	0
16	18	2	210.	REVIEW EXIST MAPS AND PH	0	4/11/73	0/ 0/ 0	4/13/73	0/ 0/ 0	0	NOT IN PROGRESS	1	0	0	0	1	0
18	20	5	845.	FTELU LOCATION STUDY	0	4/13/73	0/ 0/ 0	4/20/73	0/ 0/ 0	0	NOT IN PROGRESS	2	1	1	1	1	0
20	22	9	1521.	PRELIM SURVEY	0	4/20/73	0/ 0/ 0	5/ 3/73	0/ 0/ 0	0	NOT IN PROGRESS	2	1	1	1	1	0
22	24	5	530.	PREPARE TOPO MAPS	0	5/ 3/73	0/ 0/ 0	5/10/73	0/ 0/ 0	0	NOT IN PROGRESS	2	1	1	0	0	1
24	26	7	1505.	ESTABLISH DESIGN CRITERI	0	5/10/73	0/ 0/ 0	5/21/73	0/ 0/ 0	0	NOT IN PROGRESS	1	1	0	0	0	0
30	32	2	210.	PREPARE LOCATION REPORT	0	5/21/73	0/ 0/ 0	5/23/73	0/ 0/ 0	0	NOT IN PROGRESS	1	0	0	0	1	1
32	34	1	151.	APPROVE LOCATION REPORT	0	5/23/73	0/ 0/ 0	5/24/73	0/ 0/ 0	0	NOT IN PROGRESS	1	0	0	1	1	0

1000001 PMS-CPM HIGHWAY LOCATION RUN DOUG REID

FUNC AREA	RESOURCE CODE	DESCRIPTION	COST/DAY \$
1	1	HW ENGR WASH OFFICE	117
1	2	HW ENGR REGIONAL	98
1	3	HW ENGR DIVISION	83
1	4	HW ENGR DISTRICT	68
1	5	HW ENGR AREA ENGR	57
1	6	HW ENGR TRAINEE	48
2	1	TECH TRANSIT MAN	43
2	2	TECH ELECTROTAPE	33
2	3	TECH RODMAN	32
2	4	TECH TAPEMAN	31
2	5	TECH BOOKKEEPER	30
2	6	TECH BRUSH CUTTER	25

1000002 PMS-CPM HIGHWAY LOCATION RUN MD STYGAR

DATE OF REPORT 3/13/73

ACTIVITY	J	OUR	ACTIVITY COST	ACTIVITY DESCRIPTION	EARLIEST		LATEST		TOTAL FLOAT	RESOURCE						
					START	FINISH	START	FINISH		AREA	1	2	3	4	5	6
1			83.	ASSIGN PROJECT PRIORITIES	0	1	0	1	0	1	0	0	0	0	0	0
2	4	1	210.	OBTAIN EXIST MAPS AND PHOTOS	1	3	1	3	0	1	0	0	0	1	1	0
4	6	2	430.	EST GENERAL DESIGN CONTROLS	3	5	4	6	1	1	1	0	0	0	0	0
6	8	2	173.	FIELD REVIEW ALTERNATE ROUTES	3	4	5	6	2	1	0	0	0	1	1	1
6	10	1	315.	STUDY ALTERNATE ROUTES	3	6	3	6	0	1	0	0	0	0	1	1
8	12	3	0.	DUMMY	5	5	6	6	1	0	0	0	0	0	0	0
10	12	0	0.	DUMMY	4	4	6	6	2	0	0	0	0	0	0	0
12	14	2	210.	PREPARE RECON REPORT	5	8	6	8	0	1	0	0	0	0	1	1
14	16	1	151.	APPROVE RECON REPORT	8	9	8	9	0	1	0	0	1	0	0	0
16	18	2	210.	REVIEW EXIST MAPS AND PHOTOS	9	11	9	11	0	1	0	0	0	0	1	1
18	20	5	845.	FIELD LOCATION STUDY	11	16	11	16	0	2	1	1	1	1	1	1
18	24	7	1183.	PRELIM SOILS INVESTIGATION	11	18	11	18	13	2	1	1	1	1	1	1
20	22	10	1690.	PRELIM SURVEY	16	26	16	26	0	2	1	1	1	1	1	1
22	24	5	530.	PREPARE TOPO MAPS	26	31	26	31	0	2	1	1	0	0	1	1
24	26	7	1505.	ESTABLISH DESIGN CRITERIA	31	38	31	38	0	1	1	1	0	0	0	0
24	28	2	346.	FIELD REVIEW ALTERNATE LINES	31	33	36	38	5	1	0	0	0	1	1	1
24	30	2	212.	PROJECT ALTERNATE LINES	31	33	36	38	5	2	1	1	0	0	1	1
26	30	0	0.	DUMMY	38	38	38	38	0	0	0	0	0	0	0	0
28	30	0	0.	DUMMY	33	33	38	38	5	0	0	0	0	0	0	0
30	32	2	210.	PREPARE LOCATION REPORT	38	40	38	40	0	1	0	0	0	0	1	1
32	34	1	151.	APPROVE LOCATION REPORT	40	41	40	41	0	1	0	0	1	1	0	0
PROJECT COST				8454.	PROJECT COMPLETION				41							

1000002 PMS-CPM HIGHWAY LOCATION RUN MD STYGAR

FUNC AREA	RESOURCE CODE	DESCRIPTION	COST/DAY
1	1	HW ENGR WASH OFFICE	117
1	2	HW ENGR REGIONAL	98
1	3	HW ENGR DIVISION	83
1	4	HW ENGR DISTRICT	68
1	5	HW ENGR AREA ENGR	57
1	6	HW ENGR TRAINEE	48
2	1	TECH TRANSIT MAN	43
2	2	TECH ELECTROTAPE	33
2	3	TECH RODMAN	32
2	4	TECH TAPEMAN	31
2	5	TECH HOOKKEEPER	30
2	6	TECH BRUSH CUTTER	25

1000002 PMS-CPM HIGHWAY LOCATION RUN MD STYGAR

ACTIVITY	J	DUR	ACTIVITY COST	ACTIVITY DESCRIPTION	WORK OPT.	DATE OF REPORT 3/13/73					TOTAL FLOAT	RESOURCE					
						5 DAY WORKWEEK		LATEST				FUNC AREA		TYPES REQD			
						START	FINISH	START	FINISH	START	FINISH	START	FINISH	START	FINISH	START	FINISH
1	4	1	83.	ASSIGN PROJECT PRIORITIES	0	3/13/73	3/14/73	3/13/73	3/14/73	3/13/73	3/14/73	3/13/73	3/14/73	1	0	0	0
2	4	2	210.	OBTAIN EXIST MAPS AND PHOTOS	0	3/14/73	3/16/73	3/14/73	3/16/73	3/14/73	3/16/73	3/14/73	3/16/73	1	0	0	0
4	8	2	430.	EST GENERAL DESIGN CONTROLS	0	3/16/73	3/20/73	3/16/73	3/20/73	3/16/73	3/20/73	3/16/73	3/20/73	1	1	1	0
6	10	1	173.	FIELD REVIEW ALTERNATE ROUTES	0	3/16/73	3/19/73	3/16/73	3/19/73	3/16/73	3/21/73	3/16/73	3/21/73	2	1	0	0
6	12	3	315.	STUDY ALTERNATE ROUTES	0	3/16/73	3/21/73	3/16/73	3/21/73	3/16/73	3/21/73	3/16/73	3/21/73	0	1	0	0
8	12	0	0.	DUMMY										1	0	0	0
10	12	0	0.	DUMMY										1	0	0	0
12	14	2	210.	PREPARE RECON REPORT	0	3/21/73	3/23/73	3/21/73	3/23/73	3/21/73	3/23/73	3/21/73	3/23/73	0	1	0	0
14	16	1	151.	APPROVE RECON REPORT	0	3/23/73	3/26/73	3/23/73	3/26/73	3/23/73	3/26/73	3/23/73	3/26/73	0	1	0	0
16	18	2	210.	REVIEW EXIST MAPS AND PHOTOS	0	3/26/73	3/28/73	3/26/73	3/28/73	3/26/73	3/28/73	3/26/73	3/28/73	0	1	0	0
18	20	5	845.	FIELD LOCATION STUDY	0	3/28/73	4/ 4/73	3/28/73	4/ 4/73	3/28/73	4/ 4/73	3/28/73	4/ 4/73	0	2	1	1
18	24	7	1183.	PRELIM SOILS INVESTIGATION	0	3/28/73	4/ 6/73	3/28/73	4/ 6/73	3/28/73	4/ 6/73	3/28/73	4/ 6/73	13	2	1	1
20	22	10	1690.	PRELIM SURVEY	0	4/ 4/73	4/18/73	4/ 4/73	4/18/73	4/ 4/73	4/18/73	4/ 4/73	4/18/73	0	2	1	1
22	24	5	530.	PREPARE TOPO MAPS	0	4/18/73	4/25/73	4/18/73	4/25/73	4/18/73	4/25/73	4/18/73	4/25/73	0	2	1	0
24	26	7	1505.	ESTABLISH DESIGN CRITERIA	0	4/25/73	5/ 4/73	4/25/73	5/ 4/73	4/25/73	5/ 4/73	4/25/73	5/ 4/73	0	1	1	0
24	28	2	346.	FIELD REVIEW ALTERNATE LINES	0	4/25/73	4/27/73	4/25/73	4/27/73	4/25/73	5/ 4/73	4/25/73	5/ 4/73	5	1	0	0
24	30	2	212.	PROJECT ALTERNATE LINES	0	4/25/73	4/27/73	4/25/73	4/27/73	4/25/73	5/ 4/73	4/25/73	5/ 4/73	5	1	0	0
26	30	0	0.	DUMMY										2	1	1	0
26	30	0	0.	DUMMY										5	2	1	0
30	32	2	210.	PREPARE LOCATION REPORT	0	5/ 4/73	5/ 8/73	5/ 4/73	5/ 8/73	5/ 4/73	5/ 8/73	5/ 4/73	5/ 8/73	0	1	0	0
32	34	1	151.	APPROVE LOCATION REPORT	0	5/ 8/73	5/ 9/73	5/ 8/73	5/ 9/73	5/ 8/73	5/ 9/73	5/ 8/73	5/ 9/73	0	1	0	0

PROJECT COST 8454.

1000002 PMS-CPM HIGHWAY LOCATION RUN MD STYGAR

FUNC AREA	RESOURCE CODE	DESCRIPTION	COST/DAY \$
1	1	HW ENGR WASH OFFICE	117
1	2	HW ENGR REGIONAL	98
1	3	HW ENGR DIVISION	83
1	4	HW ENGR DISTRICT	68
1	5	HW ENGR AREA ENGR	57
1	6	HW ENGR TRAINEE	48
2	1	TECH TRANSIT MAN	43
2	2	TECH ELECTROTAPE	33
2	3	TECH RODMAN	32
2	4	TECH TAPEMAN	31
2	5	TECH BOOKKEEPER	30
2	6	TECH BRUSH CUTTER	25

1000002 PMS-CPM HIGHWAY LOCATION RUN MD STYGAR

C R I T I C A L A C T I V I T I E S L I S T

DATE OF REPORT 3/13/73

ACTIVITY	J	DUR	ACTIVITY COST	ACTIVITY DESCRIPTION	WORK OPT.	EARLIEST START	EARLIEST FINISH	LATEST START	LATEST FINISH	TOTAL FLOAT	FUNC AREA	RESOURCE
1	4	1	83.	ASSIGN PROJECT PRIORITIES	0	3/13/73	3/14/73	3/13/73	3/14/73	0	1	1
2	4	2	210.	OBTAIN EXIST MAPS AND PHOTOS	0	3/14/73	3/16/73	3/14/73	3/16/73	0	1	0
4	6	3	315.	STUDY ALTERNATE ROUTES	0	3/16/73	3/21/73	3/16/73	3/21/73	0	1	0
6	12	2	210.	PREPARE RECON REPORT	0	3/21/73	3/23/73	3/21/73	3/23/73	0	1	0
12	14	1	151.	APPROVE RECON REPORT	0	3/23/73	3/26/73	3/23/73	3/26/73	0	1	0
14	16	2	210.	REVIEW EXIST MAPS AND PHOTOS	0	3/26/73	3/28/73	3/26/73	3/28/73	0	1	0
16	18	5	845.	FIELD LOCATION STUDY	0	3/28/73	4/ 4/73	3/28/73	4/ 4/73	0	2	1
18	20	10	1690.	PRELIM SURVEY	0	4/ 4/73	4/18/73	4/ 4/73	4/18/73	0	2	1
20	22	5	530.	PREPARE TOPO MAPS	0	4/18/73	4/25/73	4/18/73	4/25/73	0	2	1
22	24	7	1505.	ESTABLISH DESIGN CRITERIA	0	4/25/73	5/ 4/73	4/25/73	5/ 4/73	0	1	1
24	26	2	210.	PREPARE LOCATION REPORT	0	5/ 4/73	5/ 8/73	5/ 4/73	5/ 8/73	0	1	0
30	32	1	151.	APPROVE LOCATION REPORT	0	5/ 8/73	5/ 9/73	5/ 8/73	5/ 9/73	0	1	0
32	34	1			0					0	1	0

1000002 PMS-CPM HIGHWAY LOCATION RUN MD STYGAR

FUNC AREA	RESOURCE CODE	RESOURCE DESCRIPTION	COST/DAY \$
1	1	HW ENGR WASH OFFICE	117
1	2	HW ENGR REGIONAL	98
1	3	HW ENGR DIVISION	83
1	4	HW ENGR DISTRICT	68
1	5	HW ENGR AREA ENGR	57
1	6	HW ENGR TRAINEE	48
2	1	TECH TRANSIT MAN	43
2	2	TECH ELECTROTAPE	33
2	3	TECH RODMAN	32
2	4	TECH TAPEMAN	31
2	5	TECH BOOKKEEPER	30
2	6	TECH HRUSH CUTTER	25

1000002 PMS-CPM HIGHWAY LOCATION RUN MU STYGAR

8112

7098

P 6084

R

O

J 5070

E

C

T 4056

C

O 3042

S

T

2028

1014

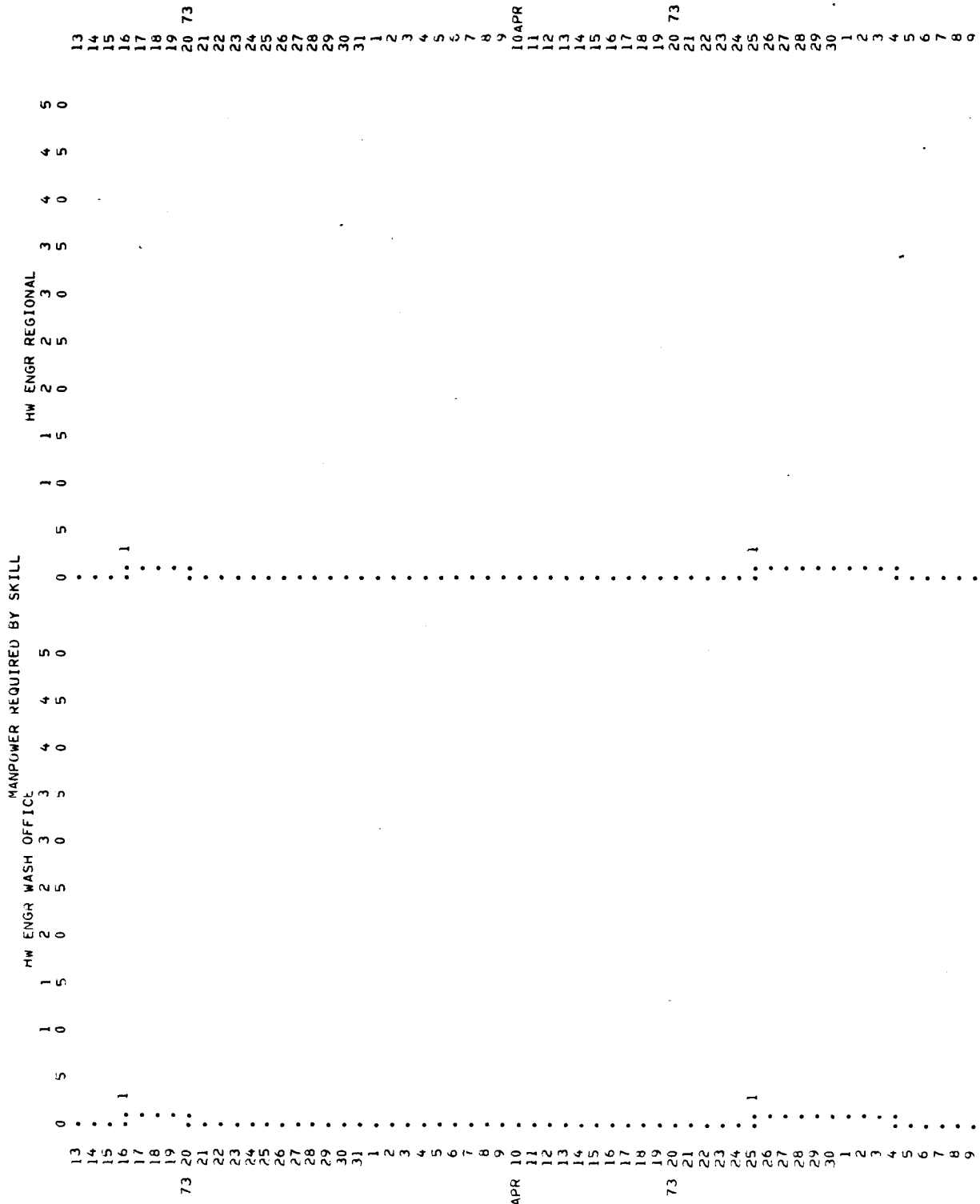
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† MAR 18 † MAR 25 † APR 01 † APR 08 † APR 15 † APR 22 † APR 29 † MAY 06 † MAY 13

FOR THE WEEK ENDING

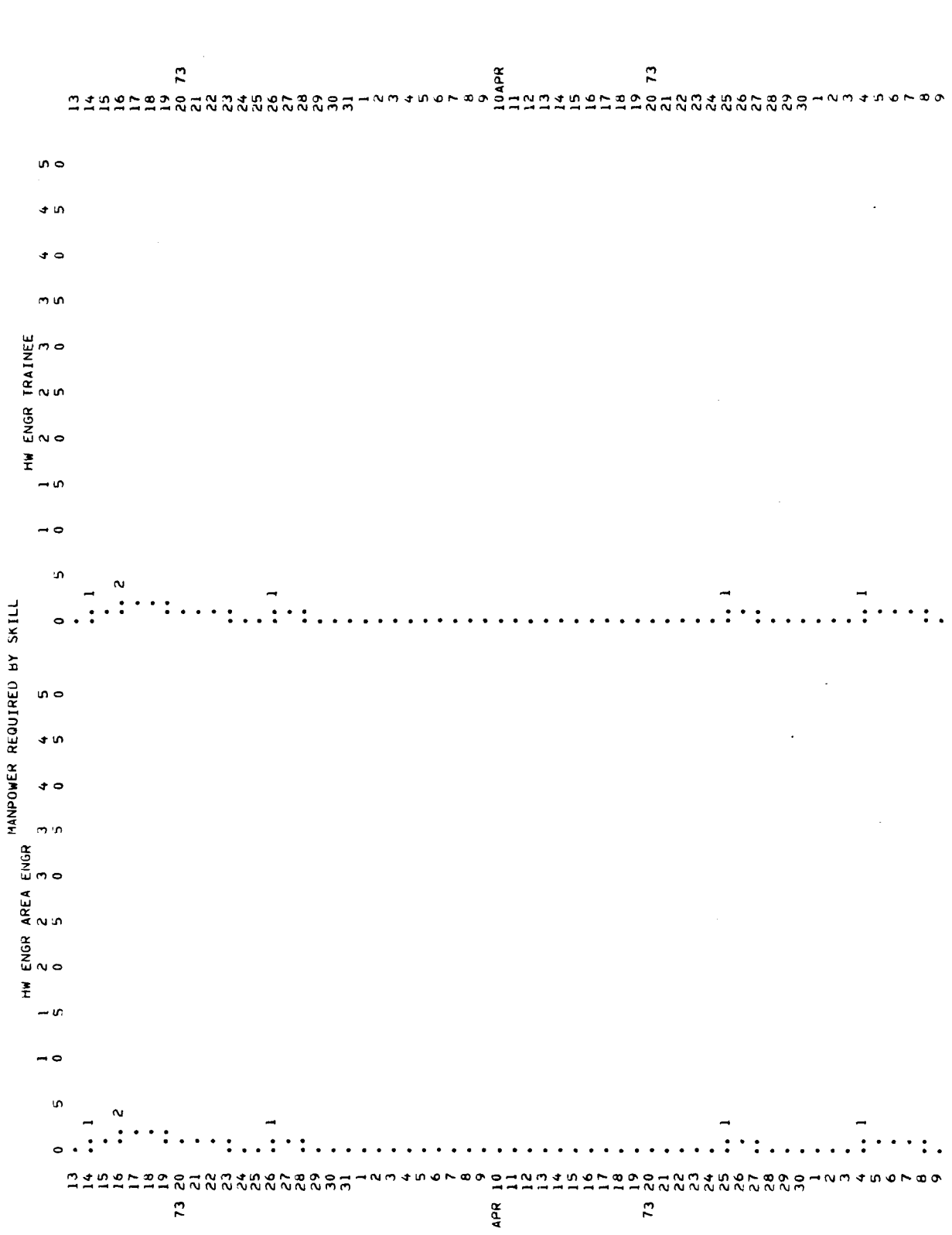
MAXIMUM NO. OF ROWS

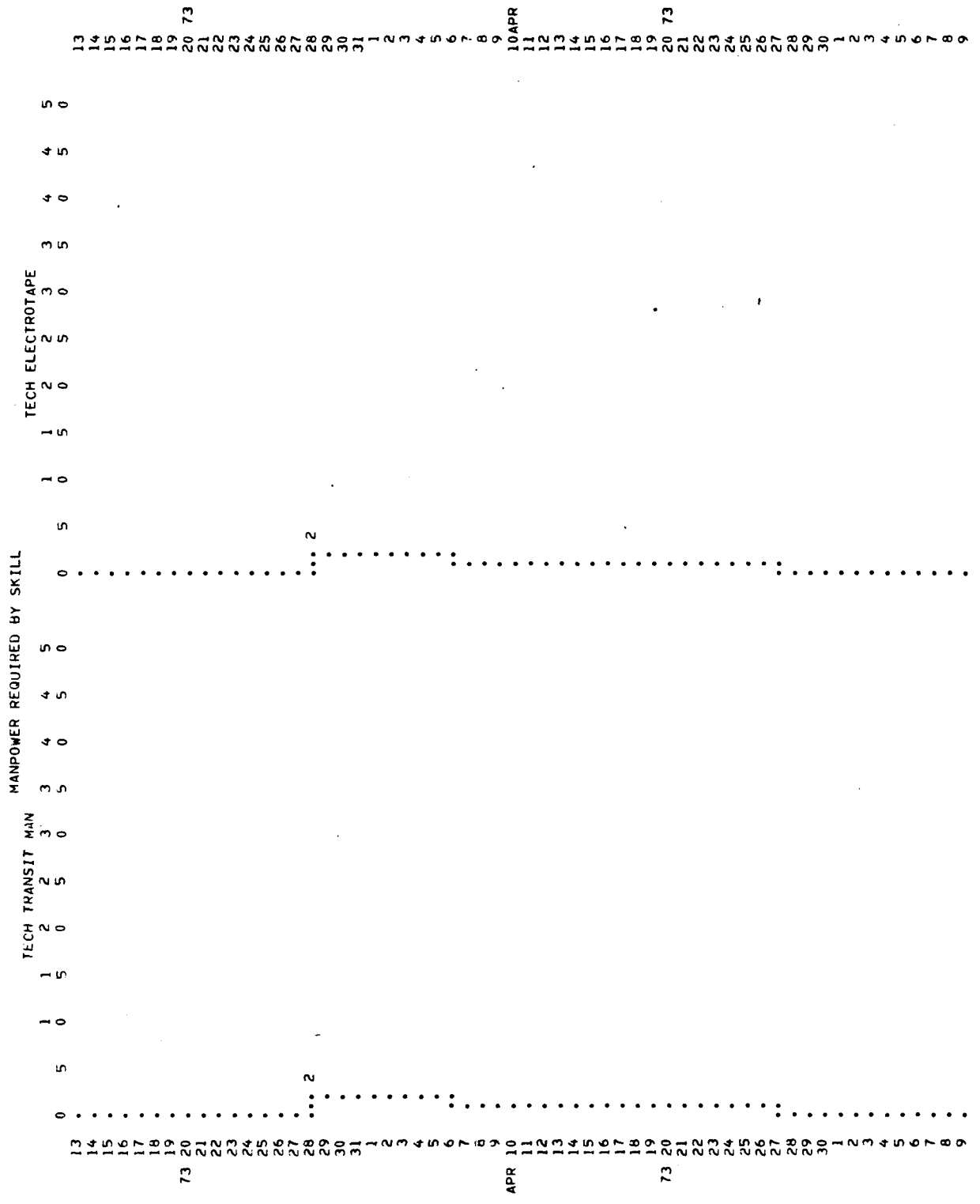
MANPOWER REQUIRED BY SKILL

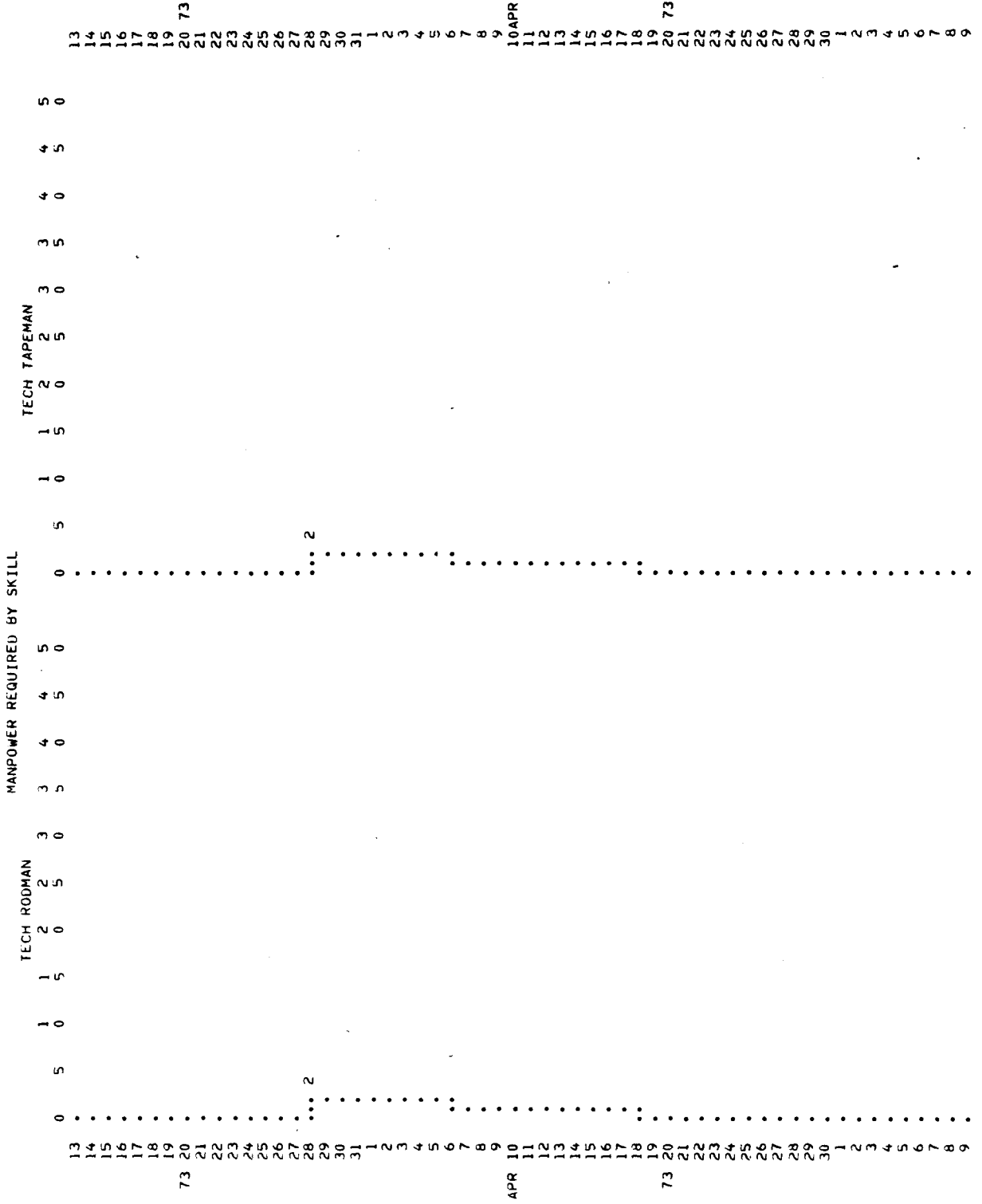


MANPOWER REQUIRED BY SKILL

HW ENGR DIVISION	MANPOWER REQUIRED BY SKILL					HW ENGR DISTRICT					HW ENGR DISTRICT	
	1	2	3	4	5	1	2	3	4	5		
13	0	0	0	0	0	0	0	0	0	0	0	13
14	0	0	0	0	0	0	0	0	0	0	0	14
15	0	0	0	0	0	0	0	0	0	0	0	15
16	0	0	0	0	0	0	0	0	0	0	0	16
17	0	0	0	0	0	0	0	0	0	0	0	17
18	0	0	0	0	0	0	0	0	0	0	0	18
19	0	0	0	0	0	0	0	0	0	0	0	19
20	0	0	0	0	0	0	0	0	0	0	0	20 73
21	0	0	0	0	0	0	0	0	0	0	0	21
22	0	0	0	0	0	0	0	0	0	0	0	22
23	0	0	0	0	0	0	0	0	0	0	0	23
24	0	0	0	0	0	0	0	0	0	0	0	24
25	0	0	0	0	0	0	0	0	0	0	0	25
26	0	0	0	0	0	0	0	0	0	0	0	26
27	0	0	0	0	0	0	0	0	0	0	0	27
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18	0	0	0	0	0	0	0	0	0	0	0	18
19	0	0	0	0	0	0	0	0	0	0	0	19
20	0	0	0	0	0	0	0	0	0	0	0	20 73
21	0	0	0	0	0	0	0	0	0	0	0	21
22	0	0	0	0	0	0	0	0	0	0	0	22
23	0	0	0	0	0	0	0	0	0	0	0	23
24	0	0	0	0	0	0	0	0	0	0	0	24
25	0	0	0	0	0	0	0	0	0	0	0	25
26	0	0	0	0	0	0	0	0	0	0	0	26
27	0	0	0	0	0	0	0	0	0	0	0	27
28	0	0	0	0	0	0	0	0	0	0	0	28
29	0	0	0	0	0	0	0	0	0	0	0	29
30	0	0	0	0	0	0	0	0	0	0	0	30
1	0	0	0	0	0	0	0	0	0	0	0	1
2	0	0	0	0	0	0	0	0	0	0	0	2
3	0	0	0	0	0	0	0	0	0	0	0	3
4	0	0	0	0	0	0	0	0	0	0	0	4
5	0	0	0	0	0	0	0	0	0	0	0	5
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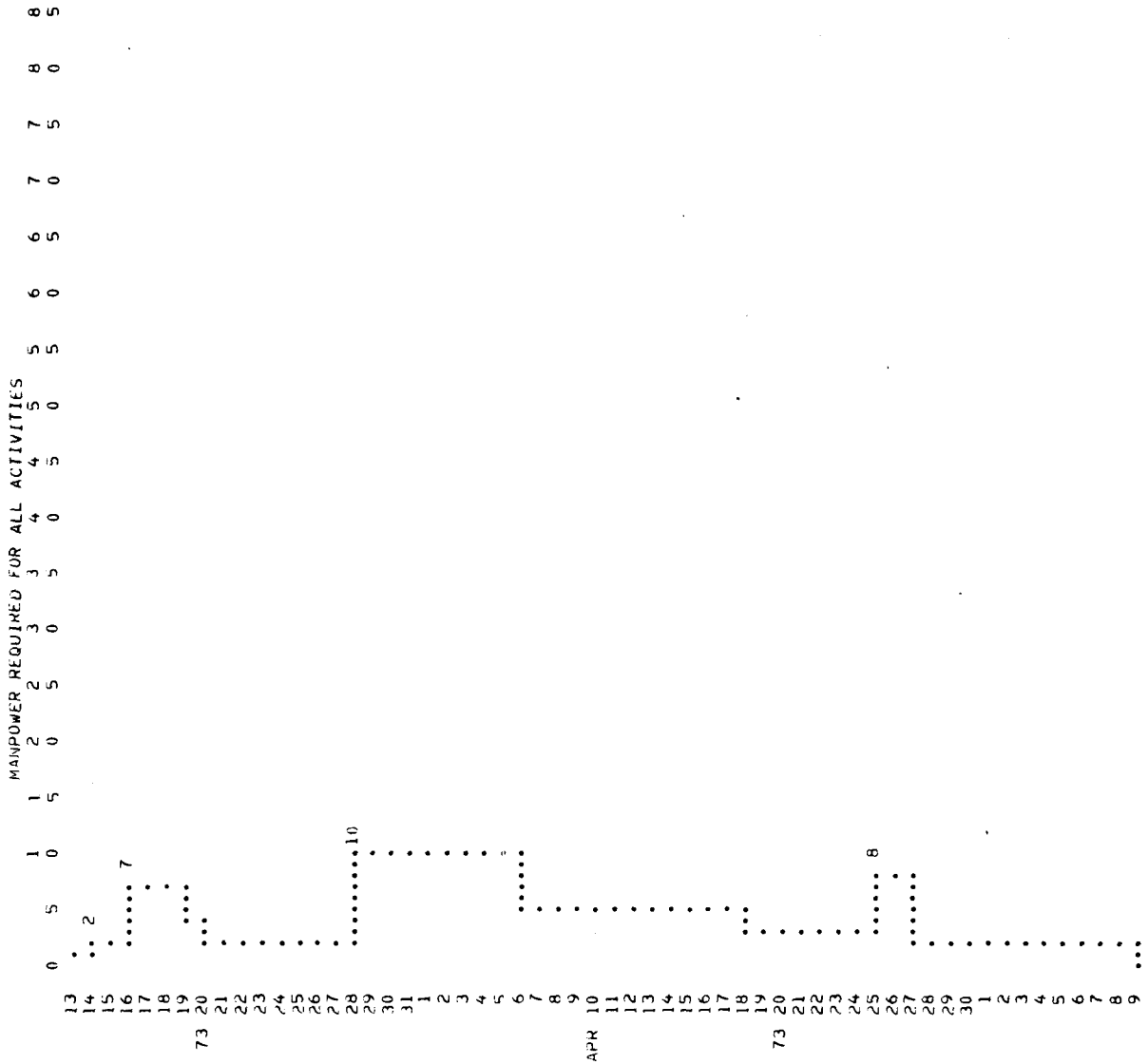




MANPOWER REQUIRED BY SKILL

TECH BOOKKEEPER	TECH BRUSH CUTTER	TECH	MANPOWER REQUIRED BY SKILL	TECH BRUSH CUTTER	TECH
13	0	0	0	0	0
14	0	0	0	0	0
15	0	0	0	0	0
16	0	0	0	0	0
17	0	0	0	0	0
18	0	0	0	0	0
19	0	0	0	0	0
20	0	0	0	0	0
21	0	0	0	0	0
22	0	0	0	0	0
23	0	0	0	0	0
24	0	0	0	0	0
25	0	0	0	0	0
26	0	0	0	0	0
27	0	0	0	0	0
28	0	0	0	0	0
29	0	0	0	0	0
30	0	0	0	0	0
31	0	0	0	0	0
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
5	0	0	0	0	0
6	0	0	0	0	0
7	0	0	0	0	0
8	0	0	0	0	0
9	0	0	0	0	0
10	0	0	0	0	0
11	0	0	0	0	0
12	0	0	0	0	0
13	0	0	0	0	0
14	0	0	0	0	0
15	0	0	0	0	0
16	0	0	0	0	0
17	0	0	0	0	0
18	0	0	0	0	0
19	0	0	0	0	0
20	0	0	0	0	0
21	0	0	0	0	0
22	0	0	0	0	0
23	0	0	0	0	0
24	0	0	0	0	0
25	0	0	0	0	0
26	0	0	0	0	0
27	0	0	0	0	0
28	0	0	0	0	0
29	0	0	0	0	0
30	0	0	0	0	0
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
5	0	0	0	0	0
6	0	0	0	0	0
7	0	0	0	0	0
8	0	0	0	0	0
9	0	0	0	0	0

1000002 PMS-CPM HIGHWAY LOCATION RUN MU STYGAR



*** MULTI-PROJECT SCHEDULING FOR PROJECTS : ***

1000001 PMS-CPM HIGHWAY LOCATION RUN DOUG REID
MAXIMUM NO. OF ROWS

1000002 PMS-CPM HIGHWAY LOCATION RUN MD STYGAR
MAXIMUM NO. OF ROWS

*** MULTI-PROJECT COST PLOT ***

15936

13944

P 11952

R

O

J 9960

E

C

T 7968

C

O 5976

S

T

3984

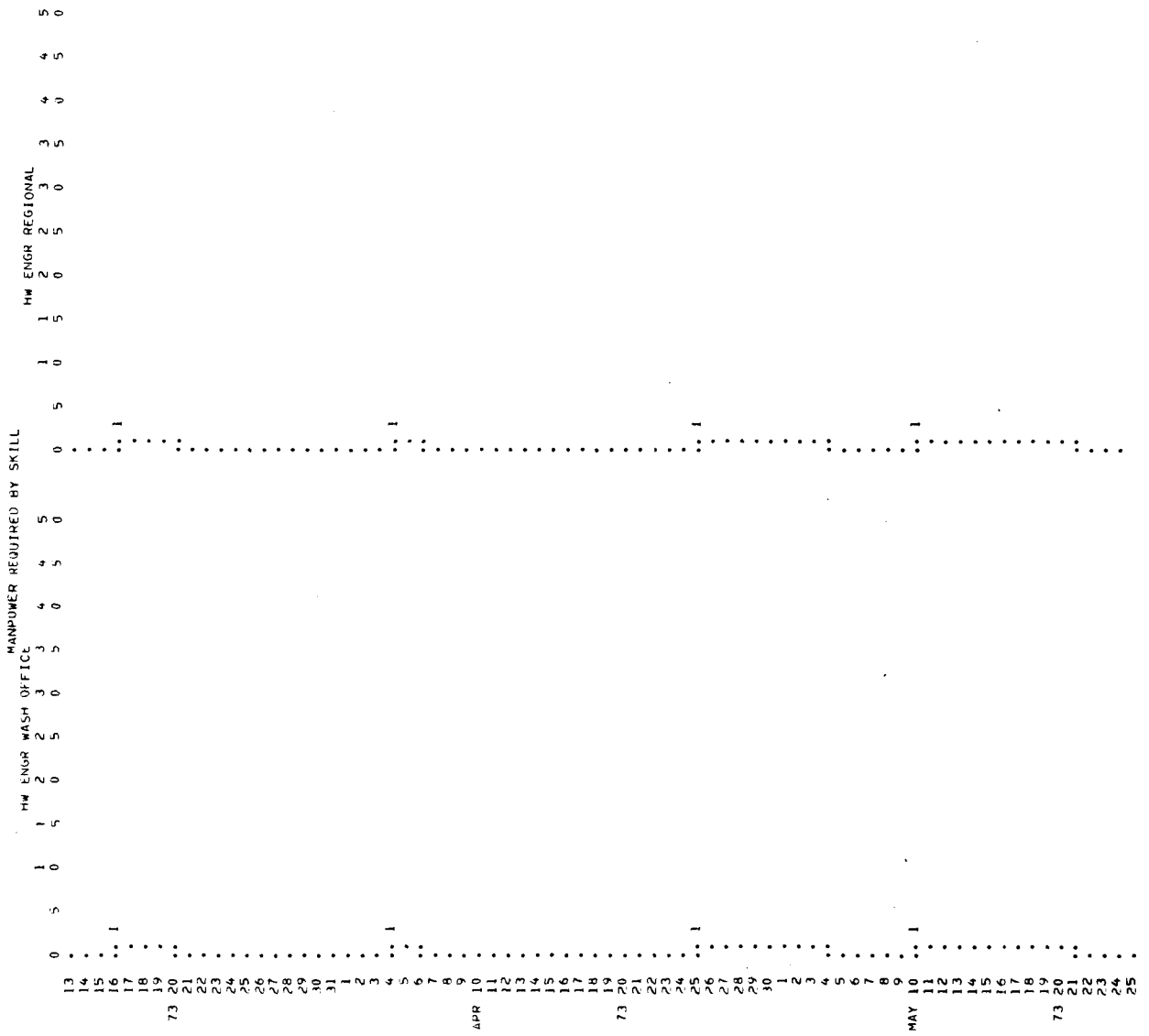
1992

0

† APR 01 † APR 08 † APR 15 † APR 22 † APR 29 † MAY 06 † MAY 13 † MAY 20 † MAY 27

FOR THE WEEK ENDING

MANPOWER REQUIRED BY SKILL

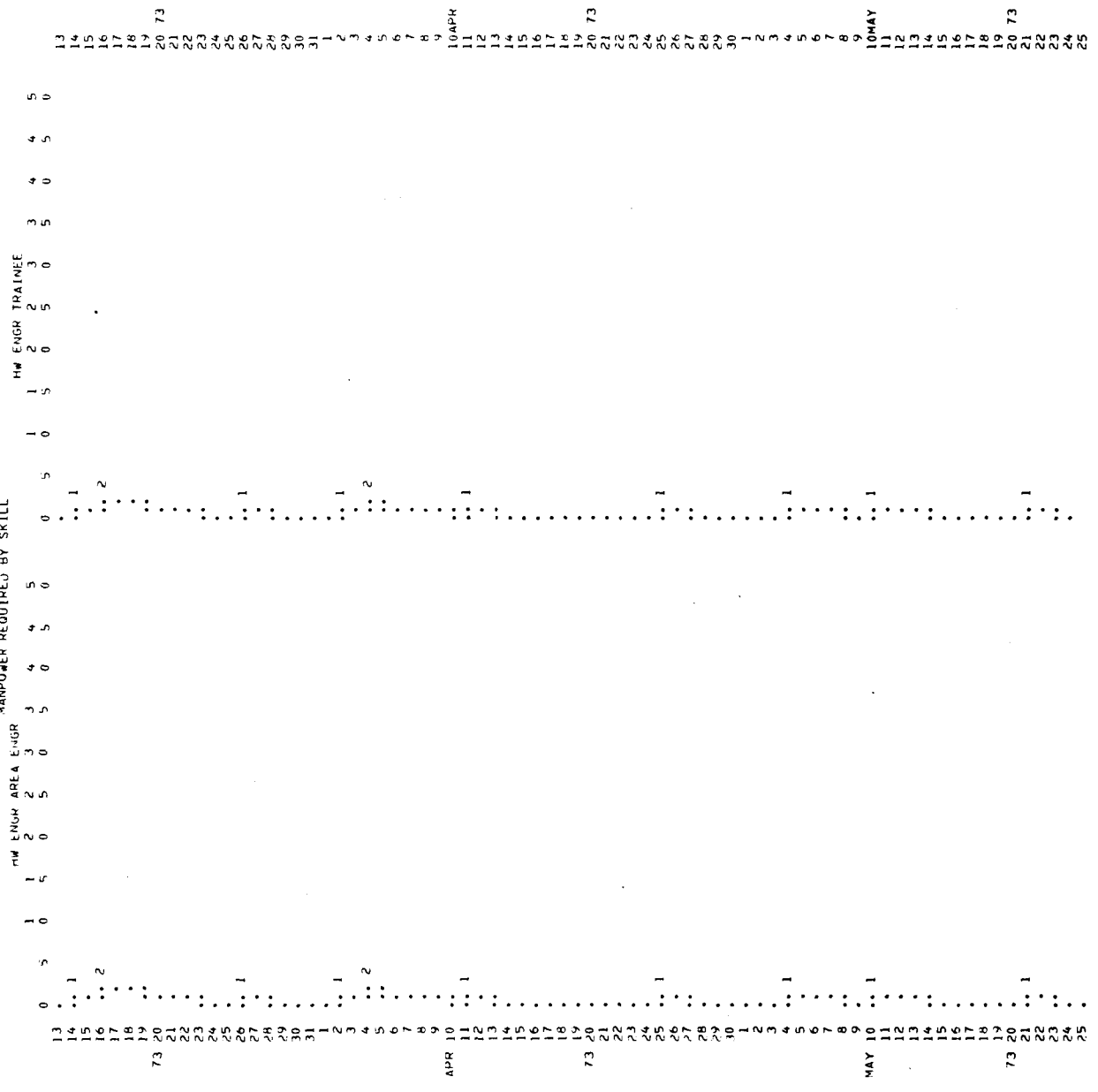


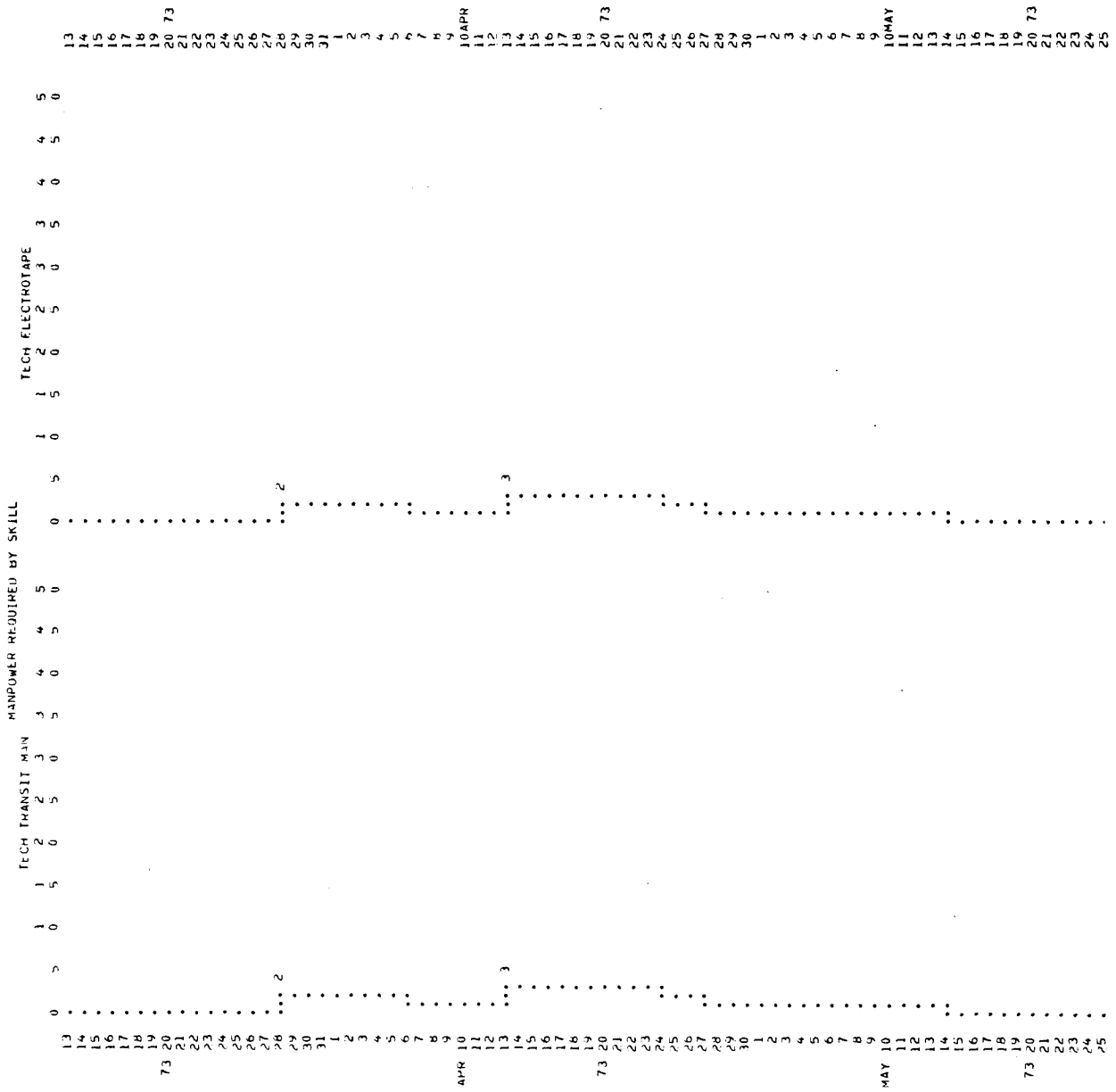
MANPOWER REQUIRED BY SKILL

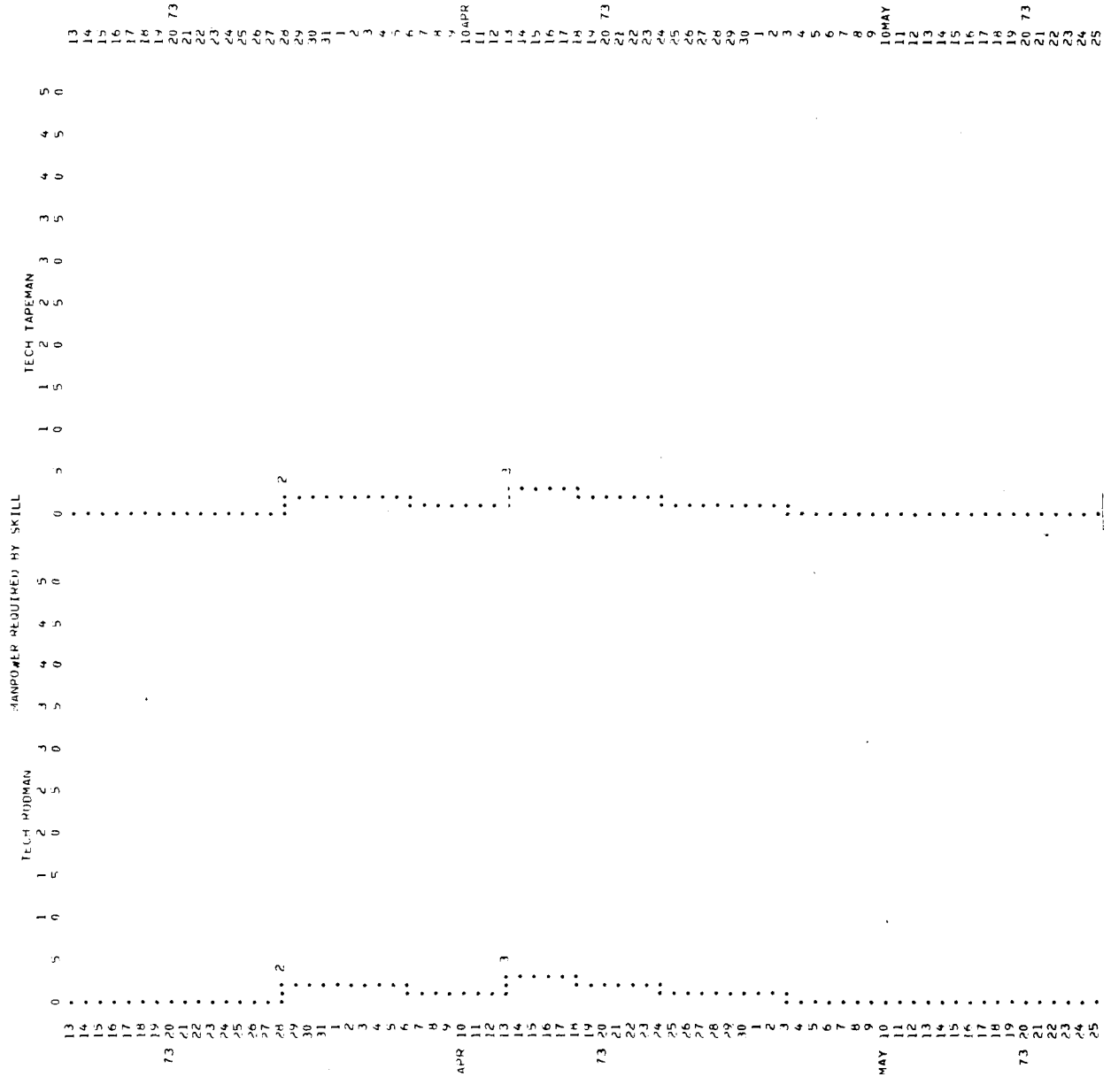
HW ENGR DIVISION HW ENGR DISTRICT

HW ENGR DIVISION	HW ENGR DISTRICT	MANPOWER REQUIRED BY SKILL
13	1	0
14	1	0
15	1	0
16	1	0
17	1	0
18	1	0
19	1	0
20	1	0
21	1	0
22	1	0
23	1	0
24	1	0
25	1	0
26	1	0
27	1	0
28	1	0
29	1	0
30	1	0
31	1	0
1	1	0
2	1	0
3	1	0
4	1	0
5	1	0
6	1	0
7	1	0
8	1	0
9	1	0
10	1	0
11	1	0
12	1	0
13	1	0
14	1	0
15	1	0
16	1	0
17	1	0
18	1	0
19	1	0
20	1	0
21	1	0
22	1	0
23	1	0
24	1	0
25	1	0
26	1	0
27	1	0
28	1	0
29	1	0
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2	2	0
3	2	0
4	2	0
5	2	0
6	2	0
7	2	0
8	2	0
9	2	0
10	2	0
11	2	0
12	2	0
13	2	0
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20	2	0
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24	2	0
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6	3	0
7	3	0
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12	3	0
13	3	0
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15	3	0
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17	3	0
18	3	0
19	3	0
20	3	0
21	3	0
22	3	0
23	3	0
24	3	0
25	3	0
26	3	0
27	3	0
28	3	0
29	3	0
30	3	0
1	4	0
2	4	0
3	4	0
4	4	0
5	4	0
6	4	0
7	4	0
8	4	0
9	4	0
10	4	0
11	4	0
12	4	0
13	4	0
14	4	0
15	4	0
16	4	0
17	4	0
18	4	0
19	4	0
20	4	0
21	4	0
22	4	0
23	4	0
24	4	0
25	4	0
26	4	0
27	4	0
28	4	0
29	4	0
30	4	0
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2	5	0
3	5	0
4	5	0
5	5	0
6	5	0
7	5	0
8	5	0
9	5	0
10	5	0
11	5	0
12	5	0
13	5	0
14	5	0
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21	5	0
22	5	0
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30	5	0

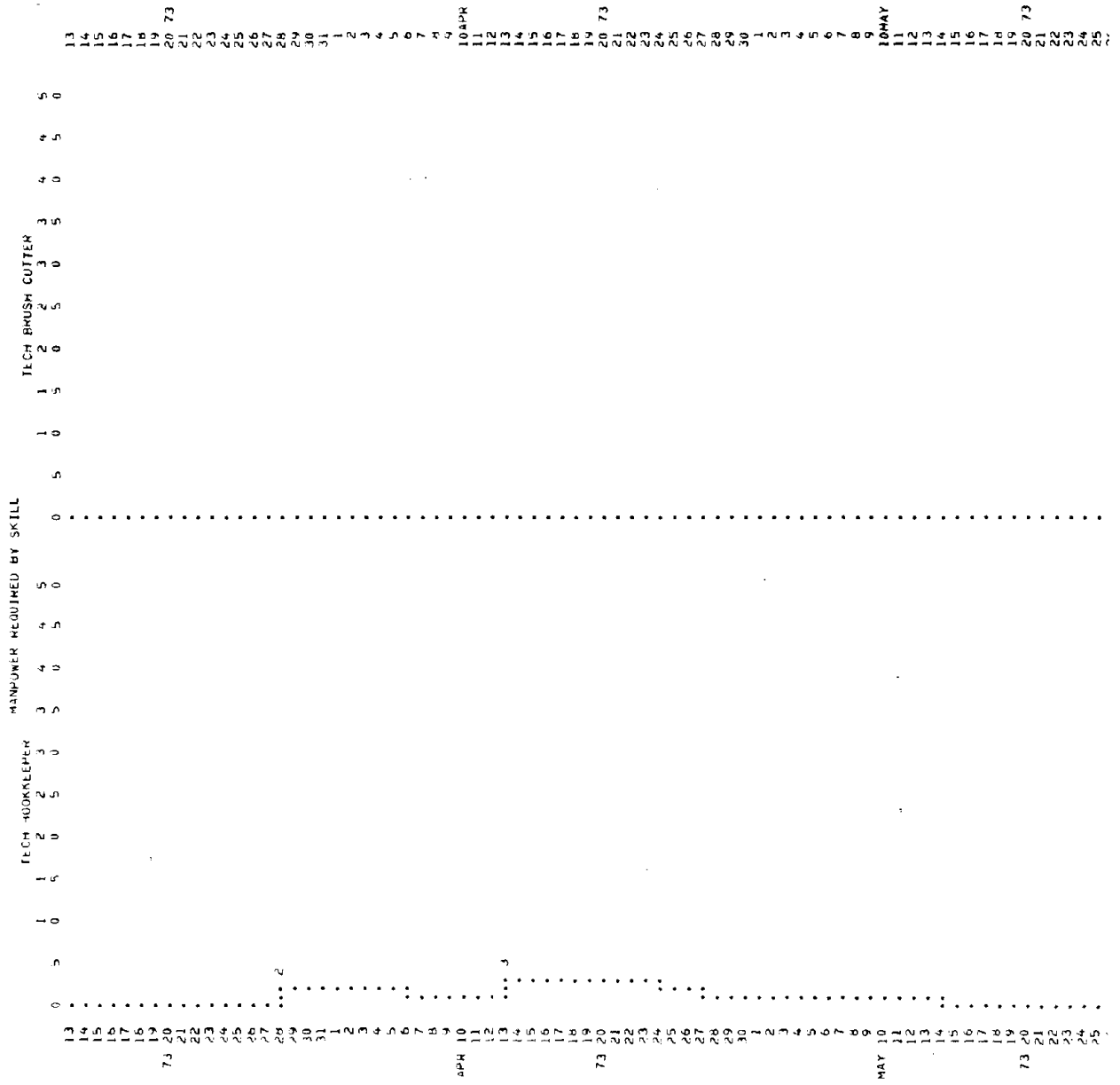
MANPOWER REQUIRED BY SKILL





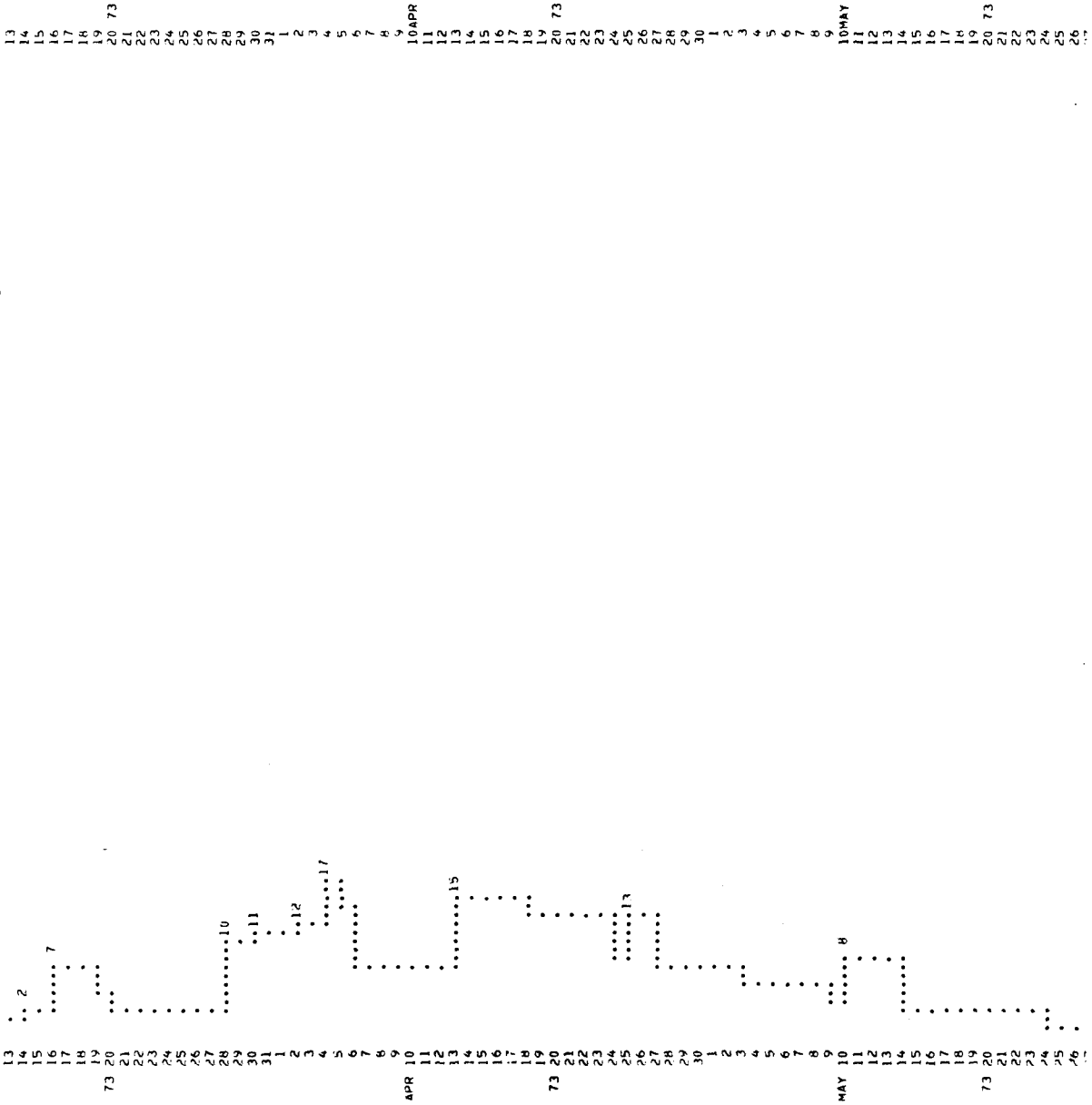


MANPOWER REQUIRED BY SKILL



*** MULTI-PROJECT RESOURCE PLOT ***

MANPOWER REQUIRED FOR ALL ACTIVITIES



```

//R4221R01 JOH (0119,6ZPT),*DOUG KEID*,MSGLEVEL=1,CLASS=M
// EXEC FORTGCLG,PARM,PORT=BCU,PARM,LKED=(MAP,LIST,ONLY)
*** PROCEDURE FORTGCLG UPDATED 05/06/70 BY DANA CLARK SAWYER
*** FHWA CHANGES SHOWN BY * AFTER LAST OPERAND ON CAKU
XXFURT EXEC PGM=IEYFORT,REGION=100K
XXSYSPRINT DD SYSOUT=A
XXSPUNCH DD SYSOUT=B
//FORT.SYSLIN DD SPACE=(TRK,(200,50),RLSE)
X/SYSLIN DD DSNNAME=ALOADSET,DISP=(MO),PASS),UNIT=SYSDA,
SPACE=(80,(200,100),RLSE),DCB=BLKSIZE=80
XX
//FORT.SYSIN DD *
IEF2361 ALLOC. FOR R4221R01 FORT
IEF2371 53E ALLOCATED TO SYSPRINT
IEF2371 400 ALLOCATED TO SYSPUNCH
IEF2371 135 ALLOCATED TO SYSLIN
IEF2371 02C ALLOCATED TO SYSIN
IEF1421 - STEP WAS EXECUTED - COND CODE 0000
IEF2851 SYS74079,1120420,RF000,R4221R01,LOADSET PASSE)
IEF2851 VOL SER NOS= CSD019.
IEF3731 STEP /FORT / START 74079.1649
IEF3741 STEP /FORT / STOP 74079.1655 CPU 0MIN 53.80SEC MAIN 100K LCS OK
I/O ACTIVITY FOR DEVICE 53E - 3,431
I/O ACTIVITY FOR DEVICE 40D - 1,197
I/O ACTIVITY FOR DEVICE 135 - 2,626
I/O ACTIVITY FOR DEVICE 02C -

```

*****11/5/73*****

```

XXLKED EXEC PGM=IEWL,REGION=96K,PARM=(XREF,LET,LIST),COND=(4,LT,FORT) 00000080
XXSYSLIB DD DSNNAME=SYS1.FORTLIB,DISP=SHR 00000090
XXSYSLMOD DD DSNNAME=&GOSET(MAIN),DISP=(NEW,PASS),UNIT=SYSIDA, 00000110
XX SPACE=(1024,(20,10,1)),DCB=BLKSIZE=1024 00000120
XXSYSPRINT DD SYSOUT=A 00000130
XXSYSUT1 DD UNIT=SYSIDA,SPACE=(1024,(100,10),RLSE),DCB=BLKSIZE=1024, 00000140
XX DSNNAME=ALOADSET,DISP=(OLD),DELETE) 00000150
XXSYSLIN DD DSNNAME=SYSIN,DCB=(BLKSIZE=80,BUFNO=1) 00000160
//LKED.SYSIN DD *

```

```

IEF2361 ALLOC. FOR R4221R01 LKED
IEF2371 337 ALLOCATED TO SYSLIB
IEF2371 132 ALLOCATED TO SYSLMOD
IEF2371 40E ALLOCATED TO SYSPRINT
IEF2371 135 ALLOCATED TO SYSUT1
IEF2371 135 ALLOCATED TO SYSLIN
IEF2371 44C ALLOCATED TO
IEF1421 - STEP WAS EXECUTED - COND CODE 0000
IEF2851 SYS1.FORTLIB KEPT
IEF2851 VOL SER NOS= NOTRES.
IEF2851 SYS74079,1120420,RF000,R4221R01,GOSET PASSE)
IEF2851 VOL SER NOS= OTHERS.
IEF2851 SYS74079,1120420,RF000,R4221R01,SYSUT1 DELETED
IEF2851 VOL SER NOS= CSD019.
IEF2851 SYS74079,1120420,RF000,R4221R01,LOADSET DELETED
IEF2851 VOL SER NOS= CSD019.
IEF3731 STEP /LKED / START 74079.1655
IEF3741 STEP /LKED / STOP 74079.1700 CPU 0MIN 04.35SEC MAIN 46K LCS OK
I/O ACTIVITY FOR DEVICE 337 - 90
I/O ACTIVITY FOR DEVICE 132 - 194
I/O ACTIVITY FOR DEVICE 40E - 89
I/O ACTIVITY FOR DEVICE 135 - 285
I/O ACTIVITY FOR DEVICE 135 - 1,198
I/O ACTIVITY FOR DEVICE 44C - 21

```

*****11/5/73*****

```

XXGO EXEC PGM=*,LKED,SYSLMOD,COND=((4,LT,FORT),(4,LT,LKED))
XXFT01F001 DD DSNNAME=SYSIN *
XXFT02F001 DD SYSOUT=B *

```

00000200
00000210

```
XXFT03F001 DD SYSOUT=A,DCB=(RECFM=VA,BLKSIZE=133) *  
XXSYSDDUMP DD SYSOUT=A *  
//GO.FT05F001 DD DSNNAME=SSWF1,UNIT=2314,DISP=(NEW,DELETE),  
// VOL=SER=FHRS01,DCB=(RECFM=VS,LRECL=1024,BLKSIZE=1028),  
// SPACE=(TRK,(10,5))  
//GO.FT06F001 DD DSNNAME=SSWF2,UNIT=2314,DISP=(NEW,DELETE),  
// VOL=SER=FHRS01,DCB=(RECFM=VS,LRECL=1024,BLKSIZE=1028),  
// SPACE=(TRK,(10,5),RLSE)  
//GO.FT07F001 DD DSNNAME=WKFL1,UNIT=2314,DISP=(NEW,DELETE),  
// VOL=SER=FHRS01,DCB=(RECFM=VHS,LRECL=1024,BLKSIZE=5124),  
// SPACE=(TRK,(10,5))  
//GO.FT08F001 DD DSNNAME=WKFL2,UNIT=2314,DISP=(NEW,DELETE),  
// VOL=SER=FHRS01,DCB=(RECFM=VHS,LRECL=1024,BLKSIZE=5124),  
// SPACE=(TRK,(10,5))  
//GO.FT09F001 DD DSNNAME=WKFL3,UNIT=2314,DISP=(NEW,DELETE),  
// VOL=SER=FHRS01,DCB=(RECFM=VHS,LRECL=1024,BLKSIZE=5124),  
// SPACE=(TRK,(10,5))  
//GO.SYSIN DD *
```

```
//  
IEF236I ALLOC. FOR R4221R01 GO  
IEF237I 132 ALLOCATED TO PGM=*.DD  
IEF237I 45C ALLOCATED TO FT01F001  
IEF237I 41D ALLOCATED TO FT02F001  
IEF237I 50E ALLOCATED TO FT03F001  
IEF237I 43E ALLOCATED TO SYSDDUMP  
IEF237I 133 ALLOCATED TO FT05F001  
IEF237I 133 ALLOCATED TO FT06F001  
IEF237I 133 ALLOCATED TO FT07F001  
IEF237I 133 ALLOCATED TO FT08F001  
IEF237I 133 ALLOCATED TO FT09F001  
IEF142I - STEP WAS EXECUTED - COND CODE 0000 PASSED  
IEF245I SYS74079.T120420.RF000.R4221R01.GOSET  
IEF245I VOL SER NOS= OTHERS. DELETED  
IEF245I SSWF1 DELETED  
IEF245I VOL SER NOS= FHRS01. DELETED  
IEF245I SSWF2 DELETED  
IEF245I VOL SER NOS= FHRS01. DELETED  
IEF245I WKFL1 DELETED  
IEF245I VOL SER NOS= FHRS01. DELETED  
IEF245I WKFL2 DELETED  
IEF245I VOL SER NOS= FHRS01. DELETED  
IEF245I WKFL3 DELETED  
IEF373I STEP /GO / START 74079.1700  
IEF374I STEP /GO / STOP 74079.1706 CPU 0MIN 47.145EC MAIN 186K LCS OK
```

```
170 ACTIVITY FOR DEVICE 132 - 335  
170 ACTIVITY FOR DEVICE 45C - 173  
170 ACTIVITY FOR DEVICE 41D -  
170 ACTIVITY FOR DEVICE 50E - 2,142  
170 ACTIVITY FOR DEVICE 43E - 241  
170 ACTIVITY FOR DEVICE 133 - 195  
170 ACTIVITY FOR DEVICE 133 - 10  
170 ACTIVITY FOR DEVICE 133 - 18  
170 ACTIVITY FOR DEVICE 133 - 94  
*****CSD SYSTEM 360/658 RELEASE 21.6 11/5/73*****  
IEF245I SYS74079.T120420.RF000.R4221R01.GOSET DELETED  
IEF245I VOL SER NOS= OTHERS.  
IEF375I JOB /R4221R01/ START 74079.1649  
IEF376I JOB /R4221R01/ STOP 74079.1706 CPU 1MIN 45.29SEC
```



```

0001 C
0002 C
0003 C
0004 C
0005 C
0006 C
0007 C
0008 C
0009 C
0010 C
0011 C
0012 C
0013 C
0014 C
0015 C
0016 C
0017 C
0018 C
0019 C
0020 C
0021 C
0022 C
0023 C
0024 C
0025 C

COMMON ICALT(1860),INFO(54),IPRINT(120),IDUR(675),IES(675),IEF(6750025000
1),ILS(675),ILF(675),IACD(8),IRES(54,9),IRES(7),IPRONO(13),00021000
2 JPRONO(13),IDENT(17) 00022000
COMMON IBCY,IWORK,ERROR,ISTMON,ISTDAY,ISTYR,IYR,IMON,IDAY,IPROG, 00023000
1 IDOP,ICAL,IDECIS,NORES,IX1,IX2,IX3,ITOMON,ITODAY,ITOYR,IX, 00024000
2 IZ 00025000
COMMON /DATES/MONDAY(12),MONTHS(12),KONST(10),IDECPT,KBLANK,KONI 00026000
1 ,SYSIN,SYSOT,SYSFN,SSWF1,SSWF2,WKFL1,WKFL2,WKFL3 00027000
COMMON /MULTI/ ILOML,IUPL,ITOTSK(12,732),ISTART,IRDMM,MUL 00028000
INTEGER SYSIN,SYSOT,SYSFN,SSWF1,SSWF2,WKFL1,WKFL2,WKFL3 00029000
DIMENSION ITABLE(18) 00030000
DATA ITABLE/4HCALC,4HCALC,4HCALE,4HTIME,4HRES0,4HPROJ,4HCRIT,4HRESE, 00031000
1 4HDELE,4HUPDA,4HSTAT,4HEXCE,4HPREP,4HTODA,4HREGI,4HEND, 00032000
2 4HCREA,4HMULT,4HTOTA/,NO/18/ 00033000
C READ AND STORE BEGINNING CALENDAR YEAR,IBCY, THE NUMBER OF 00034000
C DAYS IN THE WORKWEEK,IWORK 00035000
C 00036000
C 00037000
C 00038000
C 00039000
C 00040000
C 00041000
C 00042000
C 00043000
C 00044000
C 00045000
C 00046000
C 00047000
C 00048000
C 00049000
C 00050000
C 00051000
C 00052000
C 00053000
C 00054000
C 00055000
C 00056000
C 00057000
C 00058000
C 00059000
C 00060000
C 00061000
C 00062000
C 00063000
C 00064000
C 00065000
C 00066000
C 00067000
C 00068000
C 00069000
C 00070000

READ(SYSIN,230) IBCY,IWORK,JJJJAY
REWIND WKFL3
REWIND SSWF1

C READ AND STORE THE CALENDAR CONTAINING THE NON-WORK DAYS IN
C A MONTH. THE STORED CALENDAR IS FOR A FIVE YEAR PERIOD. A
C NON-ZERO NUMBER IN THE CALENDAR REPRESENTS THE NON-WORK DAY.
C
C READ(SYSIN,235) ICALT
C
C READ A COMMAND CARD
C
100 READ(SYSIN,240) IPROG
WRITE(WKFL3,240) IPROG
REWIND WKFL3
C
C DETERMINE WHICH COMMAND WAS GIVEN
C
DO 105 K = 1,NO
IF ( IPROG .EQ. ITABLE(K) )GO TO 110
105 CONTINUE
WRITE(SYSOT,260)
WRITE(SYSOT,240) IPROG
GO TO 225
110 IF (K .EQ. 1 .OR. K .EQ. 4 .OR. K .EQ. 13 .OR. K .EQ. 17)
1 CALL DECODE
GO TO (115,120,125,130,135,140,145,150,155,165,170,180,185,190,210)0065100
1 ,215,300,315),K 00660000
115 ISTMON = INFO(1) 00670000
ISTDAY = INFO(2) 00680000
ISTYR = INFO(3) 00690000

```

```

0026 CALL CPMCAL
0027 GO TO 220
0028
0029 120 CALL CPMDAT
0030 GO TO 220
0031 125 CALL CPMPLT
0032 GO TO 220
0033 130 CALL CPMACC
0034 GO TO 100
0035 135 CALL CPMPRO
0036 GO TO 220
0037 140 CALL CPMCRI
      GO TO 220
C
C   SFT A SWITCH INDICATING RESERVING OF A SCHEDULE
C
C
C   145 ISW1 = 1
      CALL CPMRED(ISW1)
      GO TO 220
C
C   SFT A SWITCH INDICATING DELETION OF A SCHEDULE
C
C
C   150 ISW9 = -1
      CALL CPMUPD(ISW1)
      GO TO 220
C
C   SFT A SWITCH INDICATING UPDATING OF THE ACTIVITIES
C
C   155 ISW9 = 0
      CALL CPMUPD(ISW1)
      GO TO 220
C
C   SFT A SWITCH INDICATING A STATUS REPORT
C
C   165 ISW1 = 0
      GO TO 175
C
C   SFT A SWITCH INDICATING AN EXCEPTION REPORT
C
C   170 ISW1 = 1
      CALL CPMSTA(ISW1)
      GO TO 220
C
C   SELECT PREPUNCH CARDS ROUTINE
C
C   180 CALL CPMCAU
      GO TO 220
C
C   STORE TODAY'S DATE FOR USE DURING THE RUN
C
C   185 ITOMON = INFO(1)
      ITODAY = INFO(2)
      ITOYR = INFO(3)
C
C   SET UPDATE TAPE NOS. FOR THIS RUN

```

```

0057      SSWF1 = 5
0058      SSWF2 = 6
0059      GO TO 100

C
C
C      SFT UP FOR THE START OF A NEW JOB
C
0060      190 READ(WKFL3,250) (PROG,INFO
0061          WRITE(SYSOT,245) INFO,ITOMON,ITODAY,ITDAYR
0062          REWIND WKFL3
0063          DO 205 IX1 = 1,54
0064             DO 195 IX2 = 1,2
0065                IRFS0(IX1,IX2) = 0
0066                DO 200 IX2 = 3,8
0067                200 IRFS0(IX1,IX2) = K*BLANK
0068                205 CONTINUE
0069                GO TO 100

C
C      END OF COMPUTER RUN
C
0070      210 WRITE(SYSOT,255) SSWF2
0071          RETURN

C
C      CREATE THE INITIAL CPM MASTER FILE
C
0072      215 IPRINT(1) = 999999
0073          DO 99 IX1 = 2,13
0074             99 IPRINT(IX1) = 0
0075             WRITE (SSWF2) (IPRINT(IX1),IX1) = 1,13)
0076             END FILE SSWF2
0077             REWIND SSWF2
0078             GO TO 100

C
C      CALL MULTI-PROJECT SUBROUTINE
C
0079      300 CALL CPMUL
0080          GO TO 220
0081      315 WRITE (SYSOT,265)
0082          IERROR = 1
0083          GO TO 220

C
C      ERROR ROUTINE. PROCESSES THRU COMMANDS WHEN AN ERROR
C      OCCURS IN A PROGRAM UNTIL THE NEXT BEGIN COMMAND
C
0084      220 IF ( IERROR .EQ. 0 ) GO TO 100
0085      225 READ(SYSIN,240) IPR0G
0086          IF ( IPR0G .EQ. ITABLE(14) ) GO TO 190
0087          IF ( IPR0G .EQ. ITABLE(15) ) RETURN
0088          GO TO 225

C
C      INPUT AND OUTPUT FORMATS
C
0089      230 FORMAT ( 2I2,14)
0090      235 FORMAT ( 3I11 )

```

```

0091      240 FORMAT ( A4,73H
           1
           )
0092      245 FOPMAT ( 19HIBEGIN PROJECT FOR ,54A1,12H DATE OF RUN,I4,2(1-H,I2) )00167000
0093      250 FOPMAT ( A4,15X,54A1 ) 00168000
0094      255 FOPMAT ( 29H1 UPDATED TAPE IS ON TAPE NO. ,I3 ) 00169000
0095      260 FOPMAT ( 31H0 THIS COMMAND NOT IN LANGUAGE ) 00170000
0096      265 FOPMAT (15X,45HTOTAL CARD DOES NOT FOLLOW MULTI-PROJECT CARD) 00171000
0097      END 00172000
           00173000

```

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
ICALT	0	INFO	1010	IPRINT	10E8	IDUR	1FC8
IEF	34E0	ILS	3FC0	ILF	49F8	IACID	5484
IRES	5C3C	IPRONO	5C58	JPRONO	5C8C	IDENT	5004
IWORK	5D08	IEHROR	5D0C	ISTMON	5D10	ISTDY	5D18
IYH	5D1C	IMON	5D20	IDAY	5D24	IPROG	5D2C
ICAL	5D30	IDECIS	5D34	NORES	5D38	IAX	5D40
IX3	5D44	ITOMON	5D48	ITODAY	5D4C	IX	5D54
IXZ	5D58						

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
MONDAY	0	MUNTHS	30	KONST	60	IDELCPT	88
KONJ	90	SYSIN	94	SYSOT	98	SYSPN	9C
SSWF2	A4	WKFL1	48	WKFL2	AC	WKFL3	B0

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
ILOPL	0	IOTSK	4	ISTART	8948	ITRDM	894C
MUL	8950						

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
I8COM#	194	DECODE	198	CPMPLT	1A0	CPMPLT	1A4
CPMACC	1A8	CPMPRO	1AC	CPMCR1	1B0	CPMUPD	1B8
CPMSTA	1BC	CPMCAU	1C0	CPMMUL	1C4		

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
NO	108	JJJDAY	11C	ISW1	1E4	ISW9	1E8

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
ITABLE	1EC	ARRAY MAP					

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
230	234	235	23C	240	242	245	245
255	20E	260	2F1	265	314	250	2C4

OPTIONS IN EFFECT NOIU,BCU,SOURCE,NOLIST,NODECK,LOAD,MAP
 OPTIONS IN EFFECT NAME = MAIN , LINECNT = 56
 STATISTICS SOURCE STATEMENTS = 97,PROGRAM SIZE = 2434
 STATISTICS NO DIAGNOSTICS GENERATED

```

0001 C SUBROUTINE CPMICAL 00174000
      C CRITICAL PATH METHOD OF SCHEDULING COMPUTER PROGRAM 00175000
0002 C COMMON ICALT(1860),INFO(54),IPRINT(120),IDUR(675),IES(675),IEF(67500),I77000
      1 ,ILS(675),ILF(675),IACD(8),IRESD(54,9),IRES(7),IPRONO(13),00178000
      2 ,JPRONO(13),IDENT(17) 00179000
0003 C COMMON IBCY,IWORK,IERROR,ISTMON,ISTDAY,ISTYR,IYR,IMON,IDAY,IPROG,
      1 IOP,ICAL,IDECIS,NORES,IX1,IX2,IX3,ITOMON,ITODAY,ITOYR,IX,
      2 IZ 00182000
0004 C COMMON /DATES/MONDAY(12),MONTHS(12),KONST(10),IDECPT,KBLANK,KONI
      1 ,SYSIN,SYSOT,SYSPN,SSWF1,SSWF2,WKFL1,WKFL2,WKFL3 00183000
0005 C INTEGER SYSIN,SYSOT,SYSPN,SSWF1,SSWF2,WKFL1,WKFL2,WKFL3 00184000
0006 C DIMENSION I(675),J(675) 00185000
      C 00186000
      C 00187000
      C 00188000
      C 00189000
      C 00190000
0007 C READ(SYSIN,305)IDENT 00191000
0008 C IERROR = 0 00192000
0009 C REWIND WKFL3 00192100
0010 C REWIND WKFL1 00193000
0011 C 100 DO 110 K = 1,675 00194000
      C 00195000
      C 00196000
      C 00197000
      C 00198000
      C 00199000
0012 C 105 READ(SYSIN,310) I(K),J(K),IDUR(K),ACOST,IACD,IDOP,IRES 00200000
      C 00201000
      C 00202000
      C 00203000
      C 00204000
      C 00205000
      C 00206000
      C 00207000
      C 00208000
      C 00209000
0014 C IF ( I(K) .EQ. -9 ) GO TO 115 00210000
0015 C 110 CONTINUE 00211000
0016 C WRITE (SYSOT,375) IDENT 00212000
0017 C WRITE (SYSOT,330) 00213000
0018 C IERROR = 1 00214000
0019 C GO TO 295 00215000
0020 C 115 DO 120 IX1 = 1,54 00216000
0021 C READ(SYSIN,365) (IRESD(IX1,IX2),IX2=1,9) 00217000
0022 C IF ( IRESD(IX1,1) .EQ. 0 ) GO TO 125 00218000
0023 C 120 CONTINUE 00219000
0024 C IX1 = 55 00220000
0025 C 125 NOPE5 = IX1 - 1 00221000
0026 C REWIND WKFL3 00222000
      C 00223000
      C 00224000
      C 00225000
      C 00226000
0027 C NOJOB IS THE NUMBER OF ACTIVITIES IN A CPM NETWORK 00227000
0028 C NOJOB = K - 1 00228000
      C 00229000
      C 00230000
      C 00231000
      C 00232000
      C 00233000
      C 00234000
      C 00235000
      C 00236000

```

```

C
C      EDIT NETWORK EVENT NUMBERING
C
0029      DO 140 K = 1,NOJ0H
C
C      CHECK TO DETERMINE WHETHER THE TAIL EVENT NUMBER IS LESS
C      THAN THE HEAD EVENT NUMBER
C
0030      IF ( I(K) - J(K) )140,135,135
0031      135 WRITE(SYSOT,335) I(K),J(K)
0032      IERROR = IERROR + 1
0033      140 CONTINUE
0034      M      = NOJ0H - 1
0035      DO 165 K = 1,M
0036      N      = K + 1
C
C      CHECK TO DETERMINE WHETHER THE TAIL EVENT NUMBERS ARE IN
C      ASCENDING ORDER
C
0037      IF ( I(K) - I(N) )160,150,145
0038      145 WRITE(SYSOT,340) I(N),I(K),J(K)
0039      IERROR = IERROR + 1
C
C      CHECK TO DETERMINE WHETHER THE HEAD EVENT NUMBERS ARE IN
C      ASCENDING ORDER WITHIN THE SAME TAIL NODE NUMBER
C
0040      150 IF ( J(K) - J(N) )160,155,155
0041      155 WRITE(SYSOT,345) I(N),J(N),I(K)
0042      IERROR = IERROR + 1
0043      160 DO 165 L = N,NOJ0H
C
C      CHECK TO DETERMINE WHETHER THERE IS A TAIL EVENT NUMBER
C      FOR EACH HEAD EVENT NUMBER
C
0044      IF ( J(K) - I(L) )165,170,165
0045      165 CONTINUE
0046      WRITE(SYSOT,350) I(K),J(K),J(K)
0047      IERROR = IERROR + 1
C
C      CHECK TO DETERMINE WHETHER THERE IS A HEAD EVENT NUMBER
C      FOR EACH TAIL EVENT NUMBER
C
0048      170 IF ( I(N) - I(K) )175,185,175
0049      175 DO 180 L = 1,K
0050      IF ( I(N) - J(L) )180,185,180
0051      180 CONTINUE
0052      WRITE(SYSOT,355) I(N),J(N),I(N)
0053      IERROR = IERROR + 1
0054      185 CONTINUE
0055      IF ( IERROR )190,190,295
C
C      INITIALIZE ALL STARTING AND FINISHING ARRAYS
C
0056      190 DO 195 K = 1,NOJ0H
0057      IFS(K) = 0

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0058 IEF(K) = 0
0059 ILS(K) = 0
0060 ILF(K) = 9999
C
C FORWARD PASS CALCULATIONS
C CALCULATE THE EARLY STARTS, IES%M<, AND EARLY FINISHES, IEF%M<,
C OF ALL ACTIVITIES
C
0061 IEF(1) = IDUR(1)
0062 DO 225 K = 2,NOJOB
0063 N = K - 1
0064 IF ( I(K) - I(N) ) 200,200,205
0065 IES(K) = IES(N)
0066 GO TO 225
0067 DO 220 L = 1,N
0068 IF ( I(K) - J(L) ) 220,210,220
0069 IF ( IES(K) - IEF(L) ) 215,220,220
0070 IES(K) = IEF(L)
0071 220 CONTINUE
0072 IEF(K) = IES(K) + IDUR(K)
C
C BACKWARD PASS CALCULATIONS
C CALCULATE THE LATE FINISHES, ILF%M<, AND LATE STARTS, ILS%M<,
C OF ALL ACTIVITIES
C
0073 ILF(NOJOB) = IEF(NOJOB)
0074 ILS(NOJOB) = ILF(NOJOB) - IDUR(NOJOB)
0075 DO 245 K = 2,NOJOB
0076 N = NOJOB - K + 1
0077 M = N + 1
0078 DO 240 L = M,NOJOB
0079 IF ( J(N) - I(L) ) 240,230,240
0080 IF ( ILF(N) - ILS(L) ) 240,240,235
0081 ILF(N) = ILS(L)
0082 IF ( I(L) - I(L+1) ) 245,240,240
0083 240 CONTINUE
0084 ILS(N) = ILF(N) - IDUR(N)
C
C OUTPUT OF RESULTS
C
0085 WRITE(SYSOT,320) ITOMON,ITODAY,ITOYR
0086 LINE = 0
0087 JOBS = NOJOB + 1
0088 TCOST = 0.0
0089 WRITE(WKFL1) IDENT
0090 DO 280 K = 1,JOBS
0091 READ(WKFL3) ACOST,IACST,IDOP,IRES
C
C CALCULATE TOTAL FLOAT,ITF, OF EACH ACTIVITY
C
0092 ITF = ILF(K) - IEF(K)
0093 IF ( ACOST.GT. 0.0 ) GO TO 270
0094 IF ( IRES(1) .EQ. 0 ) GO TO 270

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DATE = 74079 16/53/27

CPMCAL

FORTRAN IV G LEVEL 21

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0132      IS ACTIVITY,I4,IH-,I4 )
0133      345 FORMAT ( 10H0 ACTIVITY,I4,IH-,I4,34H, HEAD OUT OF SEQUENCE WITHIN
          1TAIL,I4 )
0134      350 FORMAT ( 10H0 ACTIVITY,I4,IH-,I4,27H, NO ACTIVITY STARTING WITH,
          1 I4 )
0135      355 FORMAT ( 10H0 ACTIVITY,I4,IH-,I4,25H, NO ACTIVITY ENDING WITH,I4 )
0136      360 FORMAT ( 20H0 FUNC RESOURCE,24X,8HCUST/DAY / 13H AREA CODE00395000
          1 ,13H DESCRIPTION,22X,1H$ )
0137      365 FORMAT ( 211,3X,6A4,I10 )
0138      370 FORMAT ( 216,3X,6A4,I10 )
0139      375 FORMAT ( 1H1,17A4 )
          EN)
00389000
00390000
00391000
00392000
00393000
00394000
00395000
00396000
00397000
00398000
00399000
00400000

```

SYMBOL	LOCATION	COMMON BLOCK /		/ MAP SIZE		SYMBOL	LOCATION	SYMBOL	LOCATION
		SYMBOL	LOCATION	SYMBOL	LOCATION				
ICALT	0	INFO	1D10	IPRINT	10E8	I0UR	1FC8	IES	2A54
IEF	34E0	ILS	3F6C	ILF	49F8	IACID	5484	IRESD	54A4
IRES	5C3C	IPRONO	5C58	JPRONO	5C8C	IDENT	5004	IBCY	5004
IWORK	5008	LEERRR	500C	ISTMON	5D10	ISTDAY	5D14	ISTYR	5D18
IYR	501C	IMON	5020	IDAY	5D24	IPK0G	5D28	IDOP	5D2C
ICAL	5D30	JDECLS	5D34	NORES	5D38	IX1	503C	IX2	5D40
IX3	5D44	ITOMON	5D48	ITODAY	5D4C	IT0YR	5050	IX	5D54
IZ	5D58								

SYMBOL	LOCATION	COMMON BLOCK /DATES		/ MAP SIZE		SYMBOL	LOCATION	SYMBOL	LOCATION
		SYMBOL	LOCATION	SYMBOL	LOCATION				
MONDAY	0	MONTHS	30	KONST	60	IUECPT	88	KBLANK	BC
KONI	90	SYSIN	94	SYSOT	98	SYSPN	9C	SSWF1	A0
SSWF2	A4	WKFL1	48	WKFL2	AC	WKFL3	H0		

SYMBOL	LOCATION	SUBPROGRAMS CALLED		SYMBOL	LOCATION	SYMBOL	LOCATION
		SYMBOL	LOCATION				
IBCOM#	1FC						

SYMBOL	LOCATION	SCALAR MAP		SYMBOL	LOCATION	SYMBOL	LOCATION
		SYMBOL	LOCATION				
K	204	ACOST	208	NOJOB	20C	M	210
L	214	LINE	21C	JOBS	220	TCOST	224

SYMBOL	LOCATION	ARRAY MAP		SYMBOL	LOCATION	SYMBOL	LOCATION
		SYMBOL	LOCATION				
J	22C						

SYMBOL	LOCATION	FORMAT STATEMENT MAP		SYMBOL	LOCATION	SYMBOL	LOCATION
		SYMBOL	LOCATION				
305	1744	310	174A	315	1765	320	178B
330	18A9	335	18C0	340	18F9	345	193F
355	19AE	360	19E0	365	1A28	370	1A36

OPTIONS IN EFFECT NUID,HCD,SOURCE,NOLIST,NODECK,LOAD,MAP
 OPTIONS IN EFFECT NAME = CPMCAL , LINECNT = 56
 STATISTICS SOURCE STATEMENTS = 139,PROGRAM SIZE = 10276
 STATISTICS NO DIAGNOSTICS GENERATED

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0001 C SUBROUTINE CPMDAT 00401000
C CRITICAL PATH METHOD CALENDAR DATING COMPUTER PROGRAM. 00402000
C THIS PROGRAM USES AS INPUT THE TAPE WRITTEN BY THE CPM 00403000
C CALCULATIONS COMPUTER PROGRAM. DEVELOPED BY R.C. TENNETT 00404000
C 00405000

0002 COMMON ICALT(1860),INFO(54),IPRINT(120),IDUR(675),IES(675),IEF(67500406000
1 ),ILS(675),ILF(675),IACD(8),IRESU(54,9),IRES(7),IPRONO(13),00407000
2 JPRONO(13),I/EVENT(17) 00408000
COMMON IBCY,IWORK,IERROR,ISTMON,ISTDAY,ISTYR,IYR,IMON,IDAY,IPROG,00409000
1 IDOP,ICAL,IDECIS,NORES,IX1,IX2,IX3,ITOMON,ITODAY,ITOYR,IX,00410000
2 IZ 00411000
COMMON /DATES/MONDAY(12),MONTHS(12),KONST(10),IDECPT,KBLANK,KONI00412000
1 ,SYSIN,YSOT,SYSPN,SSWF1,SSWF2,WKFL1,WKFL2,WKFL3 00413000
INTEGUR SYSIN,YSOT,SYSPN,SSWF1,SSWF2,WKFL1,WKFL2,WKFL3 00414000
REWIND WKFL1 00414100
REWIND WKFL2 00414200
C 00415000
C 00416000
C 00417000
C 00418000
C 00419000
C 00420000
C 00421000
C 00422000
C 00423000
C 00424000
C 00425000
C 00426000
C 00427000
C 00428000
C 00429000
C 00430000
C 00431000
C 00432000
C 00433000
C 00434000
C 00435000
C 00436000
C 00437000
C 00438000
C 00439000
C 00440000
C 00441000
C 00442000
C 00443000
C 00444000
C 00445000
C 00446000
C 00447000
C 00448000
C 00449000
C 00450000
C 00451000
C 00452000

0008 C READ AND STORE THE NETWORK IDENTIFICATION
0009 C
0010 C
C 100 READ(WKFL1)IDENT
WRITE(WKFL2)IDENT
ERROR = 0

C CHECK STARTING YEAR TO BE SURE IT IS IN THE CALENDAR
C
C 105 IF ( I STYR - IBCY )110,115,115
110 WRITE(SYSPN,245)IDENT
WRITE(SYSPN,260)
ERROR = 1
GO TO 140

C CALCULATE THE STARTING ADDRESS, ISTAR, OF THE STARTING DATE
C IN THE CALENDAR TABLE
C
C 115 ISTAR = ( I STYR - IBCY ) * 372 + ( ISTMON - 1 ) * 31 + ISTDAY
ISW1 = 0
LINE = 51
DO 120 I = 1,675
120 ILS(I) = 0

C READ FROM TAPE THE RESULTS CREATED BY THE CPM CALCULATIONS
C PROGRAM. THE RESULTS ARE ACTIVITY INFORMATION, WORKING DAY
C EARLY AND LATE STARTING AND FINISHING TIMES AND FLOAT VALUES
C
C 125 READ(WKFL1)
1 I,J,JDUR,ACOST,IACD,IDOP,JES,JEF,JLS,JLF,IIF,IRES
C
C TEST FOR LAST ACTIVITY OF NETWORK. A TAIL NODE NUMBER,I, OF
C -9 INDICATES THE LAST ACTIVITY OF THE NETWORK HAS BEEN READ
C
C IF ( I )130,145,145
130 READ (WKFL1) TCOST
WRITE(SYSPN,250) TCOST
WRITE(WKFL2)

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0026      I,J,JDUR,ACOST,IACTD,JDUR,IEFMON,IESDAY,IESYR,IEFMON,IEFDD00453000
0027      AY,IEFYR,ILSMON,ILSDAY,ILSYR,ILFMON,ILFDAY,ILFYR,ITF,IRES 00454000
0028      WRITE(SYSOT,245)IDENT 00455000
0029      DO 135 K = 1,NORES 00456000
0030      WRITE(SYSOT,275) (IRESU(K,IX1),IX1=1,9) 00457000
0031      WRITE(WKFL1) 00458000
0032      END FILE WKFL1 00459000
0033      REWIND WKFL2 00460000
0034      RETURN 00461000
0035      145 IF ( ISW1 ) 150,150,155 00462000
0036      150 ISW1 = 1 00463000
0037      IX3 = ISTAR 00464000
0038      INDEX = I 00465000
0039      GO TO 165 00466000
0040      155 IF ( I.EQ. INDEX ) GO TO 160 00467000
0041      IX2 = I - INDEX 00468000
0042      IX3 = ILS(IX2) 00469000
0043      GO TO 165 00470000
0044      160 IX3 = IESDAY 00471000
0045      165 ICAL = ICALT(IX3) 00472000
0046      CALL DECIS 00473000
0047      IF ( IUFCTS.NE. 0 ) GO TO 170 00474000
0048      IX3 = IX3 + 1 00475000
0049      GO TO 165 00476000
0050      C 00477000
0051      C 00478000
0052      C 00479000
0053      C 00480000
0054      C 00481000
0055      C 00482000
0056      C 00483000
0057      C 00484000
0058      C 00485000
0059      C 00486000
0060      C 00487000
0061      C 00488000
0062      C 00489000
0063      C 00490000
0064      C 00491000
0065      C 00492000
0066      C 00493000
0067      C 00494000
0068      C 00495000
0069      C 00496000
0070      C 00497000
0071      C 00498000
0072      C 00499000
0073      C 00500000
0074      C 00501000
0075      C 00502000
0076      C 00503000
0077      C 00504000
0078      C 00505000
0079      C 00506000

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0065 IDAY = IESDAY
0066 CALL DATE
0067 IESMON = IMON
0068 IESDAY = IDAY
0069 IESYR = IYR
0070 IDAY = IEFDAY
0071 CALL DATE
0072 IEFMON = IMON
0073 IEFDAY = IDAY
0074 IEFYR = IYR
0075 IDAY = ILSDAY
0076 CALL DATE
0077 ILSMON = IMON
0078 ILSDAY = IDAY
0079 ILSYR = IYR
0080 IDAY = ILFDAY
0081 CALL DATE
0082 ILFMON = IMON
0083 ILFDAY = IDAY
0084 ILFYR = IYR

C
C PRINT HEADINGS AND RESULTS
C
IF ( LINE - 50 ) 230,230,225
225 WRITE(SYSOT,245)IDENT
WRITE(SYSOT,265) ITOMON,ITODAY,IIOYR,IWORK
LINE = 0
230 IF ( JUUR.EQ.0 ) GO TO 235
WRITE(SYSOT,255)
1 I,J,JUUR,ACOST,IACD,IDOP,IESMON,IESDAY,IESYR,IEFMON,
1 IEFDAY,IEFYR,ILSMON,ILSDAY,ILSYR,ILFMON,ILFDAY,ILFYR,ITF,IRES
WRITE(WKFL2)
1 I,J,JUUR,ACOST,IACD,IDOP,IESMON,IESDAY,IESYR,IEFMON,IEFD
1 AY,IEFYR,ILSMON,ILSDAY,ILSYR,ILFMON,ILFDAY,ILFYR,ITF,IRES
GO TO 240
235 WRITE(SYSOT,255) I,J,JUUR,ACOST,IACD
240 LINE = LINE + 1
GO TO 125

C
C INPUT AND OUTPUT FORMATS
C
245 FORMAT ( I1,I17A4 )
250 FORMAT ( 14H0 PROJECT COST,F10.0 )
255 FORMAT ( 2I5,I6,F8.0,3X,I7A4,A2,I4, 2X,2(2X,I2,I1,I2,I1,I2) ,
12X,2(2X,I2,I1,I2,I1,I2),I6,I6,2X,6I2)
260 FORMAT ( 20H0 DATE NOT IN TABLE )
265 FORMAT ( 1H0,53X,14HDATE OF REPORT,I4,2(1H,I2) /
* 179,13H DAY WORKWEEK,26X,8HRESOURCE / 3X,2(8HACTIVITY,4X),00554000
13X,20HACTIVITY DESCRIPTION,9X,4HWORK,7X,8HEARLTEST,15X,6HLATEST, 00556000
28X,24HTOTAL FUNC TYPES REGD/4X,I1,I4X,I1H,4X,I0HOUR COST,35X,00557000
34HOPT,2(22H START FINISH ), 24HFLOAT AREA 1 2 3 4 5 6,00558000
270 FORMAT ( 20H0 FUNC RESOURCE,24X,8HCOST/DAY / 13H AREA CODE00559000
1 , 13H DESCRIPTION,22X,I1$ )
0101

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PAGE 0004

16/53/27

DATE = 74079

CPMUAT

FORTRAN IV G LEVEL 21

00561000
00562000

275 FORMAT (2I6,3X,6A4,I10)
EN)

0102
0103

COMMON BLOCK /		/ MAP SIZE		505C	
SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
ICALT	0	IURR	10E8	IES	2454
IEF	34E0	ILF	49F8	IEESD	5444
IRIS	5C3C	JPRONO	5C8C	IPCY	5004
IWORK	5D08	ISTMON	5D10	ISTYR	5018
IYR	5D1C	IDAY	5D24	I00P	502C
ICAL	5030	NORES	5D34	IX2	5040
IX3	5044	ITODAY	504C	IX	5054
IZ	5D58				

COMMON BLOCK /DATES / MAP SIZE		B4	
SYMBOL	LOCATION	SYMBOL	LOCATION
MONDAY	0	IDECP	88
KONI	90	SYSPN	9C
SSWF2	A4	WKFL3	B0

SUBPROGRAMS CALLED		LOCATION	
SYMBOL	LOCATION	SYMBOL	LOCATION
IBCOM#	158	DATE	164

SCALAR MAP		LOCATION	
SYMBOL	LOCATION	SYMBOL	LOCATION
ISTAR	174	I	180
JDUR	188	JES	194
JLF	19C	IESMON	1A8
IESYR	180	IEFYR	1HC
ILSDAY	1C4	ILFYR	1D0
K	108		

FORMAT STATEMENT MAP		LOCATION	
SYMBOL	LOCATION	SYMBOL	LOCATION
245	1E0	260	243
270	354	265	25H

OPTIONS IN EFFECT NOID,BCD,SOURCE,NOLIST,NOCK,LOAD,MAP
 OPTIONS IN EFFECT NAME = CPMQUAT , LINECNT = 56
 STATISTICS SOURCE STATEMENTS = 103,PROGRAM SIZE = 3122
 STATISTICS NO DIAGNOSTICS GENERATED


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0001      SUBROUTINE CPMPLT
C          CRITICAL PATH METHOD TIM-SEQUENCE PLOT COMPUTER PROGRAM.
C          THIS PROGRAM USES AS INPUT THE TAPE WRITTEN BY THE CPM
C          CALCULATIONS COMPUTER PROGRAM. DEVELOPED BY R.C. TENNETT
C
0002      COMMON ICALT(1860),INFO(54),IPRINT(120),IDUR(675),IES(675),IEF(675)00568000
1          ),ILS(675),ILF(675),IACD(8),IRES(154,9),IRES(7),IPRONO(131),00564000
2          JPRONO(13),IDENT(17)
C          COMMON IBCY,IWORK,IERROR,IISTMON,ISTDAY,ISTYR,IYR,IMON,IDAY,IPROG,00565000
1          IDOP,ICAL,IDECS,NURES,IX1,IX2,IX3,ITOMON,ITODAY,ITOYR,IX,00566000
2          IZ
C          COMMON /DATES/MONDAY(12),MONTHS(12),KONST(10),IDECPT,K6LANK,KONI00567000
1          ,SYSIN,SYSOT,SYSFN,SSWF1,SSWF2,WKFL1,WKFL2,WKFL3
C          INTEGER SYSIN,SYSOT,SYSFN,SSWF1,SSWF2,WKFL1,WKFL2,WKFL3
C          DIMENSION IESDAY(62),IEFDAY(62),ILFDAY(62),IWOP(62),KON(5)
C          EQUIVALENCE (IESDAY(1),IES(1)),(IEFDAY(1),IEF(1)),(ILFDAY(1),ILF(100577000
1          ),IWOP(1),IDUR(1))
C          DATA KON/1HH,1HW,1HS,1HX/,KON3/1H*/.,KON4/1HD/
C          REWIND WKFL1
C
0008      READ AND STORE THE NETWORK IDENTIFICATION
0009
C
C          ISAVE=0
C          IWORK = 1
C          100 READ(WKFL1)IDENT
C          IERROR = 0
C          105 IF ( IISTYR - IBCY )110,115,115
C          110 WRITE(SYSOT,385)IDENT
C          WRITE(SYSOT,420)
C          IERROR = 1
C          GO TO 380
C
C          CALCULATE THE STARTING ADDRESS,ISTAR, OF THE STARTING DATE
C          IN THE CALENDAR TABLE
C          115 ISTAR = ( IISTYR - IBCY ) * 372 + ( IISTMON - 1 ) * 31 + ISTDAY
C          INITIALIZE SWITCHES FOR A NEW NETWORK OF ACTIVITIES
C
C          ISW1 = 0
C          ISW2 = 0
C          ISW5 = 0
C          DO 120 I = 1,675
C          120 ILS(I) = 0
C
C          PRINT NETWORK IDENTIFICATION ON TOP OF PAGE AND THE HEADINGS
C          125 WRITE(SYSOT,385)IDENT
C          WRITE(SYSOT,390)
C
C          SET A PRINTING COUNTER,IPRCYC, TO BE USED FOR PRINTING ACTIVITY
C          NODE NUMBERS,DURATION,COST AND DESCRIPTION
C          IPRCYC = 0

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0056 IX3 = IX3 + 1
0057 GO TO 180
C
C SET THE VALUES NECESSARY FOR ADDRESS ROUTINE. ADDRESS ROUTINE
C INPUT IS A STARTING POINT,IX3,THE ACTIVITY TIME,TIME AND A
C RETURN POINT FOR ADDRESS ROUTINE EXIT,IADEX.
C
185 IESDAY(IX1) = IX3
CALL ADDR( JOUR )
190 IEFDAY(IX1) = IX3 - 1
IX2 = J - INDEX
IF ( ILS(IX2) .LT. IX3 ) ILS(IX2) = IX3
C
C COMPARE THE LATE START,ILS, AND THE EARLY START,IES. WHEN
C THEY ARE EQUAL THIS INDICATES A CRITICAL ACTIVITY
C
IF ( JLS - JES )200,195,200
195 ILFDAY(IX1) = IEFDAY(IX1)
GO TO 210
200 IX3 = IEFDAY(IX1)
CALL ADDR( ITF )
205 ILFDAY(IX1) = IX3
IF ( IERROR .EQ. 1 ) GO TO 380
C
C STORE IN ISAVE THE LARGEST VALUE OF THE LATE FINISHES
C
210 IF ( ISAVE - ILFDAY(IX1) )215,220,220
215 ISAVE = ILFDAY(IX1)
C
C
220 IWOP(IX1) = IDOP
IF ( JOUR .NE. 0 ) GO TO 130
IWOP(IX1) = -9
GO TO 130
C
C TIME SEQUENCE PLOTTING ROUTINE
C THIS ROUTINE WILL DETERMINE WHICH SYMBOL IS TO BE PLOTTED FOR
C THE ACTIVITIES IN ORDER TO SHOW THE CALENDAR DATED ACTIVITIES
C DURATION AND TOTAL FLOAT AS A BAR
C
225 IX10 = IX1 - 1
IX3 = ISTAR - 1
C
C SKIP THE PAPER TO THE TOP OF THE PAGE
C
WRITE( SYSOUT,425 )
CALL BLANK
C
C INCREMENT THE CALENDAR TABLE INDEX,IX3, BY ONE AND CHECK IT
C AGAINST ITS MAXIMUM VALUE WHICH IS STORED IN ISAVE
230 IX3 = IX3 + 1
IF ( IX3 - ISAVE )235,235,370
C
C SET INDEX COUNTER IX1 AND PRINT POSITION COUNTER EQUAL TO ZERO
0063
0064
0065
0066
0067
0068
0069
0070
0071
0072
0073
0074
0075
0076
0077
0078
0079
0080
0081
00670000
00671000
00672000
00673000
00674000
00675000
00676000
00677000
00678000
00679000
00680000
00681000
00682000
00683000
00684000
00685000
00686000
00687000
00688000
00689000
00690000
00691000
00692000
00693000
00694000
00695000
00696000
00697000
00698000
00699000
00700000
00701000
00702000
00703000
00704000
00705000
00706000
00707000
00708000
00709000
00710000
00711000
00712000
00713000
00714000
00715000
00716000
00717000
00718000
00719000
00720000
00721000
00722000
00723000

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0082      C 235 IX1 = 0
0083      IPRPOS = 0
0084      ISW6=0

0085      C INCREMENT THE ARRAY INDEX,IX1, AND CHECK AGAINST ITS MAXIMUM
0086      C 240 IX1 = IX1 + 1
0087      -IF ( IX1 - IX10 )245,245,320
0088      245 ISW4 = 1
0089      C CALCULATE INDEX FOR PRINT ARRAY,IPRINT&IX2<
0090      C IX2 = 62 - IX1
0091      C COMPARE EARLY FINISH WITH LATE FINISH TO DETERMINE IF CRITICAL
0092      C ACTIVITY IS BEING CONSIDERED AND SET SWITCH 4,ISW4,ACCORDJNGLY
0093      C IF ( IEFDAY(IX1) - ILFDAY(IX1) )250,255,250
0094      250 ISW4 = 0
0095      C DETERMINE POSITION OF CALENDAR TABLE INDEX,IX3,WITH RELATION
0096      C TO EARLY START
0097      C 255 IF ( IX3 - IESDAY(IX1) )240,265,260
0098      C DETERMINE IX3 POSITION WITH RELATION TO THE EARLY FINISH
0099      C 260 IF ( IX3 - IEFDAY(IX1) )265,265,300
0100      C CHECK POSITION IN CALENDAR TABLE FOR THE INDICATION OF A MONTH
0101      C WITH LESS THAN 31 DAYS
0102      C 265 IF ( ICALT(IX3) - 9 )270,230,270
0103      270 IPRPOS = IPRPOS + 1
0104      C CHECK POSITION IN CALENDAR TABLE FOR A NON-WORK DAY OR OPTION
0105      C ICAL = ICALT(IX3)
0106      IDOP = IWOP(IX1)
0107      CALL DECIS
0108      IF ( IDECIS )280,275,285
0109      275 IPRINT(IX2) = KON(ICAL)
0110      60 TO 240
0111      C STORE DUMMY ACTIVITY PLOT SYMBOL
0112      C 280 IPRINT(IX2) = KON4
0113      60 TO 240
0114      C CHECK SWITCH 4,ISW4,FOR A CRITICAL OR NON-CRITICAL ACTIVITY
0115      C 285 IF ( ISW4 )290,290,295
0116      C
0117      C
0118      C
0119      C
0120      C
0121      C
0122      C
0123      C
0124      C
0125      C
0126      C
0127      C
0128      C
0129      C
0130      C
0131      C
0132      C
0133      C
0134      C
0135      C
0136      C
0137      C
0138      C
0139      C
0140      C
0141      C
0142      C
0143      C
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0104 C STORE NON-CRITICAL ACTIVITY PLOT SYMBOL,*,IN PRINT ARRAY 00778000
0105 C IPRINT(IX2) = KON1 00779000
      GO TO 240 00780000
0106 C STORE CRITICAL ACTIVITY PLOT SYMBOL,*,IN PRINT ARRAY 00781000
0107 C IPRINT(IX2) = KON3 00782000
0108 C ISW6=1 00783000
      GO TO 240 00784000
0109 C CHECK SWITCH 4 FOR CRITICAL ACTIVITY BEYOND EARLY FINISH 00785000
      GO TO 240 00786000
0110 C CHECK POSITION IN CALENDAR TABLE FOR A NON-WORK DAY OR OPTION 00787000
0111 C ICAL = ICALT(IX3) 00788000
      IDOP = IDOP(IX1) 00789000
      CALL DECIS 00790000
      IF ( IDECIS )280,275,315 00791000
0112 C STORE TOTAL FLOAT PLOT SYMBOL,*,IN PRINT ARRAY 00792000
0113 C IPRINT(IX2) = IOECP 00793000
      GO TO 240 00794000
0114 C CHECK PRINT POSITION COUNTER TO DETERMINE IF ANY SYMBOL HAS 00795000
0115 C BEEN STORED IN THE PRINT ARRAY 00796000
0116 C SFT UP DATE ROUTINE IN ORDER TO DETERMINE THE MONTH AND YEAR 00797000
0117 C IPRINT(IX2) = IOECP 00798000
      GO TO 240 00799000
0118 C CALL DATE 00800000
      JWORK=JWORK+ISW6 00801000
      IPRINT(64)=JWORK 00802000
      IPRINT(62) = IDAY 00803000
      IFORM = 1 00804000
      IF ( IDAY - 10 )340,335,340 00805000
      IPRINT(63) = MONTHS(IMON) 00806000
      GO TO 350 00807000
0119 C 340 IF ( IDAY - 20 )350,345,350 00808000
0120 C IPRINT(63) = IYR 00809000
      IFORM = 0 00810000
0121 C PRINT THE PRINT ARRAY TO OBTAIN A LINE 00811000
0122 C 00812000
0123 C 00813000
0124 C 00814000
0125 C 00815000
0126 C 00816000
0127 C 00817000
0128 C 00818000
0129 C 00819000
0130 C 00820000
      C 00821000
      C 00822000
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      C 00830000
      C 00831000

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0131      350 IF ( IFORM ) 355,355,360
0132      355 WRITE(SYSOT,410) ( IPRINT(IX1),IX1=1,64)
0133      GO TO 365
0134      360 WRITE(SYSOT,415) ( IPRINT(IX1),IX1=1,64)
C
C      BLANK THE PRINT ARRAY
C
C      365 CALL HLANK
C      GO TO 230
C
C      CHECK SWITCH 5,ISWS, IF THERE ARE ADDITIONAL ACTIVITIES
C
0137      370 IF ( ISWS ) 375,375,380
0138      375 ISW2 = 1
0139      GO TO 125
0140      380 REWIN, WKFL1
0141      RETURN
C
C      INPUT AND OUTPUT FORMATS
C
0142      385 FORMAT ( 1H1,17A4 )
0143      390 FORMAT ( 11H0,ACTIVITY,4X,8HACTIVITY,7X,20HACTIVITY DESCRIPTION,
1          20X,20HACTIVITY DESCRIPTION,9X,8HACTIVITY,4X,8HACTIVITY /
2          4X,1H1,4X,1HJ,4X,10HOUR COST,76X,1H1,4X,1HJ,4X,
3          10HDUR COST )
0144      395 FORMAT ( 1H0,10X,20HTIME SEQUENCE LEGEND / 15X,14H*** CRITICAL ,
1          17HACTIVITY DURATION / 15X,24H+*+ NON-CRITICAL ACTIVI,
2          11HTY DURATION / 15X,26H... AMOUNT OF TOTAL FLOAT /
3          15X,31HS SATURDAY OR SUNDAY,NO WORK / 15X,5HH ,
4          21HLEGAL HOLIDAY,NO WORK / 15X,16HW WEATHER DAY,
5          8H,NO WORK )
0145      400 FORMAT ( 2I5,I6,F8.0,3X,7A4,A2,9X,7A4,A2,2I5,I6,F8.0 )
0146      405 FORMAT ( 1H )
0147      410 FORMAT ( 1H ,61A2,I3,I3,I3)
0148      415 FORMAT ( 1H ,61A2,I3,A3,I3)
0149      420 FORMAT ( 20H0 DATE NOT IN TABLE )
0150      425 FORMAT ( 1H1 )
0151      END

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FORTRAN IV G LEVEL 21          CPMACC          DATE = 74079          16/53/27
0001      SUBROUTINE CPMACC          00870000
C          CRITICAL PATH METHOD MANPOWER REQUIRED PLOT COMPUTER PROGRAM. 00871000
C          THIS PROGRAM USES AS INPUT THE TAPE WRITTEN BY THE CPM CALENDAR 00872000
C          DATING COMPUTER PROGRAM. DEVELOPED BY R.C.TENNENT, ENGINEERING 00873000
C          00874000
0002      COMMON ICALT(1860),INFO(54),IPRINT(120),IDUR(675),IES(675),IEF(67500875000
1          ),ILS(675),ILF(675),IACD(8),IRES(54,9),IRES(7),IPRONO(13),00876000
2          JPRONO(13),IDENT(17)
0003      COMMON IBCY,IWORK,IERROR,ISTMON,ISTDAY,ISTYH,IYR,IMON,IDAY,IPROG,00878000
1          IDOP,ICAL,IDECIS,NOHES,IX1,IX2,IX3,ITOMON,ITODAY,ITOYR,IX,00879000
2          IZ
0004      COMMON /DATES/MONDAY(12),MONTHS(12),KONST(10),IDECPT,KBLANK,KONI00880000
1          ,SYSIN,SYSOT,SYSPN,SSWF1,SSWF2,WKFL1,WKFL2,WKFL3 00881000
2          COMMON /MULTI/ ILOWL,IUPL,ITOTSK(12,732),ISTART,IROWM,MUL00882000
0005      INTEGER SYSIN,SYSOT,SYSPN,SSWF1,SSWF2,WKFL1,WKFL2,WKFL3 00882100
0006      DIMENSION ISM(2),IFUNT(9) 00883000
0007      EQUIVALENCE (IPLT,INFO(1)),(JFIMON,INFO(5)),(JSTMON,INFO(2)),(JSTDAY,INFO(3)),00884000
0008      1 (JSTYR,INFO(4)),(IFIMON,INFO(5)),(IFIDAY,INFO(6)),(IFYR,INFO(7)),00885000
2          ,(IFUNC,IRES(1)) 00886000
0009      REWIND WKFL2 00887000
0010      ISTART = 0 00887100
0011      ILOWL = 1 00888000
0012      IUPL = 12 00889000
0013      MUL = 0 00890000
C          00890100
C          00891000
C          00892000
C          00893000
C          00894000
C          00895000
C          00896000
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C          00898000
C          00899000
C          00900000
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C          00919000
C          00920000
0014      DO 105 JCOL = 1,732
0015      DO 105 IROW = 1,12
0016      105 ITOTSK(IROW,JCOL) = 0
0017      110 DO 115 I = 1,9
0018      115 IFUNT(I) = 0
0019      IROWM = 0
0020      DO 120 I = ILOWL,IUPL
0021      IFUN = IRES(I,I)
0022      IF ( IFUN .EQ. 0 ) GO TO 125
0023      IFUNT(IFUN) = IFUNT(IFUN) + 1
0024      IROWM = IROWM + 1
0025      WRITE(SYSOT,595)
0026      J = I
0027      DO 130 I = 1,9
0028      IF ( IFUNT(I) .EQ. 0 ) GO TO 130
0029      IFUNT(J) = IFUNT(I) * 10 + I
0030      J = J + 1
0031      130 CONTINUE
0032      DO 135 I = 1,12
0033      IF ( I - JSTMON ) 135,140,140
0034      135 ISTART = ISTART + MONDAY(I)
0035      140 ISTART = ISTART + JSTUDAY
C          PROCESS NETWORK IDENTIFICATION
C          145 READ(WKFL2)IDENT
C

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C READ FROM TAPE THE RESULTS CREATED BY THE CPM CALENDAR DATING
C PROGRAM. THE RESULTS ARE EARLY START MONTH, DAY&YEAR, EARLY
C FINISH MONTH, DAY&YEAR, RESOURCE REQUIRED AND THE FUNCTION CODE
C
0037 150 READ(WKFL2)
      I, J, JOUR, ACOST, IACTD, IUOP, IESMON, IESDAY, IESYR, IEFMON, IEFD
      AY, IEFYR, ILSMON, ILSDAY, ILSYR, ILFMON, ILFDAY, ILFYR, ITF, IRES
C
C TEST FOR LAST ACTIVITY OF NETWORK. A TAIL EVENT NUMBER, I, OF -9
C INDICATES THE LAST ACTIVITY HAS BEEN READ.
      IF ( I .LT. 0 ) GO TO 330
0038 155 IF ( IFUNC )150,150,160
0039
C
C DETERMINE ACTIVITY START DATE RELATIONSHIP WITH PLOTTING PERIOD
C
0040 160 IF ( IESYR - JSTYR )165,180,190
0041 165 IESYR = JSTYR
0042 170 IESMON = JSTMON
0043 175 IESDAY = JSTDAY
0044 GO TO 205
0045 180 IF ( IESMON - JSTMON )170,185,205
0046 185 IF ( IESDAY - JSTDAY )175,205,205
0047 190 IF ( IESYR - IFIYR )195,195,150
0048 195 IF ( IESMON - IFIMON )205,200,150
0049 200 IF ( IESDAY - IFIDAY )205,205,150
C
C DETERMINE ACTIVITY FINISH DATE RELATIONSHIP WITH PLOTTING PERIOD
C
0050 210 IFFYR = IFIYR
0051 205 IF ( IEFYR - IFIYR )235,225,210
0052 215 IEFMON = IFIMON
0053 220 IFFDAY = IFIDAY
0054 GO TO 245
0055 225 IF ( IEFMON - IFIMON )245,230,215
0056 230 IF ( IEFDAY - IFIDAY )245,245,220
0057 235 IF ( IEFMON - JSTMON )150,240,245
0058 240 IF ( IEFDAY - JSTDAY )150,150,245
0059 245 JES = 0
0060 DO 250 L = 1,12
0061 IF ( L - IESMON )250,255,255
0062 = JES + MONDAY(L)
0063 250 JES = JES + MONDAY(L)
0064 255 JES = JES + IESDAY - ISTART + 1
0065 IF ( IESYR - JSTYR )265,265,260
0066 260 JES = JES + 366
0067 265 JEF = 0
0068 D/O 270 L = 1,12
0069 IF ( L - IEFMON )270,275,275
0070 270 JEF = JEF + MONDAY(L)
0071 275 JEF = JEF + IEFDAY - ISTART
0072 IF ( IFFYR - JSTYR )285,285,280
      = JEF + 366
C
C ACCUMULATE THE REQUIRED RESOURCE FROM EARLY START THRU EARLY
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0073 C FINISH FOR EACH INDIVIDUAL RESOURCE REQUIRED BY THE ACTIVITY
0074 C
0075 C 285 L = 0
0076 C IRSM = 0
0077 C DO 325 K = 2,7
0078 C IF ( IRES(K) .LE. 0 ) GO TO 325
0079 C 290 IF ( IRSM ) 305,295,305
0080 C 295 IRSM = 1
0081 C DO 300 I = 1,9
0082 C IF ( IFUNC - ( IFUNT(I) - IFUNT(I)/10*10 ) ) 300,305,300
0083 C 300 L = L + IFUNT(I) / 10
0084 C WRITE (SYSOT,585) IFUNC
0085 C GO TO 150
0086 C 305 IROW = L + K - 1
0087 C IF ( IROW - IROWM ) 315,315,310
0088 C 310 WRITE (SYSOT,590) IROW,IROWM
0089 C GO TO 150
0090 C 315 DO 320 JCOL = JES,JEF
0091 C 320 ITOTSK(IROW,JCOL) = ITOTSK(IROW,JCOL) + IRES(K)
0092 C 325 CONTINUE
0093 C GO TO 150
0094 C ENTRY CPMMAC
0095 C IPLKW = ( IROWM * 10 / 2 + 5 ) / 10
0096 C IPLSW = -1
0097 C CALL BLANK
0098 C
0099 C DETERMINE WHICH TYPE OF PLOT IS DESIRED
0100 C WHEN I PLOT EQUALS 0 INDIVIDUAL RESOURCE PLOT ONLY
0101 C 1 SUMMARY OF ALL RESOURCES ONLY
0102 C 2 INDIVIDUAL RESOURCE PLOT & SUMMARY
0103 C
0104 C IF ( I PLOT - 1 ) 345,335,350
0105 C
0106 C 335 IF (MUL .NE. 0) GO TO J37
0107 C WRITE (SYSOT,545) IDENT
0108 C WRITE (SYSOT,555)
0109 C GO TO 338
0110 C 337 WRITE (SYSOT,600)
0111 C WRITE (SYSOT,555)
0112 C 338 CONTINUE
0113 C
0114 C ACCUMULATE THE INDIVIDUAL RESOURCES INTO A SUMMARY
0115 C
0116 C DO 340 JCOL = 1,732
0117 C DO 340 IROW = 2,12
0118 C 340 ITOTSK(I,JCOL) = ITOTSK(I,JCOL) + ITOTSK(IROW,JCOL)
0119 C
0120 C SFT PARAMETERS FOR TOTAL RESOURCE PLOT
0121 C
0122 C IPLKU = 1
0123 C IPLSW = 1
0124 C GO TO 350
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1478 C
1479 C
1480 C
1481 C
1482 C
1483 C
1484 C
1485 C
1486 C
1487 C
1488 C
1489 C
1490 C
1491 C
1492 C
1493 C
1494 C
1495 C
1496 C
1497 C
1498 C
1499 C
1500 C

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0110      C 345 IPLSW = 0
          C
          C      RESOURCE REQUIRED PLOT ROUTINE
          C
0111      C 350 DO 520 K = 1,IPLKW
          C
          C      K REPRESENTS THE NUMBER OF SETS OF PLOTS
          C
          C      DO 355 M1 = 1,2
0112      C 355 ISW(M1) = 0
0113      C IF ( IPLSW ) 360,360,365
0114      C 360 WRITE(SYSOT,545)
0115      C WRITE(SYSOT,550)
0116      C L = 2
0117      C I1 = K * L - L + 1
0118      C I2 = I1 + 1
0119      C WRITE(SYSOT,560) ((IRESU(I,J),J=3,8),I=I1,I2)
0120      C WRITE(SYSOT,565)
0121      C GO TO 370
0122      C 365 L = IPLKW
0123      C 370 DO 515 JCOL = 1,731
0124      C
          C      JCOL REPRESENTS THE NUMBER OF DAYS TO BE PLOTTED
          C
          C      M = K * L - L
0125      C DO 450 M1 = 1,L
0126      C
          C      M1 REPRESENTS THE NUMBER OF PLOTS ON A PAGE
          C
          C      M = M + 1
0127      C
          C      M REPRESENTS THE ROW OF THE ARRAY BEING CONSIDERED
          C
          C      IF ( JCOL - 1 ) 375,375,380
0128      C 375 N = ITOTSK(M,JCOL) + 1
0129      C NPTS = 1
0130      C ISW(M1) = 0
0131      C GO TO 395
0132      C
          C      DETERMINE RESOURCE LEVEL RELATIONSHIP WITH THE PREVIOUS DAY
          C
0133      C 380 IF ( ITOTSK(M,JCOL-1) - ITOTSK(M,JCOL) ) 385,375,390
0134      C 385 N = ITOTSK(M,JCOL-1) + 1
0135      C NPTS = ITOTSK(M,JCOL) + 1
0136      C ISW(M1) = -1
0137      C GO TO 395
0138      C 390 N = ITOTSK(M,JCOL) + 1
0139      C NPTS = ITOTSK(M,JCOL-1) + 1
0140      C ISW(M1) = 1
0141      C 395 IF ( M1 - 1 ) 410,410,400
0142      C 400 IF ( IPLKW - 2 ) 410,405,405
0143      C 405 N = N + 58
0144      C NPTS = NPTS + 58
0145      C 410 IPPRINT(N) = IOECP

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0146      N      = N + 1
0147      IF ( N - 113 ) 415,415,530
0148      415 IF ( N - NPTS ) 410,410,420
C
C      IF HISTOGRAM HAS GONE UP ADD VALUE TO PLOT
C
0149      420 IF ( ISW(MI) ) 425,450,450
0150      425 ISW(MI) = 0
0151      NPTS = ITOTSK(M,JCOL) / 10
0152      IF ( NPTS ) 435,435,430
0153      430 IPRINT(N) = KONST(NPTS)
0154      435 NPTS = ITOTSK(M,JCOL) - NPTS * 10
0155      IF ( NPTS ) 440,440,445
0156      440 NPTS = 10
0157      445 IPRINT(N+1) = KONST(NPTS)
0158      450 CONTINUE
0159      455 IFORM = 0
0160      IYR = ISTYR
0161      IDAY = ISTART + JCOL - 1
0162      IMON = 1
0163      DO 470 N = 1,12
0164      IF ( IDAY - MONDAY(N) ) 475,475,465
0165      IDAY = IDAY - MONDAY(N)
0166      470 IMON = IMON + 1
0167      IYR = IYR + 1
0168      GO TO 460
0169      475 IF ( IDAY - 10 ) 485,480,485
0170      480 IPRINT(115) = MONTHS(IMON)
0171      485 IF ( IDAY - 20 ) 495,490,495
0172      490 IFORM = 1
0173      IPRINT(115) = IYR
0174      495 IPRINT(114) = IDAY
0175      IF ( IFORM ) 500,500,505
0176      500 WRITE(SYSOT,570)
1      IPRINT(115),IPRINT(114),(IPRINT(IX1),IX1=1,115)
0177      GO TO 510
0178      505 WRITE(SYSOT,575)
1      IPRINT(115),IPRINT(114),(IPRINT(IX1),IX1=1,115)
0179      510 CALL BLANK
1      IF(IYR.EQ.IFYR .AND. IMON.EQ.IFIMON .AND. IDAY.EQ.IFIDAY)GOTO 520
0180      515 CONTINUE
0181      520 CONTINUE
0182      525 IF ( IPLSM ) 335,535,535
0183      530 WRITE(SYSOT,580) MONTHS(IMON),IDAY
0184      GO TO 450
0185      535 IF (MUL .EQ. 1) GO TO 540
0186      REWIND WKFL2
0187      536 IF (IROWM .GE. NORES) GO TO 540
0188      ILOWL = ILOWL + 12
0189      IUPL = IUPL + 12
0190      IF ( IPILOT - 1 ) 100,110,100
0191      540 RETURN
0192
C
01077000
01078000
01079000
01080000
01081000
01082000
01083000
01084000
01085000
01086000
01087000
01088000
01089000
01090000
01091000
01092000
01093000
01094000
01095000
01096000
01097000
01098000
01099000
01100000
01101000
01102000
01103000
01104000
01105000
01106000
01107000
01108000
01109000
01110000
01111000
01112000
01113000
01114000
01115000
01116000
01117000
01118000
01119000
01120000
01121000
01122000
01123000
01123100
01124000
01125000
01126000
01127000
01128000
01129000

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C
C
      INPUT AND OUTPUT FORMATS
0193 545 FORMAT ( 1H1,17A4 )
0194 550 FORMAT ( 1H0,43X,26HMANPOWER REQUIRED BY SKILL )
0195 555 FORMAT ( 1H0,25X,36HMANPOWER REQUIRED FOR ALL ACTIVITIES /
      1 19X,76H1 1 2 2 3 3 4 4 5 5
      26 6 7 7 8 8 / 9X,9(6H0 5,4X) )
0196 560 FORMAT ( 26X,6A4,34X,6A4 )
0197 565 FORMAT ( 19X,41H1 1 2 2 3 3 4 4 5,17X,
      1 41H1 1 2 2 3 3 4 4 5 / 9X,
      2 5(6H0 5,4X),1H0,7X,5(6H0 5,4X),1H0 )
0198 570 FORMAT ( 1X,A3,13,2X,113A1,I3,A3 )
0199 575 FORMAT ( 1X,2I3,2X,113A1,2I3 )
0200 580 FORMAT ( 19H SCALE EXCEEDED ON ,A3,I3 )
0201 585 FORMAT ( 14H FUNCTION CODE,I3,18H WAS NOT SUBMITTED )
0202 590 FORMAT ( 15H CALCULATEDU ROW,I3,28H EXCEEDS MAXIMUM NO. OF ROWS,I3)01145000
0203 595 FORMAT ( 20H MAXIMUM NO. OF ROWS )
0204 600 FORMAT (1H1,35H*** MULTI-PROJECT RESOURCE PLOT *** )
0205      END
01130000
01131000
01132000
01133000
01134000
01135000
01136000
01137000
01138000
01139000
01140000
01141000
01142000
01143000
01144000
01145000
01146000
01146100
01147000

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SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
ICALT	0	INFO	1010	IPLOT	1010	JSTMON	1D14
JSTYR	1D1C	IFIMON	1020	IFIDAY	1D24	IFIYR	1D28
IDUR	1FC8	IES	2A54	IEF	34E0	ILF	3F6C
IACD	5484	IRESD	5444	IRES	5C04	IPRONO	5C58
JPRONO	5C8C	IDENT	5014	IBCY	5D04	IERROR	5D0C
ISTMON	5D10	ISTDAY	5014	ISTYR	5D18	IMON	5D20
IDAY	5D24	IPROG	5D28	IDOP	5D2C	IDECIS	5D34
NORES	5D36	IX1	503C	IX2	5D40	ITOMON	5D48
ITUDAY	5D4C	IT0YR	5050	IX	5D54		

COMMON BLOCK /	MAP SIZE	SD5C
LOCATION	LOCATION	
1010	1010	
1020	1D24	
2A54	34E0	
5444	5C04	
5014	5D04	
5014	5D18	
5D28	5D2C	
503C	5D40	
5050	5D54	

COMMON BLOCK /DATES / MAP SIZE	B4
LOCATION	LOCATION
30	60
94	98
AH	AC

COMMON BLOCK /MULTI / MAP SIZE	8954
LOCATION	LOCATION
4	B

SUBPROGRAMS CALLED	SYMBOL	LOCATION	SYMBOL	LOCATION
BLANK	BLANK	3C0	SYMBOL	LOCATION
			IFUN	3D4
			IESYR	3E8
			ILSDAY	400
			ITF	414
			K	428
			I2	43C

SCALAR MAP	SYMBOL	LOCATION	SYMBOL	LOCATION
IR0W	I	3D0	IFUN	3D4
AC0T	IESMON	3E4	IESDAY	3E8
IEFDAY	IEFYR	3F8	ILSMON	3FC
ILFMON	ILFDAY	40C	ILFYR	410
L	JEF	420	IRSW	424
IPLSW	MJ	434	IJ	438
N	NPTS	448	IFORM	44C

ARRAY MAP	SYMBOL	LOCATION	SYMBOL	LOCATION
IFUNT	IFUNT	450	SYMBOL	LOCATION
			565	544
			590	62C

FORMAT STATEMENT MAP	SYMBOL	LOCATION	SYMBOL	LOCATION
550	550	485	560	536
575	575	507	585	604
600	600	679		

OPTIONS IN EFFECT NOID,RCD,SOURCE,NOLIST,NODECK,LOAD,MAP
OPTIONS IN EFFECT NAME = CPMACC , LINECNT = 56
STATISTICS SOURCE STATEMENTS = 205,PROGRAM SIZE = 5652
STATISTICS NO DIAGNOSTICS GENERATED

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0001      SURROUTINE CPMPRO
C
C      CRITICAL PATH METHOD PROJECT COST PLOT COMPUTER PROGRAM.
C      DEVELOPED BY R.C. TENNENT
C      THIS PROGRAM USES AS INPUT THE TAPE WRITTEN BY THE CPM CALENDAR
C      DATING PROGRAM.
0002      COMMON ICAL(1860),INFO(54),IPRINT(120),IDUR(675),IES(675),IEF(6750),I54000
1          ,ILS(675),ILF(675),IACD(8),IRESU(54,9),IRES(7),IPRONO(13),O1155000
2          ,JPRONO(13),IDENT(17)
0003      COMMON IBCY,IMORK,IERROR,ISTMON,ISTDAY,ISTYR,IYR,IMON,IDAY,IPROG,
1          ,IDOP,ICAL,IDECS,NORES,IX1,IX2,IX3,ITOMON,ITODAY,ITOYR,IX,
2          ,IZ,MAX
0004      COMMON /DATES/MONDAY(12),MONTHS(12),KONST(10),IDECPY,KBLANK,KONI
1          ,SYSIN,YSOT,SYSPN,SSWF1,SSWF2,WKFL1,WKFL2,WKFL3
0005      INTEGER SYSIN,YSOT,SYSPN,SSWF1,SSWF2,WKFL1,WKFL2,WKFL3
0006      DIMENSION IVTHD(24),IWEND(100),ICOAC(100)
0007      EQUIVALENCE (IWEND(1),IES(1)),(ICOAC(1),IEF(1))
0008      DATA IVTHD/1HP,1H ,1HR,1H ,1HO,1H ,1HJ,1H ,1HE,1H ,1HC,1H ,1HT,
1          ,1H ,1H ,1H ,1HS,1H ,1HO,1H ,1HS,1H ,1HT,1H /
0009      REWIND WKFL2
C
C      ZERO WEEK ENDING AND COST ACCUMULATION ARRAYS
0010      DO 100 IX1 = 1,100
0011      IWEND(IX1) = 0
0012      ICOAC(IX1) = 0
0013      IYR = IYR
0014      MAX = 0
0015      IERROR = 0
0016      105 IF ( IYR - IBCY ) 110,115,115
0017      110 WRITE(YSOT,270)
0018      IERROR = 1
0019      REWIND WKFL2
0020      RETURN
0021      115 ISTART = (ISTYR-IBCY)*372 + (ISTMON-1)*31 + ISTDAY
C
C      BUILD ARRAY OF DATES CORRESPONDING TO THE ENDING DAY OF THE WEEK
0022      IX1 = 1
0023      DO 120 IX3 = ISTART,1860
C
C      CHECK CALENDAR TABLE FOR A SUNDAY&END OF A WEEK<
0024      IF ( ICAL(IX3) .NE. 4 ) GO TO 120
0025      IWEND(IX1) = IX3
0026      IX1 = IX1 + 1
0027      IF ( IX1 .GT. 100 ) GO TO 125
0028      120 CONTINUE
C
C      PROCESS NETWORK IDENTIFICATION
0029      READ(WKFL2)IDENT
0030      WRITE(YSOT,275)IDENT
C

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0031 C 130 READ(WKFL2)
      C 1 I,J,JOUR,ACOST,IACTD,IDOP,IESMON,IESDAY,IESYR,IEFMON,IEFDO 01201000
      C 1 AY,IEFYR,ILSMON,ILSUAY,ILSYR,ILFMON,ILFDAY,ILFYR,ITF,IRE 01202000
      C 01203000
      C 01204000
      C 01205000
      C 01206000
      C 01207000
      C 01208000
      C 01209000
      C 01210000
      C 01211000
      C 01212000
      C 01213000
      C 01214000
      C 01215000
      C 01216000
      C 01217000
      C 01218000
      C 01219000
      C 01220000
      C 01221000
      C 01222000
      C 01223000
      C 01224000
      C 01225000
      C 01226000
      C 01227000
      C 01228000
      C 01228100
      C 01228200
      C 01228300
      C 01228400
      C 01229000
      C 01230000
      C 01231000
      C 01232000
      C 01233000
      C 01234000
      C 01235000
      C 01236000
      C 01237000
      C 01238000
      C 01239000
      C 01240000
      C 01241000
      C 01242000
      C 01243000
      C 01244000
      C 01245000
      C 01246000
      C 01247000
      C 01248000
      C 01249000
      C 01250000

      C IF ( I .LT. 0 ) GO TO 135
      C 135 IF ( IEFYR - IBCY ) 110,140,140
      C 140 IDATE = (IEFYR-IBCY)*372 + (IEFMON-1)*31 + IEFDAY
      C 00 145 IX2 = 1,100
      C IF ( IDATE .LE. IWEND(IX2) ) GO TO 150
      C 145 CONTINUE

      C C ACCUMULATE ACTIVITY COST TO THE PROPER WEEK ENDING
      C 150 IC0AC(IX2) = IC0AC(IX2) + IFIX(ACOST)

      C C CHECK FOR LATEST WEEK A COST IS ACCUMULATED
      C IF ( MAX .LT. IX2 ) MAX = IX2
      C GO TO 130
      C 155 DO 160 IX1 = 2,MAX
      C 160 IC0AC(IX1) = IC0AC(IX1-1) + IC0AC(IX1)

      C C ENTRY FOR MULTI-PROJECT PLOT
      C C ENTRY CPMPRO
      C C ALL ACTIVITY COSTS HAVE BEEN ACCUMULATED. PLOT THE RESULTING
      C C ACCUMULATIONS.
      C IHSCAL = 120 / MAX
      C INCVER=IC0AC(MAX) / 50
      C IYCOOR=INCVER*51
      C LINES = 1
      C ICOUNT = 4
      C IX2 = MAX
      C IX4 = 1
      C CALL BLANK
      C GO TO 170
      C 165 IYCOOR = IYCOOR - INCVER
      C 170 ISW1 = 1
      C IF ( IC0AC(IX2) .GE. IYCOOR-INCVER/2 ) GO TO 175
      C ISW1 = 0
      C GO TO 180
      C 175 IXCOOR = IX2 + IHSCAL
      C IPRINT(IXCOOR) = IUECPT
      C IWEND(IX2) = IXCOOR + 10000 + IWEND(IX2)
      C IF ( IX2 .EQ. 1 ) GO TO 180
  
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0062 C CPM MASTER TAPE FILE AND CREATING AN UPDATED CPM MASTER FILE. 01251000
0063 IF ( ICOAC(IX2-1) .LT. IYCOOR-INCVER/2 ) GO TO 180 01252000
0064 IX2 = IX2 - 1 01253000
GO TO 175 01254000
01255000
0065 C CHECK IF NECESSARY TO PRINT VERTICAL SCALE 01256000
0066 180 IF ( LINES.EQ. ICOUNT ) GO TO 185 01257000
0067 IPRSW = 1 01258000
0068 IF ( LINES.GE.16 .AND. LINES.LE.39 ) IPRSW = 2 01259000
0069 GO TO 190 01260000
0070 185 ICOUNT = ICOUNT + 6 01261000
0071 IPRSW = 3 01262000
0072 IF ( LINES.GE.16 .AND. LINES.LE.39 ) IPRSW = 4 01263000
01264000
01265000
01266000
01267000
01268000
01269000
01270000
01271000
01272000
01273000
01274000
01275000
01276000
01277000
01278000
01279000
01280000
01281000
01282000
01283000
01284000
01285000
01286000
01287000
01288000
01289000
01290000
01291000
01292000
01293000
01294000
01295000
01296000
01297000
01298000
01299000
01300000
01301000
01302000
01303000
01304000

0073 C BRANCH TO SELECTED PRINT FORMAT
0074 GO TO (195,200,205,210,215,220,225,230),IPRSW
0075 WRITE(SYSOT,280)
0076 GO TO 240
0077 200 WRITE(SYSOT,280) IVTHD(IX4),KBLANK
0078 GO TO 235
0079 205 WRITE(SYSOT,285) K-LANK,IYCOOR
0080 GO TO 240
0081 210 WRITE(SYSOT,285) IVTHD(IX4),IYCOOR
0082 GO TO 235
0083 215 WRITE(SYSOT,280) KHLANK,KBLANK,IPRINT
0084 GO TO 240
0085 220 WRITE(SYSOT,280) IVTHD(IX4),KBLANK,IPRINT
0086 GO TO 235
0087 225 WRITE(SYSOT,285) KHLANK,IYCOOR,IPRINT
0088 GO TO 240
0089 230 WRITE(SYSOT,285) IVTHD(IX4),IYCOOR,IPRINT
0090 235 IX4 = IX4 + 1
0091 CALL BLANK
0092 IF ( ISW1.EQ. 0 ) GO TO 165
0093 IX2 = IX2 - 1
0094 IF ( IX2.GE. 1 ) GO TO 165
0095 IF ( LINES.GT. 52 ) GO TO 250
0096 ISW1 = 1
0097 IYCOOR = IYCOOR - INCVER
0098 GO TO 180

0099 C DEVELOP AND PRINT HORIZONTAL SCALE
0100 250 DO 255 IX2 = 1,MAX
0101 IX1 = IEND(IX2) / 10000
0102 IPRINT(IX1) = KONJ
0103 WRITE(SYSOT,280) KHLANK,KBLANK,IPRINT
0104 CALL BLANK
0105 IX1 = 1
IF ( IHSCAL.LT. 8 ) IX1 = 4

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0106 DO 260 IX2 = 1*MAX,IX1
0107 IDAY = IEND(IX2) - IEND(IX2)/10000*10000
0108 CALL DATE
0109 IWFND(IX2) = IEND(IX2)/10000*10000 + IDAY
0110 MONTH = MONTHS(IMON)
0111 CALL COMON(MONTH,LETR1,LETR2,LETR3)
0112 IXCOOR = IEND(IX2)/10000
0113 IPRINT(IXCOOR) = LETR1
0114 IPRINT(IXCOOR+1) = LETR2
0115 IPRINT(IXCOOR+2) = LETR3
0116 CONTINUE
0117 WRITE(SYSOT,280) KBLANK,KBLANK,IPRINT
0118 CALL BLANK
0119 IX10 = IX1
0120 DO 265 IX2 = 1*MAX,IX10
0121 IXCOOR = IEND(IX2)/10000
0122 IDAY = IEND(IX2) - IXCOOR*10000
0123 IX1 = IDAY/10
0124 IF ( IX1 .EQ. 0 ) IX1 = 10
0125 IPRINT(IXCOOR) = KONST(IX1)
0126 IX1 = IDAY - IDAY/10*10
0127 IF ( IX1 .EQ. 0 ) IX1 = 10
0128 IPRINT(IXCOOR+1) = KONST(IX1)
0129 CONTINUE
0130 WRITE(SYSOT,280) KBLANK,KBLANK,IPRINT
0131 WRITE(SYSOT,290)
0132 REWIND WKFL2
0133 RETURN
C
C INPUT AND OUTPUT FORMATS
C
0134 270 FORMAT ( 33H1 STARTING DATE PRECEDES CALENDAR )
0135 275 FORMAT ( 1H1,17A4 )
0136 280 FORMAT ( 1X,A1,2X,A4,2X,120A1 )
0137 285 FORMAT ( 1X,A1,17,2X,120A1 )
0138 290 FORMAT ( / 50X,19HF0K THE WEEK ENDING )
0139 ENH
01305000
01306000
01307000
01308000
01309000
01310000
01311000
01312000
01313000
01314000
01315000
01316000
01317000
01318000
01319000
01320000
01321000
01322000
01323000
01324000
01325000
01326000
01327000
01328000
01329000
01330000
01331000
01332000
01333000
01334000
01335000
01336000
01337000
01338000
01339000
01340000
01341000

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SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
ICALT	0	INFO	1D10	IPRINT	5D60	IDUR	IFC8	IES	2A54
IWEND	2454	IEF	34E0	ICOAC	34E0	ILS	3F6C	ILF	49F8
IACD	5484	IRESU	5444	IRES	5C3C	IPRONO	5C58	JPROND	5C8C
IDENT	5CC0	IHCY	5D04	IWORK	5D08	IERROR	5D0C	ISTMON	5D10
ISTDAY	5D14	ISTYR	5D18	IYR	5D1C	IMON	5D20	IDAY	5D24
IPROG	5D28	IDUP	5D2C	ICAL	5D30	IDECIS	5D34	NORES	5D38
IX1	5D3C	IX2	5D40	IX3	5D44	ITOMON	5D48	ITODAY	5D4C
ITOYR	5D50	IX	5D54	IZ	5D58	MAX	5D5C		
COMMON BLOCK / MAP SIZE									
SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
MONDAY	0	MONTHS	30	KONST	60	IDECEPT	88	KBLANK	8C
KONI	90	SYSIN	94	SYST	98	SYSPN	9C	SSWF1	A0
SSWF2	A4	WKFL1	A8	WKFL2	AC	WKFL3	B0		
COMMON BLOCK / DATES / MAP SIZE B4									
SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IBCOM#	1FC	BLANK	200	UATE	204	COBMON	208		
SUBPROGRAMS CALLED									
SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
ISTART	220	I	224	J	228	JIDUR	22C	ACOST	230
IESMON	234	IESDAY	238	IESYR	23C	IEFMON	240	IEFDAY	244
IEFYR	248	ILSMON	24C	ILSDAY	250	ILSYR	254	ILFMON	258
ILFDAY	25C	ILFYR	260	ITF	264	IDATE	268	IHSCAL	26C
INCVR	270	IYCOOR	274	LINES	278	ICOUNT	27C	IX4	280
ISW1	284	IXCOOR	288	IPRSW	28C	MONTH	290	LETRI	294
LETR2	298	LETR3	29C	IX10	2A0				
SCALAR MAP									
SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IVTHD	2A4								
ARRAY MAP									
SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
270	304	275	329	280	332	285	342	290	350
FORMAT STATEMENT MAP									

OPTIONS IN EFFECT NOID,BCU,SOURCE,NOLIST,NODECK,LOAD,MAP
 OPTIONS IN EFFECT NAME = CPMPRO * LINECNT = 56
 STATISTICS SOURCE STATEMENTS = 139,PROGRAM SIZE = 3884
 STATISTICS NO DIAGNOSTICS GENERATED

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0001      C      SUBROUTINE CPMCRI
0002      C      CRITICAL PATH METHOD CRITICAL ACTIVITIES LISTING PROGRAM.
0003      C      DEVELOPED BY R.C. TENNENT
0004      C      THIS PROGRAM TABULATES THE CRITICAL ACTIVITIES ON A PROJECT
0005      C      BASED ON THE CALENDAR DATED NETWORK
0006      C
0007      C      COMMON ICALT(1860),INFO(54),IPRINT(120),IDUR(675),IES(675),IEF(6750)
0008      C      1,ILS(675),ILF(675),IACTD(8),IHESU(54*9),IRES(7),IPRONO(13),
0009      C      2,JKONO(13),IJEENT(17)
0010      C      COMMON IBCY,IWORK,IERROR,ISTMON,ISTDAY,ISTYR,IYR,IMON,IDAY,IPROG,
0011      C      1 IDOP,ICAL,IDECEIS,NURES,IX1,IX2,IX3,ITOMON,ITODAY,ITOYR,IX,
0012      C      2 IZ
0013      C      COMMON /DATES/MONDAY(12),MONTHS(12),KONST(10),IDECPT,KBLANK,KON1
0014      C      1,SYSPN,YSOT,SYSPN,SSWF1,SSWF2,WKFL1,WKFL2,WKFL3
0015      C      INTEGER SYSIN,YSOT,SYSPN,SSWF1,SSWF2,WKFL1,WKFL2,WKFL3
0016      C      REWIND WKFL2
0017      C
0018      C      PROCESS NETWORK IDENTIFICATION
0019      C
0020      C      READ(WKFL2) IJEENT
0021      C      WRITE(YSOT,120) IJEENT
0022      C      WRITE(YSOT,125) ITOMON,ITODAY,ITOYR
0023      C      LINES = 0
0024      C
0025      C      PROCESS ACTIVITY RECORDS, ONE AT A TIME
0026      C
0027      C      105 READ(WKFL2)
0028      C      1 I,J,JJUR,4COST,IACTD,IDOP,IESMON,IESDAY,IESYR,IEFMON,IEFDD01369000
0029      C      1 AY,IEFYR,ILSMON,ILSDAY,ILSYR,ILFMON,ILFDAY,ILFYR,ITF, IRES
0030      C
0031      C      CHECK FOR END OF NETWORK
0032      C
0033      C      IF ( I .LT. 0 ) GO TO 110
0034      C
0035      C      CHECK FOR DUMMY ACTIVITY
0036      C
0037      C      IF ( JJUR .EQ. 0 ) GO TO 105
0038      C
0039      C      CHECK FOR CRITICAL ACTIVITY
0040      C
0041      C      IF ( IIF .GT. 0 ) GO TO 105
0042      C
0043      C      LIST CRITICAL ACTIVITIES
0044      C
0045      C      WRITE(YSOT,130)
0046      C      1 I,J,JJUR,4COST,IACTD,IDOP,IESMON,IESDAY,IESYR,IEFMON,IEFDD01387000
0047      C      1 IEFDAY,IEFYR,ILSMON,ILSDAY,ILSYR,ILFMON,ILFDAY,ILFYR,ITF, IRES
0048      C      LINES = LINES + 1
0049      C      IF ( LINES .GT. 50 ) GO TO 100
0050      C      GO TO 105
0051      C
0052      C      TABULATE RESOURCE DESCRIPTIONS
0053      C
0054      C
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0019      110 WRITE (SYSOT,120) IUFNT
0020      WRITE (SYSOT,135)
0021      DO 115 K = 1,NODES
0022      115 WRITE (SYSOT,140) (IPESJ(K,IX1),IX1=1,9)
0023      REWIND WKFL2
0024      RETURN
C
C      INPUT AND OUTPUT FORMATS
C
0025      120 FORMAT ( 1H1,17A4 )
0026      125 FORMAT ( 1H0,4IX,49HC R I T I C A L A C T I V I T I E S L I 1405000
*          11IX,14HDATE OF REPORT,14,2(1H/,12) /
          11IX,8HRESOURCE / 3X,2(8HACTIVITY,4X) ,
          23X,20HACTIVITY DESCRIPTION,9X,4HWORK,7X,8HEARLIEST,15X,6HLATEST,
          38X,24HTOTAL FUNC TYPES REQD/4X,1H1,4X,1HJ,4X,10HDUR COST,35X,01409000
          44HPT.,2(122H ST ART FINISH ), 24HFLOAT AREA 1 2 3 4 5 6 )01410000
0027      130 FORMAT ( 2I5,I6,F8.0,3X,7A4,A2,I4,2(2X,12,1H/,12),I6,01411000
          I 16,2X,6I2 )
          01412000
0028      135 FORMAT ( 20H0 FUNC RESOURCE,24X,8HCOST/DAY / 13H AREA CODE01413000
          I 13H DESCRIPTION,22X,1H$ )
          01414000
0029      140 FORMAT ( 2I6,3X,6A4,I10 )
0030      END
          01415000
          01416000

```

SYMBOL	LOCATION	COMMON BLOCK /		MAP SIZE		SYMBOL	LOCATION	SYMBOL	LOCATION
		SYMBOL	LOCATION	SYMBOL	LOCATION				
ICALT	0	INFO	1010	IPRINT	10E8	IDUR	1FC8	IES	2A54
IEF	34E0	ILS	3F6C	ILF	49F8	IACFD	5484	IRESD	54A4
IRHS	5C3C	IPRONO	5C58	JPRONO	5C8C	IDENT	5C04	IBC	5D04
IRWPK	5008	LEKRROR	500C	ISTMON	5010	ISTDAY	5D14	ISTYR	5D18
IYR	5D1C	140N	5020	IDAY	5024	IPROG	5D28	IDOP	5D2C
ICAL	5D30	LUDECIS	5D34	NORES	5D38	IX1	5D3C	IX2	5D40
IX3	5D44	ITOMON	5D48	ITODAY	504C	ITOYR	5050	IX	5D54
IZ	5D58								

SYMBOL	LOCATION	COMMON BLOCK /DATES		MAP SIZE		SYMBOL	LOCATION	SYMBOL	LOCATION
		SYMBOL	LOCATION	SYMBOL	LOCATION				
MONDAY	0	MONTHS	30	KONST	60	IDECPT	88	KBLANK	8C
KON1	90	SYSIN	94	SYST	98	SYSPN	9C	SSWF1	A0
SSWF2	A4	WKFL1	98	WKFL2	AC	WKFL3	B0		

SYMBOL	LOCATION	SUBPROGRAMS CALLED		SYMBOL	LOCATION	SYMBOL	LOCATION
		SYMBOL	LOCATION				
INCOM#	U3						

SYMBOL	LOCATION	SCALAR MAP		SYMBOL	LOCATION	SYMBOL	LOCATION
		SYMBOL	LOCATION				
INES	DC	J	E4	JDUR	E8	ACOST	EC
IES40N	F0	IESYR	F8	IEFMON	FC	IEFDAY	100
IEFYR	104	ILSDAY	10C	ILSYR	110	ILFMON	114
ILFDAY	118	ITF	120	K	124		

SYMBOL	LOCATION	FORMAT STATEMENT MAP		SYMBOL	LOCATION	SYMBOL	LOCATION
		SYMBOL	LOCATION				
120	128	125	131	130	250	135	285

OPTIONS IN EFFECT NOID,BCD,SOURCE,NOLIST,NODECK,LOAD,MAP
 OPTIONS IN EFFECT NAME = CPMCRI , LINECNT = 56
 STATISTICS SOURCE STATEMENTS = 30, PROGRAM SIZE = 1628
 STATISTICS NO DIAGNOSTICS GENERATED


```

C CHECK FOR LAST ACTIVITY OF NETWORK
C
0032 IF ( IPRINT(1) .GE. 0 ) GO TO 130
C
C RFAD RESOURCE INFORMATION AND ADD TO THE MASTER FILE
C
140 READ(WKFL2) IRESD
WRITE(SSWF2) IRESD
C
C COPY EXISTING SCHEDULES FROM OLD MASTER TO NEW MASTER
C
145 WRITE (SSWF2) IPRONO
C
C CHECK FOR DUMMY END OF FILE PROJECT NO.
C
IF ( IPRONO(1) .EQ. 999999 ) GO TO 170
150 READ(SSWF1,END=153) IDENT
153 IF ( ISW .EQ. 1 ) GO TO 154
WRITE(SSWF2) IDENT
154 READ (SSWF1,END=156) ISIMON,ISTDAY,ISTYR
156 IF ( ISW .EQ. 1 ) GO TO 155
WRITE (SSWF2) ISIMON,ISTDAY,ISTYR
155 READ(SSWF1,END=154) ( IPRINT(IX2), IX2=1,50)
158 IF ( ISW .EQ. 1 ) GO TO 160
WRITE(SSWF2) ( IPRINT(IX2), IX2=1,50)
160 IF ( IPRINT(1) .GE. 0 ) GO TO 155
165 READ(SSWF1,END=168) IRESD
168 IF ( ISW .EQ. 1 ) GO TO 100
WRITE(SSWF2) IRESD
GO TO 100
C
C END OF RUN OPERATION.
C
170 END FILE SSWF2
C
C COPY DATA BACK ONTO MASTER FILE
C
REWIND SSWF1
REWIND SSWF2
SSWF1 = 5
SSWF2 = 6
175 READ (SSWF1,END = 190) IPRONO
WRITE (SSWF2) IPRONO
IF ( IPRONO(1) .EQ. 999999 ) GO TO 190
READ (SSWF1) IDENT
WRITE (SSWF2) IDENT
READ (SSWF1) ISIMON,ISTDAY,ISTYR
WRITE (SSWF2) ISIMON,ISTDAY,ISTYR
180 READ (SSWF1) ( IPRINT(IX2), IX2 = 1,50)
WRITE (SSWF2) ( IPRINT(IX2), IX2 = 1,50)
IF ( IPRINT(1) .GE. 0 ) GO TO 180
READ (SSWF1) IRESD
WRITE (SSWF2) IRESD
GO TO 175
0051
0052
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0055
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0060
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0065
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0067
0068

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0069      190 CONTINUE
0070      END FILE SSWF2
0071      REWIND SSWF1
0072      REWIND SSWF2
0073      REWIND WKFL2
0074      RETURN
0075      193 FORMAT ( A4,15X,16,12A4)
0076      195 FORMAT ( 62H1 SCHEDULE TO BE DELETED IS NOT ON FILE, CHECK PROJEC01530000
          1T NUMBER )
0077      200 FORMAT (51H1 SCHEDULE TO BE RESERVED IS ALREADY ON MASTER FILE
          1 13A4)
0078      END
```

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01528510
01528600
01528700
01528800
01528810
01528900
01529000
01531000
01531100
01531200
01532000
```

SYMBOL	LOCATION	COMMON BLOCK /		/ MAP SIZE		SD5C	SYMBOL	LOCATION	SYMBOL	LOCATION
		LOCATION	SYMBOL	LOCATION	SYMBOL					
ICALT	0	INFO	ID10	IPRINT	IDER		IDUR	IFC8	IES	2A54
IEF	34E0	ILS	3F6C	ILF	49F8		IACFD	5484	IRESD	54A4
IRCS	5C3C	IPRONO	5C58	JPRONO	5C8C		IDENT	5C00	IBCY	5004
IWORK	5008	IERRR	500C	ISTMON	5010		ISTUAY	5D14	ISTYR	5D18
IYR	5D1C	IMON	5D20	IDAY	5D24		IPR0G	5D28	IDOP	5D2C
ICAL	5D30	IDECIS	5D34	NORES	5D38		IX1	5D3C	IX2	5D40
IX3	5D44	ITOMON	5D48	ITOUAY	5D4C		IX	5D50	IX	5D54
IZ	5D58									

SYMBOL	LOCATION	COMMON BLOCK /DATES		/ MAP SIZE		H4	SYMBOL	LOCATION	SYMBOL	LOCATION
		LOCATION	SYMBOL	LOCATION	SYMBOL					
MONDAY	0	MONTHS	30	KONST	60		IDECPT	88	KBLANK	8C
KONI	90	SYSIN	94	SYSOT	98		SYSFN	9C	SSWF1	A0
SSWF2	A4	WKFL1	A8	WKFL2	AC		WKFL3	B0		

SYMBOL	LOCATION	SUBPROGRAMS CALLED		SYMBOL	LOCATION	SYMBOL	LOCATION
		LOCATION	SYMBOL				
IHCJM#	170						

SYMBOL	LOCATION	SCALAR MAP		SYMBOL	LOCATION	SYMBOL	LOCATION
		LOCATION	SYMBOL				
IENWF	174	IS#	178	ISW1	17C		

SYMBOL	LOCATION	FORMAT STATEMENT MAP		SYMBOL	LOCATION	SYMBOL	LOCATION
		LOCATION	SYMBOL				
193	180	195	19C	200	1CE		

OPTIONS IN EFFECT NOIU,SDU,SOURCE,NOLIST,NOCHECK,LOAD,MAP
 OPTIONS IN EFFECT NAME = CPMRED * LINECNT = 56
 STATISTICS SOURCE STATEMENTS = 78,PROGRAM SIZE = 2412
 STATISTICS NO DIAGNOSTICS GENERATED

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0001      SUBROUTINE CPMUPD(ISW9)
C
C      CRITICAL PATH METHOD ACTIVITY UPDATE COMPUTER PROGRAM.
C      DEVELOPED BY R.C. TENNETT
C      THIS PROGRAM TAKES INFORMATION ON THE ACTIVITIES OF A SCHEDULE
C      AND UPDATES THE CPM MASTER FILE.
C
COMMON ICALT(1660),INFO(54),IPRINT(120),IDUR(675),IES(675),IEF(675)
1  ),ILS(675),ILF(675),IACTD(8),IRESU(54,9),IRES(7),IPRONO(13),
2  JPRONO(13),IDENT(17)
COMMON IBCY,IWORK,IERRUR,ISTMON,ISTDAY,ISTYR,IYR,IMON,IDAY,IPROG,
1  IDOP,ICAL,IDECIS,NORES,IX1,IX2,IX3,ITOMON,ITODAY,ITOTYR,IX,
2  IZ
COMMON /DATES/MONDAY(12),MONTHS(12),KONST(10),IDECPT,KHLANK,KONI
1  ,SYSIN,YSOT,SYSPN,SSWF1,SSWF2,WKFL1,WKFL2,WKFL3
INTEGER SYSIN,YSOT,SYSPN,SSWF1,SSWF2,WKFL1,WKFL2,WKFL3
DIMENSION IUPDI(9)
EQUIVALENCE (ITAIL,IPRINT(1)),(IHEAD,IPRINT(2)),(JOUR,IPRINT(3)),
1  (ACOST,IPRINT(4))
EQUIVALENCE (IESMON,IPRINT(14)),(IESDAY,IPRINT(15)),(IESYR,IPRINT(1552000
1  16)),(ILSMON,IPRINT(20)),(ILSDAY,IPRINT(21)),(ILSYR,IPRINT(22)),
1  (IEFMON,IPRINT(17)),(IEFDAY,IPRINT(18)),(IEFYR,IPRINT(19)),
2  (ILFMON,IPRINT(23)),(ILFDAY,IPRINT(24)),(ILFYR,IPRINT(25)),
3  (ILF,IPRINT(26)),(IASMON,IPRINT(34)),(IASDAY,IPRINT(35)),
4  (IASYR,IPRINT(36)),(IAFMON,IPRINT(37)),(IAFDAY,IPRINT(38)),
5  (IAFYR,IPRINT(39)),(ICRIT,IPRINT(100))
EQUIVALENCE (JTAIL,INFO(1)),(JHEAD,INFO(2))
DATA IUPDI/4HSTAR,4HCOMP,4HCOST,4HWORK,4HDURA,4HDELE,4HADD
1  ,4HEND /,4DUMMY/4HJUMMI/
SSWF1 = 6
SSWF2 = 5
REWIND SSWF1
REWIND SSWF2
REWIND WKFL3
READ (WKFL3,236) IPRONO,JPRONO
ISW = 0
MATCH = 0
1 READ (SSWF1,END = 245) IPRONO
C      IF (JPRONO(1) - IPRONO(1)) 35,40,11
C
C      IF ISW EQUALS 1 DELETE SCHEDULE
C      IF ISW EQUALS 0 COPY OLD SCHEDULE ONTO NEW MASTER FILE
C
11 IF (ISW .EQ. 1) GO TO 12
WRITE (SSWF2) IPRONO
12 READ (SSWF1) IDENT
IF (ISW .EQ. 1) GO TO 13
WRITE (SSWF2) IDENT
13 READ (SSWF1) ISTMON,ISTDAY,ISTYR
IF (ISW .EQ. 1) GO TO 14
WRITE (SSWF2) ISTMON,ISTDAY,ISTYR
14 READ (SSWF1) (IPRINT(IX2),IX2= 1,50)
IF (ISW .EQ. 1) GO TO 16
0002
0003
0004
0005
0006
0007
0008
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0021
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0029
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0031

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0032 WRITE (SSWF2) (IPRINT(IX2),IX2 = 1,50)
0033 IF (IPRINT(1) .GE. 0) GO TO 14
0034 READ (SSWF1) IRESD
0035 IF (ISW .EQ. 1) GO TO 1
0036 WRITE (SSWF2) IRESD
0037 GO TO 1
C
C CHECK FOR END OF FILE
C
C
0038 35 IF (IPRONO(1) .EQ. 999999) GO TO 245
0039 GO TO 11
C
C CHECK FOR MATCH FOR UPDATING OR DELETING SCHEDULE
C
C
0040 DO 45 IX1 = 2,9
0041 IF (JPRONO(IX1) .NE. IPRONO(IX1)) GO TO 310
0042 CONTINUE
0043 MATCH = 1
0044 IF (ISWY .EQ. -1) GO TO 50
0045 GO TO 99
C
C SET SWITCH TO DELETE SCHEDULE
C
C
0046 50 ISW = 1
0047 GO TO 11
C
C PROCESS NETWORK IDENTIFICATION
C
C
0048 99 WRITE (SSWF2) JPRONO
0049 READ (SSWF1) IDENT
0050 WRITE (SSWF2) IDENT
0051 IERROR = 0
0052 ISW1 = 0
0053 ISW2 = 0
0054 ISW3 = 0
0055 100 IF ( ISW1 .GT. 0 ) GO TO 105
C
C READ ACTIVITY RECORD FROM THE CPM MASTER FILE
C
C
0056 READ (SSWF1) (IPRINT(IX2),IX2=1,50)
0057 IF ( JOUR .EQ. 0 ) GO TO 125
0058 IF ( ISW2 .GT. 0 ) GO TO 115
C
C READ UPDATE ACTIVITY CARD
C
C
0059 READ (SYSIN,215) IACTIN
0060 WRITE (WKFL3,215) IACTIN
0061 REWINO WKFL3
0062 DO 10 IX9=1,9
0063 IF ( IACTIN .EQ. IUPUT(IX9) ) GO TO 15
10 CONTINUE
15 IF (IX9 .EQ. 9) GO TO 20
CALL DECODE
GO TO 30

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0068      20 CALL DECOD
C
C      DETERMINE TYPE OF UPDATE ACTION
C
0069      30 DO 110 IX9 = 1,9
0070      IF ( IACTIM .EQ. IUPDT(IX9) ) GO TO 115
0071      110 CONTINUE
0072      WRITE(SYSOUT,230)
0073      WRITE(SYSOUT,215) IACTIM
0074      GO TO 105
C
C      CHECK FOR END OF UPDATE CARDS
C
0075      115 IF ( IX9 .EQ. 9 ) GO TO 120
C
C      COMPARE ACTIVITY TO BE UPDATED WITH CURRENT ACTIVITY FROM FILE
C
0076      IF ( JTAIL.EQ.ITAIL .AND. JHEAD.EQ.IHEAD ) GO TO 145
0077      120 ISW2 = 1
0078      125 IF ( ISW3 .GT. 0 ) GO TO 135
C
C      WRITE UPDATED ACTIVITY RECORD
C
0079      130 WRITE(SSWF2) (PRINTIIA2),IA2=1,50)
C
C      CHECK IF LAST RECORD OF NETWORK
C
0080      IF ( ITAIL .LT. 0 ) GO TO 205
0081      IF ( IX9 .EQ. 8 ) ISW3 = 1
0082      GO TO 100
0083      135 IF ( JTAIL - ITAIL ) 195,140,130
0084      140 IF ( JHEAD - IHEAD ) 195,200,130
C
C      BRANCH TO DESIRED UPDATE ROUTINE
C
0085      145 ISW2 = 0
0086      GO TO (150,155,160,165,175,180,185,195,200),IX9
C
C      ADD ACTIVITY STARTING DATE TO THE FILE
C
0087      150 IASMON = INFO(3)
0088      IASDAY = INFO(4)
0089      IASYR = INFO(5)
0090      GO TO 105
C
C      ADD ACTIVITY COMPLETION DATE TO THE FILE
C
0091      155 IAFMON = INFO(3)
0092      IAFDAY = INFO(4)
0093      IAFYR = INFO(5)
0094      IACOST = INFO(6)
0095      GO TO 105
C
C      CHANGE ACTIVITY COST IN THE FILE

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0096 C 160 ACOST = INFO(3) 01645000
0097 C GO TO 105 01646000
C 01647000
C 01648000
C 01649000
C 01650000
0098 C 165 DO 170 IX1 = 3,9 01651000
0099 C 170 IPRINT(IX1+24) = INFO(IX1) 01652000
0100 C GO TO 105 01653000
C 01654000
C 01655000
C 01656000
0101 C 175 IPRINT(10) = INFO(3) 01657000
0102 C GO TO 105 01658000
C 01659000
C 01660000
C 01661000
C 01662000
C 01663000
C 01664000
C 01665000
C 01666000
C 01667000
0105 C 185 JDJ/R = 0 01668000
0106 C DO 190 IX1 = 6,9 01669000
0107 C IPRINT(IX1) = KBLANK 01670000
0108 C IPRINT(5) = IDUMMY 01671000
0109 C GO TO 105 01672000
C 01673000
C 01674000
C 01675000
C 01676000
0110 C 195 BACKSPACE SSWF1 01677000
0111 C READ(WKFL3,225,END=196) (IPRINT(IX1),IX1=1,13),(IPRINT(IX1),IX1=27,33)
C 01678000
0112 C 196 REWIND WKFL3 01679000
0113 C ISW2 = 0 01680000
0114 C ISW3 = 0 01681000
0115 C GO TO 105 01682000
C 01683000
C 01684000
C 01685000
C 01686000
C 01687000
C 01688000
C 01689000
C 01690000
C 01691000
C 01692000
C 01693000
C 01693010
C 01693020
C 01693030
C 01693040
C 01693045
C 200 IEPROK = 1
C WRITE(SYSOT,220) JTAL,JHEAD
C RETURN
C 205 END OF NETWORK. PROCESS RESOURCE DESCRIPTIONS.
C 205 READ(SSWF1) IRESU
C 205 WRITE(SSWF2) IRESU
C GO TO 1
C 245 WRITE (SSWF2) IPRNO
C END FILE SSWF2
C REWIND SSWF1
C REWIND SSWF2
C REWIND WKFL3

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0127 SSWF1 = 5
0128 SSWF2 = 6

C
C COPY UPDATED DATA BACK ONTO MASTER FILE
C
250 READ (SSWF1,END = 300) IPRONO
    WRITE (SSWF2) IPRONO
    IF (IPRONO(1).EQ. 999999) GO TO 300
    READ (SSWF1) IDENT
    WRITE (SSWF2) IDENT
    READ (SSWF1) ISTMON,ISTDAY,ISTYR
    WRITE (SSWF2) ISTMON,ISTDAY,ISTYR
255 READ (SSWF1) (IPRINT(IX2),IX2=1,50)
    WRITE (SSWF2) (IPRINT(IX2),IX2=1,50)
    IF (IPRINT(1).GE. 0) GO TO 255
    READ (SSWF1) IRESD
    WRITE (SSWF2) IRESD
    GO TO 250
300 END FILE SSWF2
    REWIND SSWF1
    REWIND SSWF2
    IF (MATCH.EQ. 0) WRITE (SYSOT,235)
    RETURN
310 IERROR = 1
    WRITE (SYSOT,235) JPRONO
    GO TO 11

C
C INPUT FORMATS
C
215 FORMAT ( A4,73H
1
220 FORMAT ( 22H0 ADDED ACTIVITY NOS. ,I4,I4,I4,29H DUPLICATES EXIST)
225 FORMAT ( 19X,3I4,F8.0,7A4,A2,8I1 )
230 FORMAT ( 29H0 THIS UPDATE VERR IMPROPER )
235 FORMAT ( 73H1 SCHEDULE TO BE DELETED OR UPDATED IS NOT ON FILE, CH)
CHECK PROJECT NUMBER ,I3A4)
236 FORMAT (A4,I5X,I6,I2A4)
END
0150
0151
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0155
0156

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SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
ICALT	0	INFO	1D10	JTAIL	1D10	JHEAD	1D14
ITAIL	1DEB	IHEAD	1DEC	JOUR	1DF0	ACOST	1DF4
IESDAY	1E20	IESYR	1E24	IEFMON	1E28	IEFDAY	1E2C
ILSMON	1E34	ILSDAY	1E38	ILSYR	1E3C	ILFMON	1E40
ILFYR	1E48	ITF	1E4C	IASMON	1E6C	IASDAY	1E70
IAFMON	1E78	IAFDAY	1E7C	IAFYR	1E80	ICRIT	1F74
IES	2454	IEF	34E0	ILS	3F6C	ILF	49F8
IRESD	54A4	IRES	5C3C	IPRONO	5C58	JPRONO	5C8C
IHCY	5D04	IWORK	5D08	IERRDR	5D0C	ISTMON	5D10
ISTYR	5D18	IYR	5D1C	IMON	5D20	IDAY	5D24
IDOP	5D2C	ICAL	5D30	IDECIS	5D34	NORES	5D38
IX2	5D40	IX3	5D44	ITOMON	5D48	ITODAY	5D4C
IX	5D54	IX	5D58				

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
MONDAY	0	MONTHS	30	KONST	60	IDECP	88
KON1	90	SYSIN	94	YSOT	98	SYSFN	9C
SSWF2	44	WKFL1	48	WKFL2	AC	WKFL3	88

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IHCMP#	268	UECODE	26C	UECUD	270		

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IUMMY	274	ISW	278	MATCH	27C	ISW9	280
ISW2	288	ISW3	29C	IACTIN	290	IX9	294

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IUPJT	29C						

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
215	2C0	220	30F	225	34F	230	364
236	306					235	385

OPTIONS IN EFFECT NOID,RCD,SOURCE,NOLIST,NODECK,LOAD,MAP
 OPTIONS IN EFFECT NAME = CPMUPD , LINECNT = 56
 STATISTICS SOURCE STATEMENTS = 156,PROGRAM SIZE = 4046
 STATISTICS NO DIAGNOSTICS GENERATED

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0001      SURROUTINE CPMSTA(ISWL)
C
C      CRITICAL PATH METHOD STATUS REPORTS COMPUTER PROGRAM
C      DEVELOPED BY R.C. TENNENT
C      THIS PROGRAM IS USED TO PROVIDE A REPORT ON THE STATUS OF
C      EACH OF THE ACTIVITIES OF A CPM SCHEDULE.
C
COMMON ICALT(1860),INFU(54),IPRINT(120),IDUH(675),IFS(675),IEF(6750)171000
1      ),ILS(675),ILF(675),IACTD(8),IRESD(54,9),IRES(7),IPRONO(13)01705000
2      JPRONO(13),IVENT(17)01706000
0002      COMMON IBCY,IWORK,IERROR,ISTMON,ISTDAY,ISTYR,IYR,IMON,IDAY,IPROG,01707000
1      IDOP,ICAL,IDECIS,NORES,IX1,IX2,IX3,ITOMON,ITODAY,ITOYR,IX,01708000
2      IZ01709000
0003      COMMON /DATES/MONDAY(12),MONTHS(12),KONST(10),IODEPT,KBLANK,KONI01710000
1      ,SYSIN,YSOT,SYSPN,SSWF1,SSWF2,WKFL1,WKFL2,WKFL301717000
2      INTEGER SYSIN,YSOT,SYSPN,SSWF1,SSWF2,WKFL1,WKFL2,WKFL301718000
0004      DIMENSION MSG1(4),MSG2(4),MSG3(4),MSG4(4),MSG5(4),MSG6(4)01719000
0005      EQUIVALENCE (IESMON,IPRINT(14)),(IESDAY,IPRINT(15)),(IESYR,IPRINT(01720000
1      16)),(ILSMON,IPRINT(20)),(ILSDAY,IPRINT(21)),(ILSYR,IPRINT(22)01721000
2      ),(IEFMON,IPRINT(17)),(IEFDAY,IPRINT(18)),(IEFYR,IPRINT(19)01722000
0006      1 ),(ILFMON,IPRINT(23)),(ILFDAY,IPRINT(24)),(ILFYR,IPRINT(25)),01723000
2      ),(ITF,IPRINT(26)),(IASMON,IPRINT(34)),(IASDAY,IPRINT(35)),01724000
0007      3 (IASYR,IPRINT(36)),(IAFMON,IPRINT(37)),(IAFDAY,IPRINT(38)),01725000
4 (IAFYR,IPRINT(39)),(ICRIT,IPRINT(100)),(JOUR,IPRINT(3))01726000
0008      DATA MSG1/4HCOMP,4HLEI,4HD,4H /,MSG2/4HIN P,4HROGR,4HHESS,01727000
1      4H /,MSG3/4HPAST,4H EAR,4HLY F,4HIN. /,MSG4/4HDELA,4HYING,01728000
2      4H PRO,4HJECT/,MSG5/4HLATE,4H STA,4HRTIN,4HG /,MSG6/4HNOT,01729000
3      4HIN P,4HROGR,4HHESS /,NONST/3H***/,INEW/3HNEW/01730000
0009      REWIND SSWF101731000
C01732000
C01733000
C01734000
0010      CALL FIND SUBROUTINE , WHICH WILL LOCATE DESIRED PROJECT SCHEDULE01735000
0011      CALL FIND01736000
1      IF ( IERROR .EQ. 1 ) RETURN01737000
C01738000
C01739000
C01740000
0012      100 READ(SSWF1)IDENT01741000
0013      LINES = 5101742000
C01743000
C01744000
C01745000
C01746000
C01747000
0014      105 READ(SSWF1) (IPRINT(IX1),IX1=1,50)01748000
0015      IF ( IPRINT(1) .LT. 0 )GO TO 25501749000
0016      IF ( JOUR .EQ. 0 )GO TO 10501750000
0017      ICRIT = KBLANK01751000
C01752000
C01753000
C01754000
0018      CHECK ACTUAL STARTING DATE FOR A VALUE01755000
1      IF ( IASYR .GT. 0 )GO TO 18001756000
C01757000
C01758000
C01759000
C01760000
C01761000
C01762000
C01763000
C01764000
C01765000
C01766000
C01767000
C01768000
C01769000
C01770000
C01771000
C01772000
C01773000
C01774000
C01775000
C01776000
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C01782000
C01783000
C01784000
C01785000
C01786000
C01787000
C01788000
C01789000
C01790000
C01791000
C01792000
C01793000
C01794000
C01795000
C01796000
C01797000
C01798000
C01799000
C01800000

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0019      C      IF ( ITOYR - IESYR ) I20,I10,I135
0020      C      IF ( ITOMON - IESMON ) I20,I15,I135
0021      C      IF ( ITODAY - IESDAY ) I20,I20,I135
0022      C      IF ( ISW1 .EQ. 0 ) GO TO 125
0023      C      IF ( ITF .GT. 0 ) GO TO 105
0024      C      I25 DO 130 IX1 = 1,4
0025      C      I30 IPRINT(IX1+100) = MSG6(IX1)
0026      C      GO TO 230

0027      C      CHECK FOR CRITICAL ACTIVITY
0028      C
0029      C      I35 IF ( ITF .GT. 0 ) GO TO 155
0030      C      GO TO 145
0031      C      I40 IF ( ISW1 .EQ. 0 ) GO TO 145
0032      C      ICPIT = INEW
0033      C      I45 DO 150 IX1 = 1,4
0034      C      I50 IPRINT(IX1+100) = MSG4(IX1)
0035      C      GO TO 230

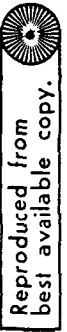
0036      C      COMPARE TODAY'S DATE WITH THE LATE START DATE
0037      C
0038      C      I55 IF ( ITOYR - ILSYR ) I70,I60,I40
0039      C      I60 IF ( ITOMON - ILSMON ) I70,I65,I40
0040      C      I65 IF ( ITODAY - ILSDAY ) I70,I70,I40
0041      C      I70 IF ( ISW1 .EQ. 1 ) GO TO 105
0042      C      DO 175 IX1 = 1,4
0043      C      I75 IPRINT(IX1+100) = MSG5(IX1)
0044      C      GO TO 230

0045      C      CHECK ACTUAL FINISH FOR A VALUE
0046      C
0047      C      I80 IF ( IAFYR .EQ. 0 ) GO TO 190
0048      C      IF ( ISW1 .EQ. 1 ) GO TO 105
0049      C      DO 185 IX1 = 1,4
0050      C      I85 IPRINT(IX1+100) = MSG1(IX1)
0051      C      GO TO 230

0052      C      COMPARE TODAY'S DATE WITH THE EARLY FINISH DATE
0053      C
0054      C      I90 IF ( ITOYR - IEFYR ) I205,I95,I220
0055      C      I95 IF ( ITOMON - IEFMON ) I205,I200,I220
0056      C      I200 IF ( ITODAY - IEFDAY ) I205,I205,I220
0057      C      I205 IF ( ISW1 .EQ. 0 ) GO TO 210
0058      C      IF ( ITF .GT. 0 ) GO TO 105
0059      C      I210 DO 215 IX1 = 1,4
0060      C      I215 IPRINT(IX1+100) = MSG2(IX1)
0061      C      GO TO 230

0062      C      CHECK FOR A CRITICAL ACTIVITY
0063      C
0064      C      I220 IF ( ITF .EQ. 0 ) GO TO 145
0065      C      IF ( ISW1 .EQ. 1 ) GO TO 105
0066      C      DO 225 IX1 = 1,4

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0057      225 IPPRINT(IX1+100) = MSG3(IX1)
C
C      PPINT HEADINGS IF NECESSARY AND STATUS OF THE ACTIVITY
C
0058      230 IF ( ISW1 .EQ. 1 ) GO TO 235
0059      IF ( IIF .EQ. 0 ) ICRIT = NONST
0060      235 IF ( LINES .LT. 50 ) GO TO 250
0061      WRITE(SYSOT,270) IDENT
0062      IF ( ISW1 .EQ. 1 ) GO TO 240
0063      WRITE(SYSOT,295)
0064      GO TO 245
0065      240 WRITE(SYSOT,300)
0066      245 WRITE(SYSOT,275) ITOMON,ITODAY,ITOYR
0067      LINES = 0
0068      250 WRITE(SYSOT,280)
C
C      1
C      1 IASMON,IASDAY,IASYR,ILFMON,ILFDAY,ILFYR,IAFMON,IAFDAY,IAFYR, (IP0,182700)
C      1 RINT(IX1),IX1=100,104), (IPRINT(IX1),IX1=27,33)
C      LINES = LINES + 1
C      GO TO 105
C
C      STORE RESOURCE DESCRIPTIONS
C
0071      255 WRITE(SYSOT,270) IDENT
0072      READ(SSWF1) IRESU
0073      WRITE(SYSOT,285)
0074      DO 260 IX1 = 1,54
0075      IF ( IRESU(IX1,2) .EQ. 0 ) GO TO 265
0076      260 WRITE(SYSOT,290) (IRESU(IX1,IX2),IX2=1,9)
C
C      END OF RUN
C
0077      265 REWINO SSWF1
0078      RETURN
C
C      INPUT AND OUTPUT FORMATS
C
0079      270 FORMAT ( 1H1,17A4 )
0080      275 FORMAT ( 46X,22HDATE OF STATUS REPORT ,2(I2,1H/),I2,42X,8HRESOURCE,01849000
C      1 / 65H ACTIVITY ,ACTIVITY ACTIVITY DESCRIPTION WORK
C      2START,15X,51HFINISH CRIT. ACTIVITY FUNC TYPES REGD /01851000
C      3 21H I J DUH COST,27X,83HOPT EARLY ACTUAL LATE 01852000
C      4 ACTUAL ACT. STATUS AREA 1 2 3 4 5 6 )
0081      280 FORMAT ( 14,2I5,F8.0,1X,6A4,13,2(1X,2(2X,12,1H/,I2),2X,A3,01854000
C      1 2X,3A4,A3,I4,I3,5I2 )
0082      285 FORMAT ( 20H0 FUNC RESOURCE,24X,8HCOST/DAY / 13H AREA CODE01856000
C      1 ,13H DESCRIPTION,22X,1H$ )
0083      290 FORMAT ( 216,3X,6A4,110 )
0084      295 FORMAT ( 1H0,33X,65HS T A T U S R E P O R T O N A L L
C      1 A C T I V I T I E S // )
0085      300 FORMAT ( 1H0,20X,82HE X C E P T I O N R E P O R T O N C R 01861000
C      1 I T I C A L A C T I V I T I E S // )
C      END
0086

```

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
ICALT	0	INFO	1010	IPRINT	105C	JOUR	10F0
IESDAY	1E20	IESYR	1E24	IEFMON	1E28	IEFYR	1E30
ILSMON	1E34	ILSDAY	1E38	ILSYR	1E3C	ILFDAY	1E44
ILFYR	1E48	ITF	1E4C	IASHMON	1E5C	IASDAY	1E74
IAFMON	1E78	IAFDAY	1E7C	IAFYR	1E80	IDUR	1FC8
IES	2A54	IEF	34E0	ILS	3F6C	IACFD	5484
IRESD	54A4	IRES	5C3C	IPRONO	5C58	IDENT	5CC0
IRCY	5004	IWORK	5008	IERHOR	500C	ISTDAY	5014
ISTYR	5018	IYR	501C	IMON	5020	IPROG	5028
IDOP	502C	ICAL	5030	IDECIS	5034	IX1	503C
IDX2	5040	IX3	5044	ITONON	5048	ITOYR	5050
IX	5054	IZ	5058				

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
MONDAY	0	MONTHS	30	KONST	60	KBLANK	8C
KON1	90	SYSIN	94	SYSOT	98	SSWF1	A0
SSWF2	A4	WKFL1	AD	WKFL2	AC		

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IRCOM#	1FH	IFC					

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
NONST	200	LINE#	204	ISW1	20C	MS65	250
MS61	210	MS62	220	MSG4	240		
MS66	260						

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
270	270	275	279	285	302	290	41A
295	428	300	474				

OPTIONS IN EFFECT NOID, HCU, SOURCE, NOLIST, NODECK, LOAD, MAP
 OPTIONS IN EFFECT NAME = CPMSTA, LINECNT = 56
 STATISTICS SOURCE STATEMENTS = 86, PROGRAM SIZE = 3168
 STATISTICS NO DIAGNOSTICS GENERATED

```

0001      C      SUBROUTINE CPMCAD                01864000
          C      CRITICAL PATH METHOD PREPUNCH CARDS COMPUTER PROGRAM.  01865000
          C      DEVELOPED BY R.C. TENNENT  01866000
          C      THIS PROGRAM IS USED FOR PREPUNCHING CARDS FOR THE REPORTING  01867000
          C      OF THE STARTS AND FINISHES OF THE ACTIVITIES  01868000
          C      01869000
          C      01870000
          C      COMMON ICAL1(1860),INFO(54),IPRINT(120),IDUR(675),IES(675),IEF(675) 01871000
          C      1,ILS(675),ILF(675),IACD(8),IRESD(54,9),IRES(7),IPRONO(13), 01872000
          C      JPRONO(13),IDENT(17)  01873000
          C      COMMON IBCY,IWORK,IERROR,ISTMON,ISTDAY,ISTYR,IVR,IMON,IOAY,IPROG, 01874000
          C      1 IDOP,ICAL,IDECEIS,NORES,IX1,IX2,IX3,ITOMON,ITODAY,IIOYR,IX, 01875000
          C      2,  01876000
          C      COMMON /DATES/MONDAY(12),MONTHS(12),KONST(10),IDECPT,KKLANC,KONI  01877000
          C      1,SYSPN,SYSPN,SYSPN,SSWF1,SSWF2,WKFL1,WKFL2,WKFL3  01878000
          C      INTEGER SYSPN,SYSPN,SYSPN,SSWF1,SSWF2,WKFL1,WKFL2,WKFL3  01879000
          C      EQUIVALENCE (IASYR,IPRINT(36)),(IAFYR,IPRINT(39)),(JOUR,IPRINT(3)) 01880000
          C      REWIND SSWF1  01881000
          C      01882000
          C      CALL FIND SUBROUTINE, WHICH WILL LOCATE DESIRED PROJECT SCHEDULE  01883000
          C      01884000
          C      CALL FIND  01885000
          C      IF ( IERROR .EQ. 1 )RETURN  01886000
          C      01887000
          C      PROCESS NETWORK IDENTIFICATION  01888000
          C      01889000
          C      READ(SSWF1)IDENT  01890000
          C      WRITE(SYSPN,115)IDENT  01891000
          C      01892000
          C      READ CALENDAR DATED SCHEDULE ONE ACTIVITY AT A TIME  01893000
          C      01894000
          C      100 READ(SSWF1) (IPRINT(IX1),IX1=1,50)  01895000
          C      IF ( IPRINT(1) .LT. 0 )GO TO 110  01896000
          C      IF ( JOUR .EQ. 0 )GO TO 100  01897000
          C      01898000
          C      CHECK IF AN ACTUAL START DATE IS ON FILE  01899000
          C      01900000
          C      IF ( IASYR .GT. 0 )GO TO 100  01901000
          C      01902000
          C      PUNCH START CARD. PUNCH IS OUTPUTTED ON TAPE 7  01903000
          C      01904000
          C      WRITE(SYSPN,120) IPRINT(1),IPRINT(2),(IPRINT(IX1),IX1=5,6),  01905000
          C      1 JPRONO(1)  01906000
          C      01907000
          C      CHECK IF ACTUAL FINISH IS ON FILE  01908000
          C      01909000
          C      105 IF ( IAFYR .GT. 0 )GO TO 100  01910000
          C      01911000
          C      PUNCH COMPLETION CARDS  01912000
          C      01913000
          C      WRITE(SYSPN,125) IPRINT(1),IPRINT(2),(IPRINT(IX1),IX1=5,6),  01914000
          C      1 JPRONO(1)  01915000
          C      GO TO 100  01916000
          C
    
```

```

C      END OF RUN
C
0020 110 REWIND SSWF1
0021 RETURN
C
C      INPUT AND OUTPUT FORMATS
C
0022 115 FORMAT ( 17A4 )
0023 120 FORMAT ( 19HSTARTED ACTIVITY ,2I5,35X,2A4,16,2H 1 )
0024 125 FORMAT ( 19HCOMPLETED ACTIVITY ,2I5,35X,2A4,16,2H 2 )
0025 EN)
01917000
01918000
01919000
01920000
01921000
01922000
01923000
01924000
01925000
01926000
01927000

```

SYMBOL	LOCATION	SYMBOL	LOCATION	COMMON BLOCK /	SYMBOL	MAP SIZE	505C	SYMBOL	LOCATION	SYMBOL	LOCATION
ICALT	0	INFO	1010	IPRINT	10EH			JOUR	1DF0	IASYR	1E74
IAFYR	1E80	IOUR	1FC8	IES	2A54			IEF	34E0	ILS	3F6C
ILF	49F8	IACTD	54F4	IRESU	5404			IRIS	5C3C	IPRONO	5C58
JPRONO	5C8C	IDENT	5CC0	IBCY	5004			IWORK	5008	IERROR	500C
ISTRMON	5D10	ISTDAY	5D14	ISTYH	5D18			IYH	5D1C	IMON	5020
IDAY	5D24	IPROG	5D28	IDOP	5D2C			ICAL	5D30	IDECIS	5034
NORES	5D38	IXI	5D3C	IX2	5D40			IX3	5D44	IITOMON	5044
ITODAY	5D4C	ITUYR	5D50	IX	5D54			IZ	5D58		

SYMBOL	LOCATION	SYMBOL	LOCATION	COMMON BLOCK /DATES	SYMBOL	MAP SIZE	H4	SYMBOL	LOCATION	SYMBOL	LOCATION
MONDAY	0	MONTHS	30	KONST	60			IDECP	88	KBLANK	HC
KONI	90	SYSIN	94	SYSOT	98			SYSFN	9C	SSWF1	A0
SSWF2	A4	WKFL1	A8	WKFL2	AC			WKFL3	H0		

SYMBOL	LOCATION	SYMBOL	LOCATION	SUBPROGRAMS CALLED	SYMBOL	LOCATION	SYMBOL	LOCATION
IBCOM#	D8	FIND	D0C					

SYMBOL	LOCATION	SYMBOL	LOCATION	FORMAT STATEMENT MAP	SYMBOL	LOCATION	SYMBOL	LOCATION
I15	E0	I20	F6		I25	10D		

OPTIONS IN EFFECT NOID,HCD,SOURCE,NOLIST,NODECK,LOAD,MAP
 OPTIONS IN EFFECT NAME = CPMCAD , LINECNT = 56
 STATISTICS SOURCE STATEMENTS = 25,PROGRAM SIZE = 896
 STATISTICS NO DIAGNOSTICS GENERATED


```

0001      SUBROUTINE BLANK
C
C      BLANK THE PRINT ARRAY
C
0002      COMMON ICALT(1860),INF0(54),IPRINT(120),IDUR(675),IES(675),IEF(6750),IPRONO(13),
1      ILS(675),ILF(675),IACTD(8),IRES0(54,9),IRES(7),IPRONO(13),01933000
2      JPRONO(13),IDENT(17)
0003      COMMON IBCY,IWORK,IERROR,ISTMON,ISTDAY,ISTYR,IYR,IMON,IDAY,IPROG,
1      IDOP,ICAL,IDECIS,NORES,IX1,IX2,IX3,ITOMON,ITODAY,ITOYR,IX,
2      IZ
0004      COMMON /DATES/MONDAY(12),MONTHS(12),KONST(10),IDEPT,KBLANK,KONI
1      ,SYSIN,SYSOT,SYSPN,SSWF1,SSWF2,WKFL1,WKFL2,WKFL3
0005      INTEGER SYSIN,SYSOT,SYSPN,SSWF1,SSWF2,WKFL1,WKFL2,WKFL3
0006      DO 100 IX = 1,120
0007      100 IPRINT(IX) = KBLANK
0008      RETURN
0009      END
01928000
01929000
01930000
01931000
01932000
01933000
01934000
01935000
01936000
01937000
01938000
01939000
01940000
01941000
01942000
01943000
01944000

```

SYMBOL	LOCATION	SYMBOL	LOCATION	COMMON BLOCK /	SYMBOL	MAP SIZE	505C	SYMBOL	LOCATION	SYMBOL	LOCATION
ICAL1	0	INFO	IUI0	IPRINT	10E8			IDUR	IFC8	IES	2A54
IEF	34E0	ILS	3F6C	ILF	49F8			IACD	5484	IRESD	54A4
IRES	5C3C	IPRONO	5C58	JPRONO	5C8C			IDENT	5CC0	IBC	5D04
IWORK	5D08	IERROR	5D0C	ISTMON	5D10			ISTDAY	5D14	IBCY	5D18
IYR	5D1C	IMON	5D20	IDAY	5D24			IPROG	5D28	IDOP	5D2C
ICAL	5D30	IDECIS	5D34	NORES	5D38			IX1	5D3C	IX2	5D40
IX3	5D44	ITOMON	5D48	ITODAY	5D4C			ITUVR	5D50	IX	5D54
IZ	5D58										

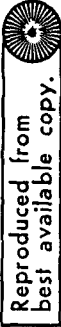
SYMBOL	LOCATION	SYMBOL	LOCATION	COMMON BLOCK /DATES	SYMBOL	MAP SIZE	B4	SYMBOL	LOCATION	SYMBOL	LOCATION
MONDAY	0	MONTHS	30	KONST	60			IDECPT	88	KBLANK	8C
KON1	90	SYSIN	94	SYSOT	98			SSWF1	9C	SSWF1	A0
SSWF2	A4	WKFL1	48	WKFL2	AC			WKFL3	80		

SYMBOL	LOCATION	SYMBOL	LOCATION	SCALAR MAP	SYMBOL	LOCATION	SYMBOL	LOCATION
IX9	AC							

OPTIONS IN EFFECT NOID*CD*SOURCE*NO LIST*NODECK*LOAD*MAP
 OPTIONS IN EFFECT NAME = BLANK * LINECNT = 56
 STATISTICS SOURCE STATEMENTS = 9*PROGRAM SIZE = 338
 STATISTICS NO DIAGNOSTICS GENERATED

```

0001 SURROUTINE DECIS
0002 COMMON ICALT(1860),INFO(54),IPRINT(120),IDUR(675),IES(675),IEF(6750),I946000
      1),ILS(675),ILF(675),IACID(8),IRESU(54,9),IRES(7),IPRONO(13),I947000
      2)JPRONO(13),IPIENT(17)
0003 COMMON IBCY,IWORK,IERRUR,ISTMON,ISTDAY,ISTYR,IYR,IMON,IDAY,IPROG,
      1)IDOP,ICAL,IDE CIS=NORES,IX1,IX2,IX3,ITOMON,ITODAY,ITOYR,IX,
      2)I7
0004 COMMON /DATES/MONDAY(12),MONTHS(12),KONST(10),IDECPT,KBLANK,KONI
      1)SYSIN,YSOT,SYSPN,SSWF1,SSWF2,WKFL1,WKFL2,WKFL3
0005 INTEGER SYSIN,YSOT,SYSPN,SSWF1,SSWF2,WKFL1,WKFL2,WKFL3
0006 IDECIS = 0
0007 IF(ICAL.EQ.0)GO TO 100
0008 IF(ICAL.EQ.9)GO TO 105
0009 IF(IDOP.EQ.0)GO TO 105
0010 IF(IDOP.EQ.1)GO TO 100
0011 IF(IDOP.EQ.2 .AND. ICAL.EQ.1)GO TO 100
0012 IF(IDOP.EQ.3 .AND. ICAL.EQ.2)GO TO 100
0013 IF(IDOP.EQ.4 .AND. ICAL.EQ.3)GO TO 100
0014 IF(IDOP.EQ.5 .AND. ICAL.EQ.4)GO TO 100
0015 IF(IDOP.EQ.6 .AND. ICAL.LE.2)GO TO 100
0016 IF(IDOP.EQ.7 .AND. ICAL.EQ.1 .OR. IDOP.EQ.7 .AND. ICAL.GE.3)GO TO
      1)100
0017 IF(IDOP.EQ.8 .AND. ICAL.NE.2)GO TO 100
0018 IF ( IDOP.NE. - ) GO TO 105
0019 IDECIS = -1
0020 GO TO 105
0021 IDECIS = 1
0022 105 RETURN
0023 END
      01945000
      01946000
      01947000
      01948000
      01949000
      01950000
      01951000
      01952000
      01953000
      01954000
      01955000
      01956000
      01957000
      01958000
      01959000
      01960000
      01961000
      01962000
      01963000
      01964000
      01965000
      01966000
      01967000
      01968000
      01969000
      01970000
      01971000
      01972000
      01973000
  
```



SYMBOL	LOCATION	SYMBOL	LOCATION	COMMON BLOCK /	MAP SIZE	SYMBOL	LOCATION	SYMBOL	LOCATION
ICALT	0	INFO	1010	IPRINT	505C	TUUR	1FCR	IES	2A54
IEF	34E0	ILS	3F6C	ILF	49F8	IACD	5484	IRES	54A4
IRES	5C3C	IPRONO	5C58	JPRONO	5C8C	IDENT	5CC0	I5CY	5004
IWORK	5008	IEPROR	500C	ISTMON	5D10	ISTDAY	5D14	ISTYR	5018
IYH	5D1C	IMON	5D20	IDAY	5D24	IPROG	5D28	I00P	5D2C
ICAL	5D30	IDECIS	5034	NORES	5038	IX1	5D3C	IX2	5040
IX3	5D44	ITOMON	5048	ITUDAY	504C	ITUUR	5D50	IX	5054
IZ	5058								

SYMBOL	LOCATION	SYMBOL	LOCATION	COMMON BLOCK /DATES	MAP SIZE	SYMBOL	LOCATION	SYMBOL	LOCATION
MONDAY	0	MONTHS	30	KONST	60	IDECPT	88	KBLANK	8C
KON1	90	SYSIN	74	SYSOT	98	SYSPN	9C	SSWF1	A0
SSWF2	A4	WKFL1	88	WKFL2	AC	WKFL3	H0		

OPTIONS IN EFFECT NOJD*BCD*SDU*CE*NOI*LIST*MODECK*LOAD*MAP
 OPTIONS IN EFFECT NAME = DECIS * LINECNT = 56
 STATISTICS SOURCE STATEMENTS = 23*PROGRAM SIZE = 880
 STATISTICS NO DIAGNOSTICS GENERATED

```

0001      SUBROUTINE DECODE
C          BEGINNING IN CARD COLUMN 20 SCAN FOR BLANKS WHICH ARE USED
C          TO DELIMIT EACH DATA WORD
C
0002      COMMON ICAL(1860),INFU(54),IPRINT(120),IDUR(675),IES(675),IEF(6750),I979000
1          ,ILS(675),ILF(675),IAC(8),IRES(54,9),IRES(7),IPRONO(13),I980000
2          ,IPRONO(13),I981000
0003      COMMON IBCY,IWORK,IBERR,ISTMON,ISTDAY,ISTYK,IYK,IMON,IUAY,IPROG,
1          ,IDOP,ICAL,IDEJIS,NDRES,IX1,IX2,IX3,ITOMON,ITODAY,ITOYR,IX,
2          ,IZ
0004      COMMON /DATES/MONDAY(12),MONTHS(12),KONST(10),IDECHT,KBLANK,KONI
1          ,SYSIN,SYSOI,SYSPN,SSWF1,SSWF2,WKFL1,WKFL2,WKFL3
0005      INTEGER SYSIN,SYSOI,SYSPN,SSWF1,SSWF2,WKFL1,WKFL2,WKFL3
0006      READ(WKFL3,115) IPRG,(INFO(IX2),IX2=1,4)
0007      REWIND WKFL3
0008      RETURN
0009      115 FORMAT ( A4,15X,9I5 )
0010      END

```

```

01974000
01975000
01976000
01977000
01978000
01981000
01982000
01983000
01984000
01985000
01986000
01987000
01988000
01989000
01990000
01991000
01992000

```

SYMBOL	LOCATION	COMMON	BLOCK /	MAP	SIZE	SYMBOL	LOCATION	SYMBOL	LOCATION
ICALT	0					IPRINT			
IFF	34E0	1D10				ILF	49F8	IOUR	IFC8
IRES	5C3C	3F5C				JPRONO	5C8C	IACFD	5484
IWORK	5D08	5C58				ISTMON	5D10	IDENT	5CC0
ICAL	5D30	5D1C				IDAY	5D24	ISTDAY	5D14
IX3	5D44	5D34				NORES	5D38	IPROG	5D28
IZ	5D58	5D4H				ITODAY	5D4C	IX1	5D3C
								IX2	5D50
								IX	5D54

SYMBOL	LOCATION	COMMON	HLCK /DATES	MAP	SIZE	SYMBOL	LOCATION	SYMBOL	LOCATION
MONDAY	0					KONST	60	IDECPT	88
KONI	40	94				SYSOT	9B	SSWF1	9C
SSWF2	44	48				WKFL2	AC	WKFL3	80

SUBPROGRAMS CALLED

SYMBOL	LOCATION	SYMBOL	LOCATION
IHC0M#	AC		

FORMAT STATEMENT MAP

SYMBOL	LOCATION	SYMBOL	LOCATION
115	H0		

```
*OPTIONS IN EFFECT* NOID*HCU*SOURCE*ANOLIST*NODECK*LOAD*MAP
*OPTIONS IN EFFECT* NAME = DECODE * LINECNT = 56
*STATISTICS* SOURCE STATEMENTS = 10*PROGRAM SIZE = 412
*STATISTICS* NO DIAGNOSTICS GENERATED
```

```

0001      C      SU-ROUTINE DECOU
          C      BEGINNING IN CARD COLUMN 20 SCAN FOR BLANKS WHICH ARE USED
          C      TO DELIMIT EACH DATA WORD
          C
0002      COMMON ICALT(1860),INFO(54),IPRINT(120),IDUR(675),IES(675),IEF(675),IPRONO(13),
          1      ),ILS(675),ILF(675),IACID(8),IRESD(54+9),IRES(7),IPRONO(13),
          2      JPRONO(13),IJEINT(17)
0003      COMMON IFCY,IMORK,IEROR,ISTMON,ISTDAY,ISTYR,IYR,IMON,IDAY,IPROG,
          1      IDOP,ICAL,IUECIS,NORES,IX1,IX2,IX3,ITOMON,ITODAY,ITOYR,IX,
          2      IZ
0004      COMMON /DATES/MONDAY(12),MONTHS(12),KONST(10),IDECPT,KBLANK,KONI
          1      ,SYSIN,YSOT,SYSPN,SSWF1,SSWF2,WKFL1,WKFL2,WKFL3
0005      INTEGER SYSIN,YSOT,SYSPN,SSWF1,SSWF2,WKFL1,WKFL2,WKFL3
0006      READ(WKFL3,115) IPRUG,(INFO(IX2),IX2=1,9)
0007      REWIND WKFL3
0008      RETURN
0009
0010      115 FORMAT ( 44,15X,3I4,8A4)
          ENDD

```

```

01993000
01994000
01995000
01996000
01997000
02000000
02001000
02002000
02003000
02004000
02005000
02006000
02007000
02008000
02009000
02010000
02011000

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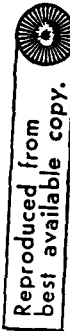
SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
ICALT	0	IPRINT	505C	IOUR	IFCR	IES	2A54
IFF	34E0	ILF	49F8	IACU	5484	IRESO	54A4
IRES	5C3C	IPRONO	5C8C	IDENT	5C00	IHCY	5004
IWORK	5D08	ISTMON	5D10	ISTUAY	5D14	ISTYR	5018
IYR	5D1C	IDAY	5D24	IPK06	5D28	IDOP	502C
ICAL	5D30	MORES	5038	IXI	503C	IX2	5040
IX3	5D44	ITONAY	504C	IT0YR	5050	IX	5054
IZ	5058						

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
MONDAY	0	KONST	60	IDECPT	88	KBLANK	8C
KON1	90	SYSOT	98	SYSFN	9C	SSWF1	A0
SSWF2	A4	WKFL1	AC	WKFL3	80		

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IBCOM#	AC						

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
115	90						

OPTIONS IN EFFECT NOID, #CD, SOURCE, NOLIST, NODECK, LOAD, MAP
 OPTIONS IN EFFECT NAME = DECLD , LINECNT = 56
 STATISTICS SOURCE STATEMENTS = 10, PROGRAM SIZE = 412
 STATISTICS NO DIAGNOSTICS GENERATED




```

0001      SUBROUTINE ADDRESS(ITIME)
C          ADDRESS ROUTINE
C          ADDRESS OF SCHEDULED DATE IN A CALENDAR TABLE.
C          ICALT*IX3. THE VALUE OF IX3 IS THE DESIRED RESULT. INPUT TO
C          THE ROUTINE IS THE STARTING POINT,IX3, AND THE TIME,ITIME.
C
0002      COMMON ICALT(1860),INFU(54),IPRINT(120),IURR(675),IES(675),IEF(675)
1          ),ILS(675),ILF(675),IACD(8),IRESU(54,9),IRES(7),IPRONO(13),
2          JPRONO(13),IDENT(17)
COMMON IBCY,IMORK,IEORR,ISTMON,ISTDAY,ISTYH,IYR,IMON,IUAY,IPROG,
1          IDOOP,ICAL,IDECS,NORES,IX1,IX2,IX3,ITOMON,ITODAY,ITOYR,IX,
2          IZ
COMMON /DATES/MONDAY(12),MONTHS(12),KONST(10),IDECPT,KBLANK,KONI
1          ,SYSIN,SYSOT,SYSPN,SSWF1,SSWF2,WKFL1,WKFL2,WKFL3
0005      INTEGER SYSIN,SYSOT,SYSPN,SSWF1,SSWF2,WKFL1,WKFL2,WKFL3
0006      IF ( ITIME )100,130,100
0007      100 IWDAYS = 0
C
C          INCREMENT THE WORKING DAY COUNTER,IWDAYS, BY ONE
C
0008      105 IWDAYS = IWDAYS + 1
C
C          INCREMENT THE CALENDAR TABLE INDEX,IX3, BY ONE AND CHECK
C          AGAINST THE MAXIMUM NUMBER
C
0009      110 IX3 = IX3 + 1
0010      IF ( IX3 - 1860 )115,115,125
C
C          CHECK CALENDAR TABLE POSITION FOR A ZERO VALUE. THE ZERO VALUE
C          INDICATES A VALID WORKDAY AND A NON-ZERO VALUE IS A NON-WORKDAY.
C
0011      115 ICAL = ICALT(IX3)
0012      CALL DECIS
0013      IF ( IDECS .EQ. 0 )GO TO 110
C
C          CHECK WORKING DAY COUNTER,IWDAYS, FOR EXCEEDING THE TIME
C
0014      120 IF ( IWDAYS - ITIME )105,130,130
C
C          THE DESIRED VALUE EXCEEDS THE SIZE OF THE CALENDAR TABLE
C
0015      125 WRITE(SYSOT,135)
0016      IEPROM = 1
0017      RETURN
0018      135 FORMAT ( 20H0 CALENDAR EXCEEDED )
0019      END

```



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SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
ICALT	0	INFO	1010	IPRINT	10E6	IDUR	1FC8
IEF	34E0	ILS	3F6C	ILF	49F8	IACD	5484
I-ES	5C3C	IPRONO	5C58	JPRONO	5C8C	IDENT	5C00
I40PK	5008	IEPROR	500C	ISTMON	5010	ISTYR	5014
IYR	5D1C	I40N	5020	IDAY	5024	IDOP	5D28
ICAL	5030	IDECIS	5034	MORES	5038	IX2	5D2C
IX3	5044	IT0MON	5048	ITODAY	504C	IX	5D40
IZ	5058						5D54

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
MONDAY	0	MONTHS	30	KONST	60	KBLANK	8C
KON1	40	SYNIN	44	YSOT	98	SSWF1	A0
SSWF2	44	WKFL1	48	WKFL2	AC	WKFL3	80

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
DECIS	DC	MAP	84				

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
ITIME	E4	MAP	E8				

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
135	EC						

OPTIONS IN EFFECT NOID,HCD,SOURCE,NOLIST,NODECK,LOAD,MAP
 OPTIONS IN EFFECT NAME = ADDR, LINECNT = 56
 STATISTICS SOURCE STATEMENTS = 19,PROGRAM SIZE = 580
 STATISTICS NO DIAGNOSTICS GENERATED



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 best available copy.

SYMBOL	LOCATION	COMMON BLOCK /	SYMBOL	LOCATION	MAP SIZE	SYMBOL	LOCATION	SYMBOL	LOCATION
ICALT	0	INFO	IPRINT	IDE8	505C	IDUR	IFC8	IES	2A54
IEF	34E0	ILS	ILF	49F8		IACID	5484	IRESD	54A4
IRES	5C3C	IPRONO	JPRONO	5C8C		IDENT	5CC0	JHCY	5D04
IWORK	5D08	IERROR	ISTMON	5D10		ISTDAY	5D14	ISTYR	5D18
IYR	5D1C	I40N	IDAY	5D24		IPROG	5D28	IDOP	5D2C
ICAL	5D30	IDECIS	NORES	5D38		IX1	5D3C	IX2	5D40
IX3	5D44	ITOMON	ITODAY	5D4C		ITOYR	5D50	IX	5D54
IZ	5D58								

SYMBOL	LOCATION	COMMON BLOCK /DATES	SYMBOL	LOCATION	MAP SIZE	SYMBOL	LOCATION	SYMBOL	LOCATION
MONDAY	0	MONTHS	KONST	60	B4	IDECPT	88	KBLANK	RC
KONI	90	SYSIN	YSOT	98		SYSPN	9C	SSWFI	A0
SSWF2	A4	WKFL1	WKFL2	AC		WKFL3	B0		

OPTIONS IN EFFECT NOJD,PCD,SOURCE,NOLIST,NODECK,LOAD,MAP
 OPTIONS IN EFFECT NAME = DATE , LINECNT = 56
 STATISTICS SOURCE STATEMENTS = 17,PROGRAM SIZE = 456
 STATISTICS NO DIAGNOSTICS GENERATED

```

0001      C      SUBROUTINE FIND
0002      C      THIS SUBROUTINE IS TO SEARCH THE CPM MASTER FILE AND
0003      C      FIND THE DESIRED CPM SCHEDULE.
0004      C
0005      COMMON ICALT(1860),INFU(54),IPRINT(120),IDUR(675),IFS(675),IEF(675),IOP(13),IPRONO(13),
0006      C      ILS(675),ILF(675),IACTD(8),IRES(54,9),IRES(7),IPRONO(13),
0007      C      JPRONO(13),IDENT(17)
0008      C
0009      COMMON IBCY,IWOKK,IERROR,ISTMON,ISTDAY,ISTYR,IYR,IMON,IDAY,IPROG,
0010      C      IDOP,ICAL,IDECS,NORES,IX1,IX2,IX3,ITOMON,ITODAY,ITOYR,IX,
0011      C      IZ
0012      COMMON /DATES/MONDAY(12),MONTHS(12),KONST(10),IDECPT,KHLANK,KON1
0013      C      ,SYSIN,SYSOT,SYSPN,SSWF1,SSWF2,WKFL1,WKFL2,WKFL3
0014      C      INTEGER SYSIN,SYSOT,SYSPN,SSWF1,SSWF2,WKFL1,WKFL2,WKFL3
0015      C      REWIN) SSWF1
0016      C
0017      C      STORE THE DESIRED PROJECT NO.
0018      C
0019      C      READ(WKFL3,135) IPROG,JPRONO
0020      C      REWIN) WKFL3
0021      C      IERROR = 0
0022      C
0023      C      READ PROJECT NO. FROM CPM MASTER FILE
0024      C
0025      C      100 READ(SSWF1) IPRONO
0026      C
0027      C      CHECK IF DUMMY END OF FILE ENCOUNTERED
0028      C
0029      C      IF ( IPRONO(1) .EQ. 999999 ) GO TO 125
0030      C
0031      C      CHECK IF THIS IS THE DESIRED CPM SCHEDULE
0032      C
0033      C      IF ( JPRONO(1) - IPRONO(1) )125,105,115
0034      C      105 DO 110 IX1 = 2,9
0035      C      IF ( JPRONO(IX1) .NE. IPRONO(IX1) ) GO TO 115
0036      C      110 CONTINUE
0037      C      GO TO 130
0038      C      115 READ(SSWF1) IDENT
0039      C      120 READ(SSWF1) (IPRINT(IX1),IX1=1,50)
0040      C      IF ( IPRINT(1) .GT. 0 ) GO TO 120
0041      C      READ(SSWF1) IRES)
0042      C      GO TO 100
0043      C
0044      C      ERROR ROUTINE
0045      C
0046      C      125 IERROR = 1
0047      C      WRITE(SYSOT,145) JPRONO)
0048      C      REWIN) SSWF1
0049      C      130 RETURN)
0050      C      135 FORMAT ( A4,15X,16,12A4 )
0051      C      145 FORMAT ( 59H1 SCHEDULE IS NOT ON CPM MASTER FILE, CHECK PROJECT
0052      C      NUMBER ,I8,12A4 )
0053      C      EN)
0054      C
0055      C      02091000
0056      C      02092000
0057      C      02093000
0058      C      02094000
0059      C      02095000
0060      C      02096000
0061      C      02097000
0062      C      02098000
0063      C      02099000
0064      C      02100000
0065      C      02101000
0066      C      02102000
0067      C      02103000
0068      C      02104000
0069      C      02104100
0070      C      02105000
0071      C      02106000
0072      C      02107000
0073      C      02108000
0074      C      02109000
0075      C      02110000
0076      C      02111000
0077      C      02112000
0078      C      02113000
0079      C      02114000
0080      C      02115000
0081      C      02116000
0082      C      02117000
0083      C      02118000
0084      C      02119000
0085      C      02120000
0086      C      02121000
0087      C      02122000
0088      C      02123000
0089      C      02124000
0090      C      02125000
0091      C      02126000
0092      C      02127000
0093      C      02128000
0094      C      02129000
0095      C      02130000
0096      C      02131000
0097      C      02132000
0098      C      02133000
0099      C      02134000
0100      C      02135000
0101      C      02136000
0102      C      02137000
0103      C      02138000
0104      C      02139000
0105      C      02140000
0106      C      02141000
0107      C      02142000

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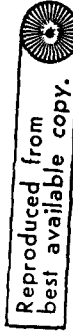
SYMBOL	LOCATION	SYMBOL	LOCATION	COMMON BLOCK /	SYMBOL	MAP SIZE	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
ICALT	0	INFO	IP10	IPRINT	505C			IDUR	1FC8	IES	2A54
IEF	34E0	ILS	3F6C	ILF	49F8			IACID	5484	IBCY	54A4
IRLS	5C3C	IPRONO	5C58	JPRONO	5C8C			IDENT	5004	ISTYR	5D18
IWORK	5D08	ERROR	5D0C	ISTMON	5D10			IPROG	5D14	IDOP	5D2C
IYR	5D1C	IMON	5D20	IDAY	5D24			IXI	5D28	IX2	5D40
ICAL	5D30	IOECIS	5D34	NORES	5D38			IT0YR	5D3C	IX	5D54
IX3	5D44	ITOMON	5D48	ITODAY	5D4C						
IZ	5D58										

SYMBOL	LOCATION	SYMBOL	LOCATION	COMMON BLOCK /DATES	SYMBOL	MAP SIZE	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
MONJAY	0	MONTHS	30	KONST	B4			IDECP	88	KBLANK	8C
KONI	90	SYSTN	94	SYST	60			SYSPN	9C	SSWF1	A0
SSWF2	A4	WKFLI	A8	WK6L2	98			WKFL3	R0		

SYMBOL	LOCATION	SYMBOL	LOCATION	SUBPROGRAMS CALLED	SYMBOL	LOCATION	SYMBOL	LOCATION
hCOM#	EC							

SYMBOL	LOCATION	SYMBOL	LOCATION	FORMAT STATEMENT MAP	SYMBOL	LOCATION	SYMBOL	LOCATION
135	F0	145	FC					

OPTIONS IN EFFECT NOID,BCU,SOURCE,NOLIST,NODECK,LOAD,MAP
 OPTIONS IN EFFECT NAME = FIND , LINECNT = 56
 STATISTICS SOURCE STATEMENTS = 28,PROGRAM SIZE = 872
 STATISTICS NO DIAGNOSTICS GENERATED



```

0001      SUBROUTINE COBMON(MONTH,LETR1,LETR2,LETR3)
C
C      THIS SUBROUTINE IS USED FOR SPLITTING ONE WORD CONTAINING 3
C      CHARACTERS INTO 3 WORDS CONTAINING 1 CHARACTER EACH
C
C      K1 AND K2 ARE CONSTANTS TO PROVIDE SHIFTING ON A 32 BIT,
C      4 BYTES/WORD, 4 CHARACTERS/WORD COMPUTER
C      K1 = 2**24
C      K2 = 2**16
0002      LETR1=(MONTH/K1*K1-K1)
0003      LETR2=(MONTH/K2*K1-K1)
0004      LETR3 = MONTH*K2
0005      RETURN
0006      END
0007
0008
02143000
02144000
02145000
02146000
02147000
02148000
02149000
02150000
02151000
02152000
02153000
02154000
02155000
02156000

```




```

0033 IERROR = 0
0034 M = 0
0035 MATCH = 0
0036 JSTART = 999999

C
C ZERO COST ACCUMULATION ARRAY
C
0037 DO 140 IX1 = 1,100
0038 ISOAC(IX1) = 0
0039 DO 30 I=1,9
0040 IFUNT(I) = 0
0041 DO 33 I=1,100
0042 IFUNC(I) = 0
0043 DO 50 I=1,100
0044 DO 50 J=1,7
0045 JRF5(I,J) = 0
0046 II = 0
0047 IMAX = 0
0048 DO 145 JCOL=1,732
0049 DO 145 IROW = 1,12
0050 JTOTSK(IROW,JCOL) = 0

C
C READ PROJECT NUMBER FROM TOTAL CARD
C
0051 READ (SYSIN,430) IPR06,IDENT1
0052 IF (IPR06.NE. ITOT) GO TO 498
0053 M = M + 1

C
C READ PROJECT NUMBER FROM MASTER FILE AND CHECK FOR MATCH WITH
C A TOTAL CARD
C
0054 READ (SSWF2) JPRONO
0055 READ (SSWF2,END=300) IIDENT
0056 IF (IIDENT(1).NE. IDENT1(1)) GO TO 300
0057 DO 305 IX1 = 2,17
0058 IF (IIDENT(IX1).NE. IDENT1(IX1)) GO TO 300
0059 305 CONTINUE
0060 MATCH = MATCH + 1
0061 IROWM = 0
0062 WRITE (SYSOT,630) IIDENT

C
C COMPUTE START DATE FOR NETWORK
C
0063 READ (SSWF2) ISTM0N,ISTDAY,ISTYR
0064 IYR = ISTYR
0065 IF (ISTYR - IBCY) 110,115,115
0066 110 WRITE (SYSOT,270)
0067 IERROR = 1
0068 RETURN
0069 KSTART = (ISTYR - IBCY) * 372 + (ISTMON - 1) * 31 + ISTDAY
0070 IF (KSTART .GT. JSTART) GO TO 315
0071 JSTART = KSTART
0072 KSTM0N = ISTM0N
0073 KSTDAY = ISTDAY

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0074 KSTYR = ISTDYR
0075 GO TO 316
0076 315 ISTMUN = KSTMUN
0077 ISTDAY = KSTDAY
0078 ISTDYR = KSTDYR
0079 KSTART = JSTART
0080 GO TO 330
C
C BUTLD ARRAY OF DATES CORRESPONDING TO THE ENDING DAY OF THE WEEK
C
0081 316 IX1 = 1
0082 DO 120 IX3 = KSTART,1860
C
C CHCK CALENDAR TABLE FOR A SUNDAY (END OF WEEK)
C
C IF (ICALT(IX3) .NE. 4) GO TO 120
0083 IWFND(IX1) = IX3
0084 IX1 = IX1 + 1
0085 IF (IX1 .GT. 100) GO TO 330
0086 120 CONTINUE
0087 330 II = II + 1
0088 331 CONTINUE
0089
C
C WHEN A MATCH IS FOUND, READ NETWORK INFORMATION FROM MASTER FILE
C
0090 READ (SSWF2) I,J,JDUR,ACOST,IACID,IDOP,IESMON,IESDAY,IESYR,IEFMON,
2 IEFYR,ILSMON,ILSDAY,ILSYR,ILFMON,ILFDAY,ILFYM,ITF,IRES
C
C CHECK FOR LAST ACTIVITY OF NETWORK
C
0091 IF (I .LT. 0) GO TO 355
0092 DO 335 J=1,7
0093 335 JRF5(II,J) = IRES(J)
0094 IFUNC(II) = IRES(1)
0095 IF (IEFYR - IBCY) 110,340,340
0096 340 IDATE = (IEFYR-IBCY)*372 + (IEFMON-1)*31 + IEFDAY
C
C ACCUMULATE ACTIVITY COST TO THE PROPER WEEK ENDING
C
0097 DO 345 IX2 = 1,100
0098 IF (IDATE .LE. IWEND(IX2)) GO TO 350
0099 345 CONTINUE
0100 350 ISOAC(IX2) = ISOAC(IX2) + IFIX(ACOST)
C
C CHECK FOR LATEST WEEK A COST IS ACCUMULATED
C
0101 IF (IMAX .LT. IX2) IMAX = IX2
C
C DETERMINE ACTIVITY START DATE RELATIONSHIP WITH PLOTTING PERIOD
C RESOURCE PLOT
C
0102 1155 IF (IFUNC(II)) 331,331,1160
0103 1160 IF (IESYR-JSTYR) 1165,1180,1190
0104 1165 IFSYR = JSTYR
03100000
03101000
03102000
03103000
03104000
03105000
03106000
03107000
03108000
03109000
03110000
03111000
03112000
03113000
03114000
03115000
03116000
03117000
03118000
03119000
03120000
03120100
03121000
03122000
03123000
03124000
03125000
03126000
03126100
03126200
03126300
03127000
03128000
03129000
03130000
03130000
03131000
03132000
03133000
03134000
03134200
03134300
03135000
03136000
03137000
03140000
03142000
03143000
03144000
03145000
03146000
03147000
03148000
03149000
03150000
03151000
03152000

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0105 1170 IESMON = JSTMON
0106 1175 IESDAY = JSTDAY
0107 GO TO 1205
0108 1180 IF (IESMON - JSTMON) 1170,1185,1205
0109 1185 IF (IESDAY - JSTDAY) 1175,1205,1205
0110 1190 IF (IESYR - IFIYR) 1195,1195,331
0111 1195 IF (IESMON - IFIMON) 1205,1200,331
0112 1200 IF (IESDAY - IFIDAY) 1205,1205,331
C
C DETERMINE ACTIVITY FINISH DATE RELATIONSHIP WITH PLOTTING PERIOD
C RESOURCE PLOT
C
0113 1205 IF (IEFYR - IFIYR) 1235,1225,1210
0114 1210 IEFYR = IFIYR
0115 1215 IEFMON = IFIMON
0116 1220 IEFDAY = IFIDAY
0117 GO TO 1245
0118 1225 IF (IEFMON - IFIMON) 1245,1230,1215
0119 1230 IF (IEFDAY - IFIDAY) 1245,1245,1220
0120 1235 IF (IEFMON - JSTMON) 331,1240,1245
0121 1240 IF (IEFDAY - JSTDAY) 331,331,1245
0122 1245 JES = 0
0123 DO 1250 L = 1,12
0124 IF (L - IESMON) 1250,1255,1255
0125 JES = JES + MONDAY(L)
0126 JES = JES + IESDAY - ISTART + 1
0127 IF (IESYR - JSTYR) 1265,1265,1260
0128 1260 JES = JES + 366
0129 1265 JEF = 0
0130 DO 1270 L = 1,12
0131 IF (L - IEFMON) 1270,1275,1275
0132 1270 JEF = JEF + MONDAY(L)
0133 1275 JEF = JEF + IEFDAY - ISTART
0134 IF (IEFYR - JSTYR) 1285,1285,1280
0135 1280 JEF = JEF + 366
0136 1285 JF(II) = JEF
0137 JS(II) = JES
0138 GO TO 330
0139 355 DO 360 IX1 = 2,IMAX
0140 360 ISOAC(IX1) = ISOAC(IX1-1) + ISOAC(IX1)
C
C READ RESOURCE DESCRIPTIONS
C
0141 READ (SSWF2,END=365) IRESO
0142 II = II - 1
C
C ACCUMULATE FUNCTION TYPES FOR RESOURCE PLOT
C
0143 DO 1350 I = ILOWL,IUPL
0144 IFUN = IRESO(II,1)
0145 IF (IFUN .EQ.0) GO TO 1355
0146 IFUNT(IFUN) = IFUNT(IFUN) + 1
0147 IROWM = IROWM + 1
0148 1350 CONTINUE

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0149 1352 WRITE (SYSOT,595)
0150 1355 J = 1
0151 DO 1360 I = 1,9
0152 IF (IFUNT(I) .EQ. 0) GO TO 1360
0153 IFUNT(J) = IFUNT(I) * 10 + I
0154 J = J + 1
0155 1360 CONTINUE
C
0156 DO 1420 I = 1,II
0157 L = 0
0158 IRSW = 0
0159 DO 1400 K = 2,7
0160 IF (JRES(I,K) .LE. 0) GO TO 1400
0161 IF (IRSW) 1385,1375,1385
0162 IRSW = 1
0163 DO 1380 J = 1,9
0164 IF (IFUNC(I) - (IFUNT(J) - IFUNT(J) / 10 * 10)) 1380,1385,1380
0165 L = L + IFUNT(J) / 10
0166 WRITE (SYSOT,585) IFUNC(I)
0167 WRITE (SYSOT,596) I,J
0168 FORMAT (5X,I =,15,5X,J =,15)
0169 GO TO 1420
0170 1385 IROW = L + K - 1
0171 IF (IROW - IROWM) 1395,1395,1390
0172 1390 WRITE (SYSOT,590) IROW,IROWM
0173 GO TO 1420
0174 1395 JSI = JS(I)
0175 JFI = JF(I)
0176 IF (JS(I) .LT. JFI) JSI = JS(I)
0177 IF (JF(I) .GT. JFI) JFI = JF(I)
0178 IF (IROW .GT. IR) IR = IROW
0179 DO 1398 JCOL = JSI,JFI
0180 1398 JTOTSK(IROW,JCOL) = JTOTSK(IROW,JCOL) + JRES(I,K)
0181 1400 CONTINUE
0182 1420 CONTINUE
C
0183 C ACCUMULATE TOTALS FOR RESOURCE PLOT
0184 IF (JFT .GT. 732) JFT = 732
0185 IF (IR .GT. 12) IR = 12
0186 DO 1450 JCOL = JSI,JFI
0187 DO 1450 IROW = 1,IR
0188 1450 ITOTSK(IROW,JCOL) = ITOTSK(IROW,JCOL) + JTOTSK(IROW,JCOL)
C
0189 C ACCUMULATE TOTALS FOR MULTI-PROJECT PLOT
0190 IF (MAX .LT. IMAX) MAX = IMAX
0191 IF (N .LE. IMAX) GO TO 470
0192 DO 450 IXI = 1,IMAX
0193 450 ICOAC(IXI) = ICOAC(IXI) + ISOAC(IXI)
0194 NN = IMAX + 1

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```

0193      DO 460 IX1 = NN,MAX
0194      ICOAC(IX1) = ISOAC(IMAX) + ICOAC(IX1)
0195      GO TO 495
0196      470 IF (N.EQ. 0) N = IMAX
0197      DO 480 IX1 = 1,N
0198      ICOAC(IX1) = ICOAC(IX1) + ISOAC(IX1)
0199      IF (N.EQ. IMAX) GO TO 495
0200      NN = N + 1
0201      DO 490 IX1 = NN,MAX
0202      ICOAC(IX1) = (ICOAC(IX1-1) - ISOAC(IX1-1)) + ISOAC(IX1)
0203      495 N = IMAX
0204      GO TO 130
C
C      CHECK FOR LAST TOTAL CARD
C
0205      498 IF (IPROG.NE. ISTOP) GO TO 510
0206      IF (MATCH.NE. M) GO TO 500
0207      WRITE (SYSOT,600)
C
C      CALL SUBROUTINE CPMPRO TO PLOT MULTI-PROJECT COST PLOT
C
0208      CALL CPMMPR
C
C      CALL SUBROUTINE CPMACC TO PLOT MULTI-PROJECT RESOURCE PLOT
C
0209      CALL CPMMAC
0210      RETURN
0211      500 WRITE (SYSOT,420)
0212      IERROR = 1
0213      RETURN
0214      510 WRITE (SYSOT,410)
0215      IERROR = 1
0216      RETURN
C
C      INPUT AND OUTPUT FORMATS
C
0217      270 FORMAT (33H1 STARTING DATE PRECEDES CALENDAR )
0218      410 FORMAT(5X,34HNO STOP CARD FOR MULTI-PROJECT RUN)
0219      420 FORMAT (5X,56HATLEAST ONE TOTAL CARD COULD NOT BE FOUND IN MASTER
0220             IFILE)
0221      430 FORMAT (A4,5X,17A4)
0222      585 FORMAT ( 14H FUNCTION CODE,I3,18H WAS NOT SUBMITTED )
0223      590 FORMAT ( 15H CALCULATED ROW,I3,28H EXCEEDS MAXIMUM NO. OF ROWS,I3)
0224      595 FORMAT ( 20H MAXIMUM NO. OF ROWS )
0225      600 FORMAT (1H1,/,/,30X,31H*** MULTI-PROJECT COST PLOT *** )
0226      620 FORMAT (1H1,/,/,14X,47H*** MULTI-PROJECT SCHEDULING FOR PROJECTS :
0227             1*** )
0228      630 FORMAT (/,/,20X,17A4)
0229      END
0230      03251000
0231      03252000
0232      03253000
0233      03254000
0234      03255000
0235      03256000
0236      03257000
0237      03258000
0238      03259000
0239      03260000
0240      03261000
0241      03262000
0242      03263000
0243      03264000
0244      03265000
0245      03266000
0246      03267000
0247      03268000
0248      03270000
0249      03271000
0250      03272000
0251      03273000
0252      03273200
0253      03273300
0254      03274000
0255      03275000
0256      03276000
0257      03277000
0258      03278000
0259      03279000
0260      03280000
0261      03281000
0262      03282000
0263      03283000
0264      03284000
0265      03285000
0266      03286000
0267      03287000
0268      03288000
0269      03289000
0270      03290000
0271      03291000
0272      03292000
0273      03292100
0274      03292200
0275      03292300
0276      03293000
0277      03293000

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COMMON BLOCK /		MAP SIZE		MAP SIZE	
SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
ICALT	0	INFO	1D10	JSTMON	1D14
JSTYR	ID1C	IFIMON	1D20	IFIYR	1D28
IDUR	1FC8	ItS	2A54	IEF	34E0
ILS	3F6C	ILF	49F8	IRESD	54A4
IPRONO	5C58	JPRONO	5C8C	IBCY	5D04
IERROR	5D0C	ISTMON	5D10	ISTYR	5D18
IMON	5D20	IDAY	5D24	IDOP	5D2C
IDECIS	5D34	NORES	5D38	IX2	5D40
ITOMON	5D48	ITODAY	5D4C	IX	5D54
MAX	5D5C			IX	5D58
COMMON BLOCK /DATES		MAP SIZE		MAP SIZE	
SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
MONDAY	0	MONTHS	30	IDECPT	88
KONI	90	SYSIN	94	SYSFN	9C
SSWF2	A4	WKFL1	A8	WKFL3	B0
COMMON BLOCK /MULTI		MAP SIZE		MAP SIZE	
SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
ILQWL	0	ITOT	35C	ISTART	8948
MUL	8950	ITOT	370		
SUBPROGRAMS CALLED		MAP SIZE		MAP SIZE	
SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
ICOM#	344	CPMMPR	348		
SCALAR MAP		MAP SIZE		MAP SIZE	
SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
ISTOP	354	ICHECK	358	JST	360
IR	368	JCOL	36C	I	374
M	37C	MATCH	380	J	388
IMAX	390	KSTART	394	KSTDAY	39C
JOUR	3A4	ACUST	3A8	IESDAY	3B0
IEFMON	39A	IEFDAY	39C	ILSMON	3C4
ILSYR	3CC	ILFMON	300	ILFYR	3D8
IDATE	3E0	JES	3E4	ITF	3DC
IKSW	3F4	K	3F8	IFUN	3F0
				NN	404
ARRAY MAP		MAP SIZE		MAP SIZE	
SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IVJHD	408	ITUAC	468	ISW	7CC
IFUNT	704	JMES	7F8	IFUNC	1608
JTUTSK	1798				

FORMAT STATEMENT MAP

FORTRAN IV G LEVEL 21 CPMUL DATE = 74079 16/53/27 PAGE 0008
 SYMBOL LOCATION SYMBOL LOCATION SYMBOL LOCATION SYMBOL LOCATION
 596 A0D8 270 A0FC 410 420 430 A177
 585 A181 590 A1A9 595 A1DE 600 A1F6 620 A220
 630 A25A

OPTIONS IN EFFECT NOID,BCD,SOURCE,NOLIST,NODECK,LOAD,MAP
 OPTIONS IN EFFECT NAME = CPMUL , LINECNT = 56
 STATISTICS SOURCE STATEMENTS = 227,PROGRAM SIZE = 46200
 STATISTICS NO DIAGNOSTICS GENERATED
 STATISTICS NO DIAGNOSTICS THIS STEP 2

NAME	ORIGIN	LENGTH	SEG. NO.	NAME	LOCATION	NAME	LOCATION	NAME	LOCATION
IHCUATBL*	5B30	328	1						
SHT	5E58	5004	1						
PSS	BB60	58	1						
\$BLANKCOM	BB88	5060	1						
MULTI	11918	8954	1						
\$ENTAB	1A270	9C	1						
CPMCAL	1A310	2824	2						
CPMDAT	1C838	C32	2						
CPMPLT	1D770	F30	2						
CPMCRI	1E6A0	65C	2						
CPMRED	1ED00	96C	2						
CPMUPD	1F670	F E	2						
CPMSTA	20640	C60	2						
CPMCAD	212A0	380	2						
DECIS	21620	370	2						
DECODE	21990	19C	2						
DEC00	21830	19C	2						
ADDRS	21C00	244	2						
FIND	21F18	368	2						
CPMACC	1A310	1614	3	CPMMAC	1A340				
CPMPRO	1B928	F2C	3	CPMMPR	1B958				
CO3MON	1C858	1DA	3						
CPMMUL	1CA38	B478	3						

ENTRY ADDRESS E0
TOTAL LENGTH 27EB0

****MAIN DOES NOT EXIST BUT HAS BEEN ADDED TO DATA SET