

SERIES 200

PERT TIME C

PERT Time C is a Honeywell Series 200 program which gives a project manager powerful assistance in planning and scheduling large projects. The advantages of PERT Time C lie in its ability to analyze networks of great complexity (up to 2,000 activities) while operating with only 12,288 characters of main memory. This network analysis enables managers to plan and control activities directed toward the completion of a particular project, to forecast critical areas, and to initiate corrective action if necessary.

PERT Time C includes many of the capabilities found in larger scale PERT programs, but it is unique in that it can calculate the number of workers required each workday for five craft categories. The program computes schedules for five-, six-, or seven-day workweeks. Each activity can be completely defined on one input card. The duration of each activity, and of the entire project, can be more accurately estimated because a flexible range of time estimates may be prepared as input to the program.

PERT Time C is similar to Critical Path Method (CPM) in some respects. Both are designed to assist the project manager in estimating the duration of activities along the most critical path to the desired objective. However, CPM allows only a single time estimate whereas PERT Time C permits either one or three time estimates for each activity (optimistic, pessimistic, and most likely).

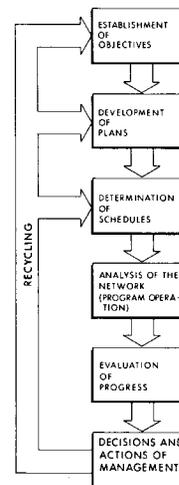
DEVELOPING THE PROJECT BY PERT TIME C

Development of the project through network analysis by PERT Time C consists of six steps: establishment of objectives, development of plans, determination of schedules, analysis of the network, evaluation of progress, and decisions and actions of management, followed by a recycling of the above process (as shown in the illustration). Usually, developing a network is simplified by first establishing the major events or checkpoints that must be reached. Each supporting activity is then added to the network, and its interaction with other activities is indicated in terms of the activities that must precede it, the activities that must succeed it, and the activities that can be performed concurrently with it. The set of activities that must be finished (and events which must have occurred) before any other given activity can begin is exhibited by the network. Thus, the network defines the relationships of any given task to the needs of the total project, ensuring that the project is fully planned. All derivative plans and activities contribute directly to the desired objectives of the project.

Establishment of Objectives

The initial and most important step is the determination and definition of prime and supporting objectives. Given the assignment of an objective, the next step is the development of a plan.

Specifications remain subject to change in order to allow the introduction of design improvements.



Development of Plans

The planning function is primarily concerned with the nature, sequence, and interrelationship of major and supporting activities that compose a project network. During this phase, time estimates are assigned to the activity arrows representing the expected time for the performance of an activity. The effectiveness and accuracy of PERT Time C depends directly on the correctness of the network logic and the exactness of the time estimates.

Determination of Schedules

Scheduling is the translation of the plan, with its elapsed time estimates, into calendar time. The manager establishes schedule dates, if any, representing the planned accomplishment of any objective and produces a time-phased plan consistent with the estimated completion dates of these objectives.

Analysis of the Network (Program Operation)

Mathematical analysis of the network determines activity time relationships from which the time schedule may be evaluated. These computations determine:

- The amount of time required to accomplish a task in the schedule and the total amount of time required for the project,
- The earliest and latest start and finish times for each activity,
- The earliest and latest start and finish times for the entire project,
- The amount of slack (total float) available for all activities involved,
- The status of each activity, either critical or non-critical, and

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- The number of men in each skill category required for each working day of the project.

Evaluation of Progress

The project manager can control the progress of the project by periodic re-evaluation of the activities and critical path, initiating corrective action if necessary. The evaluation and review will establish:

- The status of the project — whether it is on, ahead of, or behind schedule,
- The current status of each activity, and
- The amount of slack (or float) remaining for each activity.

Throughout the project, a constant check on the status of each activity is made by a comparison of estimated times with actual times. If the estimated time to the network end event indicates a lapse in the schedule, the project manager can expedite activities on the critical path and replan the network in order to meet specified dates.

Decisions and Actions of Management

In replanning the network, time estimates will necessarily change; thus, the critical path must be recomputed. The incorporation of change is achieved by a recycling of the developmental process to provide a revised schedule.

PERT TIME C PROGRAMS

PERT Time C consists of ten separate but dependent programs which function in three phases — input, calculations, and output.

Input

The input to PERT Time C consists of punched cards. Each card defines one activity, and a complete deck represents one network plus the control cards required for the operation of the system. Phase I reads the input cards (or card images on tape), checks for input errors, and produces activity and calendar holiday listings. It also detects network breaks and loops and, if required, topologically orders network events. If any errors are detected, this phase generates a listing of network errors.

Calculations

Phase II performs the computer calculations, such as timings (e.g., earliest and latest start and finish times), slack values, and manpower estimates (the total number of workers in each craft for each working day of the project), that are required by the PERT Time C program.

Output

Phase III prints the requested output reports and summary reports. These final output reports contain the results of all program calculations as well as activity titles and descriptions. PERT Time C is capable of arranging the output in six different sequences for easier analysis (e.g., they may be sorted according to their primary slack values, critical values appearing first).

PERT Time C is unique in that it produces an output report defining the manpower accumulation for each craft on a project. It also generates a printed listing with calendar dating of up to 2,000 working days. This listing is produced in accordance with a designated five-, six-, or seven-day workweek, allowing for as many as 150 holidays for each project. If requested, a bar chart is generated for each department showing activities that will be active within 90 days (or other time unit) of the report date (the current date when the input deck is submitted for a computer run).

EQUIPMENT AND SOFTWARE REQUIREMENTS

Minimum Equipment

- Series 200 Central Processor
- 12,288 characters of memory
- Advanced Programming Instructions
- Card Reader
- Printer
- 4 Magnetic Tape Units (1/2-inch)

Software

- EasyCoder Assembler C
- Tape Sort C Program

Optional Additional Equipment

- 1 Magnetic Tape Unit (1/2-inch)
- 1 Console Typewriter