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An Assessment of PERT as a Technique for Schedule Planning and Control

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PREFACE

PERT, an acronym derived from the words "Program Evaluation and Review Technique," is a technique designed principally to serve as an aid in the schedule planning and analysis of complex, one-of-a-kind operations. It has been used at NASA/LaRC for more than 20 years. The purpose of this paper is to discuss how PERT works, and how it is used, emphasizing its strengths and weaknesses, based on its use by NASA/LaRC personnel. It has been written primarily to serve as a reference guide for personnel performing project planning and control functions and technical personnel whose responsibilities either include schedule planning and control or require a general knowledge of this subject area.

HISTORY/CURRENT STATUS

PERT was used initially during the late 1950's to plan and control the construction of major facilities (such as chemical plants) and the development of weapons systems such as Polaris. It was used extensively by NASA during the 1960's--the "catch-up" years in the space program--when an extremely high value was placed on schedule accomplishment/acceleration. In subsequent years, the use of PERT, or similar techniques such as the Critical Path Method (CPM), continued at a high level, in part because of an increased awareness of the cost implications of schedule performance; and PERT continues to be used in various forms by a large number of companies/agencies in industry and government. It has passed the test of time. More pointedly, there are now sufficient empirical results of its usage that it is possible to make a reliable assessment of its value for various applications.

HOW PERT WORKS

Reduced to its simplest form, the PERT technique uses a network-type model which includes (1) the end product(s) of an effort or project; e.g., an instrument or spacecraft (2) schedule dates for the start and completion of the total effort, (3) the activities or tasks that must be performed successfully in order to complete the effort (4) the estimated time required to complete each activity, and (5)the sequential relationships of these activities; i.e., which specific activities must be started or completed before other specific activities can be started or completed. The PERT technique, using this model, can produce several types of analyses that have value for purposes of schedule planning, analysis, control and reporting. These include (but are not limited to): (1) identification of the sequential path of activities which reflects the longest estimated time to complete, (2) identification of all other sequential paths of activities, (3) the estimated start and completion dates of all activities, and (4) the amount of slack or float in each discrete path of activities, based on the schedule dates for the start of the total effort and either the schedule date for completion of the total effort or specified schedule dates for the completion of a certain activity(ies) or event(s).

Appendix A contains an example of a simplified PERT network. It contains all of the essential information necessary to determine the above-noted information. Using the estimated times (normally expressed in weeks) for the

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completion of each activity, and assuming a date for the commencement of the total effort (September 1, 1981), the model represented by the network provides the means for determining the expected completion date of each activity. This is accomplished by adding cumulatively the time estimates for those activities which are dependent sequentially; i.e., which must be performed in series, and then calculating the expected completion date for each activity based on the longest time span from the start of the total effort up to and including that specific activity. For example, there are two paths which lead to Event No. 9--1,2,4,7,9, and 1,2,3,5,7,9. As indicated in the example, the cumulative estimated time to complete Event No. 9; i.e., all of the logically precedent activities, is nine (9) weeks. Therefore, the estimated completion date of Activity J (or Event No. 9) is November 3, 1981, nine weeks after September 1, 1981 (the start date of the total effort). If a scheduled completion date for the overall effort is assumed (January 15, 1982 in the example), it is also possible to determine the latest date that each activity could be completed without causing late completion of the total effort, <u>assuming</u> the network is a valid model of the remaining activities. For example, after completion of Activity J, there are two paths to the completion of the overall effort (Event No. 12)-- 9,11,12, and 9,10,11,12. The latter is, of course, the longer path; it is estimated to take five (5) weeks to accomplish. Therefore, the latest completion date of Activity J which will support the scheduled completion date for the total effort is December 11, 1981 -- five (5) weeks prior to the scheduled completion date. These examples illustrate the two basic calculations used in PERT.

METHOD OF OPERATION: MANUAL OR COMPUTER

PERT can be performed manually or by computer. It is feasible to perform manually the above-discussed calculations for a very small network; i.e., one containing no more than fifty (50) activities. Rarely would it be feasible to use a manual approach on a network with as many as 200 activities. One hundred activities are used often as a rule-of-thumb for determining which approach is more feasible--manual or computer. However, there are several factors other than the number of activities which should be considered when making this decision, including: (1) complexity of the network, (2) importance of accuracy, (3) importance of timely and/or frequent output, (4) number of times that the network will be updated or revised, and (5) availability (and cost) of the alternative resources-- human and computer. The use of a computer becomes more attractive, compared to the manual approach, when (1) a network contains a high percentage of dissimilar, interrelated activities (2) the schedule analyses must be very accurate; e.g., when the results affect contractual dates or the scheduling of a major test facility, (3) results of analyses are needed very soon after receipt of input data, (4) the network will be updated or revised many times, and (5) appropriate computer hardware and software, and personnel trained as to use of the computer approach, are available.

COMPUTER-GENERATED REPORTS

PPARS, the NASA/LaRC computer program for performing PERT calculations, is also capable of producing a wide variety of reports in both tabular and graphic form. The principal reports used show either all or selected activities sorted as follows: (1) chronologically, by expected completion or expected start dates; (2) by amount of slack - each discrete schedule path is shown in the sequence in which the activities are to be performed; and (3) by organization - each activity to be performed by a certain organization or for which a certain person is responsible is shown (the sequence of these activities can be by amount of slack or expected completion date).

Appendixes B through G are examples of the principal reports generated by the NASA/LaRC PPARS Program. It should be noted that these examples do not necessarily show all of the information contained in the actual reports. Examples of tabular and bar charts reports sorted by expected completion date are shown in Appendixes B and C. Appendix D contains four variations of reports listing activities expected to either start or be completed during a certain period. Appendixes B, C, and D are used extensively by project personnel and the schedule analyst to review the status of current and near-term activities. Appendix E is an example of a project master schedule in tabular format which contains selected activities or events listed by expected completion date. This report, which is also available in barchart format, is very effective for management reporting.

Appendix F is an example of a report containing all of the activities in a PERT network sorted by the amount of positive or negative slack. The report groups the activities comprising a discrete path and lists the activities chronologically by expected completion dates. This report is very important to the schedule analyst in assessing the project schedule or making modifications to the existing PERT schedule. It is also a handy source of important schedule information for project management.

Appendix G is an example of a report containing all of the activities in a PERT network which have been identified by a specific "organization" code. The activities are listed by expected completion date. This report is used extensively to provide project personnel information regarding the work they are involved in without having to extract that data from reports containing all of the activities in the PERT network. Similar reports sorted by paths of criticality are also available.

There are other types of schedule reports which can be produced by PPARS that are used in special situations. However, the above-described reports are the basic reports which are used on almost all projects.

TYPES OF EFFORTS ON WHICH PERT IS EFFECTIVE

The two biggest users of PERT are the construction and the aerospace research and development industries. The characteristics of the efforts in these industries on which PERT has been used extensively are worth noting. Generally, such efforts have involved: (1) either a single or a limited number of tangible end products, (2) one-of-a-kind overall design, (3) high cost, (4) many interrelated activities, (5) more than one organization, (6) a period of performance of several months or longer, and (7) a scheduled completion date which is considered an important commitment.

The above-listed characteristics are valid indicators as to whether PERT would be an effective tool for use in the schedule planning and control of a particular effort.

TYPES OF EFFORTS ON WHICH PERT IS NOT EFFECTIVE

PERT is not effective under certain conditions. For the most part, these conditions are the converse of the above-listed items. For example, PERT would not be cost effective for the scheduling of a typical production-line type of operation. Even in the aerospace R&D environment there are some efforts on which PERT is not effective. Two types of efforts which fall under this category warrant special comment. First, there are many basic research efforts which are "planned" only as the results of on-going efforts become known so that there is seldom, if ever, an identifiable schedule plan for future activity. Therefore, the essential elements for PERT do not exist. Second, there are low priority efforts which are only worked intermittently when the necessary labor and/or facilities are available. In theory, PERT could be used for the latter type of effort if valid, timely input could be obtained regarding the external conditions which affect the schedule for a given project. However, in pratice this is rarely feasible.

PERT AS A SCHEDULE PLANNING TOOL

The PERT technique generally has earned high grades as a planning tool. The PERT network explicitly shows the interdependencies of the activities comprising the planned effort, and the PERT calculations reflect these interdependencies. On simple efforts that are well known to the responsible individual(s) a simpler type of schedule; e.g., a Gantt or milestone chart, might serve equally well. However, in the planning of a complex, one-of-a-kind type effort, the discrete identification of interdependencies and their schedule impacts are important. These features of PERT have even greater value when different organizations within a company or more than one company are involved in the effort. Project personnel can use the network and reports reflecting the results of PERT calculations to develop and review the work plan. In practice, the development of an original baseline schedule or major schedule revision usually entails several iterations. At appropriate times in the process the plan(s) under consideration is (are) "tested" by PERT; i.e., changes in logic and/or time estimates are made, and PERT calculations are then made to determine the schedule impact of these changes. The end result of this process should be the adoption of a logic flow plan which is understood by all key personnel and is acceptable to all individuals who are responsible for tasks. It is important to recognize that this plan might not be the only reasonable approach to performing the project or effort. It can best be described as an optimal plan at a point in time which is to be the baseline for all future planning unless project management approves a deviation(s).

It is important that the right personnel are made a part of the process which results in a schedule baseline plan or subsequent revisions. There is no one simple way to state who the right people are. However, at a minimum they must have: (1) knowledge of the work to be done and what is required of other organizations for their own organization to do its job, (2) responsibility for the work or at least the scheduling of the work, and

(3) the ability and desire to think in terms of the overall project schedule and not limit their thinking strictly to their own area(s) of responsibility. The PERT technique will not be effective for planning purposes-- or any other constructive purpose--unless people are involved who meet these requirements.

PERT AS A SCHEDULE ANALYSIS TOOL

The PERT technique is generally regarded as an excellent tool for analyzing the schedule status/outlook of a complex effort. As previously discussed, it can readily identify the amount of slack in various schedule paths. It is the rule rather than the exception for many schedule options to be considered and a number of significant changes to be made during the operational phase of a project. PERT can be a real asset by helping to bring about a common understanding of the schedule implications of these options and changes so that project personnel may take appropriate actions in a timely manner. It can quickly reflect the impact of the late completion of an activity on all the activities which are schedule dependent on it. In addition the network feature of PERT provides visibility as to such impacts and facilitates the identification of schedule options.

Although not major limitations, the PERT technique does have two limiting features as an analysis tool which warrant comment. One is due to the fact that a PERT network reflects only one way of accomplishing an effort, whereas in practice there is usually at least one reasonable alternative approach. For example, the network for the construction of a building might show all of the plumbing work being completed prior to the start of electrical work as this might have been considered the optimal plan at one point in time, although it was also recognized that much of this work could be done simultaneously if this was necessary from the standpoint of the overall job schedule. It is possible that delays then could be encountered causing the PERT calculations to indicate the job would not be completed on time. In such a case, the analyst must be careful to explain the meaning of the PERT results; i.e., explaining that the PERT expected completion date is predicated on the plumbing and electrical work being done in series in accordance with the baseline plan. The analyst would be remiss if he did not also state that some of this work could be performed in parallel, indicating the expected completion date of the total job if this change was made to the baseline plan. This example illustrates the principle that PERT results must be interpreted in the context of what is known by the analyst and, per se, do not constitute a complete schedule analysis.

There is also a potential for error in PERT calculations which should be noted. This is due to the fact that the time estimates for the activities comprising the network are expressed by a single number; e.g., 10 weeks, which is usually thought of as a median average; i.e., the chances are equal that a 10-week activity will be completed in less than or more than 10 weeks. This type of time estimate does not take into consideration the range of possible outcomes from a probabilistic standpoint. Experience to date with a schedule analysis technique which incorporates a probabilistic expression of activity time, viz., QGERT, has shown that in some cases a somewhat different expected completion date for a complex effort will be obtained than that obtained using PERT. QGERT results indicate that PERT calculations tend to be slightly optimistic for highly complex efforts. I do not believe that the results obtained by QGERT or any other schedule analysis tool indicate that PERT results are invalid. However, the user of PERT should be aware of the possibility that PERT could be producing a somewhat optimistic expected completion date for the above discussed reason.

PERT AS A SCHEDULE CONTROL TOOL

PERT has been used effectively as a schedule control tool, but there have been many cases where its usefulness for this purpose has been strongly challenged, especially when the cost of operating a computer-augmented PERT system is considered.

PERT has been an effective tool for controlling the schedules of many LaRC in-house R&D projects. As a general rule, the PERT networks on such efforts have been developed either by or with the active participation of the technical leads who are responsible for subareas of the project. A schedule analyst coordinates the development and prepares the appropriate computer input for operation of the PPARS program. During the operational phase of the project the same personnel are involved. The network is updated frequently and there is open discussion as to status, plans and problems. The PERT reports generated by PPARS as a result of these meetings usually do not contain any surprises, but rather serve to confirm the effects of any changes made at the meeting; i.e., the report contains the expected completion dates agreed upon at the meeting, which then become the commitment dates for the responsible technical leads.

The use of PERT for the schedule control of contractual efforts differs widely from the above-described mode on LaRC in-house R&D projects. And the results obtained by various contractors also vary widely. The major R&D contractors in the aerospace industry have developed schedule control systems over the years which best suit their operations. As a general rule these systems are closely integrated with their other management control systems, especially with their financial control systems. As a consequence, a contractor's schedule control system is usually structured in the way he controls his costs, issues authorizations, maintains manpower records, etc. Generally, it will follow his organization structure. When a contractor undertakes a major R&D contract effort, he normally establishes a project team to manage the effort. The team, in turn, develops "mini contracts" with various organizations of the company to perform certain activities or tasks. These work contracts are written up in detail in accordance with the company's mode of operation. However, the end product is the same- each organization which has work to perform under the NASA contract receives a budget authorization to perform the work specified in his "mini contract" and assumes responsibility for completing that work not just within budget but also in accordance with an agreed upon schedule. The individual organizations then integrate this work into their total work plans. It is important to note that an individual organization's optimal schedule will often not be the same as the project team's optimal schedule. The organization seeks maximum flexibility in scheduling its tasks in support of a particular project, whereas the project office wants these tasks performed in accordance with a schedule which will minimize risks from a total project standpoint. As a result of this difference in orientation, a medium or high level schedule of the organization's activities is usually negotiated. In some cases it will be only a schedule commitment for the completion of the task. A certain member(s) of the project team monitors the progress of the various organizations vis-a-vis the negotiated schedule date(s). This surveillance is the project team's principal means of statusing the overall schedule. When they feel that the schedule in a certain area is in jeopardy, they attempt to work the problem with the responsible organization, and if unsuccessful, report the situation to the project manager. The project manager will then work the problem at a management level. It is important to note that the technical leads and the schedule specialist in the performing organizations typically would not use PERT on a regular basis. They would most likely work with detailed bar chart type schedules, possibly supplemented by lists of subtasks and dates for performance thereof. However, the project team member(s) monitoring the project schedule will often assess the schedule impact of a real or potential delay by reference to a project level PERT network reflecting the interdependencies of all major task areas. This assessment will often help to determine the options which are available, and will provide the project manager with relevant information for his use in working the problem, if that is necessary. In summary, PERT is normally not used directly by contractors in their day-to-day control of detailed schedules maintained by performing organizations, but is often used effectively in analyses of a project level schedule.

PERT AS A TOOL FOR MONITORING CONTRACTOR SCHEDULE PERFORMANCE

PERT has been used effectively by NASA/LaRC in many instances to obtain the visibility of a contractor's schedule performance and plans which is necessary to properly manage a contractual effort. However, several conditions are necessary in order for PERT to be effective for this purpose. First, the contractor's PERT schedule must be an integral part of his project schedule control system, although it does not have to be his lowest level schedule. As mentioned earlier, contractor's often use PERT at a project level as a schedule planning and control tool. Under these conditions PERT can be used very effectively to meet NASA/LaRC reporting requirements. As a general rule the level of detail in the PERT schedule required by NASA/LaRC should not exceed the level required by the contractor's project team to maintain schedule control. The best arrangement is one whereby the contractor uses the same PERT schedule as he submits to NASA/LaRC. It is important that NASA/LaRC not require PERT reporting at such a low level of detail as to be very costly due to the ineffective methods the contractor must take to provide such data; i.e., his project schedule control personnel must convert low level schedules into PERT format and continuously update these schedules.

In order for PERT to be used effectively for reporting contractor schedule status and plans to NASA the following requirement must be satisfied: the contractor must assign personnel who understand PERT to the effort and make an organizational commitment to maintain a valid PERT schedule. In many instances NASA/LaRC has provided assistance to contractors to enable them to implement a PERT-type schedule reporting system. In some instances the NASA/LaRC PPARS Program, and assistance in the use of that program has been provided which has made it possible for contractors to use this program on their own computers. In other cases, NASA/LaRC has done all of the computer processing at LaRC's computer complex, using contractor input and providing appropriate output to the respective contractors. A note of caution-- when the above types of assistance are provided NASA/LaRC project personnel should not endorse the use of a schedule reporting system which is not fully integrated with the contractor's internal schedule control system.

PERT AS A SCHEDULE REPORTING TOOL

As previously discussed, the NASA/LaRC PPARS system can provide a wide variety of reports which reflect PERT calculations. The types of reports shown in the Appendixes have been used very successfully in providing members of a project team, higher management and personnel of other participating organizations with timely, relevant schedule information concerning both contractor and LaRC in-house efforts. It is recommended that a distribution list be established for various reports based on the needs of various personnel, and that this list be adhered to. If this is done, the recipients will quickly become familiar with the reports and be inclined to make more use of them.

Certain computer-generated bar charts, such as the one shown in Appendix C, are well suited for reporting project schedule status to higher management. The use of such reports for reporting to higher management is highly recommended as they are directly traceable to the project schedule baseline. Therefore, if management requires additional schedule information in a certain subarea such information can be provided very quickly from the same data base as the one which generated the original management report.

SUMMARY

The PERT technique is an effective tool for the schedule planning of complex, one-of-a-kind type efforts (or projects).

The use of a computer-program for producing PERT calculations and reports generally becomes cost effective when the number of activities in the schedule network is in the 100-200 range, and is almost always required when the number of activities exceeds 200.

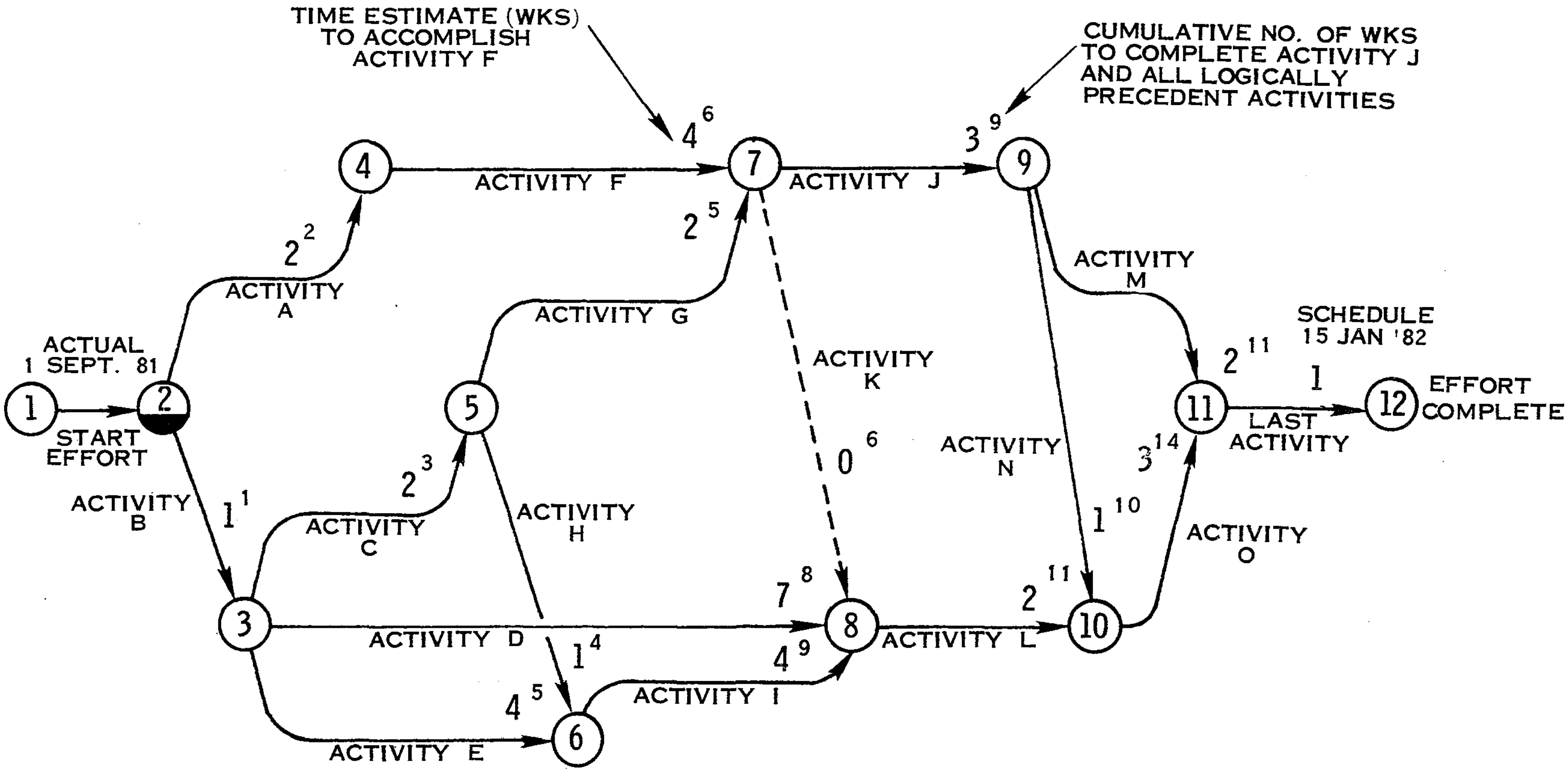
During the operational phase of complex, one-of-a-kind type efforts, PERT is an effective tool for analyzing the status/outlook of such efforts vis-a-vis a baseline schedule. However, caution must be exercised in using the results of PERT calculations since the results obtained are based on only one approach to doing the remaining tasks, viz. the schedule baseline, whereas alternate approaches might be feasible. PERT results, per se, do not constitute a schedule analysis, but rather should be viewed as data for making a schedule analysis which takes into consideration all that is known regarding the schedule; e.g., planned changes, potential problems, etc.

The effective use of PERT as the day-to-day schedule for controlling an effort is not wide-spread. Generally such use has been limited to situations where all of the technical leads work in close proximity to each other and there are few organizational constraints on the work schedule. Under these conditions, the technical leads are able to meet frequently and integrate their near-term work plans using inputs from each other. This is the typical mode of operation for NASA/LaRC in-house R&D projects, and PERT has been used effectively for many years for the schedule control of such efforts.

Contractors rarely use PERT as the lowest level schedule for control purposes. However, PERT is frequently used effectively by contractors at the project level, where schedule specialists develop and maintain an integrated schedule reflecting the efforts of many different organizations. PERT schedules at this level have also been used effectively in many instances as the basis for schedule reporting to NASA/LaRC.

Some computer programs, including NASA/LaRC's PPARS system, are capable of producing excellent schedule reports of PERT data for use by members of the project team and reporting to management.

SAMPLE PERT NETWORK



NOTE: CUMULATIVE NUMBERS ARE SHOWN FOR ILLUSTRATIVE PURPOSES ONLY.

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PROJECT PLANNING ANALYSIS & REPORTING SYSTEM

PPARS 1.1.A.1
PAGE 1

RUN 1 REPORT 4 DATE OF THIS REPORT IS 6/16/81

BY EXPECTED DATE AND PREDECESSOR EVENT NUMBER
NETWORK TEST HORNS

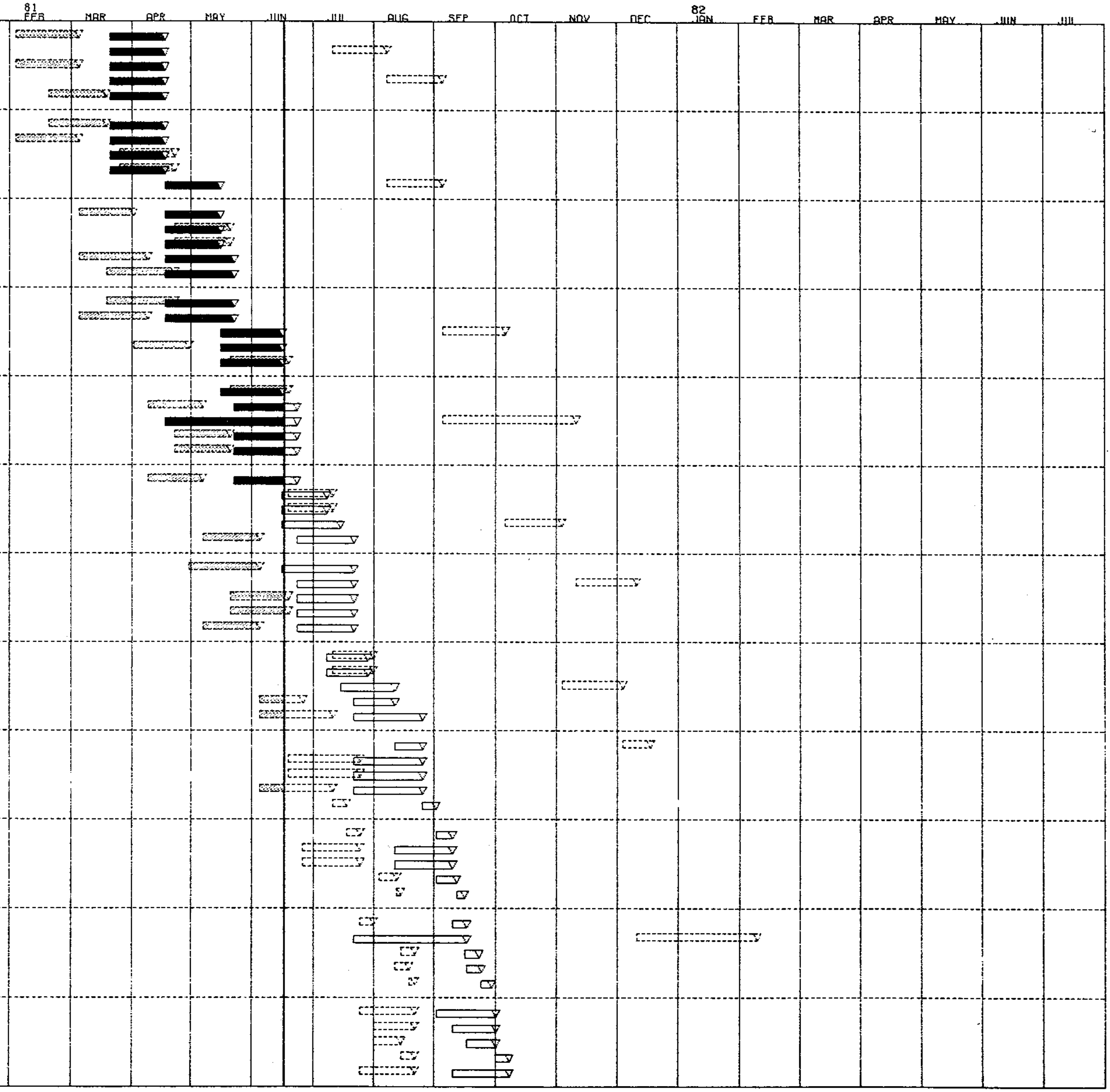
EVENT PRE.	SUC.	ACTIVITY DESCRIPTION	PLOT CODE	ACTIV. TIME	COMPLETION DATE EXPECTED	ALLOWED	DATE SCHD/ACT.	SLACK	RE-SOURCE	TIME REM.	ORGAN-IZATION
400- 99S	526-200	TELESCOPE PARTS ACQ START FM					*03/20/81		0		
400- 99S	526-300	BIAXIAL GIMBAL PARTS ACQ START FM					*03/20/81		0		
400- 99S	526-400	INTEG HARDWARE PARTS ACQ START FM					*03/20/81		0		
400- 99S	526-700	SUN SENSOR PARTS ACQ START FM					*03/20/81		0		
400- 99S	534-400	AFT OPTICS PARTS ACQ START FM					*03/20/81		0		
400- 99S	535- 0	CALIB WHEEL PARTS ACQ START FM					*03/20/81		0		
400- 99S	535-100	CHOPPER PARTS ACQ START FM					*03/20/81		0		
400- 99S	535-200	GAS CHANNEL PARTS ACQ START FM					*03/20/81		0		
400- 99S	535-300	RADIOMETER PARTS ACQ START FM					*03/20/81		0		
526-200	526-205	PLACE PO TELESCOPE MECH PARTS	P	4.0	04/17/81	03/04/81		-6.4	0	-8.2	Z
526-300	526-305	PLACE PO GIMBAL MECH PARTS	P	4.0	04/17/81	08/07/81		15.6	0	-8.2	L
526-400	526-405	PLACE PO INTEG HDW MECH PARTS	P	4.0	04/17/81	03/04/81		-6.4	0	-8.2	Z
526-700	526-705	PLACE PO SUN SENSOR MECH PARTS	P	4.0	04/17/81	09/04/81		19.6	0	-8.2	9
534-400	534-405	PLACE PO/AFT OPTICS MECH PARTS	P	4.0	04/17/81	03/18/81		-4.4	0	-8.2	Z
535- 0	535- 5	PLACE PO CALIBR WHEEL MECH PARTS	P	4.0	04/17/81	03/18/81		-4.4	0	-8.2	Z
535-100	535-105	PLACE PO CHOPPER MECH PARTS	P	4.0	04/17/81	03/04/81		-6.4	0	-8.2	Z
535-200	535-205	PLACE PO GAS CH MECH PARTS	P	4.0	04/17/81	04/22/81		.6	0	-8.2	Z
535-300	535-305	PLACE PO RADIOMETER MECH PARTS	P	4.0	04/17/81	04/22/81		.6	0	-8.2	Z
526-305	526-310	UPDATE REPORT GIMBAL MECH PARTS	P	4.0	05/15/81	09/04/81		15.6	0	-4.2	L
526-405	526-410	UPDATE REPORT INTEG HDW MECH PARTS	P	4.0	05/15/81	04/01/81		-6.4	0	-4.2	Z
535-205	535-210	UPDATE REPORT GAS CH MECH PARTS	P	4.0	05/15/81	05/20/81		.6	0	-4.2	Z
535-305	535-310	UPDATE REPORT RADIOMETER MECH PARTS	P	4.0	05/15/81	05/20/81		.6	0	-4.2	Z
526-205	526-210	UPDATE REPORT TELESCOPE MECH PARTS	P	5.0	05/22/81	04/08/81		-6.4	0	-3.2	Z
534-405	534-410	UPDATE REPORT AFT OPTICS MECH PARTS	P	5.0	05/22/81	04/22/81		-4.4	0	-3.2	Z
535- 5	535- 10	UPDATE REPORT CALIBR WHEEL MECH PARTS	P	5.0	05/22/81	04/22/81		-4.4	0	-3.2	Z
535-105	535-110	UPDATE REPORT CHOPPER MECH PARTS	P	5.0	05/22/81	04/08/81		-6.4	0	-3.2	Z
526-310	526-315	UPDATE REPORT GIMBAL MECH PARTS	P	4.0	06/15/81	10/05/81		15.6	0	-.2	L
526-410	526-415	UPDATE REPORT INTEG HDW MECH PARTS	P	4.0	06/15/81	04/29/81		-6.4	0	-.2	Z
535-210	535-215	UPDATE REPORT GAS CH MECH PARTS	P	4.0	06/15/81	06/18/81		.6	0	-.2	Z
535-310	535-315	UPDATE REPORT RADIOMETER MECH PARTS	P	4.0	06/15/81	06/18/81		.6	0	-.2	Z
526-210	526-215	UPDATE REPORT TELESCOPE MECH PARTS	P	4.0	06/22/81	05/06/81		-6.4	0	.8	Z
526-705	526-710	STATUS REPORT	P	9.0	06/22/81	11/10/81		19.6	0	.8	9
534-410	534-415	UPDATE REPORT AFT OPTICS MECH PARTS	P	4.0	06/22/81	05/20/81		-4.4	0	.8	Z
535- 10	535- 15	UPDATE REPORT CALIBR WHEEL MECH PARTS	P	4.0	06/22/81	05/20/81		-4.4	0	.8	Z
535-110	535-115	UPDATE REPORT CHOPPER MECH PARTS	P	4.0	06/22/81	05/06/81		-6.4	0	.8	Z
535-215	535-220	UPDATE REPORT GAS CH MECH PARTS	P	3.0	07/07/81	07/10/81		.6	0	2.8	Z

APPENDIX B

REPORT DATE: JUN 16, 81 REPORT 4 PAGE 1

SOLID LINE - EXPECTED COMPLETION DATE
BROKEN LINE - ALLOWED COMPLETION DATE

PRED	SUCC	ACTIVITY DESCRIPTION
526-200	526-205	PLACE PO TELESCOPE MECH PARTS
526-300	526-305	PLACE PO GIMBAL MECH PARTS
526-400	526-405	PLACE PO INTEG HDW MECH PARTS
526-700	526-705	PLACE PO SUN SENSOR MECH PARTS
534-400	534-405	PLACE PO/AFT OPTICS MECH PARTS
535- 0	535- 5	PLACE PO CALIBR WHEEL MECH PARTS
535-100	535-105	PLACE PO CHOPPER MECH PARTS
535-200	535-205	PLACE PO GAS CH MECH PARTS
535-300	535-305	PLACE PO RADIOMETER MECH PARTS
526-305	526-310	UPDATE REPORT GIMBAL MECH PARTS
526-405	526-410	UPDATE REPORT INTEG HDW MECH PARTS
535-205	535-210	UPDATE REPORT GAS CH MECH PARTS
535-305	535-310	UPDATE REPORT RADIOMETER MECH PARTS
526-205	526-210	UPDATE REPORT TELESCOPE MECH PARTS
534-405	534-410	UPDATE REPORT AFT OPTICS MECH PARTS
535- 5	535- 10	UPDATE REPORT CALIBR WHEEL MECH PARTS
535-105	535-110	UPDATE REPORT CHOPPER MECH PARTS
526-310	526-315	UPDATE REPORT GIMBAL MECH PARTS
526-410	526-415	UPDATE REPORT INTEG HDW MECH PARTS
535-210	535-215	UPDATE REPORT GAS CH MECH PARTS
535-310	535-315	UPDATE REPORT RADIOMETER MECH PARTS
526-210	526-215	UPDATE REPORT TELESCOPE MECH PARTS
526-705	526-710	STATUS REPORT
534-410	534-415	UPDATE REPORT AFT OPTICS MECH PARTS
535- 10	535- 15	UPDATE REPORT CALIBR WHEEL MECH PARTS
535-110	535-115	UPDATE REPORT CHOPPER MECH PARTS
535-215	535-220	UPDATE REPORT GAS CH MECH PARTS
535-315	535-320	UPDATE REPORT RADIOMETER MECH PARTS
526-315	526-320	UPDATE REPORT GIMBAL MECH PARTS
526-215	526-220	UPDATE REPORT TELESCOPE MECH PARTS
526-415	526-499	RECIEVE MECH INTEG PARTS
526-710	526-799	RECEIVE MECH PARTS SUN SENSOR
534-415	534-420	UPDATE REPORT AFT OPTICS MECH PARTS
535- 15	535- 20	UPDATE REPORT CALIBR WHEEL MECH PARTS
535-115	535-120	UPDATE REPORT CHOPPER MECH PARTS
535-220	535-299	RECEIVE MECH PARTS GAS CHANNEL
535-320	535-399	RECEIVE MECH PARTS RADIOMETER
526-320	526-325	UPDATE REPORT GIMBAL MECH PARTS
534-600	534-610	PRE ASSY CLEANING OF 1 MOD ASSY COMP
526-220	526-299	RECEIVE MECH PARTS TELESCOPE
526-325	526-399	RECEIVE MECH PARTS-GIMBAL
534-420	534-499	RECEIVE MECH PARTS AFT OPTICS
535- 20	535- 99	RECEIVE MECH PARTS CAL WHEEL
535-120	535-199	RECEIVE MECH PARTS CHOPPER
532- 5	532- 10	MECH TELESCOPE BARREL ASSY
532- 10	532- 15	ASSY PRIMARY MIRROR
534-610	534-620	PRE ASSY CLEANING OF 2 MOD ASSY COMP
534-610	534-630	PRE ASSY CLEANING OF OPTICS UNIT 1
532- 35	532- 40	ASSY AFT OPTICS
532- 40	532- 45	INSTALL CHOPPER
532- 15	532- 20	ASSY SECONDARY MIRROR
534-300	534-310	SUN SENSOR ASSY
532- 45	532- 70	ALIGN AFT OPTICS
532- 20	532- 25	FINAL TELESCOPE ASSY
532- 25	532- 30	INSTALL TELESCOPE DOOR
532- 50	532- 70	ASSY CALIBR WHEEL
532- 55	532- 70	ASSY GAS CHANNEL MODULE
532- 60	532- 65	ASSY RADIOMETER
532- 65	532- 70	ALIGN RADIOMETER
534-620	534-699	PRE ASSY CLEANING OF 3 MOD ASSY COMP



NASA - LANGLEY RESEARCH CENTER
PROJECT PLANNING ANALYSIS & REPORTING SYSTEM

PPARS 1.1.A.1
PAGE 1

RUN 1 REPORT 21 DATE OF THIS REPORT IS 6/16/81

BY ACTIVITIES DUE FOR COMPLETION THRU REPORT DATE.(06/17/81)
NETWORK TEST HORNS

EVENT PRE.	SUC.	ACTIVITY DESCRIPTION	PLOT CODE	ACTIV. TIME	COMPLETION DATE EXPECTED	ALLOWED	DATE SCHD/ACT.	SLACK	RE-SOURCE	TIME REM.	ORGAN-IZATION
526-200	526-205	PLACE PO TELESCOPE MECH PARTS	P	4.0	04/17/81	03/04/81		-6.4	0	-8.2	Z
526-300	526-305	PLACE PO GIMBAL MECH PARTS	P	4.0	04/17/81	08/07/81		15.6	0	-8.2	L
526-400	526-405	PLACE PO INTEG HDW MECH PARTS	P	4.0	04/17/81	03/04/81		-6.4	0	-8.2	Z
526-700	526-705	PLACE PO SUN SENSOR MECH PARTS	P	4.0	04/17/81	09/04/81		19.6	0	-8.2	9
534-400	534-405	PLACE PO/AFT OPTICS MECH PARTS	P	4.0	04/17/81	03/18/81		-4.4	0	-8.2	Z
535- 0	535- 5	PLACE PO CALIBR WHEEL MECH PARTS	P	4.0	04/17/81	03/18/81		-4.4	0	-8.2	Z
535-100	535-105	PLACE PO CHOPPER MECH PARTS	P	4.0	04/17/81	03/04/81		-6.4	0	-8.2	Z
535-200	535-205	PLACE PO GAS CH MECH PARTS	P	4.0	04/17/81	04/22/81		.6	0	-8.2	Z
535-300	535-305	PLACE PO RADIOMETER MECH PARTS	P	4.0	04/17/81	04/22/81		.6	0	-8.2	Z
526-305	526-310	UPDATE REPORT GIMBAL MECH PARTS	P	4.0	05/15/81	09/04/81		15.6	0	-4.2	L
526-405	526-410	UPDATE REPORT INTEG HDW MECH PARTS	P	4.0	05/15/81	04/01/81		-6.4	0	-4.2	Z
535-205	535-210	UPDATE REPORT GAS CH MECH PARTS	P	4.0	05/15/81	05/20/81		.6	0	-4.2	Z
535-305	535-310	UPDATE REPORT RADIOMETER MECH PARTS	P	4.0	05/15/81	05/20/81		.6	0	-4.2	Z
526-205	526-210	UPDATE REPORT TELESCOPE MECH PARTS	P	5.0	05/22/81	04/08/81		-6.4	0	-3.2	Z
534-405	534-410	UPDATE REPORT AFT OPTICS MECH PARTS	P	5.0	05/22/81	04/22/81		-4.4	0	-3.2	Z
535- 5	535- 10	UPDATE REPORT CALIBR WHEEL MECH PARTS	P	5.0	05/22/81	04/22/81		-4.4	0	-3.2	Z
535-105	535-110	UPDATE REPORT CHOPPER MECH PARTS	P	5.0	05/22/81	04/08/81		-6.4	0	-3.2	Z
526-310	526-315	UPDATE REPORT GIMBAL MECH PARTS	P	4.0	06/15/81	10/05/81		15.6	0	-.2	L
526-410	526-415	UPDATE REPORT INTEG HDW MECH PARTS	P	4.0	06/15/81	04/29/81		-6.4	0	-.2	Z
535-210	535-215	UPDATE REPORT GAS CH MECH PARTS	P	4.0	06/15/81	06/18/81		.6	0	-.2	Z
535-310	535-315	UPDATE REPORT RADIOMETER MECH PARTS	P	4.0	06/15/81	06/18/81		.6	0	-.2	Z

NASA - LANGLEY RESEARCH CENTER
PROJECT PLANNING ANALYSIS & REPORTING SYSTEM

RUN 1 REPORT 21 DATE OF THIS REPORT IS 6/16/81

BY ACTIVITIES DUE FOR COMPLETION AFTER REPORT DATE THRU NEXT REPORT DATE.(06/18/81 - 07/17/81)
NETWORK TEST HORNS

EVENT PRE.	SUC.	ACTIVITY DESCRIPTION	PLOT CODE	ACTIV. TIME	COMPLETION DATE EXPECTED	ALLOWED	DATE SCHD/ACT.	SLACK	RE-SOURCE	TIME REM.	ORGAN-IZATION
526-210	526-215	UPDATE REPORT TELESCOPE MECH PARTS	P	4.0	06/22/81	05/06/81		-6.4	0	.8	Z
526-705	526-710	STATUS REPORT	P	9.0	06/22/81	11/10/81		19.6	0	.8	9
534-410	534-415	UPDATE REPORT AFT OPTICS MECH PARTS	P	4.0	06/22/81	05/20/81		-4.4	0	.8	Z
535- 10	535- 15	UPDATE REPORT CALIBR WHEEL MECH PARTS	P	4.0	06/22/81	05/20/81		-4.4	0	.8	Z
535-110	535-115	UPDATE REPORT CHOPPER MECH PARTS	P	4.0	06/22/81	05/06/81		-6.4	0	.8	Z
535-215	535-220	UPDATE REPORT GAS CH MECH PARTS	P	3.0	07/07/81	07/10/81		.6	0	2.8	Z
535-315	535-320	UPDATE REPORT RADIOMETER MECH PARTS	P	3.0	07/07/81	07/10/81		.6	0	2.8	Z
526-315	526-320	UPDATE REPORT GIMBAL MECH PARTS	P	4.0	07/14/81	11/03/81		15.6	0	3.8	L

RUN 1 REPORT 21 DATE OF THIS REPORT IS 6/16/81

BY ACTIVITIES DUE TO START FROM LAST REPORT DATE THRU REPORT DATE.(05/22/81 - 06/17/81)
NETWORK TEST HORNS

EVENT PRE.	SUC.	ACTIVITY DESCRIPTION	PLOT CODE	ACTIV. TIME	START EXPECTED	DATE ALLOWED	DATE SCHD/ACT.	SLACK	RE-SOURCE	TIME REM.	ORGAN-IZATION
526-415	526-499	RECIEVE MECH INTEG PARTS	P	5.0	06/15/81	04/29/81		-6.4	0	4.8	Z

15

APPENDIX D
3 of 4

RUN 1 REPORT 21 DATE OF THIS REPORT IS 6/16/81

BY ACTIVITIES DUE TO START AFTER REPORT DATE THRU NEXT REPORT DATE.(06/18/81-07/17/81)
NETWORK TEST HORNS

EVENT PRE.	SUC.	ACTIVITY DESCRIPTION	PLOT CODE	ACTIV. TIME	START DATE EXPECTED	ALLOWED	DATE SCHD/ACT.	SLACK	RE-SOURCE	TIME REM.	ORGAN-IZATION
526-215	526-220	UPDATE REPORT TELESCOPE MECH PARTS	P	4.0	06/22/81	05/06/81		-6.4	0	4.8	Z
526-710	526-799	RECEIVE MECH PARTS SUN SENSOR	P	4.0	06/22/81	11/10/81		19.6	0	4.8	9
534-415	534-420	UPDATE REPORT AFT OPTICS MECH PARTS	P	4.0	06/22/81	05/20/81		-4.4	0	4.8	Z
535- 15	535- 20	UPDATE REPORT CALIBR WHEEL MECH PARTS	P	4.0	06/22/81	05/20/81		-4.4	0	4.8	Z
535-115	535-120	UPDATE REPORT CHOPPER MECH PARTS	P	4.0	06/22/81	05/06/81		-6.4	0	4.8	Z
535-220	535-299	RECEIVE MECH PARTS GAS CHANNEL	P	3.0	07/07/81	07/10/81		.6	0	5.8	Z
535-320	535-399	RECEIVE MECH PARTS RADIOMETER	P	3.0	07/07/81	07/10/81		.6	0	5.8	Z
526-320	526-325	UPDATE REPORT GIMBAL MECH PARTS	P	4.0	07/14/81	11/03/81		15.6	0	7.8	L

01

NASA - LANGLEY RESEARCH CENTER
PROJECT PLANNING ANALYSIS & REPORTING SYSTEM

PPARS 1.1.A.1
PAGE 1

RUN 1

REPORT 12

DATE OF THIS REPORT IS 6/16/81

MASTER SCHEDULE 01
NETWORK TEST HORNS

EVENT PRE.	SUC.	ACTIVITY DESCRIPTION	PLOT CODE	ACTIV. TIME	COMPLETION DATE EXPECTED	ALLOWED	DATE SCHD/ACT.	SLACK	RE-SOURCE	TIME REM.	ORGAN-IZATION
526-200	526-205	PLACE PO TELESCOPE MECH PARTS	P	4.0	04/17/81	03/04/81		-6.4	0	-8.2	Z
526-300	526-305	PLACE PO GIMBAL MECH PARTS	P	4.0	04/17/81	08/07/81		15.6	0	-8.2	L
526-400	526-405	PLACE PO INTEG HDW MECH PARTS	P	4.0	04/17/81	03/04/81		-6.4	0	-8.2	Z
526-305	526-310	UPDATE REPORT GIMBAL MECH PARTS	P	4.0	05/15/81	09/04/81		15.6	0	-4.2	L
526-405	526-410	UPDATE REPORT INTEG HDW MECH PARTS	P	4.0	05/15/81	04/01/81		-6.4	0	-4.2	Z
526-205	526-210	UPDATE REPORT TELESCOPE MECH PARTS	P	5.0	05/22/81	04/08/81		-6.4	0	-3.2	Z
526-310	526-315	UPDATE REPORT GIMBAL MECH PARTS	P	4.0	06/15/81	10/05/81		15.6	0	-.2	L
526-410	526-415	UPDATE REPORT INTEG HDW MECH PARTS	P	4.0	06/15/81	04/29/81		-6.4	0	-.2	Z
526-210	526-215	UPDATE REPORT TELESCOPE MECH PARTS	P	4.0	06/22/81	05/06/81		-6.4	0	.8	Z
526-315	526-320	UPDATE REPORT GIMBAL MECH PARTS	P	4.0	07/14/81	11/03/81		15.6	0	3.8	L
526-215	526-220	UPDATE REPORT TELESCOPE MECH PARTS	P	4.0	07/21/81	06/04/81		-6.4	0	4.8	Z
526-415	526-499	RECIEVE MECH INTEG PARTS	P	5.0	07/21/81	06/04/81		-6.4	0	4.8	Z
526-499	532- 0	REC MECH PARTS INTEG HDW RESTRAINT		0.0	07/21/81	07/10/81		-1.4	0	4.8	
526-499	534-600	REC MECH PARTS INTEG HDW RESTRAINT		0.0	07/21/81	06/04/81		-6.4	0	4.8	
526-320	526-325	UPDATE REPORT GIMBAL MECH PARTS	P	4.0	08/11/81	12/03/81		15.6	0	7.8	L
526-220	526-299	RECEIVE MECH PARTS TELESCOPE	P	5.0	08/25/81	07/10/81		-6.4	0	9.8	Z
526-299	532- 5	RECEIVE MECH PARTS TELESCOPE RESTRAINT		0.0	08/25/81	07/10/81		-6.4	0	9.8	
526-299	532- 25	RECEIVE MECH PARTS TELESCOPE RESTRAINT		0.0	08/25/81	08/18/81		-1.0	0	9.8	
526-325	526-399	RECEIVE MECH PARTS-GIMBAL	P	2.0	08/25/81	12/17/81		15.6	0	9.8	L
526-399	534-200	RECEIVE MECH PARTS-GIMBAL RESTRAINT		0.0	08/25/81	12/17/81		15.6	0	9.8	
520-400	520-499E	FM DELIVERY	P	2.0	11/18/82	10/01/82	10/01/82	-6.4	0	71.8	X

RUN 1 REPORT 3 DATE OF THIS REPORT IS 6/16/81

BY PATHS OF CRITICALITY
NETWORK TEST HORNS

EVENT PRE.	SUC.	ACTIVITY DESCRIPTION	PLOT CODE	ACTIV. TIME	COMPLETION DATE EXPECTED	ALLOWED	DATE SCHD/ACT.	SLACK	RE-SOURCE	TIME REM.	ORGAN-IZATION
535-115	535-120	UPDATE REPORT CHOPPER MECH PARTS	P	4.0	07/21/81	06/04/81		-6.4	0	4.8	Z
535-120	535-199	RECEIVE MECH PARTS CHOPPER	P	5.0	08/25/81	07/10/81		-6.4	0	9.8	Z
535-199	532- 5	RECEIVE MECH PARTS CHOPPER RESTRAINT		0.0	08/25/81	07/10/81		-6.4	0	9.8	
532- 5	532- 10	MECH TELESCOPE BARREL ASSY	P	1.0	09/01/81	07/17/81		-6.4	0	10.8	X
532- 10	532- 15	ASSY PRIMARY MIRROR	P	1.0	09/09/81	07/24/81		-6.4	0	11.8	X
532- 15	532- 20	ASSY SECONDARY MIRROR	P	1.0	09/16/81	07/31/81		-6.4	0	12.8	X
532- 20	532- 60	RESTRAINT		0.0	09/16/81	07/31/81		-6.4	0	12.8	
532- 60	532- 65	ASSY RADIOMETER	P	2.0	09/30/81	08/14/81		-6.4	0	14.8	X
532- 65	532- 70	ALIGN RADIOMETER	P	1.0	10/07/81	08/21/81		-6.4	0	15.8	X
534-610	534-620	PRE ASSY CLEANING OF 2 MOD ASSY COMP	P	4.0	09/09/81	07/24/81		-6.4	0	11.8	X
534-620	534-699	PRE ASSY CLEANING OF 3 MOD ASSY COMP	P	4.0	10/07/81	08/21/81		-6.4	0	15.8	X
532-140	532-145	THERMAL BLANKET INSTALLATION	P	4.0	06/25/82	05/11/82		-6.4	0	51.8	X
532-145	532-150	PREP FM FOR DELIVERY		0.0	06/25/82	05/11/82		-6.4	0	51.8	
532-150	532-700	RESTRAINT		0.0	06/25/82	05/11/82		-6.4	0	51.8	
532-700	532-799	FUNCTIONAL TEST RESTRAINT	P	4.0	07/26/82	06/09/82		-6.4	0	55.8	X
532-799	532-800	FM FUNCTIONAL TEST RESTRAINT		0.0	07/26/82	06/09/82		-6.4	0	55.8	
532-800	532-805	FM CALIBRATION	P	2.0	08/09/82	06/23/82		-6.4	0	57.8	X
532-805	532-810	SINE+RANDOM VIBR + FUNCT TESTS	P	1.0	08/16/82	06/30/82		-6.4	0	58.8	X
532-810	532-815	ENVIRONMENTAL + FUNCTIONAL TESTS	P	3.0	09/07/82	07/22/82		-6.4	0	61.8	X
532-815	532-820	PRESSURE DECAY + FUNC TESTS	P	2.0	09/21/82	08/05/82		-6.4	0	63.8	X
532-820	532-825	EMI TEST	P	1.0	09/28/82	08/12/82		-6.4	0	64.8	X
532-825	532-830	FINAL FUNC TEST	P	3.0	10/20/82	09/02/82		-6.4	0	67.8	X
532-830	532-835	FINAL CALIBR	P	2.0	11/03/82	09/17/82		-6.4	0	69.8	X
532-835	532-899	FM ENVIRONMENTAL TEST CMPL		0.0	11/03/82	09/17/82		-6.4	0	69.8	
532-899	520-400	FM ENVIRONMENTAL TEST CMPL RESTRAINT		0.0	11/03/82	09/17/82		-6.4	0	69.8	
520-400	520-499E	FM DELIVERY	P	2.0	11/18/82	10/01/82	10/01/82	-6.4	0	71.8	X
532- 10	532- 35	RESTRAINT		0.0	09/01/81	07/24/81		-5.4	0	10.8	
532- 35	532- 50	RESTRAINT		0.0	09/01/81	07/24/81		-5.4	0	10.8	
532- 50	532- 70	ASSY CALIBR WHEEL	P	4.0	09/30/81	08/21/81		-5.4	0	14.8	X
532- 15	532- 55	RESTRAINT		0.0	09/09/81	07/31/81		-5.4	0	11.8	
532- 55	532- 70	ASSY GAS CHANNEL MODULE	P	3.0	09/30/81	08/21/81		-5.4	0	14.8	X

RUN 1 REPORT 22 DATE OF THIS REPORT IS 6/16/81

BY ORGANIZATION, EXPECTED DATE, AND PREDECESSOR EVENT SORTED BY SSNNNNN LISTED BY SSNNNNN
NETWORK TEST HORNS

EVENT PRE.	SUC.	ACTIVITY DESCRIPTION	PLOT CODE	ACTIV. TIME	COMPLETION DATE EXPECTED	ALLOWED	DATE SCHD/ACT.	SLACK	RE- SOURCE	TIME REM.	ORGAN- IZATTON
526-200	526-205	PLACE PO TELESCOPE MECH PARTS	P	4.0	04/17/81	03/04/81		-6.4	0	-8.2	Z
526-400	526-405	PLACE PO INTEG HDW MECH PARTS	P	4.0	04/17/81	03/04/81		-6.4	0	-8.2	Z
534-400	534-405	PLACE PO/AFT OPTICS MECH PARTS	P	4.0	04/17/81	03/18/81		-4.4	0	-8.2	Z
535- 0	535- 5	PLACE PO CALIBR WHEEL MECH PARTS	P	4.0	04/17/81	03/18/81		-4.4	0	-8.2	Z
535-100	535-105	PLACE PO CHOPPER MECH PARTS	P	4.0	04/17/81	03/04/81		-6.4	0	-8.2	Z
535-200	535-205	PLACE PO GAS CH MECH PARTS	P	4.0	04/17/81	04/22/81		.6	0	-8.2	Z
535-300	535-305	PLACE PO RADIOMETER MECH PARTS	P	4.0	04/17/81	04/22/81		.6	0	-8.2	Z
526-405	526-410	UPDATE REPORT INTEG HDW MECH PARTS	P	4.0	05/15/81	04/01/81		-6.4	0	-4.2	Z
535-205	535-210	UPDATE REPORT GAS CH MECH PARTS	P	4.0	05/15/81	05/20/81		.6	0	-4.2	Z
535-305	535-310	UPDATE REPORT RADIOMETER MECH PARTS	P	4.0	05/15/81	05/20/81		.6	0	-4.2	Z
526-205	526-210	UPDATE REPORT TELESCOPE MECH PARTS	P	5.0	05/22/81	04/08/81		-6.4	0	-3.2	Z
534-405	534-410	UPDATE REPORT AFT OPTICS MECH PARTS	P	5.0	05/22/81	04/22/81		-4.4	0	-3.2	Z
535- 5	535- 10	UPDATE REPORT CALIBR WHEEL MECH PARTS	P	5.0	05/22/81	04/22/81		-4.4	0	-3.2	Z
535-105	535-110	UPDATE REPORT CHOPPER MECH PARTS	P	5.0	05/22/81	04/08/81		-6.4	0	-3.2	Z
526-410	526-415	UPDATE REPORT INTEG HDW MECH PARTS	P	4.0	06/15/81	04/29/81		-6.4	0	-.2	Z
535-210	535-215	UPDATE REPORT GAS CH MECH PARTS	P	4.0	06/15/81	06/18/81		.6	0	-.2	Z
535-310	535-315	UPDATE REPORT RADIOMETER MECH PARTS	P	4.0	06/15/81	06/18/81		.6	0	-.2	Z
526-210	526-215	UPDATE REPORT TELESCOPE MECH PARTS	P	4.0	06/22/81	05/06/81		-6.4	0	.8	Z
534-410	534-415	UPDATE REPORT AFT OPTICS MECH PARTS	P	4.0	06/22/81	05/20/81		-4.4	0	.8	Z
535- 10	535- 15	UPDATE REPORT CALIBR WHEEL MECH PARTS	P	4.0	06/22/81	05/20/81		-4.4	0	.8	Z
535-110	535-115	UPDATE REPORT CHOPPER MECH PARTS	P	4.0	06/22/81	05/06/81		-6.4	0	.8	Z
535-215	535-220	UPDATE REPORT GAS CH MECH PARTS	P	3.0	07/07/81	07/10/81		.6	0	2.8	Z
535-315	535-320	UPDATE REPORT RADIOMETER MECH PARTS	P	3.0	07/07/81	07/10/81		.6	0	2.8	Z
526-215	526-220	UPDATE REPORT TELESCOPE MECH PARTS	P	4.0	07/21/81	06/04/81		-6.4	0	4.8	Z
526-415	526-499	RECIEVE MECH INTEG PARTS	P	5.0	07/21/81	06/04/81		-6.4	0	4.8	Z
534-415	534-420	UPDATE REPORT AFT OPTICS MECH PARTS	P	4.0	07/21/81	06/18/81		-4.4	0	4.8	Z
535- 15	535- 20	UPDATE REPORT CALIBR WHEEL MECH PARTS	P	4.0	07/21/81	06/18/81		-4.4	0	4.8	Z
535-115	535-120	UPDATE REPORT CHOPPER MECH PARTS	P	4.0	07/21/81	06/04/81		-6.4	0	4.8	Z
535-220	535-299	RECEIVE MECH PARTS GAS CHANNEL	P	3.0	07/28/81	07/31/81		.6	0	5.8	Z
535-320	535-399	RECEIVE MECH PARTS RADIOMETER	P	3.0	07/28/81	07/31/81		.6	0	5.8	Z
526-220	526-299	RECEIVE MECH PARTS TELESCOPE	P	5.0	08/25/81	07/10/81		-6.4	0	9.8	Z
534-420	534-499	RECEIVE MECH PARTS AFT OPTICS	P	5.0	08/25/81	07/24/81		-4.4	0	9.8	Z
535- 20	535- 99	RECEIVE MECH PARTS CAL WHEEL	P	5.0	08/25/81	07/24/81		-4.4	0	9.8	Z
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16. Abstract

PERT, an acronym for Project Evaluation and Review Technique, has been used extensively by NASA/LaRC for more than twenty (20) years in the areas of schedule planning and control. This report describes the PERT technique including the types of reports which can be computer generated using the NASA/LaRC PPARS System. An assessment is made of the effectiveness of PERT on various types of efforts as well as for specific purposes, namely, schedule planning, schedule analysis, schedule control, monitoring contractor schedule performance, and management reporting. This assessment is based primarily on the author's knowledge of the usage of PERT by NASA/LaRC personnel since the early 1960's. Both strengths and weaknesses of the technique for various applications are discussed. It is intended to serve as a reference guide for personnel performing project planning and control functions and technical personnel whose responsibilities either include schedule planning and control or require a general knowledge of the subject.

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