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Manufacturing Methods and Technology

**COMPUTERIZED PRODUCTION
PROCESS PLANNING**

**VOLUME III APPENDICES A, B,
AND C TO BENEFIT ANALYSIS**

AD-A151 997

Interim Report

November, 1976

Hsien-Hwei H. Shu

Janis C. Church

Jack P. Kornfeld

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**U.S. Army Missile Command
Contract No. DAAH01-76-C-1104**

Prepared by: **IIT Research Institute**
Chicago, Illinois 60616

For: **United Technologies Research Center**
East Hartford, Ct 06108



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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM	
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER	
	AD-A151997		
4. TITLE (and Subtitle)		5. TYPE OF REPORT & PERIOD COVERED	
Computerized Production Process Planning Volume III - Appendices A, B, and C of Benefit Analysis		Interim Technical Report 30 Jun 76 - 30 Nov 76	
		6. PERFORMING ORG. REPORT NUMBER	
7. AUTHOR(s)		8. CONTRACT OR GRANT NUMBER(s)	
Hsien-Hwei Hunter Shu Janis C. Church Jack P. Kornfield		DAAH01-76-C-1104	
9. PERFORMING ORGANIZATION NAME AND ADDRESS		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS	
IIT Research Institute 10 West 35th Street Chicago, Illinois 60616			
11. CONTROLLING OFFICE NAME AND ADDRESS		12. REPORT DATE	
U.S. Army Missile Command Redstone Arsenal, Alabama 35809		November, 1976	
		13. NUMBER OF PAGES	
		366	
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		15. SECURITY CLASS (of this report)	
		Unclassified	
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE	
16. DISTRIBUTION STATEMENT (of this Report)			
Approved for public release; distribution unlimited.			
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)			
18. SUPPLEMENTARY NOTES			
19. KEY WORDS (Continue on reverse side if necessary and identify by block number)			
Computer-aided manufacturing		Process planning	
Computerized production process planning		Benefit analysis	
Computer applications		Cost reduction	
Production Process Planning		<i>2000</i>	
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)			
Presents data collected, using industry survey, on process planning methods, related costs, and benefits of computerized production process planning.			

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APPENDIX A - DATA REQUEST

This appendix contains the data request which was mailed to 153 individuals in various manufacturing companies and divisions. The criteria for selecting the addresses were that each Army missile prime contractor should receive a data request and individuals known to be knowledgeable in the subject matter should also be solicited for information. Individuals meeting these criteria were identified from a variety of sources: a list of participants in the Army's Missile Manufacturing Technology Conference; attendance lists for CAM-I's meetings on process planning and the Air Force's meetings on AFCAM and I-CAM; lists of respondees for similar surveys; and, individuals suggested by UTRC, IITRI staff and other people contacted during the project.

A breakdown of the mailing by industry type is as follows:

Missile Prime Contractors	10
Missile Subcontractors	4
Other Aerospace Companies	37
Other Types of Manufacturers	102
	<hr/>
	153

The data request consists of three major sections. The first section describes the purpose of the project, explains the function of the data request and provides definitions of process planning and other terminology needed to complete the form. The second section requests information which characterizes the company, its process planning methods, and other relevant

parameters -- company size, type of products, product similarity, batch sizes, current usage of computers in process planning, process planning costs, machinery costs, tooling costs, etc. In the third section, three levels of process planning automation are described, and each addressee was asked to estimate their benefits, implementation costs, operation and maintenance costs, and obstacles to implementation for each level of planning automation. Also included with each data request was a reprint of an article from N/C Commline (Vol. 5, No. 3, June/July, 1976) which contained a description of UTRC's approach to computer aided process planning.

Responses to the data request served as the major source of information for the cost/benefit analysis contained in Volume I of this report. Twenty-one responses were received, although all were not completely filled out. This represents a response rate of 13.7%, an unusually high number for a survey of this type and breadth.

The data request is presented on the following pages and the responses are presented in Appendix B.



IIT Research Institute
10 West 35 Street Chicago, Illinois 60610
312/567-4000

COMPUTER AIDED PROCESS PLANNING
OF MACHINED PARTS

IIT Research Institute is attempting to identify the potential impact of computer aided production process planning for discrete machined parts and to perform cost benefit analyses of various degrees of process planning automation. Hopefully, one of the outcomes of this study will be an indication of the direction and degree to which the development of computer aids should be supported.

This study is sponsored by the U.S. Army Missile Command and is part of a larger project to develop and demonstrate a prototype computer aided process planning system. The development and demonstration of the prototype system is being done by United Technologies Research Center, East Hartford, Connecticut. A brief description of United Technologies' approach to computer aided process planning is contained in the enclosed article reprinted from N/C Commline.

We are asking you to help us in this endeavor by describing in general terms your products and facilities, your current process planning procedures and your estimate of the impact computer aided process planning has or would have on your operation.

In order to complete our study within the allotted time, we request that you complete the attached form and return it by September 3, 1976. The results of the study will be provided to those individuals who submit data.

We will consider all data proprietary and will summarize or consolidate the information so that the source of specific items cannot be identified. We appreciate your assistance and welcome any information which you can give us.

INTRODUCTION

This form is broken into two sections. In the first section we are requesting information which will enable us to quantify the costs of process planning for discrete machined parts, to assess the current usage of computer aids in process planning, and to analyze the factors which may impact whether or not a company would implement a computer aided process planning system. In the second section we have described several hypothetical computer aided process planning systems and are requesting that you estimate the impact these systems would have on your company.

However, before proceeding further, it is necessary to provide you with several definitions so that you have an understanding of what we mean when we use terms like "machined parts" and "process planning".

MACHINED PARTS: For the purposes of this study, machined parts are defined as those parts for which the primary manufacturing operations include milling, turning, boring, drilling, grinding, hobbing, etc. Machined parts do not include those parts for which the primary manufacturing operations are stamping, forming, welding, etc., nor does it include assemblies.

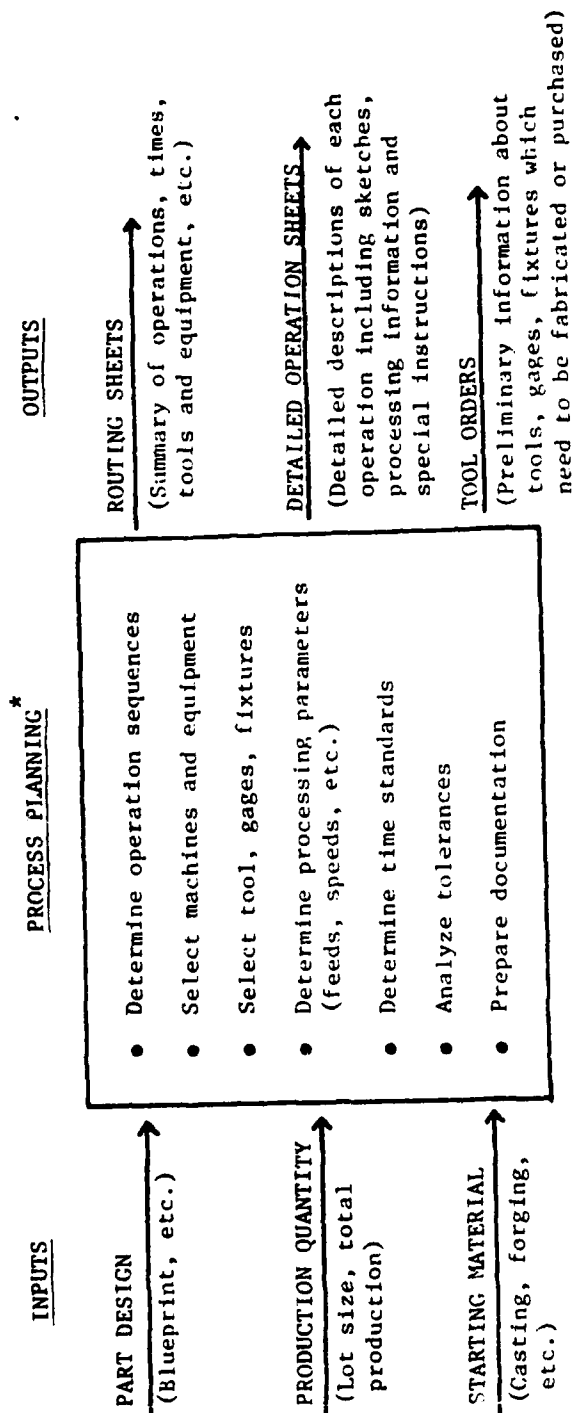
CYLINDRICAL MACHINED PARTS: For the purposes of this study, cylindrical machined parts are those for which the major features of the part are symmetrical about an axis of rotation and the primary manufacturing operations are turning, boring, etc. Examples of cylindrical machined parts include shafts, sleeves, pistons, etc.

NON-CYLINDRICAL MACHINED PARTS: For the purposes of this study, non-cylindrical machined parts are those for which the major features of the part are not symmetrical about an axis of rotation. Examples of non-cylindrical machined parts include engine blocks, pump housings, etc.

PROCESS PLANNING: Process planning is basically the conversion of part design information into the "how-to" information needed to manufacture the part. The inputs, outputs, and major functions of process planning are shown in Figure 1.

The process planner starts with information about the part design, the quantity of the part to be produced and the starting material the part will be made from. The process planner then performs the following types of tasks:

- Determination of operations and sequences.
- Selection of machines and equipment needed to perform the operations.
- Selection of appropriate tools, gages, and fixtures.
- Determination of processing parameters (speeds, feeds, cutter paths, etc.) for each operation.



* As defined here, process planning does not include NC part programming, production scheduling, planning and scheduling of material handling, tool design or plant layout.

Fig. 1. - Diagram of Process Planning

- Determination of time standards.
- Analysis of tolerances.
- Preparation of routing sheets which summarize the operations to be performed, the times required for each operation and the tooling and equipment needed.
- Preparation of detailed operation sheets which describe each operation, including sketches of the workpiece, identification of tools, fixtures, etc., tool layout and parts clamping, speeds and feeds, and special instructions for inspection, cleaning, etc.
- Preparation of tool orders for jigs, fixtures, gages, etc., which need to be fabricated or purchases.

Process planning, as we have defined it, does not include production scheduling, tool design, NC part programming or plant layout.

We recognize that our definition of process planning may not coincide with yours and that several of the tasks mentioned above may be performed by people who are not called "process planners". However, it was necessary to draw a boundary around process planning so that there will be some uniformity in the responses we receive.

Please read each question carefully before answering it. We realize that some of the information we are requesting will not be readily available. If you are unable to obtain the information we ask that you give us the best estimate that you can.

Occasionally companies have data available which do not fit the categories as we have defined them or which relate to production process planning in other areas (sheet metal fabrication, for example). In these cases, we would appreciate any data you could provide us regardless of form.

If you have any questions or need additional information, please feel free to call (collect) Dr. Hunter Shu (312/567-4615) or Mr. Jack Kornfeld (312/567-4635) at IITRI.

SECTION I - GENERAL INFORMATION

1. What types of products are manufactured at your location?

2. Please estimate the total number of employees at your location.
_____ #
3. What is the approximate dollar value of products shipped from your plant annually?
\$ _____
4. What percentage of that value would you estimate represents cylindrical and non-cylindrical machined parts (even if they were part of an assembly or finished product)?
Cylindrical Machined Parts _____ %
Non-Cylindrical Machined Parts _____ %
5. If you purchase machined parts from outside sources, what would you estimate are the annual dollar values of your purchases?
Cylindrical Machined Parts \$ _____
Non-Cylindrical Machined Parts \$ _____
6. Approximately how many different machined parts are manufactured in your plant each year? (By "different", we mean different part numbers rather than serial numbers or total volume).
Cylindrical Machined Parts _____ #
Non-Cylindrical Machined Parts _____ #
7. Approximately how many new machined parts (new part numbers) are introduced into your plant each year?
Cylindrical Machined Parts _____ #
Non-Cylindrical Machined Parts _____ #
8. What is the approximate total volume of machined parts manufactured in your plant each year?
Cylindrical Machined Parts _____ #
Non-Cylindrical Machined Parts _____ #

9. Considering the total number of batches or production runs you make each year for machined parts, what percentage are batches of less than 100 units, batches of 100-1000 units, and batches of over 1000 units?

<u>Batch Size</u>	<u>Cylindrical Machined Parts</u>	<u>Non-Cylindrical Machined Parts</u>
1-100	_____ %	_____ %
100-1000	_____ %	_____ %
over 1000	_____ %	_____ %
	100%	100%

10. Considering the number of batches made for each machined part during a year, what percentage of the parts only have 1 batch made per year, 2 to 10 batches, and over 10 batches?

<u>No. of Batches/Year</u>	<u>Cylindrical Machined Parts</u>	<u>Non-Cylindrical Machined Parts</u>
1	_____ %	_____ %
2-10	_____ %	_____ %
Over 10	_____ %	_____ %
	100%	100%

11. Please estimate the percentage of machined parts manufactured in your plant which have less than 10 operation numbers per process plan, 10 to 25 operation numbers, and more than 25 operation numbers.

<u>No. of Operations</u>	<u>Cylindrical Machined Parts</u>	<u>Non-Cylindrical Machined Parts</u>
1-10	_____ %	_____ %
10-25	_____ %	_____ %
more than 25	_____ %	_____ %
	100%	100%

33. Assuming that reliable software, good user documentation, and a training source were available for the system, please estimate what you feel would be realistic costs and times if your company installed and maintained such a system for machined parts. (You may attach additional sheets containing assumptions and calculations if you like.)

System Implementation:

- Hardware (if necessary)
- Establish initial data files
- Train personnel
- Test system
- Other (Please specify) _____

Cylindrical Machined Parts	
Cost (\$)	Time (Months)

Non-Cylindrical Machined Parts	
Cost (\$)	Time (Months)

System Maintenance

- Computer charges and program maintenance
- Updating of data files
- Other (Please specify) _____

Cylindrical Machined Parts
Cost (\$/Year)

Non-Cylindrical Machined Parts
Cost (\$/Year)

34. Please list what you feel would be major obstacles to implementing such a system.

31. Assuming such a system is operating in your plant, please indicate a percentage increase or decrease in the following cost areas over manual process planning for machined parts. (You may specify a range, but please keep it as narrow as possible.)

	Cylindrical Machined Parts	Non-Cylindrical Machined Parts
Process Planning	_____ %	_____ %
Determining Operation Sequences	(_____ %)	(_____ %)
Machine/Equipment Selection	(_____ %)	(_____ %)
Tool Selection	(_____ %)	(_____ %)
Determining Processing Parameters	(_____ %)	(_____ %)
Generating Time Standards	(_____ %)	(_____ %)
Performing Tolerance Analyses	(_____ %)	(_____ %)
Preparing Documentation	(_____ %)	(_____ %)
Material	_____ %	_____ %
Direct Labor	_____ %	_____ %
Scrap and Rework	_____ %	_____ %
Tooling	_____ %	_____ %
Work-in-Process Inventory	_____ %	_____ %
Other (Please specify)	_____ %	_____ %

32. Considering a scale of +2 to -2, where +2 = significant improvement, +1 = slight improvement, 0 = no change, -1 = slightly negative impact and -2 = significantly negative impact, please indicate the impact such a system would have over manual process planning methods by putting the appropriate number next to each item listed below.

	<u>Impact</u>		<u>Impact</u>
Production Leadtime	_____	Critical Labor Skills	_____
Process Planning Leadtime	_____	Raw Material Standardization	_____
Machine Utilization	_____	Producibility of Parts	_____
Product Quality	_____	Plant Layout	_____
Direct Labor Utilization	_____	Material Handling	_____
Uniformity of process plans	_____	Production Scheduling	_____
Cost Estimating Procedures	_____	Capacity Planning	_____
Make/Buy Decisions	_____	Others (Please specify)	_____
Product Standardization	_____		_____

specify details of a particular operation or if the data bases are incomplete and the system needs inputs from him to proceed. The final process plan, including routing sheets and detailed operation sheets is then stored in the data for future use.

3. A process planner can also use the system to retrieve and to modify process plans which have been previously generated and stored in the data base.

In summary, at this level of automation, the computer may be used not only for the retrieval and up-dating of existing process plans, but also is capable of generating a feasible, efficient process plan by using internally stored data and logic.

System 3

Semi-Automatic System with Computer-Aided Operation Determination

This system is considerably different from the previous system in several respects. One of the major differences is that this system has a "generative" process planning capability in that it contains a certain degree of decision logic concerning process planning, thereby enabling the system to produce most or all of the process planning without relying on the existence of a standard process plan or a process plan for a similar part (although this system could also operate in the same mode as the previous system if desired).

The main features of this system are described below.

1. The system has the following data bases:
 - a) A machine/equipment data base which contains information concerning a machine's physical characteristics, cutting capabilities, tolerance ratings and operating costs.
 - b) A tooling data base which contains information on tool geometry, material, application and cost.
 - c) A machinability data base which contains information on speeds, feeds, tool life, etc. This data base has two parts, one for "look-up" data on machinability, and one for machinability equations which are used to "optimize" processing parameters.
 - d) A data base containing process decision rules which provide the system with the logic needed to generate process plans. In general, these rules would be developed from past experience in your plant.
 - e) Stored process plans for previously planned parts.
2. In operation of the system, a process planner would sit down at a CRT terminal and input data on the machined part design (e.g., geometry, tolerances, surface finish, hardness, concentricity, etc.), the starting material (e.g., type, geometry, etc.) and the lot size. The computer system would then generate a process plan using the process decision rules to select the machine or equipment type, select tooling and fixtures, and determine "optimum" machine/tool path combinations for each metal removal operation. The system also calculates time standards, inserts operations for heat treating, cleaning, inspection, etc., and produces sketches of the workpiece and tooling suitable for inclusion in the operation sheets. The process planner can interact with the system if he wishes to override the decision logic and

29. Assuming that reliable software, good user documentation, and a training source were available for the system, please estimate what you feel would be realistic costs and times if your company installed and maintained such a system for machined parts. (You may attach additional sheets containing assumptions and calculations if you like.)

System Implementation:

- Hardware (if necessary)
- Establish initial data files
- Train personnel
- Test system
- Other (Please specify) _____

Cylindrical Machined Parts	
Cost (\$)	Time (Months)

Non-Cylindrical Machined Parts	
Cost (\$)	Time (Months)

System Maintenance

- Computer charges and program maintenance
- Updating of data files
- Other (Please specify) _____

Cylindrical Machined Parts
Cost (\$/Year)

Non-Cylindrical Machined Parts
Cost (\$/Year)

30. Please list what you feel would be major obstacles to implementing such a system.

27. Assuming such a system is operating in your plant, please indicate a percentage increase or decrease in the following cost areas over manual process planning for machined parts. (You may specify a range, but please keep it as narrow as possible.)

	Cylindrical Machined Parts	Non-Cylindrical Machined Parts
Process Planning	_____ %	_____ %
Determining Operation Sequences	(_____ %)	(_____ %)
Machine/Equipment Selection	(_____ %)	(_____ %)
Tool Selection	(_____ %)	(_____ %)
Determining Processing Parameters	(_____ %)	(_____ %)
Generating Time Standards	(_____ %)	(_____ %)
Performing Tolerance Analyses	(_____ %)	(_____ %)
Preparing Documentation	(_____ %)	(_____ %)
Material	_____ %	_____ %
Direct Labor	_____ %	_____ %
Scrap and Rework	_____ %	_____ %
Tooling	_____ %	_____ %
Work-in-Process Inventory	_____ %	_____ %
Other (Please specify)	_____ %	_____ %

28. Considering a scale of +2 to -2, where +2 = significant improvement, +1 = slight improvement, 0 = no change, -1 = slightly negative impact and -2 = significantly negative impact, please indicate the impact such a system would have over manual process planning methods by putting the appropriate number next to each item listed below.

	<u>Impact</u>		<u>Impact</u>
Production Leadtime	_____	Critical Labor Skills	_____
Process Planning Leadtime	_____	Raw Material Standardization	_____
Machine Utilization	_____	Producibility of Parts	_____
Product Quality	_____	Plant Layout	_____
Direct Labor Utilization	_____	Material Handling	_____
Uniformity of process plans	_____	Production Scheduling	_____
Cost Estimating Procedures	_____	Capacity Planning	_____
Make/Buy Decisions	_____	Others (Please specify)	_____
Product Standardization	_____		_____

System 2

Interactive System with Computer-Aided Cutting Parameter Determination

This system is essentially the same as the previously described system except that it has been up-graded in the following areas:

1. A computerized database, in conjunction with appropriate database management software will allow the retrieval of:
 - a) A list of parts belonging to the same part family (i.e., a list of all parts having the same Group Technology code).
 - b) A skeletal (or standard) sequence of operations for a particular Group Technology code.
 - c) A process plan for an existing part number.
2. An interactive graphics (CRT terminal) capability to enhance a skeletal sequence of operations retrieved by a Group Technology code or modify an existing process plan for a particular part number. The editing consists of:
 - a) Entering or modifying production demand data (e.g., job no., lot size, etc.)
 - b) Deleting and adding operations and associated data on a routine sheet.
 - c) Detailed planning for any operation on an operation sheet.
3. The edited results are the inputs to cutting parameter determination subroutines. Typically, the best feeds and speeds of a material removal operation with known machine and tooling will be determined and the associated cutting time computed. Such determination may be through either a table look-up in a machinability database or an analysis of empirical equations for metal removal. These parameter values, as well as other processing parameter values (e.g., heat treating temperature and time, etc.), may be reviewed by the process planner and modified if desired.
4. The completed process plan is then stored in the database under its part number for future reference.
5. The computer is used in the generation of shop documents as described in the previous system.

At this level of automation, the computer is used to (a) assist in retrieving process plans that are closely related to the part in question; (b) facilitate interactive editing (modifying and enriching) the retrieved process plan; (c) determine best metal cutting parameters and associated time; and (d) produce needed documents for shop use (excluding sketches, which must still be prepared manually).

25. Assuming that reliable software, good user documentation, and a training source were available for the system, please estimate what you feel would be realistic costs and times if your company installed and maintained such a system for machined parts. (You may attach additional sheets containing assumptions and calculations if you like.)

System Implementation:

- Hardware (if necessary)
- Establish initial data files
- Train personnel
- Test system
- Other (Please specify) _____

Cylindrical Machined Parts	
Cost (\$)	Time (Months)

Non-Cylindrical Machined Parts	
Cost (\$)	Time (Months)

System Maintenance

- Computer charges and program maintenance
- Updating of data files
- Other (Please specify) _____

Cylindrical Machined Parts
Cost (\$/Year)

Non-Cylindrical Machined Parts
Cost (\$/Year)

26. Please list what you feel would be major obstacles to implementing such a system.

23. Assuming such a system is operating in your plant, please indicate a percentage increase or decrease in the following cost areas over manual process planning for machined parts. (You may specify a range, but please keep it as narrow as possible.)

	Cylindrical Machined Parts	Non-Cylindrical Machined Parts
Process Planning	_____ %	_____ %
Determining Operation Sequences	(_____ %)	(_____ %)
Machine/Equipment Selection	(_____ %)	(_____ %)
Tool Selection	(_____ %)	(_____ %)
Determining Processing Parameters	(_____ %)	(_____ %)
Generating Time Standards	(_____ %)	(_____ %)
Performing Tolerance Analyses	(_____ %)	(_____ %)
Preparing Documentation	(_____ %)	(_____ %)
Material	_____ %	_____ %
Direct Labor	_____ %	_____ %
Scrap and Rework	_____ %	_____ %
Tooling	_____ %	_____ %
Work-in-Process Inventory	_____ %	_____ %
Other (Please specify)	_____ %	_____ %

24. Considering a scale of +2 to -2, where +2 = significant improvement, +1 = slight improvement, 0 = no change, -1 = slightly negative impact and -2 = significantly negative impact, please indicate the impact such a system would have over manual process planning methods by putting the appropriate number next to each item listed below.

	<u>Impact</u>		<u>Impact</u>
Production Leadtime	_____	Critical Labor Skills	_____
Process Planning Leadtime	_____	Raw Material Standardization	_____
Machine Utilization	_____	Producibility of Parts	_____
Product Quality	_____	Plant Layout	_____
Direct Labor Utilization	_____	Material Handling	_____
Uniformity of process plans	_____	Production Scheduling	_____
Cost Estimating Procedures	_____	Capacity Planning	_____
Make/Buy Decisions	_____	Others (Please specify)	_____
Product Standardization	_____		_____

SECTION II - IMPACT OF COMPUTER AIDED PROCESS PLANNING

In this section, we briefly describe three types of computer aided process planning systems. Please read the description of each system and then estimate the savings such a system would provide over a manual system and the cost of implementing and maintaining such a system in your plant.

System 1

Computer-Aided Group Technology Code Management and Document Generation

At this level of automation, the process planner does pretty much what he used to do manually except in two respects:

1. Every machined part, distinguishable by its part number, is also assigned a Group Technology Code which characterizes the geometrics and machining requirements of various machined parts into part families. An experienced process planner may assign a G.T. code to a given part by inspection of the blueprint. Computer maintained Group Technology code data files, in the form of listings, are then examined to ascertain whether the process plan of a given part:
 - a) is currently available;
 - b) can be prepared by modifying an existing process plan for a similar part; or
 - c) must be created from scratch because the part belongs to none of the known part families.

The process planner will then take maximum advantage of the process information uncovered in his manual effort to produce a process plan for the part. The Group Technology code data files are up-dated periodically to reflect current availability of similar process plans.

2. Once the process plan of a given part is manually prepared, the machining and material processing steps may be coded into the computer (by keypunch operators working from a coding sheet) which, in turn, produces useful hard copy documents for the shops. These documents may be:
 - a) Routing sheets containing a summary of the operations, machines and equipment needed, jigs/fixtures and cutter types, and standard times for each operation.
 - b) Operation sheets containing detailed instructions for each operation such as cutter path, feeds, speeds and/or material processing parameters. If graphical aids are needed for these operations, these aids are manually generated.

At this level of automation, therefore, the process planner is (a) assisted in locating some process plan that is closely related to the part in question if such a plan exists and (b) relieved of much of the tedium of producing documents used in the production of the part.

18. Please estimate your average cost of preparing a process plan for each of the following categories. (Include costs for labor, material, reproduction, computer support, if appropriate, etc.) (See question 13.)

	Cylindrical Machined Parts	Non-Cylindrical Machined Parts
Prepare plan for a new part	\$ _____	\$ _____
Modify an existing plan	\$ _____	\$ _____
Prepare plan for study purposes	\$ _____	\$ _____

19. For the machined parts you manufacture in-house, please estimate the approximate percentages for the cost components listed below. (This information is quite important in analyzing the impact of computer aided process planning, so please be as accurate as possible.)

	Cylindrical Machined Parts	Non-Cylindrical Machined Parts
Material	_____ %	_____ %
Direct Labor (Wages + Fringe Benefits)	_____ %	_____ %
Tooling (Perishable + Amortized Non-perishable)	_____ %	_____ %
Scrap and Rework	_____ %	_____ %
Process Planning	_____ %	_____ %
Other (Overhead, Profit, etc.)	_____ %	_____ %
	100%	100%

20. Approximately what is the average value of work-in-process inventory for machined parts manufactured in your plant?

Cylindrical Machined Parts \$ _____

Non-Cylindrical Machined Parts \$ _____

21. Does your plant use computer assisted process planning and/or group technology for areas other than machined parts?

YES

NO

22. Has your company performed studies relating to process planning economics or the costs of manufacturing machined parts?

YES

NO

16. Please estimate the cost percentages for process planning of a typical new machined part to be manufactured in your plant.

PLANNING FUNCTION	Percent of Process Planning Costs	
	Cylindrical Machined Parts	Non-Cylindrical Machined Parts
• Determine operation sequences	_____ %	_____ %
• Select machines and equipment	_____ %	_____ %
• Select tooling, gages, etc.	_____ %	_____ %
• Determine processing parameters (speeds, feeds, etc.) (Please exclude NC part programming).	_____ %	_____ %
• Determine time standards	_____ %	_____ %
• Analyze tolerances	_____ %	_____ %
• Prepare routing sheets	_____ %	_____ %
• Prepare operations sheets	_____ %	_____ %
• Prepare tool orders	_____ %	_____ %
• Other (Please specify) _____	_____ %	_____ %
	100%	100%

17. Please estimate the number of man-hours, cost and leadtime in days to prepare a typical process plan for a new machined part having the following number of operations. (Please exclude NC part programming.)

No. of Operations	Cylindrical Machined Parts			Non-Cylindrical Machined Parts		
	Man Hours	Cost (\$)	Lead-time (Days)	Man Hours	Cost (\$)	Lead-time (Days)
10						
25						
50						

14. We would like to know what process planning functions are performed in your plant for machined parts and what computer aids are available. Please place a check in the appropriate box if you are performing the function. If you are planning to implement computer techniques to assist in any of these functions within the next 2 years, please indicate by putting a "P" in the appropriate box.

PLANNING FUNCTIONS

- Determine operation sequences
 - Select machines and equipment
 - Select tooling, gages, etc.
 - Determine processing parameters (speeds, feeds, etc.) (Please exclude NC part programming.)
 - Determine time standards
 - Analyze tolerances
 - Prepare routing sheets
 - Prepare operations sheets
 - Prepare tool orders
 - Conduct design/ producibility reviews
 - Other (please specify)
-
-

MANUALLY	SOME AUTOMATION	FULLY AUTOMATED
(Please check if currently performing function. Insert "P" if computer aids are planned.)		

15. If you are currently using some form of computer assisted process planning for machined parts, what are the approximate annual maintenance and support costs? (Please exclude NC part programming.)

\$ _____

12. One of the factors influencing whether or not a company would implement a computer assisted process planning system may be the degree of similarity between the parts being manufactured. Part types or families which are basically similar from the standpoint of design characteristics and manufacturing processes required may be more suited to computer assisted process planning than parts which are totally different.

Keeping this in mind, please estimate what percentage of machined parts manufactured in your plant are: (1) basically similar and could be grouped into part families having more than 5 parts per family; (2) somewhat similar and could be grouped into parts families having between 2 and 5 parts per family; and (3) totally different.

	<u>Cylindrical Machined Parts</u>	<u>Non-Cylindrical Machined Parts</u>
Basically Similar (more than 5 parts per family)	_____ %	_____ %
Somewhat Similar (2-5 parts per family)	_____ %	_____ %
Totally Different	_____ %	_____ %
	100%	100%

13. Approximately how many process plans for machined parts are prepared annually in each of the following categories?

	<u>Cylindrical Machined Parts</u>	<u>Non-Cylindrical Machined Parts</u>
Process plans for new parts	_____ #	_____ #
Process plans for parts manufactured previously but which must be modified because of changes in part design or processing.	_____ #	_____ #
Process plans for analyses (Make/Buy studies, produc- ibility studies, cost estimates, etc.)	_____ #	_____ #
Other (please specify) _____	_____ #	_____ #
TOTAL	_____ #	_____ #

(If different from the attached label)

NAME _____

TITLE _____

ORGANIZATION _____

ADDRESS _____

PHONE: _____

Thank you for your cooperation. It is sincerely appreciated. Please return this form in the attached, self-addressed envelope to:

Dr. Hunter Shu
Scientific Advisor
Management & Computer Sciences Division
IIT Research Institute
10 West 35th Street
Chicago, Illinois 60616

APPENDIX B
RESULTS FROM DATA REQUEST

This appendix contains an analysis of the responses to the questions in the data survey.

A total of 21 data requests were filled out and returned to IITRI. By industry type, the responses were as follows:

Missile Prime and Subcontractors	4
Other Aerospace Companies	8
Other Types of Manufacturers	<u>9</u>
TOTAL	21

All of the data requests returned were not completely filled out. However, for most questions a majority of the respondents provided answers.

The approach used to analyze the data was to first develop a "spread sheet" containing columns for each data element. The data request had approximately 330 possible answers. In addition, the spread sheet was also used as a means of performing numerous intermediate calculations on the data as described in Appendix C. The intermediate calculations added to the number of columns bring the total to around 600.

The spread sheet was laid out on 14 large poster boards (approximately 3' x 4' each), and then rows were laid out corresponding to each data survey received.

Upon receipt of the data surveys, each was reviewed for consistency and completeness. Where obvious misunderstandings or inconsistencies were apparent, the resposdee was contacted for clarification or the particular answer was considered a no response.

After the initial review of the data surveys, the data was manually entered onto the spread sheet and again checked for accuracy. Although this turned out to be a large effort, it paid off in the long-run because it displayed all of the data in a way that variations between responses and the interrelationships between columns could easily be assessed visually.

Once the data had been transferred to the spread sheets and was verified, the intermediate calculations described in Appendix C were then made for each data survey response. These calculations were then re-checked to assure accuracy.

Once these steps had been taken, the data for each column was fed into a computer program for analysis. The outputs from the computer analysis were the number of observations, means, standard deviations, minimum observations, maximum observations, and histograms for the data points. These were done by industry group and for the total number of responses.

The outputs from the computer program are contained in this appendix. Each page has a title which is keyed to a question number in the data request.

It should be pointed out that the scale on the horizontal axes of all histograms are in units of standard deviations from the mean for the total number of observations. Thus the histograms for the industry grouping are to the same scale as those for all responses and are not scaled in terms of standard deviations from the mean for the sub-groupings. By keeping the scaling for the subgroupings the same as for all responses, one is able to visually detect major shifts in subgroups from the total population.

In some cases, histograms were not appropriate as a means of representing the data and in those instances tabular summaries have been provided.

Some more advanced statistical analyses, such as regression and correlation analyses and scatter plots, were attempted but did not prove to be particularly meaningful. Because of resource constraints on the program, these approaches were not pursued further.

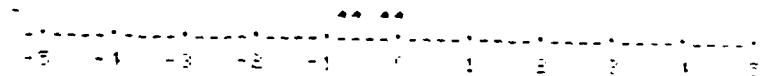
No attempt was made to determine confidence levels for the data because of the small sample size, the non-randomness in selecting the sample, the incompleteness of the data, and the wide variations in many of the answers received.

As far as the variations in the data are concerned, this can be attributed to many factors: the size of the company and the type of products; the current business trends the company was experiencing; differences between respondees in their interpretation of the terminology and questions; and, in some cases, a lack of concrete information which could be used as a basis for the response.

Q2 - TOTAL NUMBER OF EMPLOYEES

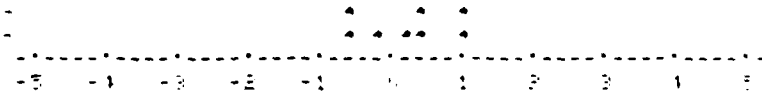
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 2800
 STD. DEV. = 1857
 MIN. OBS. = 1000
 MAX. OBS. = 4500



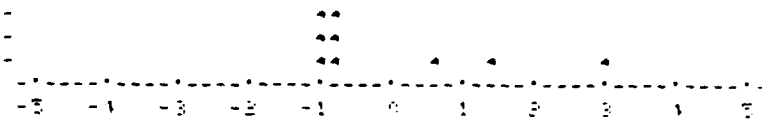
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 5988
 STD. DEV. = 3233
 MIN. OBS. = 1800
 MAX. OBS. = 10000



OTHER INDUSTRY

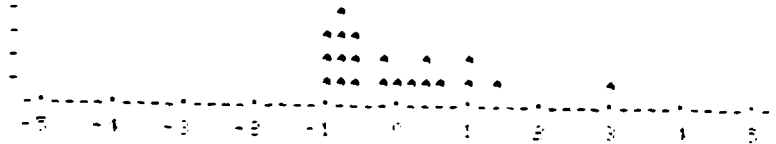
NO. OBS. = 9
 MEAN = 4742
 STD. DEV. = 7010
 MIN. OBS. = 130
 MAX. OBS. = 19600



ALL RESPONSES

NO. OBS. = 21
 MIN. OBS. = 130
 MAX. OBS. = 19600

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

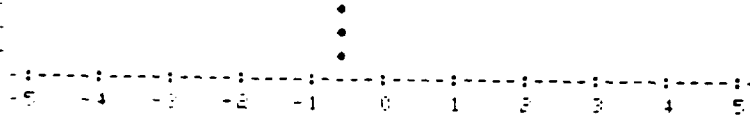
MEAN = 4847

STD. DEV. = 5019

Q3 - APPROXIMATE DOLLAR VALUE OF PRODUCTS SHIPPED ANNUALLY.

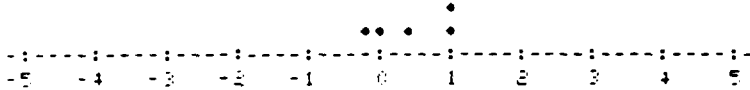
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = \$50 mil.
 STD. DEV. = \$10 mil.
 MIN. OBS. = \$40 mil.
 MAX. OBS. = \$60 mil.



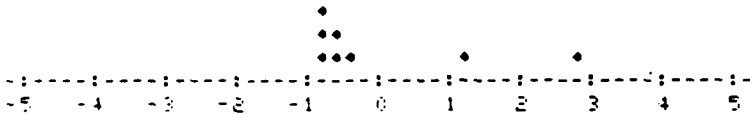
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = \$268 mil.
 STD. DEV. = \$129 mil.
 MIN. OBS. = \$125 mil.
 MAX. OBS. = \$400 mil.



OTHER INDUSTRY

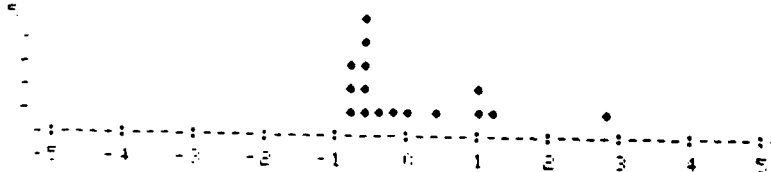
NO. OBS. = 8
 MEAN = \$178 mil.
 STD. DEV. = \$292 mil.
 MIN. OBS. = \$2 mil.
 MAX. OBS. = \$800 mil.



ALL RESPONSES

NO. OBS. = 16
 MIN. OBS. = \$2 mil.
 MAX. OBS. = \$800 mil.

OBSERVATIONS



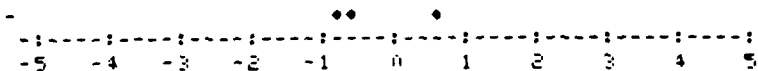
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$182 mil. STD. DEV. = \$224 mil.

Q4 - PERCENTAGE OF VALUE OF PRODUCTS SHIPPED WHICH REPRESENTS CYLINDRICAL MACHINED PARTS
(EVEN IF THEY WERE PART OF AN ASSEMBLY OR FINISHED PRODUCT)

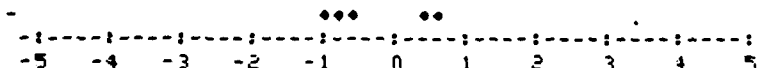
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 12.1%
 STD. DEV. = 11.2%
 MIN. OBS. = 5%
 MAX. OBS. = 25%



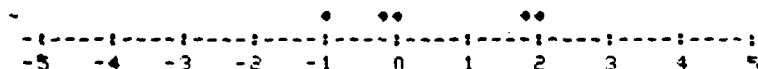
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = 11.1%
 STD. DEV. = 10.3%
 MIN. OBS. = 0.5%
 MAX. OBS. = 24%



OTHER INDUSTRY

NO. OBS. = 5
 MEAN = 21.8%
 STD. DEV. = 17.9%
 MIN. OBS. = 1%
 MAX. OBS. = 42%



ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = 0.5%
 MAX. OBS. = 42%

OBSERVATIONS

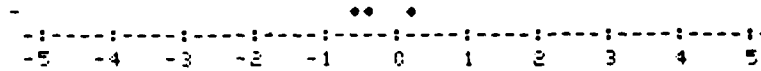


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 15.5% STD. DEV. = 13.8%

Q4 - PERCENTAGE OF VALUE OF PRODUCTS SHIPPED WHICH REPRESENTS NON-CYLINDRICAL MACHINED PARTS
(EVEN IF THEY WERE PART OF AN ASSEMBLY OR FINISHED PRODUCT)

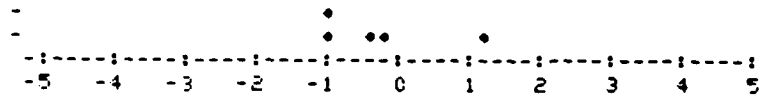
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 10.3%
 STD. DEV. = 4.6%
 MIN. OBS. = 5.9%
 MAX. OBS. = 15%



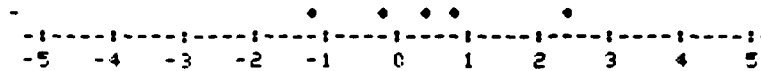
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = 10.1%
 STD. DEV. = 9.8%
 MIN. OBS. = 2.0%
 MAX. OBS. = 26%



OTHER INDUSTRY

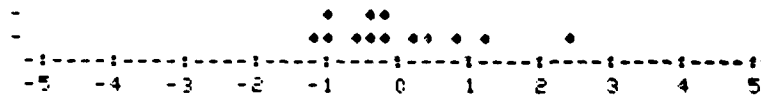
NO. OBS. = 5
 MEAN = 18.6%
 STD. DEV. = 14.5%
 MIN. OBS. = 1.0%
 MAX. OBS. = 40%



ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = 1%
 MAX. OBS. = 40%

OBSERVATIONS



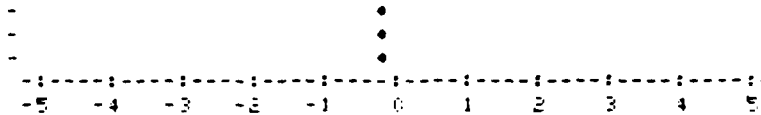
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 13.4% STD. DEV. = 11.1%

Q5 - ANNUAL DOLLAR VALUE OF CYLINDRICAL PARTS PURCHASED FROM OUTSIDE SOURCES

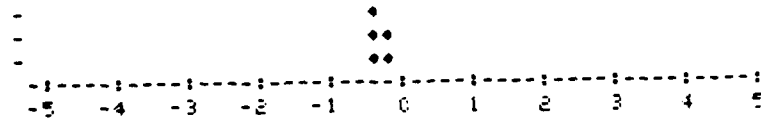
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = \$2.0 MIL
 STD. DEV. = \$1.1 MIL
 MIN. OBS. = \$0.8 MIL
 MAX. OBS. = \$3.0 MIL



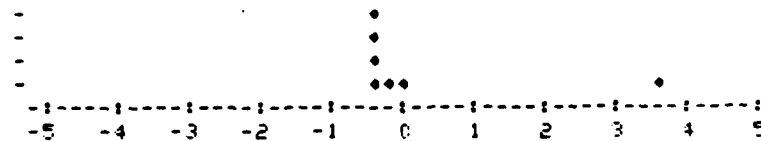
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = \$1.5 MIL
 STD. DEV. = \$2.0 MIL
 MIN. OBS. = \$0.02 MIL
 MAX. OBS. = \$4.0 MIL



OTHER INDUSTRY

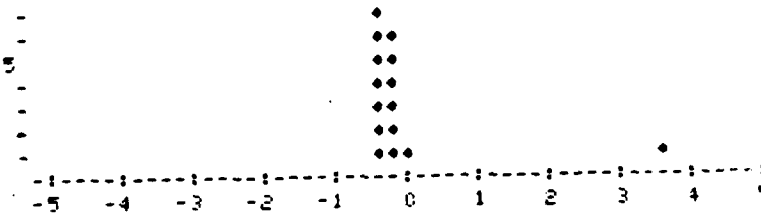
NO. OBS. = 7
 MEAN = \$11.4 MIL
 STD. DEV. = \$26.8 MIL
 MIN. OBS. = \$0
 MAX. OBS. = \$72 MIL



ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = \$0
 MAX. OBS. = \$72 MIL

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$6.2 MIL STD. DEV. = \$18.3 MIL

Q5 - ANNUAL DOLLAR VALUE OF NON-CYLINDRICAL PARTS PURCHASED FROM OUTSIDE SOURCES

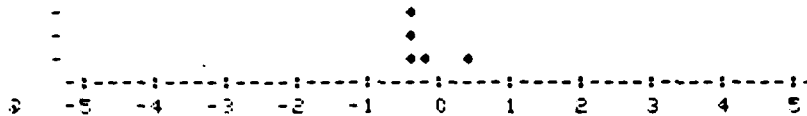
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = \$1.5 mil.
 STD. DEV. = \$0.6 mil.
 MIN. OBS. = \$1.0 mil.
 MAX. OBS. = \$2.1 mil.



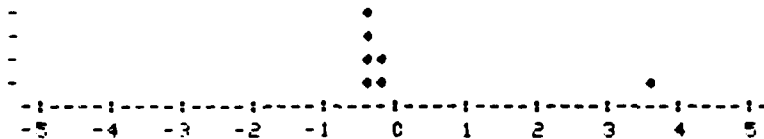
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = \$1.8 mil.
 STD. DEV. = \$2.5 mil.
 MIN. OBS. = \$0.08 mil.
 MAX. OBS. = \$6.0 mil.



OTHER INDUSTRY

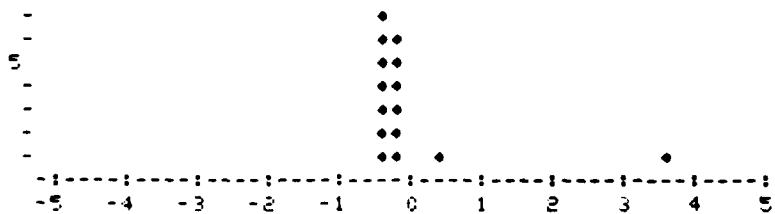
NO. OBS. = 7
 MEAN = \$5.0 mil.
 STD. DEV. = \$11.5 mil.
 MIN. OBS. = \$0.01 mil.
 MAX. OBS. = \$31 mil.



ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = \$0.01 mil.
 MAX. OBS. = \$31 mil.

OBSERVATIONS



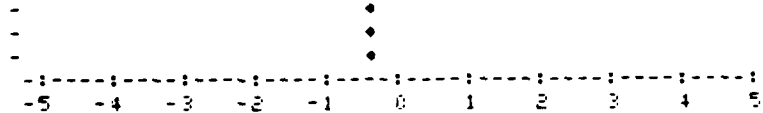
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$3.3 mil. STD. DEV. = \$7.8 mil.

Q6 - APPROXIMATE NUMBER OF DIFFERENT TYPES OF CYLINDRICAL PARTS (DIFFERENT PART NUMBERS)
MANUFACTURED IN-HOUSE PER YEAR

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 877
 STD. DEV. = 571
 MIN. OBS. = 380
 MAX. OBS. = 7500



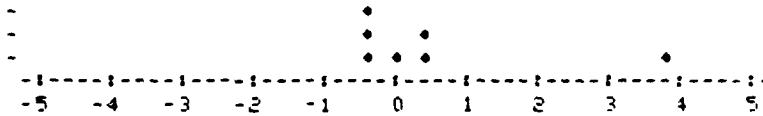
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 3400
 STD. DEV. = 4826
 MIN. OBS. = 140
 MAX. OBS. = 15000



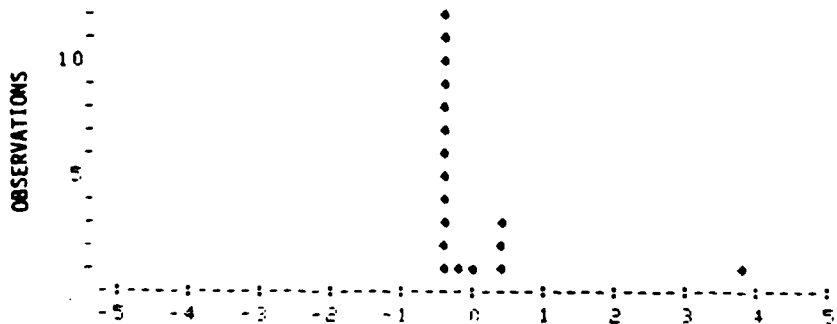
OTHER INDUSTRY

NO. OBS. = 7
 MEAN = 17204
 STD. DEV. = 28451
 MIN. OBS. = 300
 MAX. OBS. = 80000



ALL RESPONSES

NO. OBS. = 18
 MIN. OBS. = 140
 MAX. OBS. = 80000



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

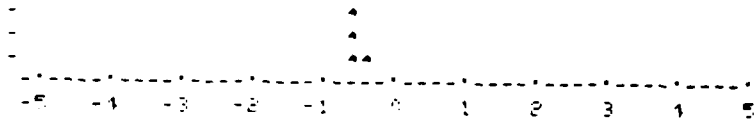
MEAN = 8348

STD. DEV. = 18681

Q6 - APPROXIMATE NUMBER OF DIFFERENT TYPES OF NON-CYLINDRICAL PARTS (DIFFERENT PART NUMBERS)
MANUFACTURED IN-HOUSE PER YEAR

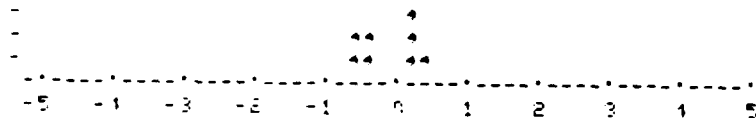
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 1070
STD. DEV. = 1291
MIN. OBS. = 350
MAX. OBS. = 3000



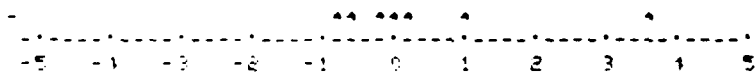
OTHER AEROSPACE

NO. OBS. = 8
MEAN = 5034
STD. DEV. = 3292
MIN. OBS. = 440
MAX. OBS. = 9600



OTHER INDUSTRY

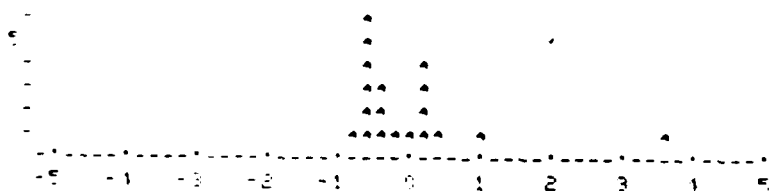
NO. OBS. = 7
MEAN = 9624
STD. DEV. = 11971
MIN. OBS. = 300
MAX. OBS. = 35000



ALL RESPONSES

NO. OBS. = 19
MIN. OBS. = 300
MAX. OBS. = 35000

OBSERVATIONS



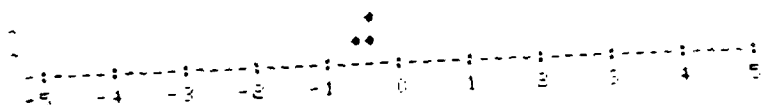
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 5890 STD. DEV. = 1947

Q7 - APPROXIMATE NUMBER OF NEW CYLINDRICAL MACHINED PARTS (NEW PART NUMBERS) INTRODUCED INTO THE PLANT EACH YEAR

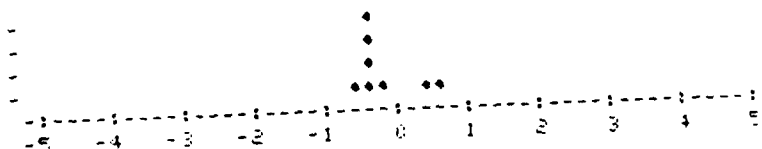
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 195
 STD. DEV. = 57
 MIN. OBS. = 136
 MAX. OBS. = 250



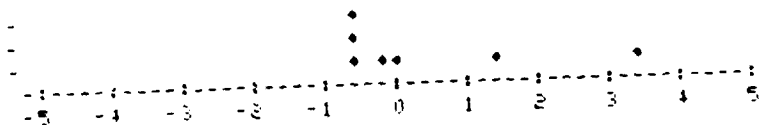
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 659
 STD. DEV. = 768
 MIN. OBS. = 30
 MAX. OBS. = 2000



OTHER INDUSTRY

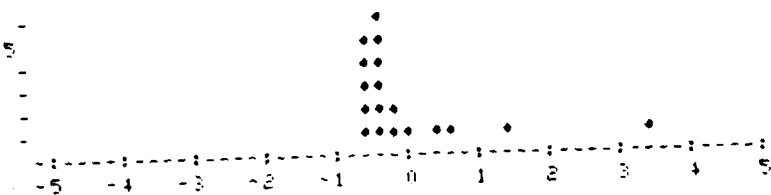
NO. OBS. = 7
 MEAN = 1848
 STD. DEV. = 2694
 MIN. OBS. = 10
 MAX. OBS. = 7250



ALL RESPONSES

NO. OBS. = 18
 MIN. OBS. = 10
 MAX. OBS. = 7250

OBSERVATIONS

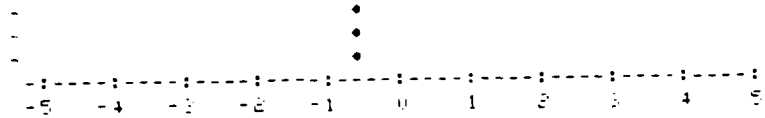


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 1044 STD. DEV = 1808

Q10 - PERCENTAGE OF CYLINDRICAL PARTS WHICH HAVE GREATER THAN 10 BATCHES MADE PER YEAR

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 0%
 STD. DEV. = 0%
 MIN. OBS. = 0%
 MAX. OBS. = 0%



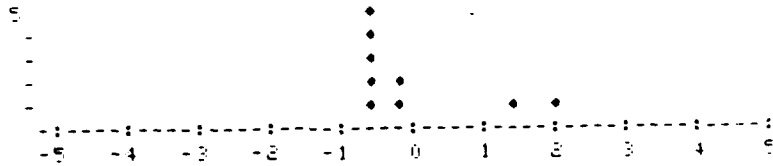
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 27%
 STD. DEV. = 35%
 MIN. OBS. = 0%
 MAX. OBS. = 100%



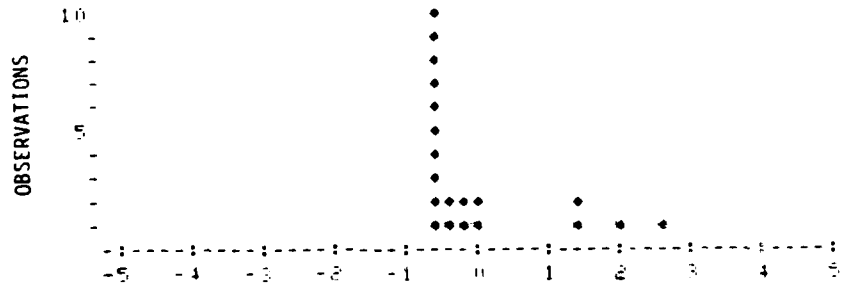
OTHER INDUSTRY

NO. OBS. = 9
 MEAN = 18%
 STD. DEV. = 30%
 MIN. OBS. = 0%
 MAX. OBS. = 80%



ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = 0%
 MAX. OBS. = 100%



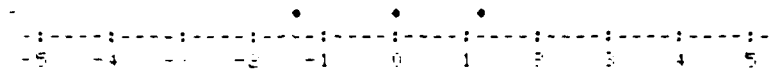
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 19% STD. DEV. = 30%

Q10 - PERCENTAGE OF NON-CYLINDRICAL PARTS WHICH HAVE BETWEEN 2 and 10 BATCHES MADE PER YEAR

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 60%
 STD. DEV. = 40%
 MIN. OBS. = 20%
 MAX. OBS. = 100%



OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 66%
 STD. DEV. = 34%
 MIN. OBS. = 0%
 MAX. OBS. = 100%



OTHER INDUSTRY

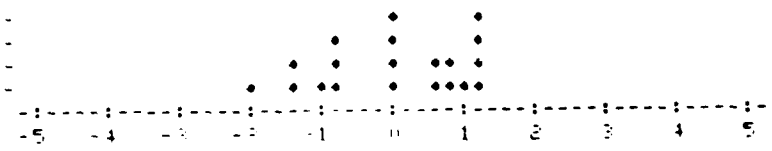
NO. OBS. = 9
 MEAN = 62%
 STD. DEV. = 32%
 MIN. OBS. = 15%
 MAX. OBS. = 100%



ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = 0%
 MAX. OBS. = 100%

OBSERVATIONS

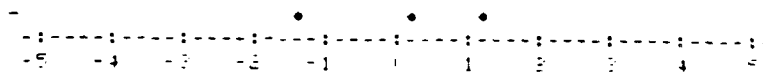


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 63% STD. DEV. = 32%

Q10 - PERCENTAGE OF CYLINDRICAL PARTS WHICH HAVE BETWEEN 2 AND 10 BATCHES MADE PER YEAR

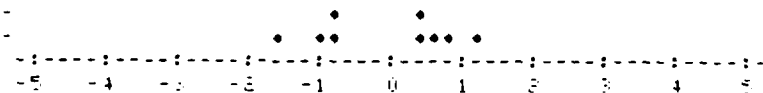
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 63%
 STD. DEV. = 40%
 MIN. OBS. = 20%
 MAX. OBS. = 100%



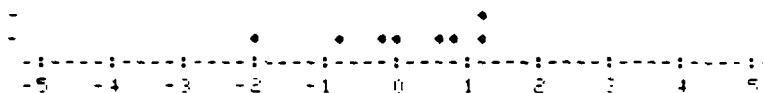
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 67%
 STD. DEV. = 34%
 MIN. OBS. = 0%
 MAX. OBS. = 100%



OTHER INDUSTRY

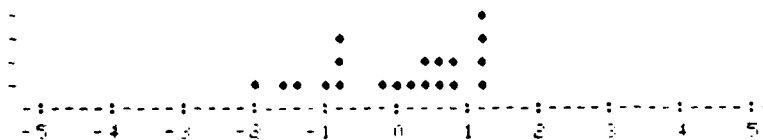
NO. OBS. = 9
 MEAN = 61%
 STD. DEV. = 30%
 MIN. OBS. = 15%
 MAX. OBS. = 100%



ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = 0%
 MAX. OBS. = 100%

OBSERVATIONS



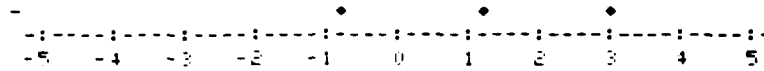
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 63% STD. DEV. = 31%

Q10 - PERCENTAGE OF NON-CYLINDRICAL PARTS WHICH HAVE ONLY 1 BATCH MADE PER YEAR

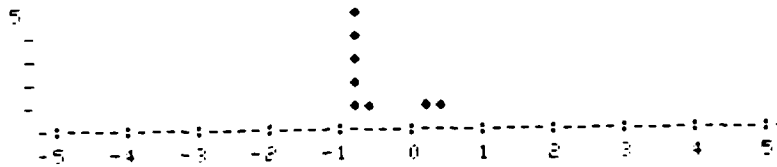
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 40%
 STD. DEV. = 40%
 MIN. OBS. = 0%
 MAX. OBS. = 80%



OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 6%
 STD. DEV. = 10%
 MIN. OBS. = 0%
 MAX. OBS. = 22%



OTHER INDUSTRY

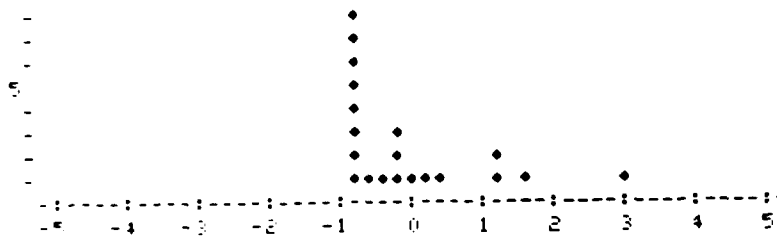
NO. OBS. = 9
 MEAN = 16%
 STD. DEV. = 18%
 MIN. OBS. = 0%
 MAX. OBS. = 50%



ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = 0%
 MAX. OBS. = 80%

OBSERVATIONS



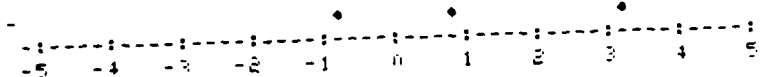
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 15% STD. DEV. = 22%

Q10 - PERCENTAGE OF CYLINDRICAL PARTS WHICH HAVE ONLY 1 BATCH MADE PER YEAR

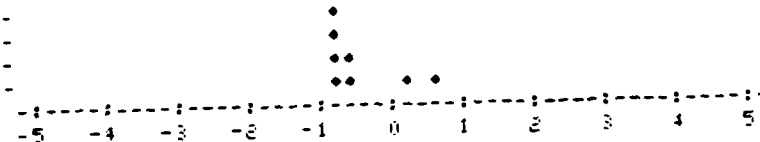
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 37%
 STD. DEV. = 40%
 MIN. OBS. = 0%
 MAX. OBS. = 80%



OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 6%
 STD. DEV. = 11%
 MIN. OBS. = 0%
 MAX. OBS. = 27%



OTHER INDUSTRY

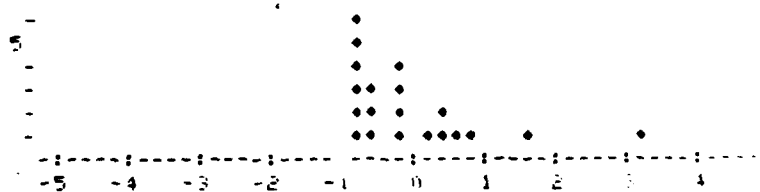
NO. OBS. = 9
 MEAN = 16%
 STD. DEV. = 15%
 MIN. OBS. = 0%
 MAX. OBS. = 50%



ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = 0%
 MAX. OBS. = 80%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 15% STD. DEV. = 20%

Q9 - PERCENTAGE OF NON-CYLINDRICAL PARTS WHICH ARE MANUFACTURED IN BATCHES OF GREATER THAN 1000 PARTS PER BATCH

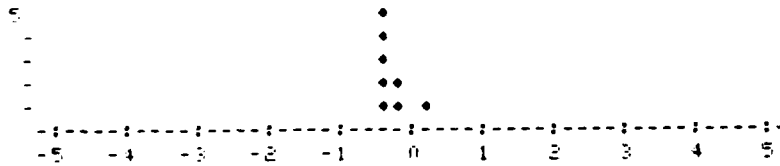
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 0.3%
 STD. DEV. = 0.6%
 MIN. OBS. = 0%
 MAX. OBS. = 1%



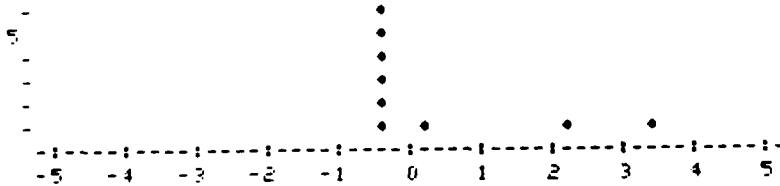
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 1.3%
 STD. DEV. = 1.8%
 MIN. OBS. = 0%
 MAX. OBS. = 5%



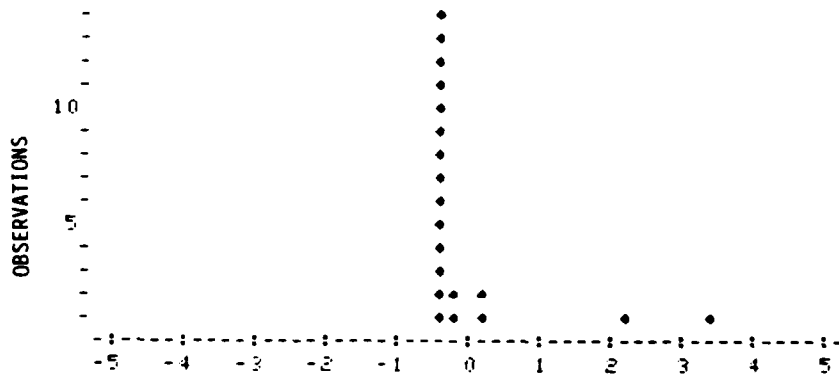
OTHER INDUSTRY

NO. OBS. = 9
 MEAN = 6.2%
 STD. DEV. = 11.1%
 MIN. OBS. = 0%
 MAX. OBS. = 30%



ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = 0%
 MAX. OBS. = 30%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 3.4% STD. DEV. = 7.7%

Q9 - PERCENTAGE OF CYLINDRICAL PARTS WHICH ARE MANUFACTURED IN BATCHES OF GREATER THAN 1000 PARTS PER BATCH

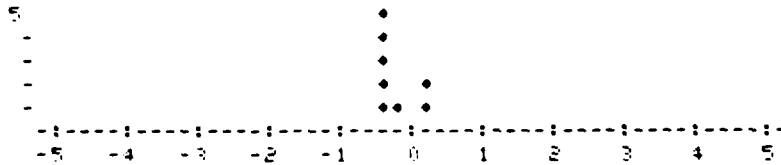
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 0.3%
 STD. DEV. = 0.6%
 MIN. OBS. = 0%
 MAX. OBS. = 1%



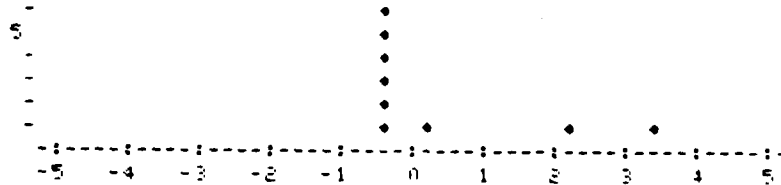
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 1.8%
 STD. DEV. = 2.1%
 MIN. OBS. = 0%
 MAX. OBS. = 5%



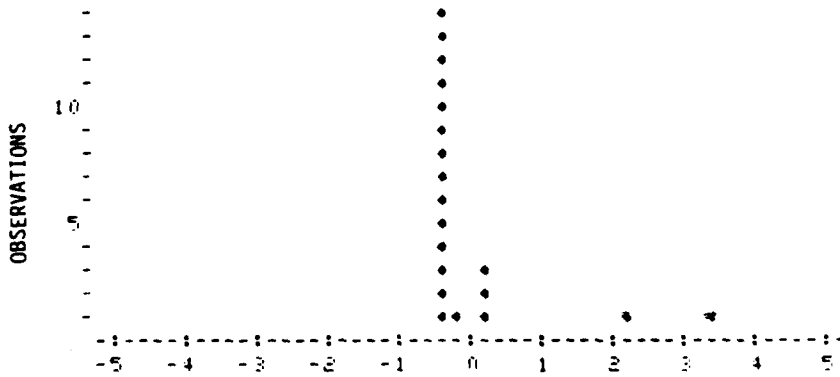
OTHER INDUSTRY

NO. OBS. = 9
 MEAN = 6.1%
 STD. DEV. = 11.1%
 MIN. OBS. = 0%
 MAX. OBS. = 30%



ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = 0%
 MAX. OBS. = 30%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 3.5% STD. DEV. = 7.7%

Q9 - PERCENTAGE OF NON-CYLINDRICAL PARTS WHICH ARE MANUFACTURED IN BATCHS of 100 to 1000
UNITS PER BATCH

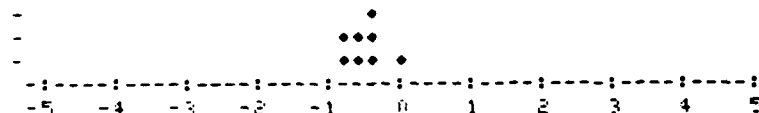
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 28%
STD. DEV. = 19%
MIN. OBS. = 14%
MAX. OBS. = 50%



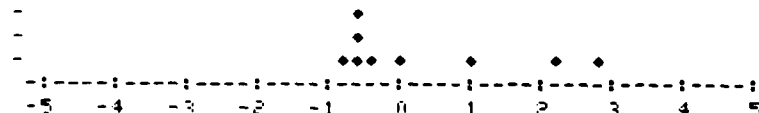
OTHER AEROSPACE

NO. OBS. = 8
MEAN = 7%
STD. DEV. = 6%
MIN. OBS. = 0%
MAX. OBS. = 20%



OTHER INDUSTRY

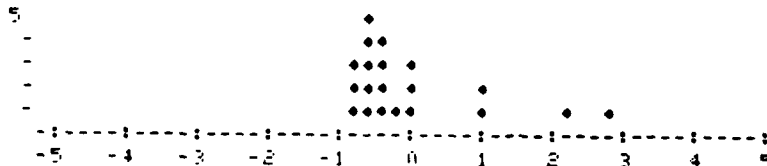
NO. OBS. = 9
MEAN = 29%
STD. DEV. = 38%
MIN. OBS. = 0%
MAX. OBS. = 100%



ALL RESPONSES

NO. OBS. = 20
MIN. OBS. = 0%
MAX. OBS. = 100%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

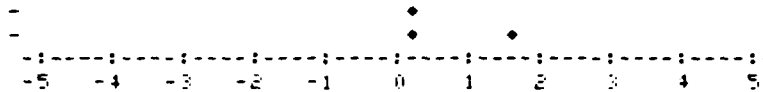
MEAN = 20%

STD. DEV. = 28%

Q9 - PERCENTAGE OF CYLINDRICAL PARTS WHICH ARE MANUFACTURED IN BATCHES OF 100 TO 1000 UNITS PER BATCH

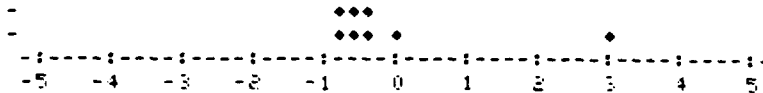
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 30%
 STD. DEV. = 18%
 MIN. OBS. = 19%
 MAX. OBS. = 50%



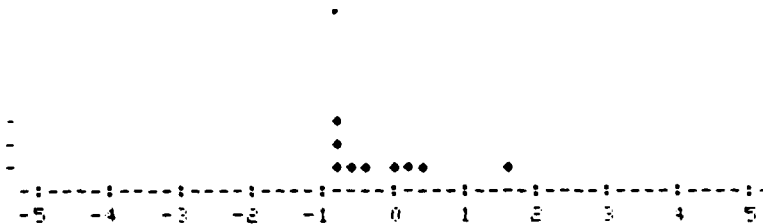
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 14%
 STD. DEV. = 25%
 MIN. OBS. = 0%
 MAX. OBS. = 75%



OTHER INDUSTRY

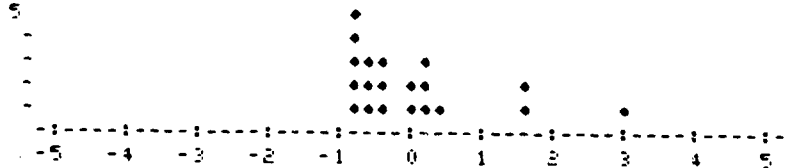
NO. OBS. = 9
 MEAN = 14%
 STD. DEV. = 16%
 MIN. OBS. = 0%
 MAX. OBS. = 50%



ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = 0%
 MAX. OBS. = 75%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 16%

STD. DEV. = 20%

Q9 -- PERCENTAGE OF NON-CYLINDRICAL PARTS WHICH ARE MANUFACTURED IN BATCHES OF LESS THAN 100 UNITS PER BATCH

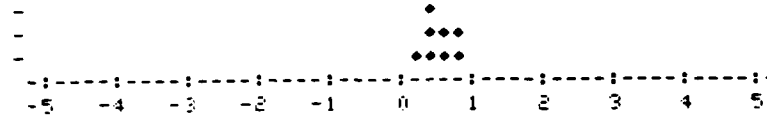
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 72%
 STD. DEV. = 19%
 MIN. OBS. = 50%
 MAX. OBS. = 80%



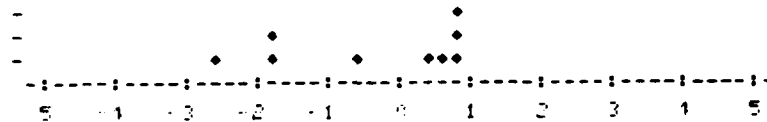
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 92%
 STD. DEV. = 7%
 MIN. OBS. = 80%
 MAX. OBS. = 100%



OTHER INDUSTRY

NO. OBS. = 9
 MEAN = 64%
 STD. DEV. = 41%
 MIN. OBS. = 0%
 MAX. OBS. = 100%



ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = 0%
 MAX. OBS. = 100%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

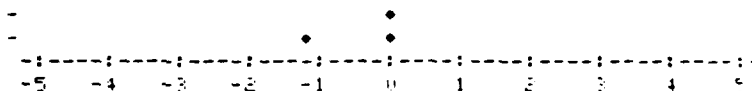
MEAN = 76%

STD. DEV. = 30%

Q9 -- PERCENTAGE OF CYLINDRICAL PARTS WHICH ARE MANUFACTURED IN BATCHES OF LESS THAN 100 UNITS PER BATCH

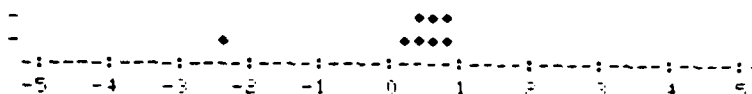
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 70%
 STD. DEV. = 17%
 MIN. OBS. = 50%
 MAX. OBS. = 80%



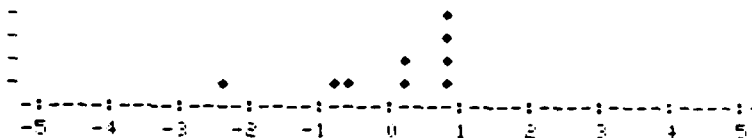
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 84%
 STD. DEV. = 26%
 MIN. OBS. = 20%
 MAX. OBS. = 100%



OTHER INDUSTRY

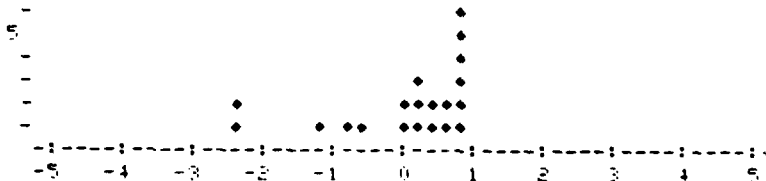
NO. OBS. = 9
 MEAN = 79%
 STD. DEV. = 27%
 MIN. OBS. = 20%
 MAX. OBS. = 100%



ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = 20%
 MAX. OBS. = 100%

OBSERVATIONS

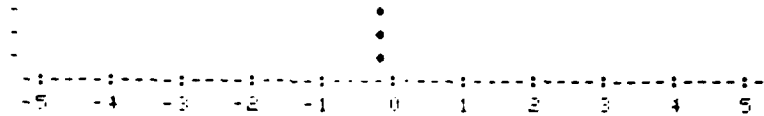


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 80% STD. DEV. = 25%

Q8 - APPROXIMATE TOTAL VOLUME (NUMBER OF UNITS) OF NON-CYLINDRICAL MACHINED PARTS MANUFACTURED
IN-HOUSE ASSEMBLY

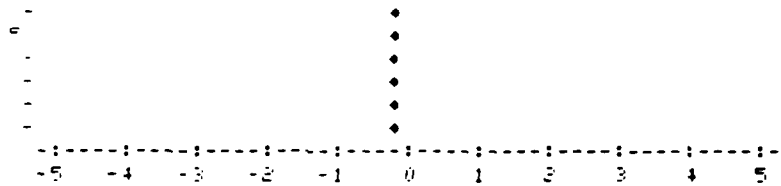
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 206K
 STD. DEV. = 341K
 MIN. OBS. = 1K
 MAX. OBS. = 600K



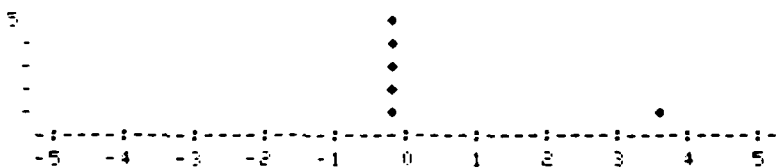
OTHER AEROSPACE

NO. OBS. = 6
 MEAN = 673K
 STD. DEV. = 669K
 MIN. OBS. = 7.5K
 MAX. OBS. = 1420K



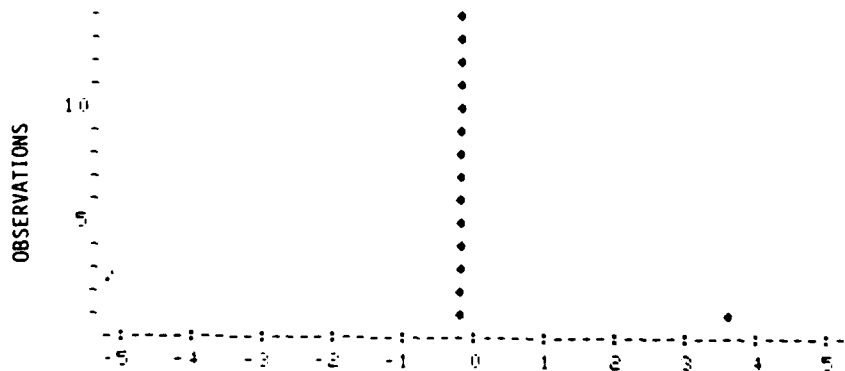
OTHER INDUSTRY

NO. OBS. = 6
 MEAN = 8163K
 STD. DEV. = 1956K
 MIN. OBS. = 1.2K
 MAX. OBS. = 4810K



ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = 1K
 MAX. OBS. = 4810K

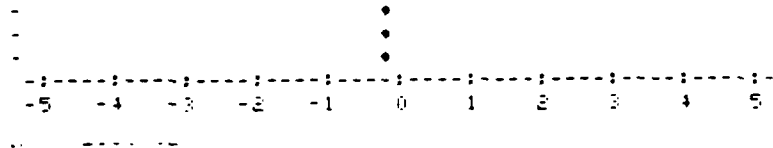


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 3576K STD. DEV. = 12327K

Q8 - APPROXIMATE TOTAL VOLUME (NUMBER OF UNITS) OF CYLINDRICAL MACHINED PARTS MANUFACTURED
IN-HOUSE ASSEMBLY

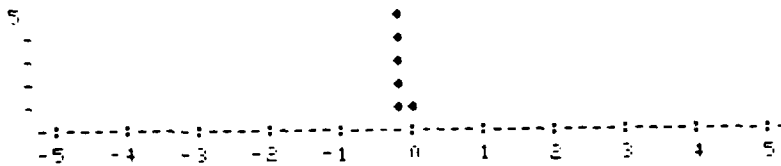
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 105K
 STD. DEV. = 169K
 MIN. OBS. = 3K
 MAX. OBS. = 300K



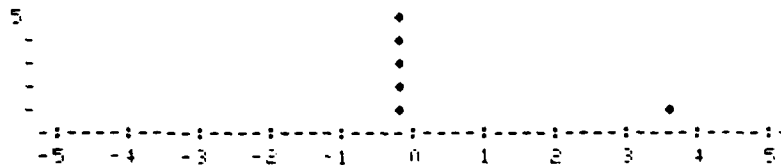
OTHER AEROSPACE

NO. OBS. = 6
 MEAN = 1199K
 STD. DEV. = 2342K
 MIN. OBS. = 0.3K
 MAX. OBS. = 5950K



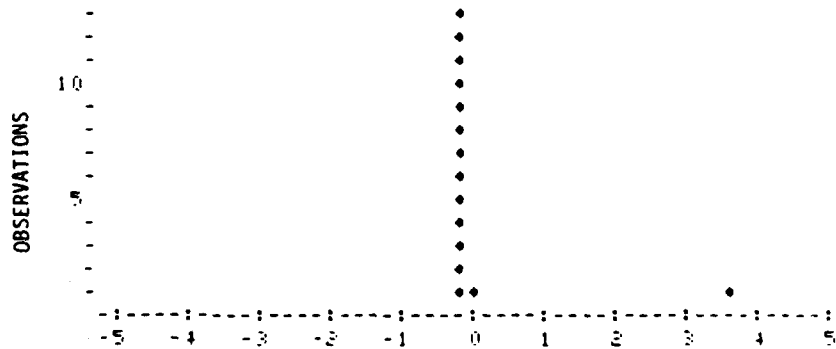
OTHER INDUSTRY

NO. OBS. = 6
 MEAN = 13713K
 STD. DEV. = 33405K
 MIN. OBS. = 4.5K
 MAX. OBS. = 81900K



ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = 0.3K
 MAX. OBS. = 81900K

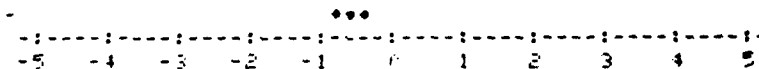


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 5986K STD. DEV. = 21055K

Q7 - APPROXIMATE NUMBER OF NEW NON-CYLINDRICAL MACHINED PARTS (NEW PART NUMBERS) INTRODUCED INTO THE PLANT EACH YEAR

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 252
 STD. DEV. = 150
 MIN. OBS. = 100
 MAX. OBS. = 400



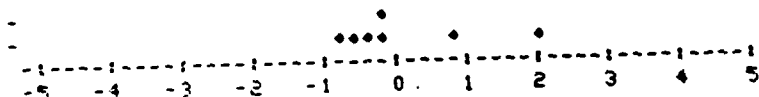
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 1089
 STD. DEV. = 1289
 MIN. OBS. = 50
 MAX. OBS. = 3250



OTHER INDUSTRY

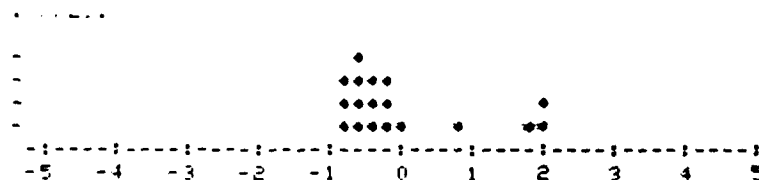
NO. OBS. = 7
 MEAN = 1014
 STD. DEV. = 1161
 MIN. OBS. = 30
 MAX. OBS. = 3250



ALL RESPONSES

NO. OBS. = 18
 MIN. OBS. = 80
 MAX. OBS. = 3250

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 920

STD. DEV. = 1122

Q10 - PERCENTAGE OF NON-CYLINDRICAL PARTS WHICH HAVE GREATER THAN 10 BATCHES MADE PER YEAR

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 0%
 STD. DEV. = 0%
 MIN. OBS. = 0%
 MAX. OBS. = 0%



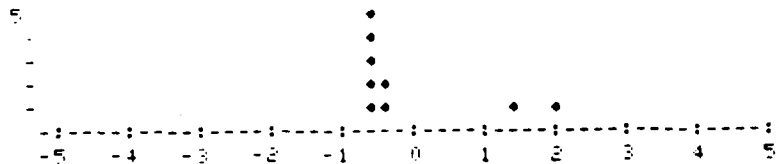
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 29%
 STD. DEV. = 35%
 MIN. OBS. = 0%
 MAX. OBS. = 100%



OTHER INDUSTRY

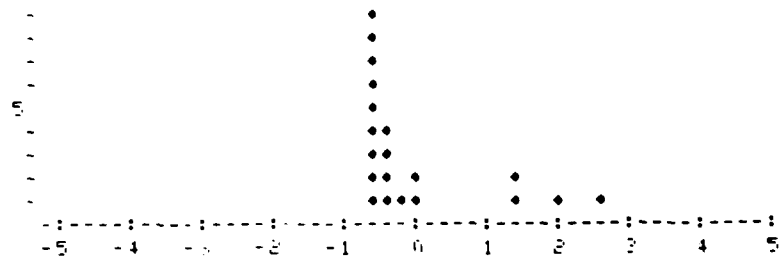
NO. OBS. = 9
 MEAN = 18%
 STD. DEV. = 30%
 MIN. OBS. = 0%
 MAX. OBS. = 80%



ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = 0%
 MAX. OBS. = 100%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

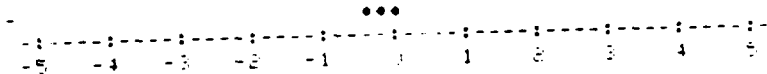
MEAN = 20%

STD. DEV. = 31%

Q11 - PERCENTAGE OF CYLINDRICAL PARTS WITH 1 TO 10 OPERATIONS PER PROCESS PLAN

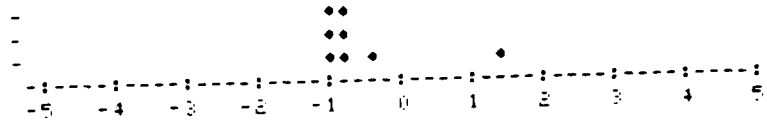
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 25%
 STD. DEV. = 5%
 MIN. OBS. = 20%
 MAX. OBS. = 30%



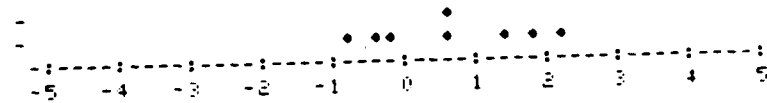
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 15%
 STD. DEV. = 25%
 MIN. OBS. = 2%
 MAX. OBS. = 75%



OTHER INDUSTRY

NO. OBS. = 8
 MEAN = 53%
 STD. DEV. = 34%
 MIN. OBS. = 10%
 MAX. OBS. = 100%



ALL RESPONSES

NO. OBS. = 19
 MIN. OBS. = 2%
 MAX. OBS. = 100%

OBSERVATIONS

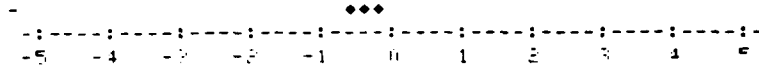


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 33% STD. DEV. = 32%

Q11 - PERCENTAGE OF NON-CYLINDRICAL PARTS WITH 1 TO 10 OPERATIONS PER PROCESS PLAN

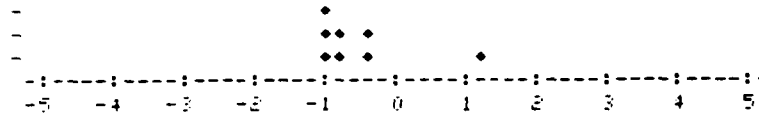
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 23%
 STD. DEV. = 8%
 MIN. OBS. = 15%
 MAX. OBS. = 30%



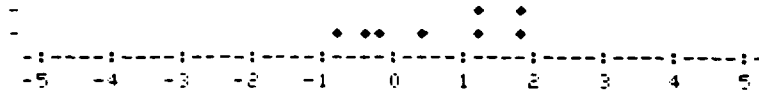
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 17%
 STD. DEV. = 25%
 MIN. OBS. = 0%
 MAX. OBS. = 75%



OTHER INDUSTRY

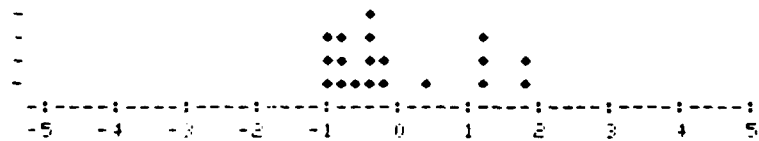
NO. OBS. = 8
 MEAN = 59%
 STD. DEV. = 36%
 MIN. OBS. = 5%
 MAX. OBS. = 100%



ALL RESPONSES

NO. OBS. = 19
 MIN. OBS. = 0%
 MAX. OBS. = 100%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

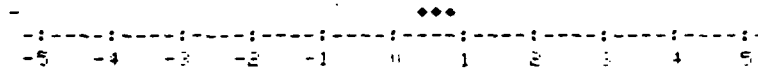
MEAN = 35%

STD. DEV. = 34%

Q11 - PERCENTAGE OF CYLINDRICAL PARTS WITH 10 TO 25 OPERATIONS PER PROCESS PLAN

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 65%
 STD. DEV. = 5%
 MIN. OBS. = 60%
 MAX. OBS. = 70%



OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 57%
 STD. DEV. = 23%
 MIN. OBS. = 20%
 MAX. OBS. = 88%



OTHER INDUSTRY

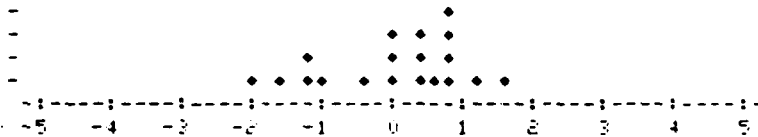
NO. OBS. = 8
 MEAN = 39%
 STD. DEV. = 27%
 MIN. OBS. = 0%
 MAX. OBS. = 80%



ALL RESPONSES

NO. OBS. = 19
 MIN. OBS. = 0%
 MAX. OBS. = 88%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

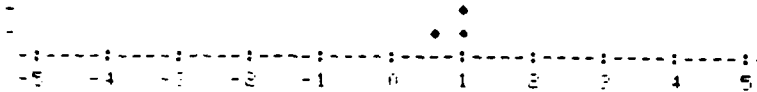
MEAN = 51%

STD. DEV. = 25%

Q11 - PERCENTAGE OF NON-CYLINDRICAL PARTS WITH 10 TO 25 OPERATIONS PER PROCESS PLAN

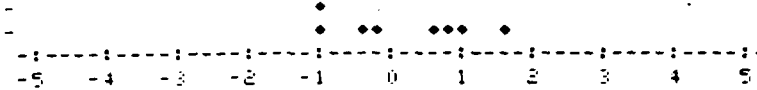
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 67%
 STD. DEV. = 6%
 MIN. OBS. = 60%
 MAX. OBS. = 70%



OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 49%
 STD. DEV. = 24%
 MIN. OBS. = 20%
 MAX. OBS. = 84%



OTHER INDUSTRY

NO. OBS. = 8
 MEAN = 30%
 STD. DEV. = 23%
 MIN. OBS. = 0%
 MAX. OBS. = 55%



ALL RESPONSES

NO. OBS. = 19
 MIN. OBS. = 0%
 MAX. OBS. = 84%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 44%

STD. DEV. = 25%

Q11 - PERCENT OF CYLINDRICAL PARTS WITH > 25 OPERATIONS

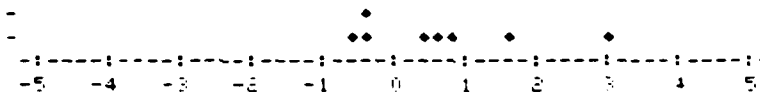
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 10%
 STD. DEV. = 5%
 MIN. OBS. = 5%
 MAX. OBS. = 15%



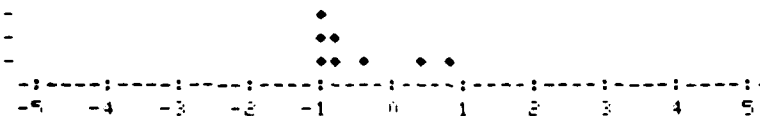
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 28%
 STD. DEV. = 22%
 MIN. OBS. = 5%
 MAX. OBS. = 70%



OTHER INDUSTRY

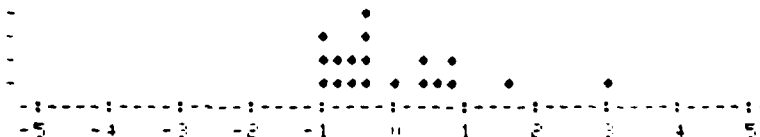
NO. OBS. = 8
 MEAN = 8%
 STD. DEV. = 12%
 MIN. OBS. = 0%
 MAX. OBS. = 30%



ALL RESPONSES

NO. OBS. = 19
 MIN. OBS. = 0%
 MAX. OBS. = 70%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

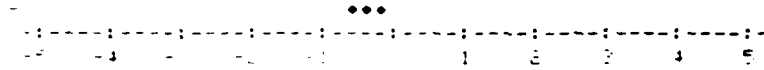
MEAN = 17%

STD. DEV. = 18%

Q11 - PERCENT OF NON-CYLINDRICAL PARTS WITH > 25 OPERATIONS

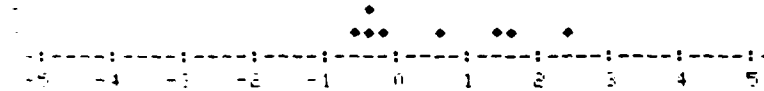
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 10%
 STD. DEV. = 5%
 MIN. OBS. = 5%
 MAX. OBS. = 15%



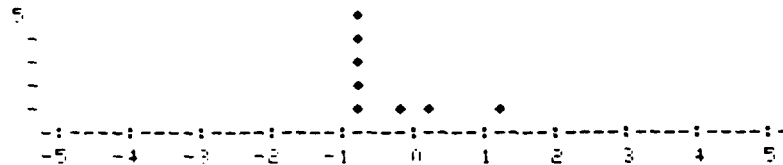
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 34%
 STD. DEV. = 28%
 MIN. OBS. = 5%
 MAX. OBS. = 80%



OTHER INDUSTRY

NO. OBS. = 8
 MEAN = 11%
 STD. DEV. = 18%
 MIN. OBS. = 0%
 MAX. OBS. = 50%



ALL RESPONSES

NO. OBS. = 19
 MIN. OBS. = 0%
 MAX. OBS. = 80%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

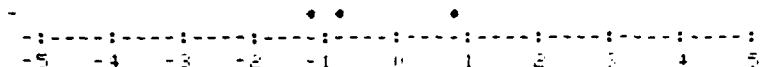
MEAN = 21%

STD. DEV. = 24%

Q12 - PERCENT OF CYLINDRICAL PARTS WITH > 5 PARTS PER FAMILY

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 31%
 STD. DEV. = 34%
 MIN. OBS. = 5%
 MAX. OBS. = 75%



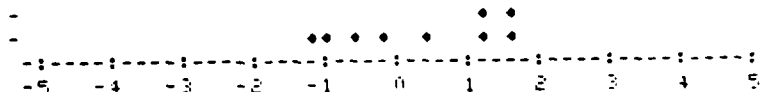
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 38%
 STD. DEV. = 24%
 MIN. OBS. = 0%
 MAX. OBS. = 90%



OTHER INDUSTRY

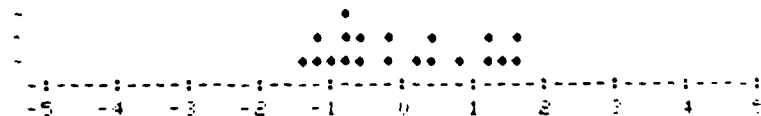
NO. OBS. = 9
 MEAN = 57%
 STD. DEV. = 38%
 MIN. OBS. = 5%
 MAX. OBS. = 100%



ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = 0%
 MAX. OBS. = 100%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

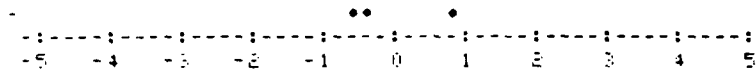
MEAN = 45%

STD. DEV. = 34%

Q12 - PERCENT OF NON-CYLINDRICAL PARTS WITH > 5 PARTS PER FAMILY

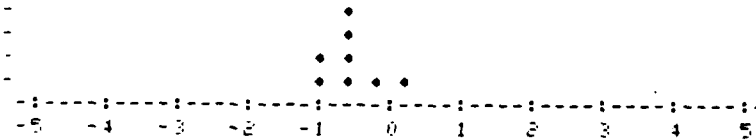
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 31%
 STD. DEV. = 25%
 MIN. OBS. = 15%
 MAX. OBS. = 60%



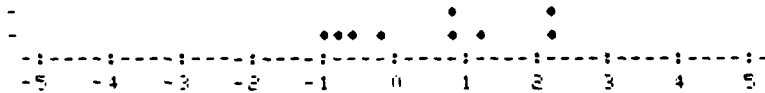
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 15%
 STD. DEV. = 13%
 MIN. OBS. = 0%
 MAX. OBS. = 40%



OTHER INDUSTRY

NO. OBS. = 9
 MEAN = 48%
 STD. DEV. = 32%
 MIN. OBS. = 0%
 MAX. OBS. = 100%



ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = 0%
 MAX. OBS. = 100%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 32%

STD. DEV. = 32%

Q12 - PERCENT OF CYLINDRICAL PARTS WITH 2-5 PARTS PER FAMILY

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 39%
 STD. DEV. = 20%
 MIN. OBS. = 20%
 MAX. OBS. = 60%



OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 42%
 STD. DEV. = 26%
 MIN. OBS. = 0%
 MAX. OBS. = 75%



OTHER INDUSTRY

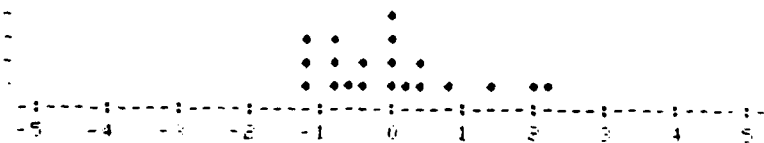
NO. OBS. = 9
 MEAN = 15%
 STD. DEV. = 13%
 MIN. OBS. = 0%
 MAX. OBS. = 40%



ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = 0%
 MAX. OBS. = 75%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 29%

STD. DEV. = 23%

Q12 - PERCENT OF NON-CYLINDRICAL PARTS WITH 2-5 PARTS PER FAMILY

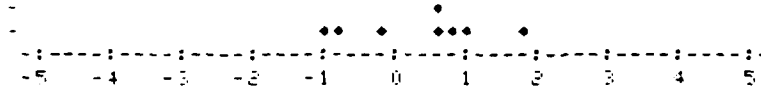
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 37%
 STD. DEV. = 13%
 MIN. OBS. = 25%
 MAX. OBS. = 50%



OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 44%
 STD. DEV. = 24%
 MIN. OBS. = 10%
 MAX. OBS. = 80%



OTHER INDUSTRY

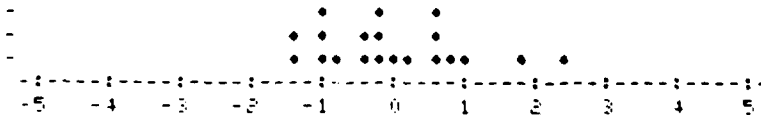
NO. OBS. = 9
 MEAN = 27%
 STD. DEV. = 31%
 MIN. OBS. = 0%
 MAX. OBS. = 100%



ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = 0%
 MAX. OBS. = 100%

OBSERVATIONS

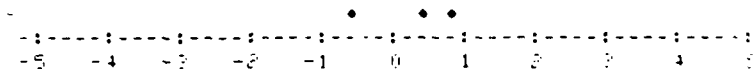


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 35% STD. DEV. = 26%

Q12 - PERCENT OF CYLINDRICAL PARTS, TOTALLY DIFFERENT

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 30%
 STD. DEV. = 18%
 MIN. OBS. = 10%
 MAX. OBS. = 46%



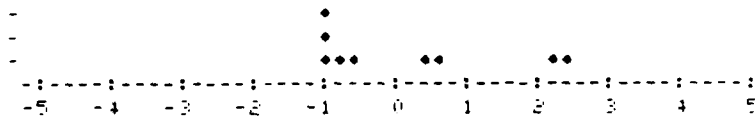
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 20%
 STD. DEV. = 16%
 MIN. OBS. = 5%
 MAX. OBS. = 55%



OTHER INDUSTRY

NO. OBS. = 9
 MEAN = 28%
 STD. DEV. = 34%
 MIN. OBS. = 0%
 MAX. OBS. = 85%



ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = 0%
 MAX. OBS. = 85%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

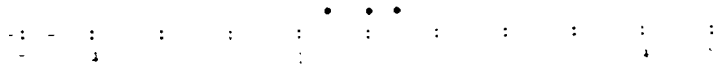
MEAN = 25%

STD. DEV. = 25%

Q12 - PERCENT OF NON-CYLINDRICAL PARTS, TOTALLY DIFFERENT

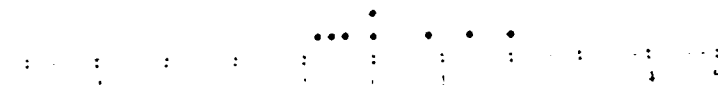
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 32
 STD. DEV. = 16.0
 MIN. OBS. = 15
 MAX. OBS. = 46



OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 41
 STD. DEV. = 29
 MIN. OBS. = 10
 MAX. OBS. = 90



OTHER INDUSTRY

NO. OBS. = 9
 MEAN = 25
 STD. DEV. = 34
 MIN. OBS. = 0
 MAX. OBS. = 85



ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = 0
 MAX. OBS. = 90

OBSERVATIONS

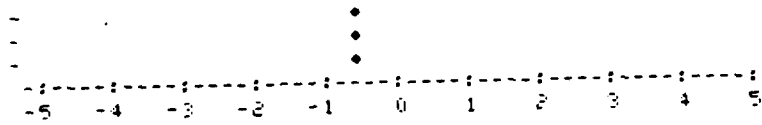


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 33% STD. DEV. = 30

Q13 - ANNUAL NUMBER OF PROCESS PLANS FOR NEW CYLINDRICAL PARTS

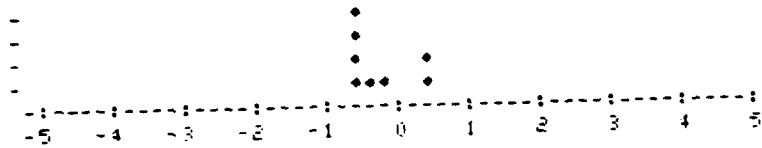
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 145
 STD. DEV. = 51
 MIN. OBS. = 100
 MAX. OBS. = 136



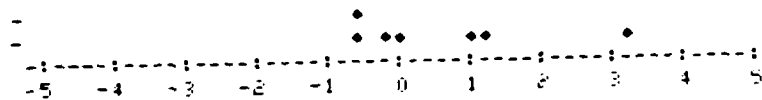
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 673
 STD. DEV. = 801
 MIN. OBS. = 30
 MAX. OBS. = 2000



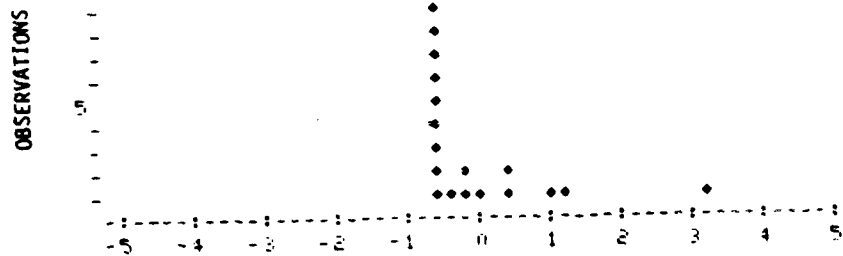
OTHER INDUSTRY

NO. OBS. = 7
 MEAN = 2276
 STD. DEV. = 2589
 MIN. OBS. = 50
 MAX. OBS. = 7250



ALL RESPONSES

NO. OBS. = 18
 MIN. OBS. = 30
 MAX. OBS. = 7250



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

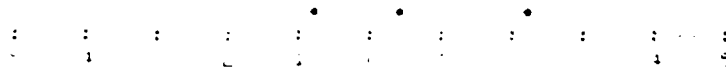
MEAN = 1208

STD. DEV. = 1853

16 - PERCENTAGE OF PROCESS PLANNING COSTS TO SELECT MACHINES AND EQUIPMENT FOR A NEW NON-CYLINDRICAL PART

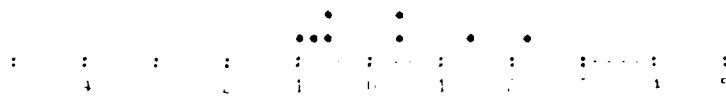
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 11%
 STD. DEV. = 8.6%
 MIN. OBS. = 3%
 MAX. OBS. = 20%



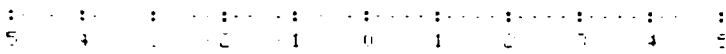
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 8.5%
 STD. DEV. = 6.5%
 MIN. OBS. = 2%
 MAX. OBS. = 20%



OTHER INDUSTRY

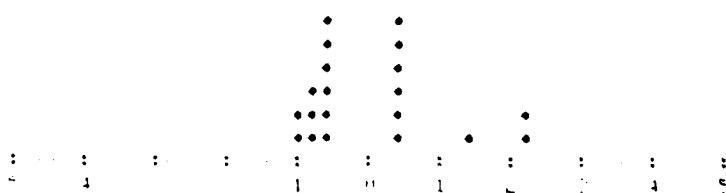
NO. OBS. = 9
 MEAN = 6.1%
 STD. DEV. = 3.1%
 MIN. OBS. = 2%
 MAX. OBS. = 10%



ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = 2%
 MAX. OBS. = 20%

OBSERVATIONS



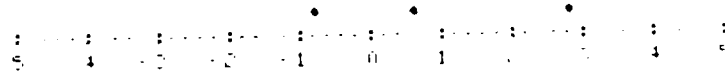
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 7.8% STD. DEV. = 5.5%

Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO SELECT MACHINES AND EQUIPMENT FOR A NEW CYLINDRICAL PART

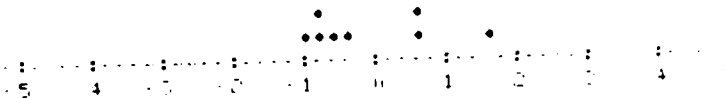
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 11%
 STD. DEV. = 8.5%
 MIN. OBS. = 3%
 MAX. OBS. = 20%



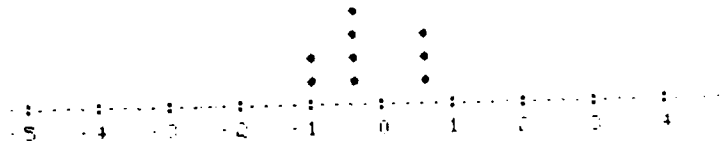
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 6.5%
 STD. DEV. = 4.6%
 MIN. OBS. = 2%
 MAX. OBS. = 15%



OTHER INDUSTRY

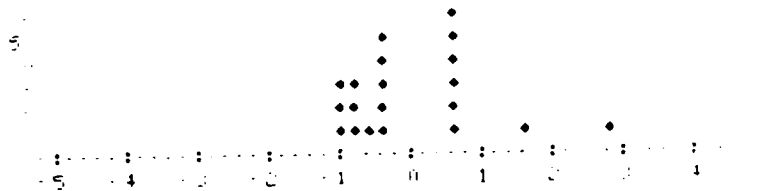
NO. OBS. = 9
 MEAN = 6%
 STD. DEV. = 3.2%
 MIN. OBS. = 2%
 MAX. OBS. = 10%



ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = 2%
 MAX. OBS. = 15%

OBSERVATIONS

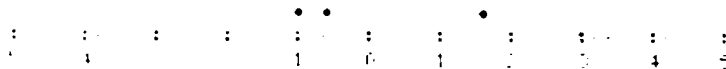


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 7% STD. DEV. = 4.8%

Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO DETERMINE OPERATION SEQUENCES FOR A NEW NON-CYLINDRICAL PART

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 20.7
 STD. DEV. = 25.7
 MIN. OBS. = 2
 MAX. OBS. = 50



OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 14.9
 STD. DEV. = 15.9
 MIN. OBS. = 4
 MAX. OBS. = 50



OTHER INDUSTRY

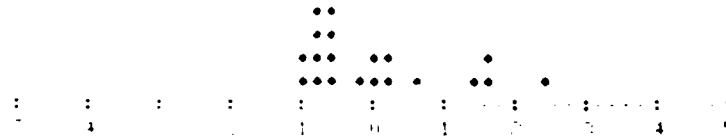
NO. OBS. = 9
 MEAN = 25.3
 STD. DEV. = 19.4
 MIN. OBS. = 3
 MAX. OBS. = 65



OBSERVATIONS

ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = 2
 MAX. OBS. = 65



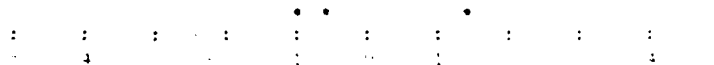
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 20.5 STD. DEV. = 18.6

Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO DETERMINE OPERATION SEQUENCES FOR A NEW CYLINDRICAL PART

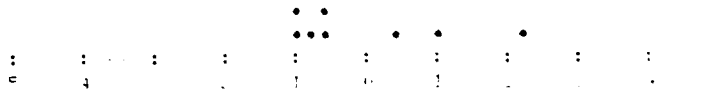
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 20.7
 STD. DEV. = 25.7
 MIN. OBS. = 2
 MAX. OBS. = 50



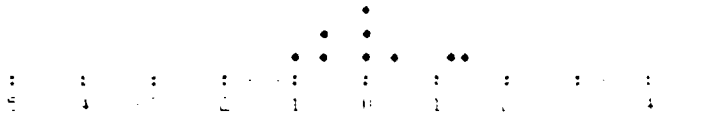
OTHER AEROSPACE

NO. OBS. = 2
 MEAN = 20.9
 STD. DEV. = 22.3
 MIN. OBS. = 3
 MAX. OBS. = 65



OTHER-INDUSTRY

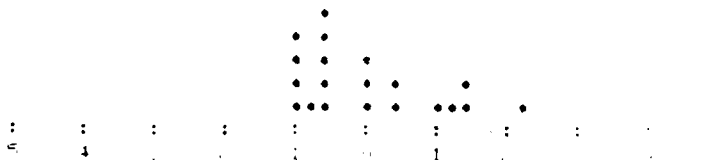
NO. OBS. = 9
 MEAN = 23
 STD. DEV. = 16.1
 MIN. OBS. = 2
 MAX. OBS. = 50



ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = 2
 MAX. OBS. = 50

OBSERVATIONS

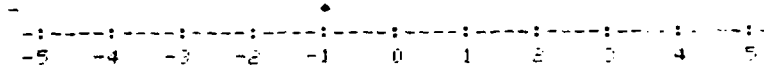


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 21.8 STD. DEV. = 19.1

Q15 - APPROXIMATE ANNUAL MAINTENANCE AND SUPPORT COSTS FOR CURRENTLY USED COMPUTER ASSISTED
PROCESS PLANNING

MISSILE PRIMES & SUBS

NO. OBS. = 1
MEAN = \$5K
STD. DEV. = \$0
MIN. OBS. = \$5K
MAX. OBS. = \$5K



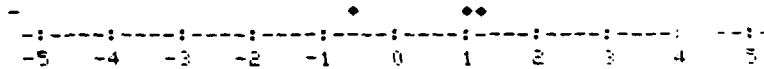
OTHER AEROSPACE

NO. OBS. = 1
MEAN = \$20K
STD. DEV. = \$0
MIN. OBS. = \$20K
MAX. OBS. = \$20K



OTHER INDUSTRY

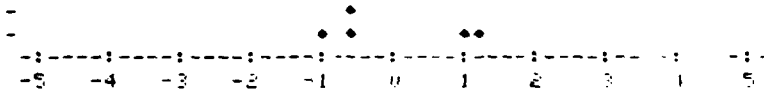
NO. OBS. = 3
MEAN = \$71K
STD. DEV. = \$41K
MIN. OBS. = \$24K
MAX. OBS. = \$100K



ALL RESPONSES

NO. OBS. = 5
MIN. OBS. = \$5K
MAX. OBS. = \$100K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = \$48K STD. DEV. = \$44K

Q14 - AUTOMATION PLANNED FOR PROCESS PLANNING FUNCTIONS WITHIN THE NEXT 2 YEARS

PLANNING FUNCTION	MISSILE PRIME AND SUBS.			OTHER AEROSPACE			OTHER INDUSTRY			TOTAL		
	MANUAL	SOME AUTOMATION	FULLY AUTOMATED	MANUAL	SOME AUTOMATION	FULLY AUTOMATED	MANUAL	SOME AUTOMATION	FULLY AUTOMATED	MANUAL	SOME AUTOMATION	FULLY AUTOMATED
DETERMINE OPERATION SEQUENCES		1	1		3	0		2	2		6	3
SELECT MACHINES AND EQUIPMENT		1	1		3	0		4	1		8	2
SELECT TOOLING, GAGES, ETC.		1	1		2	0		2	2		5	3
DETERMINE PROCESSING PARAMETERS (SPEEDS, FEEDS, ETC).		1	0		3	0		3	3		7	3
DETERMINE TIME STANDARDS		2	0		4	1		3	3		9	4
ANALYZE TOLERANCES		1	0		1	0		1	1		3	1
PREPARE ROUTING SHEETS		1	0		3	1		3	3		7	4
PREPARE OPERATIONS SHEETS		1	0		3	0		2	3		6	3
PREPARE TOOL ORDERS		1	0		3	1		0	2		4	3
CONDUCT DESIGN/PRODUCTIBILITY REVIEWS		0	0		2	0		1	0		3	0

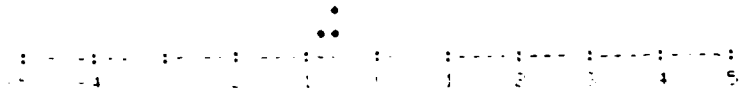
Q14 - CURRENT PROCESS PLANNING FUNCTIONS AND LEVELS OF AUTOMATION

PLANNING FUNCTION	MISSILE PRIME AND SUBS.			OTHER AEROSPACE			OTHER INDUSTRY			TOTAL		
	MANUAL	SOME AUTOMATION	FULLY AUTOMATED	MANUAL	SOME AUTOMATION	FULLY AUTOMATED	MANUAL	SOME AUTOMATION	FULLY AUTOMATED	MANUAL	SOME AUTOMATION	FULLY AUTOMATED
DETERMINE OPERATION SEQUENCES	4	0	0	6	2	0	7	0	1	17	2	1
SELECT MACHINES AND EQUIPMENT	4	0	0	6	2	0	8	0	1	18	2	1
SELECT TOOLING, GAGES, ETC.	4	0	0	8	0	0	8	0	0	20	0	0
DETERMINE PROCESSING PARAMETERS (SPEEDS, FEEDS, ETC).	4	0	0	7	0	0	7	1	1	18	1	1
DETERMINE TIME STANDARDS	4	0	0	6	1	0	6	2	1	16	3	1
ANALYZE TOLERANCES	4	0	0	7	1	0	6	0	0	17	1	0
PREPARE ROUTING SHEETS	3	1	0	3	4	1	6	2	1	12	1	2
PREPARE OPERATIONS SHEETS	3	1	0	4	2	1	5	2	1	12	5	2
PREPARE TOOL ORDERS	4	0	0	6	1	0	7	0	0	17	1	0
CONDUCT DESIGN/PRODUCTIBILITY REVIEWS	4	0	0	7	1	0	6	0	0	17	1	0

Q13 - TOTAL NUMBER OF PROCESS PLANS OF ALL TYPES PREPARED ANNUALLY FOR NON-CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 692
STD. DEV. = 299
MIN. OBS. = 350
MAX. OBS. = 906



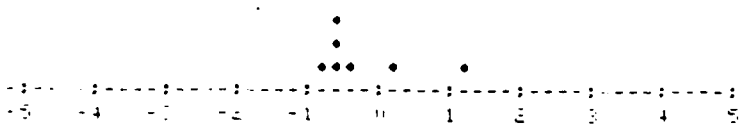
OTHER AEROSPACE

NO. OBS. = 8
MEAN = 4040
STD. DEV. = 4064
MIN. OBS. = 585
MAX. OBS. = 12100



OTHER INDUSTRY

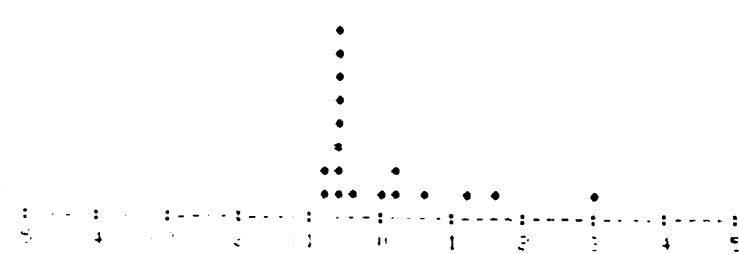
NO. OBS. = 7
MEAN = 1867
STD. DEV. = 2228
MIN. OBS. = 100
MAX. OBS. = 6300



ALL RESPONSES

NO. OBS. = 18
MIN. OBS. = 100
MAX. OBS. = 12100

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

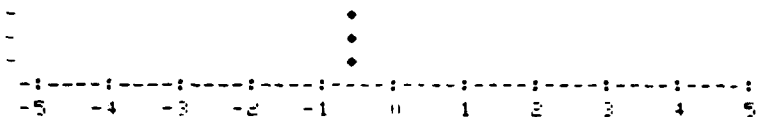
MEAN = 2637

STD. DEV. = 3225

Q13 - TOTAL NUMBER OF PROCESS PLANS OF ALL TYPES PREPARED ANNUALLY FOR CYLINDRICAL PARTS

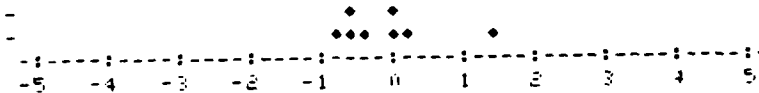
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 422
 STD. DEV. = 59
 MIN. OBS. = 370
 MAX. OBS. = 486



OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 2363
 STD. DEV. = 2380
 MIN. OBS. = 180
 MAX. OBS. = 7600



OTHER INDUSTRY

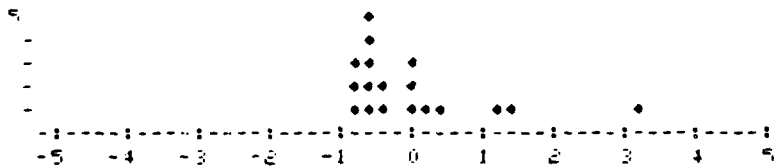
NO. OBS. = 7
 MEAN = 4184
 STD. DEV. = 5096
 MIN. OBS. = 160
 MAX. OBS. = 14350



ALL RESPONSES

NO. OBS. = 18
 MIN. OBS. = 160
 MAX. OBS. = 14350

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 2748 STD. DEV. = 3657

Q13 - TOTAL NUMBER OF STUDY PLANS PREPARED ANNUALLY FOR NON-CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 383
 STD. DEV. = 176
 MIN. OBS. = 200
 MAX. OBS. = 550



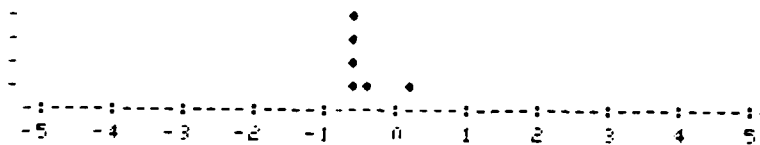
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 786
 STD. DEV. = 949
 MIN. OBS. = 10
 MAX. OBS. = 3000



OTHER INDUSTRY

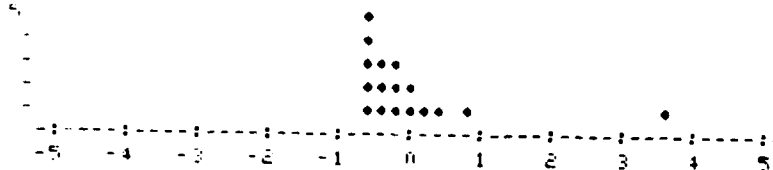
NO. OBS. = 6
 MEAN = 140
 STD. DEV. = 219
 MIN. OBS. = 0
 MAX. OBS. = 560



ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = 0
 MAX. OBS. = 3000

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 487 STD. DEV. = 711

Q13 - TOTAL NUMBER OF STUDY PLANS PREPARED ANNUALLY FOR CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 233
 STD. DEV. = 58
 MIN. OBS. = 200
 MAX. OBS. = 300



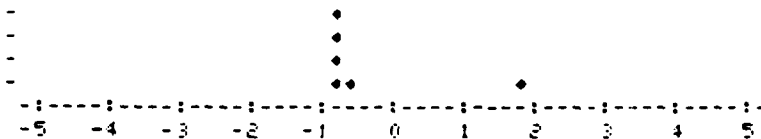
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 373
 STD. DEV. = 362
 MIN. OBS. = 10
 MAX. OBS. = 1000



OTHER INDUSTRY

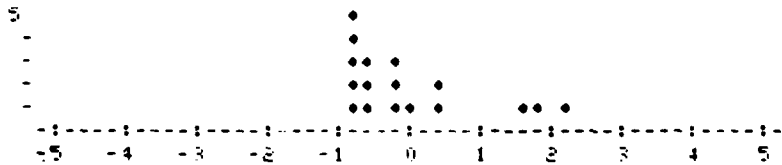
NO. OBS. = 6
 MEAN = 162
 STD. DEV. = 334
 MIN. OBS. = 0
 MAX. OBS. = 840



ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = 0
 MAX. OBS. = 1000

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 274

STD. DEV. = 320

Q13 - TOTAL NUMBER OF PROCESS PLANS WHICH ARE MODIFIED ANNUALLY FOR NON-CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 65
 STD. DEV. = 41
 MIN. OBS. = 20
 MAX. OBS. = 100



OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 2133
 STD. DEV. = 2653
 MIN. OBS. = 260
 MAX. OBS. = 8100



OTHER INDUSTRY

NO. OBS. = 7
 MEAN = 736
 STD. DEV. = 1071
 MIN. OBS. = 90
 MAX. OBS. = 3000



ALL RESPONSES

NO. OBS. = 18
 MIN. OBS. = 20
 MAX. OBS. = 8100

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 1245

STD. DEV. = 2007

Q13 - TOTAL NUMBER OF PROCESS PLANS WHICH ARE MODIFIED ANNUALLY FOR CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 43
 STD. DEV. = 31
 MIN. OBS. = 10
 MAX. OBS. = 70



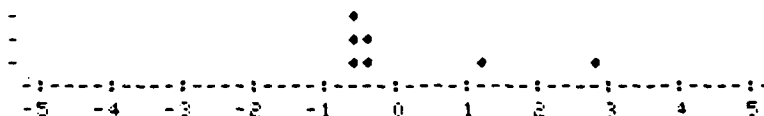
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 1318
 STD. DEV. = 1773
 MIN. OBS. = 100
 MAX. OBS. = 5400



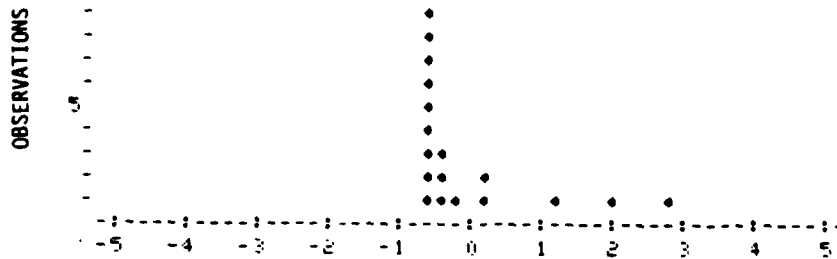
OTHER INDUSTRY

NO. OBS. = 7
 MEAN = 1770
 STD. DEV. = 2677
 MIN. OBS. = 50
 MAX. OBS. = 7000



ALL RESPONSES

NO. OBS. = 18
 MIN. OBS. = 10
 MAX. OBS. = 7000

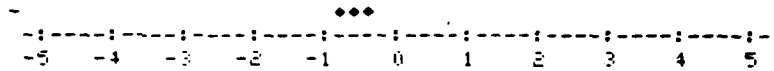


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 1281 STD. DEV. = 2047

Q13 - ANNUAL NUMBER OF PROCESS PLANS FOR NEW NON-CYLINDRICAL PARTS

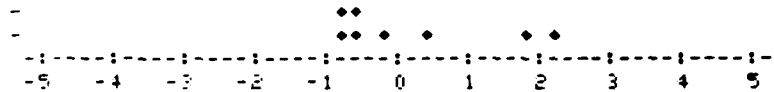
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 244
 STD. DEV. = 163
 MIN. OBS. = 75
 MAX. OBS. = 400



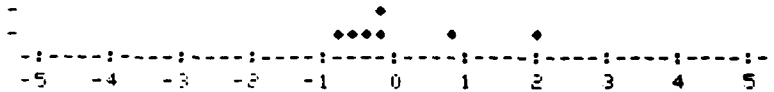
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 1121
 STD. DEV. = 1379
 MIN. OBS. = 50
 MAX. OBS. = 3445



OTHER INDUSTRY

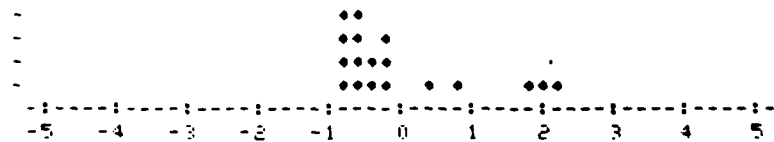
NO. OBS. = 7
 MEAN = 1012
 STD. DEV. = 1164
 MIN. OBS. = 10
 MAX. OBS. = 3250



ALL RESPONSES

NO. OBS. = 18
 MIN. OBS. = 10
 MAX. OBS. = 3445

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 932

STD. DEV. = 1170

Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO SELECT TOOLING FOR A NEW CYLINDRICAL PART

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 14.7
 STD. DEV. = 5%
 MIN. OBS. = 10%
 MAX. OBS. = 20%

OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 11.9
 STD. DEV. = 8%
 MIN. OBS. = 0%
 MAX. OBS. = 25%

OTHER INDUSTRY

NO. OBS. = 8
 MEAN = 8.5%
 STD. DEV. = 3.1%
 MIN. OBS. = 5%
 MAX. OBS. = 13%

ALL RESPONSES

NO. OBS. = 19
 MIN. OBS. = 0%
 MAX. OBS. = 25%

OBSERVATIONS

STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 10.9 STD. DEV. = 6.1

Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO SELECT TOOLING FOR A NEW NON-CYLINDRICAL PART

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 13
 STD. DEV. = 2.6
 MIN. OBS. = 10
 MAX. OBS. = 15



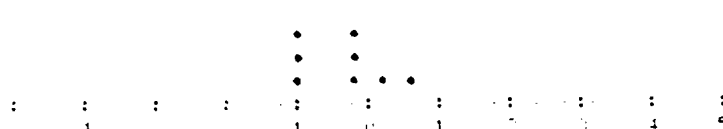
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 12.5
 STD. DEV. = 8.8
 MIN. OBS. = 0
 MAX. OBS. = 30



OTHER INDUSTRY

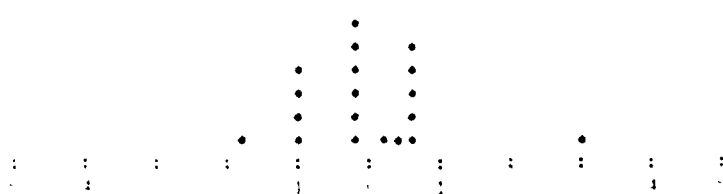
NO. OBS. = 8
 MEAN = 9.1
 STD. DEV. = 3.8
 MIN. OBS. = 5
 MAX. OBS. = 15



ALL RESPONSES

NO. OBS. = 19
 MIN. OBS. = 0
 MAX. OBS. = 30

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 11.2 STD. DEV. = 6.3

Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO DETERMINE PROCESSING PARAMETERS FOR A NEW CYLINDRICAL PART

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 4.7
 STD. DEV. = 5.0%
 MIN. OBS. = 0%
 MAX. OBS. = 10%

OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 10.3%
 STD. DEV. = 18.1%
 MIN. OBS. = 0%
 MAX. OBS. = 53%

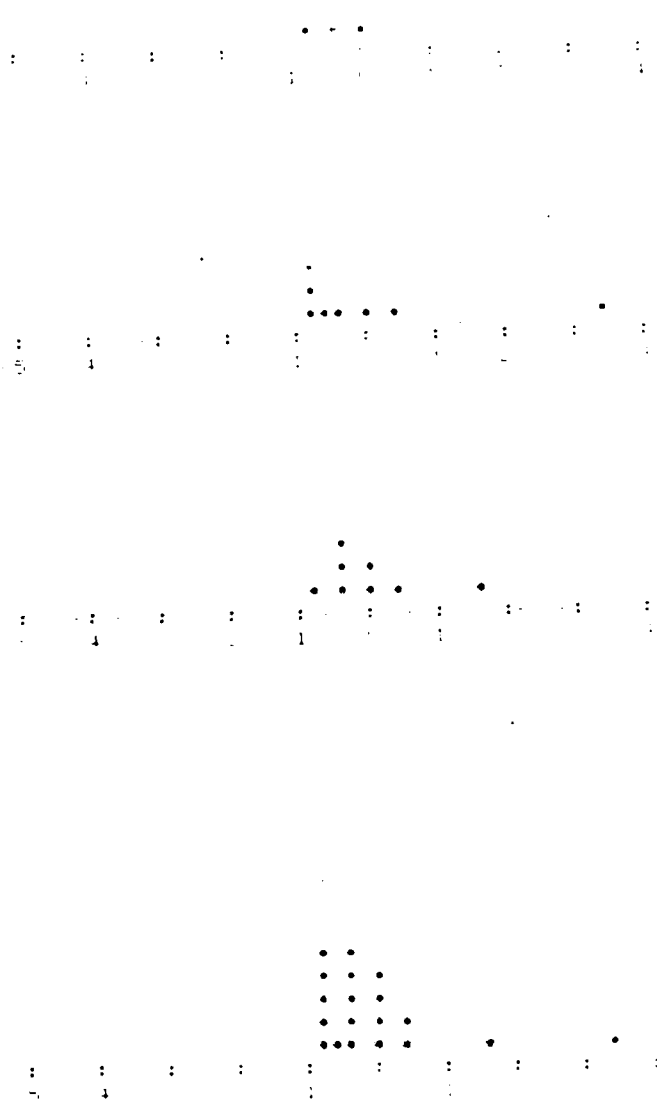
OTHER INDUSTRY

NO. OBS. = 8
 MEAN = 10%
 STD. DEV. = 9.3%
 MIN. OBS. = 0%
 MAX. OBS. = 30%

ALL RESPONSES

NO. OBS. = 19
 MIN. OBS. = 0%
 MAX. OBS. = 53%

OBSERVATIONS

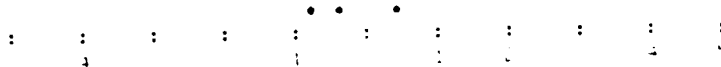


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 9.3% STD. DEV. = 12.9

Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO DETERMINE PROCESSING PARAMETERS FOR A NEW
NON-CYLINDRICAL PART

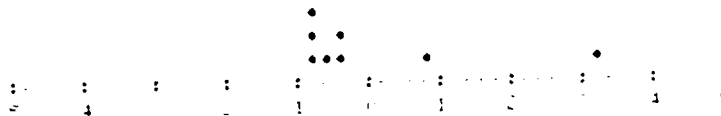
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 6.3
 STD. DEV. = 7.8
 MIN. OBS. = 0
 MAX. OBS. = 15



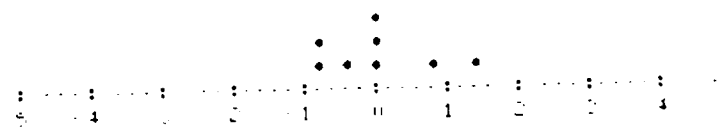
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 10.9
 STD. DEV. = 18.3
 MIN. OBS. = 0
 MAX. OBS. = 53



OTHER INDUSTRY

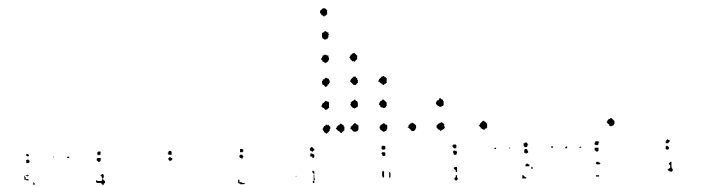
NO. OBS. = 8
 MEAN = 10.6
 STD. DEV. = 10.2
 MIN. OBS. = 0
 MAX. OBS. = 20



ALL RESPONSES

NO. OBS. = 19
 MIN. OBS. = 0
 MAX. OBS. = 53

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

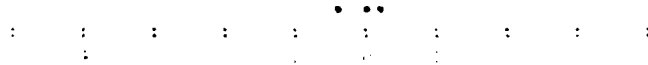
MEAN = 10.1

STD. DEV. = 13.4

Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO DETERMINE TIME STANDARDS FOR A NEW CYLINDRICAL PART

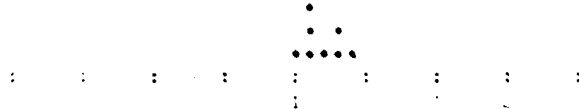
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 7.7
 STD. DEV. = 2.5
 MIN. OBS. = 5
 MAX. OBS. = 10



OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 3.5
 STD. DEV. = 2.2
 MIN. OBS. = 0
 MAX. OBS. = 7



OTHER INDUSTRY

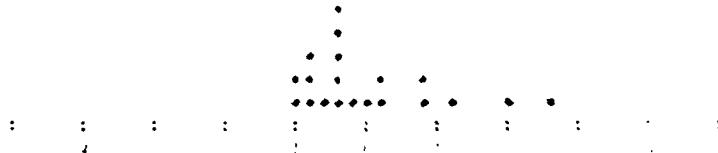
NO. OBS. = 9
 MEAN = 13.8
 STD. DEV. = 9.6
 MIN. OBS. = 1
 MAX. OBS. = 30



ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = 0
 MAX. OBS. = 30

OBSERVATIONS



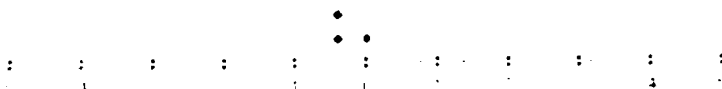
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 8.8 STD. DEV. = 8.1

Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO DETERMINE TIME STANDARDS FOR A NEW NON-CYLINDRICAL PART

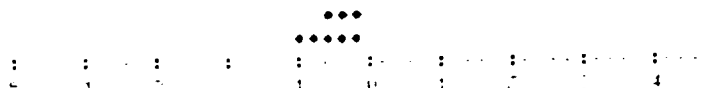
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 6.0
 STD. DEV. = 1.73
 MIN. OBS. = 5
 MAX. OBS. = 8



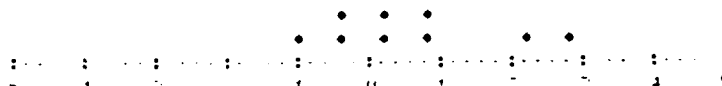
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 4
 STD. DEV. = 2.45
 MIN. OBS. = 0
 MAX. OBS. = 7



OTHER INDUSTRY

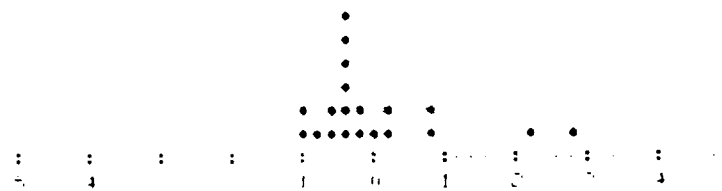
NO. OBS. = 9
 MEAN = 12.9
 STD. DEV. = 9.6
 MIN. OBS. = 1
 MAX. OBS. = 25



ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = 0
 MAX. OBS. = 25

OBSERVATIONS



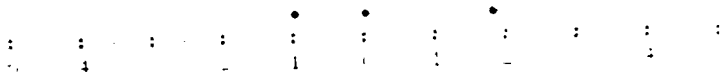
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 8.3 STD. DEV. = 7.7

Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO ANALYZE TOLERANCES FOR A NEW CYLINDRICAL PART

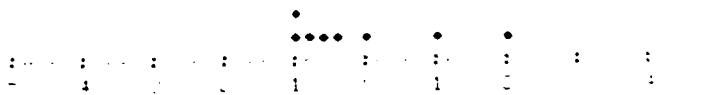
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 6.3%
 STD. DEV. = 7.1%
 MIN. OBS. = 0%
 MAX. OBS. = 11.1%



OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 4.5%
 STD. DEV. = 5.4%
 MIN. OBS. = 0%
 MAX. OBS. = 15%



OTHER INDUSTRY

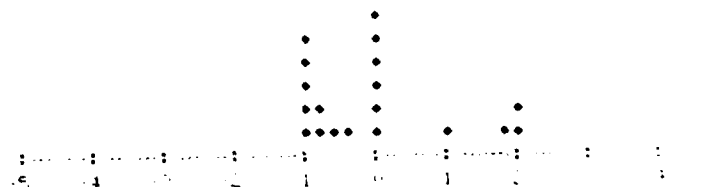
NO. OBS. = 8
 MEAN = 4.5%
 STD. DEV. = 4.8%
 MIN. OBS. = 0%
 MAX. OBS. = 15%



ALL RESPONSES

NO. OBS. = 19
 MIN. OBS. = 0%
 MAX. OBS. = 15%

OBSERVATIONS

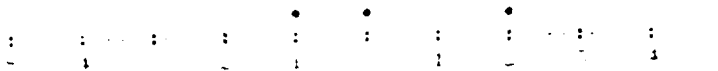


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 4.8% STD. DEV. = 5.1

Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO ANALYZE TOLERANCES FOR A NEW NON-CYLINDRICAL PART

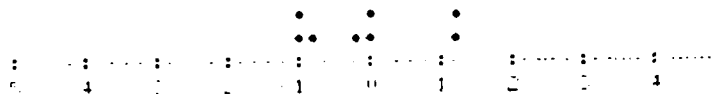
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 6.3%
 STD. DEV. = 7.1%
 MIN. OBS. = 0%
 MAX. OBS. = 14%



OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 4.4%
 STD. DEV. = 4.1%
 MIN. OBS. = 0%
 MAX. OBS. = 10%



OTHER INDUSTRY

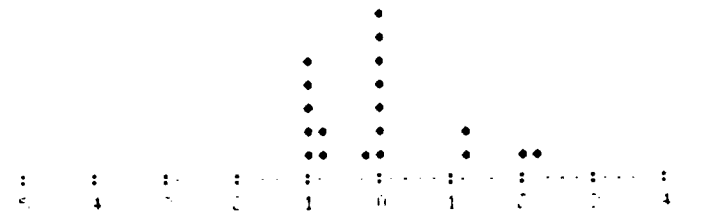
NO. OBS. = 8
 MEAN = 4.5%
 STD. DEV. = 4.8%
 MIN. OBS. = 0%
 MAX. OBS. = 15%



ALL RESPONSES

NO. OBS. = 19
 MIN. OBS. = 0%
 MAX. OBS. = 15%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 4.7% STD. DEV. = 4.6%

Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO PREPARE ROUTING SHEETS FOR A NEW CYLINDRICAL PART

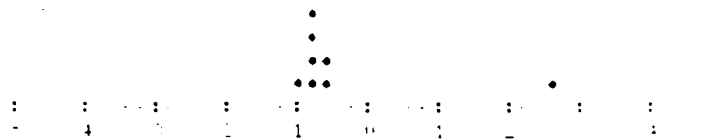
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 15.8%
 STD. DEV. = 12.2%
 MIN. OBS. = 5%
 MAX. OBS. = 33%



OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 6.1%
 STD. DEV. = 11.8%
 MIN. OBS. = 0%
 MAX. OBS. = 35%



OTHER INDUSTRY

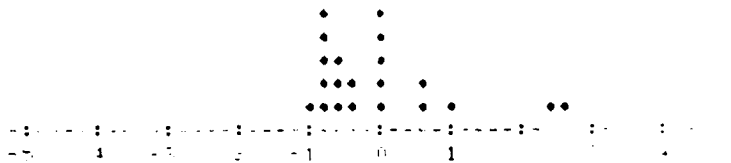
NO. OBS. = 9
 MEAN = 9.6%
 STD. DEV. = 5.6%
 MIN. OBS. = 2%
 MAX. OBS. = 20%



ALL RESPONSES

NO. OBS. = 21
 MIN. OBS. = 0%
 MAX. OBS. = 35%

OBSERVATIONS

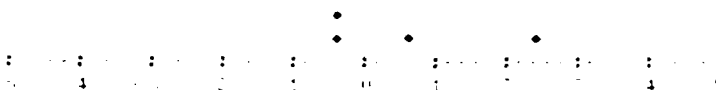


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 9.4% STD. DEV. = 9.8

Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO PREPARE ROUTING SHEETS FOR A NEW NON-CYLINDRICAL PART

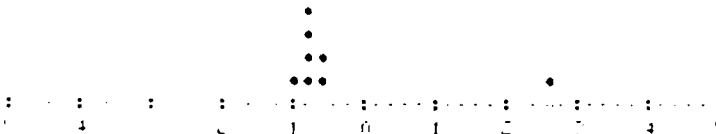
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 14.5%
 STD. DEV. = 13.2%
 MIN. OBS. = 5%
 MAX. OBS. = 33%



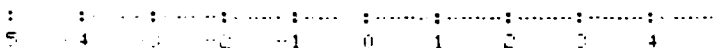
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 6.3%
 STD. DEV. = 11.7%
 MIN. OBS. = 0%
 MAX. OBS. = 35%



OTHER INDUSTRY

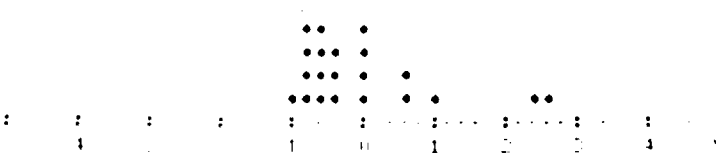
NO. OBS. = 9
 MEAN = 9.7%
 STD. DEV. = 5.4%
 MIN. OBS. = 3%
 MAX. OBS. = 20%



ALL RESPONSES

NO. OBS. = 21
 MIN. OBS. = 0%
 MAX. OBS. = 35%

OBSERVATIONS



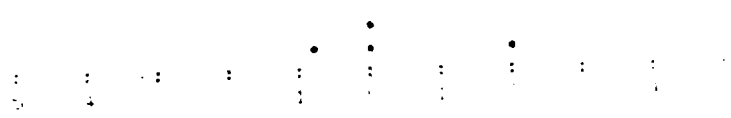
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 9.3% STD. DEV. = 9.7%

Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO PREPARE OPERATION SHEETS FOR A NEW CYLINDRICAL PART

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 19%
 STD. DEV. = 14.9%
 MIN. OBS. = 5%
 MAX. OBS. = 40%



OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 16.3%
 STD. DEV. = 13.8%
 MIN. OBS. = 0%
 MAX. OBS. = 37%



OTHER INDUSTRY

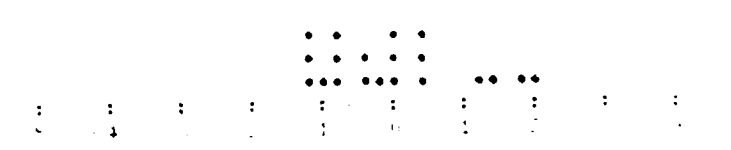
NO. OBS. = 8
 MEAN = 11.3%
 STD. DEV. = 10.3%
 MIN. OBS. = 0%
 MAX. OBS. = 30%



ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = 0%
 MAX. OBS. = 40%

OBSERVATIONS



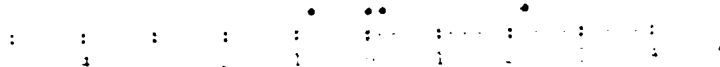
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 14.8% STD. DEV. = 12.4%

Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO PREPARE OPERATION SHEETS FOR A NEW NON-CYLINDRICAL PART

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 21.5
 STD. DEV. = 16.9
 MIN. OBS. = 5
 MAX. OBS. = 45



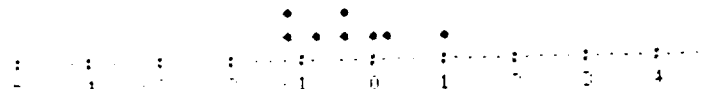
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 18.3
 STD. DEV. = 15.4
 MIN. OBS. = 0
 MAX. OBS. = 40



OTHER INDUSTRY

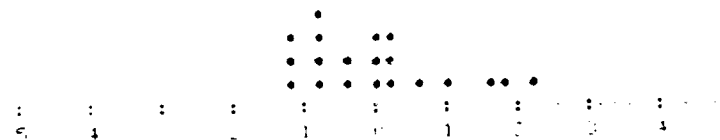
NO. OBS. = 8
 MEAN = 11.3
 STD. DEV. = 10.3
 MIN. OBS. = 0
 MAX. OBS. = 20



OBSERVATIONS

ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = 0
 MAX. OBS. = 45



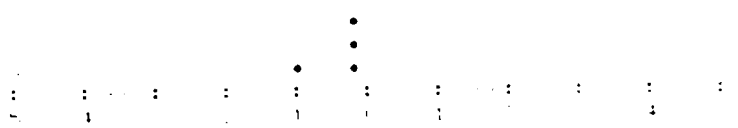
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 16.1 STD. DEV. = 13.7

Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO PREPARE TOOL DRESSERS FOR A NEW CYLINDRICAL PART

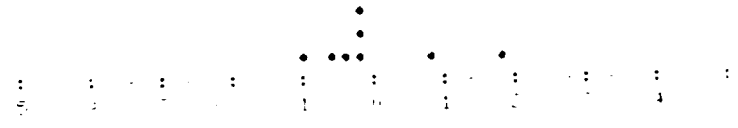
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 4%
 STD. DEV. = 2%
 MIN. OBS. = 1%
 MAX. OBS. = 5%



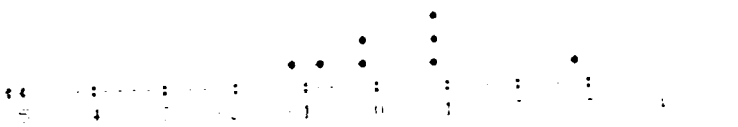
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 6%
 STD. DEV. = 4.4%
 MIN. OBS. = 1%
 MAX. OBS. = 15%



OTHER INDUSTRY

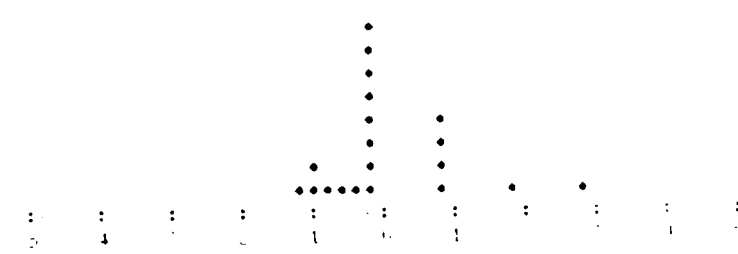
NO. OBS. = 8
 MEAN = 7.8%
 STD. DEV. = 6.3%
 MIN. OBS. = 0%
 MAX. OBS. = 20%



ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = 0%
 MAX. OBS. = 20%

OBSERVATIONS



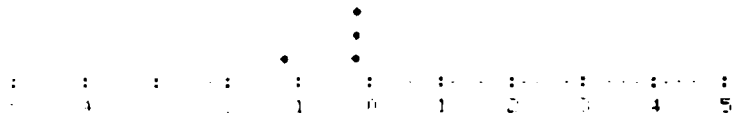
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 6.3% STD. DEV. = 5.0%

Q16 - PERCENTAGE OF PROCESS PLANNING COSTS TO PREPARE TOOL ORDERS FOR A NEW NON-CYLINDRICAL PART

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 4.25
 STD. DEV. = 2.25
 MIN. OBS. = 1
 MAX. OBS. = 5



OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 6.9
 STD. DEV. = 4.5
 MIN. OBS. = 1
 MAX. OBS. = 15



OTHER INDUSTRY

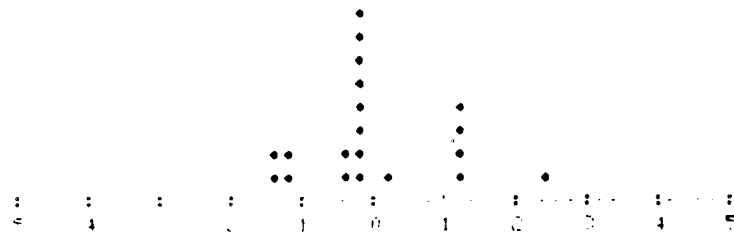
NO. OBS. = 8
 MEAN = 5.25
 STD. DEV. = 3.8
 MIN. OBS. = 0
 MAX. OBS. = 10



ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = 0
 MAX. OBS. = 10

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 5.6 STD. DEV. = 3.8

AD-A151 997

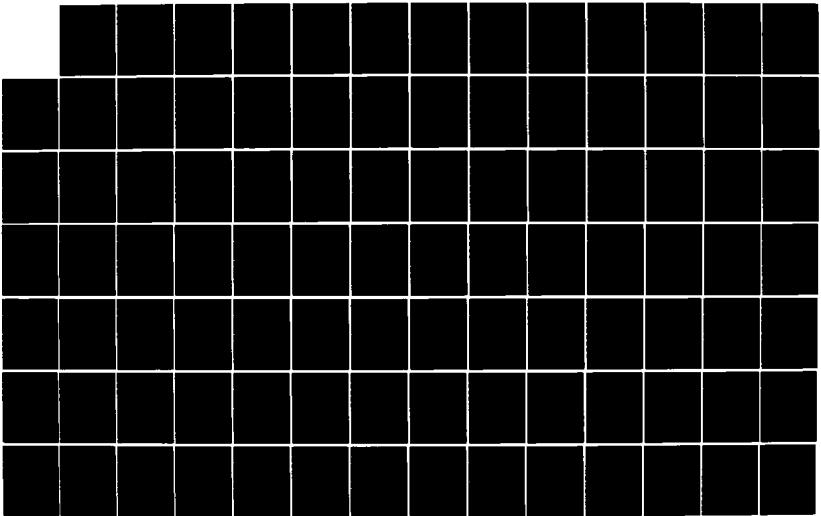
COMPUTERIZED PRODUCTION PROCESS PLANNING VOLUME 3
APPENDICES A B AND C TO BENEFIT ANALYSIS(U) IIT
RESEARCH INST CHICAGO IL H H SHU ET AL. NOV 76
DRAH01-76-C-1104

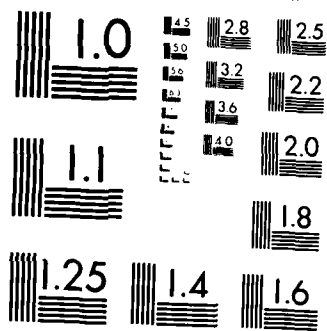
2/4

UNCLASSIFIED

F/G 9/2

NL



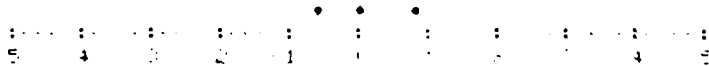


MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

Q17 - MANHOURS TO PREPARE A PROCESS PLAN FOR A NEW CYLINDRICAL PART HAVING 10 OPERATIONS

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 11 M-H
 STD. DEV. = 8 M-H
 MIN. OBS. = 4 M-H
 MAX. OBS. = 20 M-H



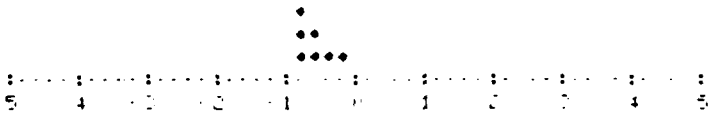
OTHER AEROSPACE

NO. OBS. = 6
 MEAN = 20 M-H
 STD. DEV. = 16 M-H
 MIN. OBS. = 3 M-H
 MAX. OBS. = 40 M-H



OTHER INDUSTRY

NO. OBS. = 7
 MEAN = 4 M-H
 STD. DEV. = 3 M-H
 MIN. OBS. = 0.5 M-H
 MAX. OBS. = 8 M-H



ALL RESPONSES

NO. OBS. = 16
 MIN. OBS. = 0.5 M-H
 MAX. OBS. = 40 M-H

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 11 M-H STD. DEV. = 12 M-H

Q17 - MANHOURS TO PREPARE A PROCESS PLAN FOR A NEW CYLINDRICAL PART HAVING 25 OPERATIONS

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 33 M-H
 STD. DEV. = 15 M-H
 MIN. OBS. = 24 M-H
 MAX. OBS. = 50 M-H



OTHER AEROSPACE

NO. OBS. = 6
 MEAN = 45 M-H
 STD. DEV. = 40 M-H
 MIN. OBS. = 6 M-H
 MAX. OBS. = 100 M-H



OTHER INDUSTRY

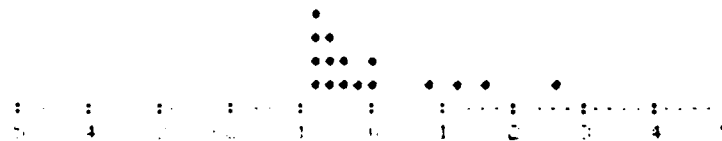
NO. OBS. = 7
 MEAN = 8 M-H
 STD. DEV. = 6 M-H
 MIN. OBS. = 1 M-H
 MAX. OBS. = 16 M-H



ALL RESPONSES

NO. OBS. = 16
 MIN. OBS. = 1 M-H
 MAX. OBS. = 100 M-H

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 26 M-H

STD. DEV. = 29 M-H

Q17 - MAN HOURS TO PREPARE A PROCESS PLAN FOR A NEW CYLINDRICAL MACHINED PART HAVING 50 OPERATIONS

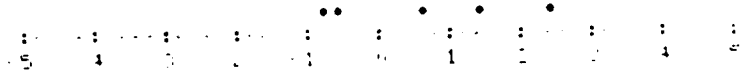
MISSILE PRIMES & SUBS

NO. OBS. = 2
 MEAN = 55 M-H
 STD. DEV. = 7 M-H
 MIN. OBS. = 50 M-H
 MAX. OBS. = 60 M-H



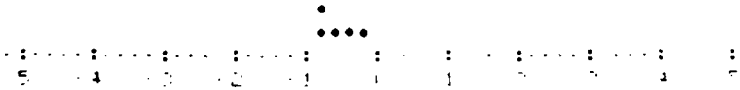
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = 97 M-H
 STD. DEV. = 81 M-H
 MIN. OBS. = 12 M-H
 MAX. OBS. = 200 M-H



OTHER INDUSTRY

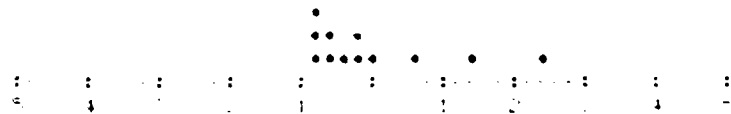
NO. OBS. = 5
 MEAN = 21 M-H
 STD. DEV. = 15 M-H
 MIN. OBS. = 6 M-H
 MAX. OBS. = 40 M-H



ALL RESPONSES

NO. OBS. = 12
 MIN. OBS. = 6 M-H
 MAX. OBS. = 200 M-H

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 58 M-H STD. DEV. = 61 M-H

Q17 - MANHOURS TO PREPARE A PROCESS PLAN FOR A NEW NON-CYLINDRICAL PART HAVING 10 OPERATIONS

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 19 M-H
 STD. DEV. = 19 M-H
 MIN. OBS. = 6 M-H
 MAX. OBS. = 40 M-H



OTHER AEROSPACE

NO. OBS. = 6
 MEAN = 30 M-H
 STD. DEV. = 29 M-H
 MIN. OBS. = 4 M-H
 MAX. OBS. = 73 M-H



OTHER INDUSTRY

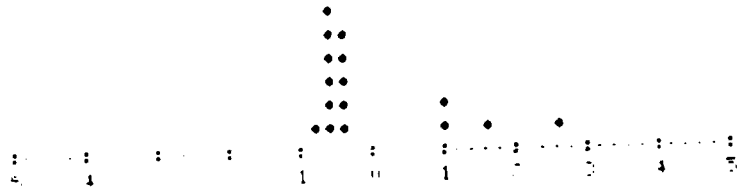
NO. OBS. = 7
 MEAN = 4 M-H
 STD. DEV. = 3 M-H
 MIN. OBS. = 0.5 M-H
 MAX. OBS. = 10 M-H



ALL RESPONSES

NO. OBS. = 16
 MIN. OBS. = 0.5 M-H
 MAX. OBS. = 73 M-H

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

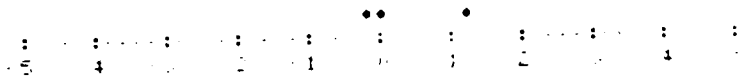
MEAN = 17 M-H

STD. DEV. = 22 M-H

Q17 - MANHOURS TO PREPARE A PROCESS PLAN FOR A NEW NON-CYLINDRICAL PART HAVING 25 OPERATIONS

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 55 M-H
 STD. DEV. = 40 M-H
 MIN. OBS. = 25 M-H
 MAX. OBS. = 100 M-H



OTHER AEROSPACE

NO. OBS. = 6
 MEAN = 67 M-H
 STD. DEV. = 63 M-H
 MIN. OBS. = 6 M-H
 MAX. OBS. = 140 M-H



OTHER INDUSTRY

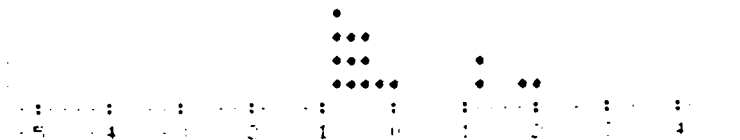
NO. OBS. = 7
 MEAN = 8 M-H
 STD. DEV. = 7 M-H
 MIN. OBS. = 1 M-H
 MAX. OBS. = 20 M-H



ALL RESPONSES

NO. OBS. = 16
 MIN. OBS. = 1 M-H
 MAX. OBS. = 140 M-H

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 39 M-H STD. DEV. = 49 M-H

Q17 - MAN HOURS TO PREPARE A PROCESS PLAN FOR A NEW NON-CYLINDRICAL MACHINED PART HAVING 50 OPERATIONS

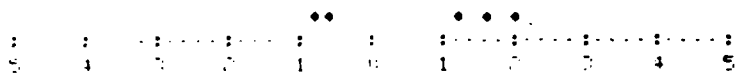
MISSILE PRIMES & SUBS

NO. OBS. = 2
 MEAN = 75 M-H
 STD. DEV. = 35 M-H
 MIN. OBS. = 50 M-H
 MAX. OBS. = 100 M-H



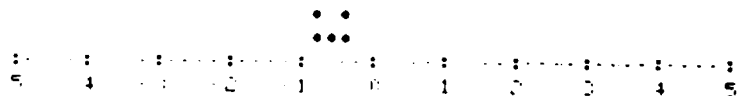
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = 157 M-H
 STD. DEV. = 128 M-H
 MIN. OBS. = 12 M-H
 MAX. OBS. = 300 M-H



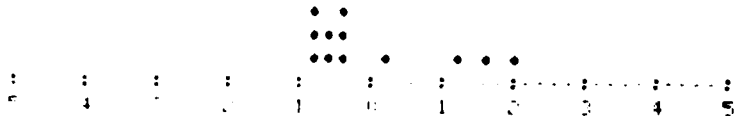
OTHER INDUSTRY

NO. OBS. = 5
 MEAN = 23 M-H
 STD. DEV. = 17 M-H
 MIN. OBS. = 6 M-H
 MAX. OBS. = 40 M-H



ALL RESPONSES

NO. OBS. = 12
 MIN. OBS. = 6 M-H
 MAX. OBS. = 300 M-H



OBSERVATIONS

STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

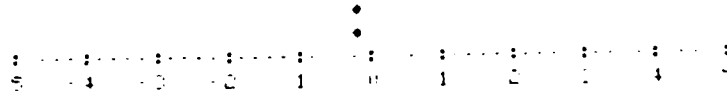
MEAN = 87 M-H

STD. DEV. = 102 M-H

Q17 - COST TO PREPARE A PROCESS PLAN FOR A NEW CYLINDRICAL PART HAVING 10 OPERATIONS

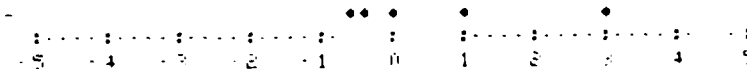
MISSILE PRIMES & SUBS

NO. OBS. = 2
 MEAN = \$ 123
 STD. DEV. = \$ 4
 MIN. OBS. = \$ 120
 MAX. OBS. = \$ 125



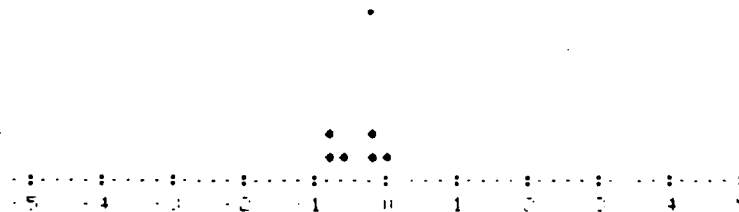
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = \$ 231
 STD. DEV. = \$ 210
 MIN. OBS. = \$ 60
 MAX. OBS. = \$ 567



OTHER INDUSTRY

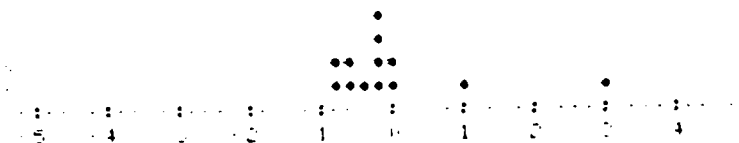
NO. OBS. = 6
 MEAN = \$ 78
 STD. DEV. = \$ 53
 MIN. OBS. = \$ 18
 MAX. OBS. = \$ 150



ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = \$ 18
 MAX. OBS. = \$ 567

OBSERVATIONS

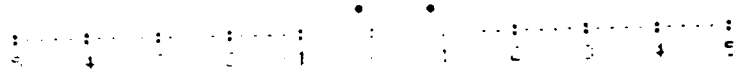


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$ 144 STD. DEV. = \$ 146

Q17 - COST TO PREPARE A PROCESS PLAN FOR A NEW CYLINDRICAL PART HAVING 25 OPERATIONS

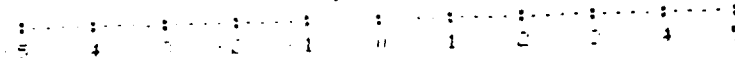
MISSILE PRIMES & SUBS

NO. OBS. = 2
 MEAN = \$525
 STD. DEV. = \$318
 MIN. OBS. = \$300
 MAX. OBS. = \$750



OTHER AEROSPACE

NO. OBS. = 5
 MEAN = \$658
 STD. DEV. = \$565
 MIN. OBS. = \$120
 MAX. OBS. = \$1418



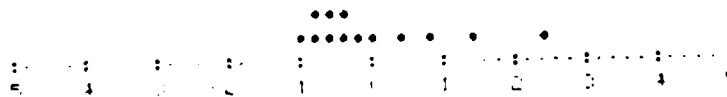
OTHER INDUSTRY

NO. OBS. = 6
 MEAN = \$159
 STD. DEV. = \$137
 MIN. OBS. = \$18
 MAX. OBS. = \$375



ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = \$18
 MAX. OBS. = \$1418



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$407 STD. DEV. = \$427

OBSERVATIONS

Q17 - COST TO PREPARE A PROCESS PLAN FOR A NEW CYLINDRICAL PART HAVING 50 OPERATIONS

MISSILE PRIMES & SUBS

NO. OBS. = 2
 MEAN = \$1225
 STD. DEV. = \$ 884
 MIN. OBS. = \$ 680
 MAX. OBS. = \$1850



OTHER AEROSPACE

NO. OBS. = 4
 MEAN = \$1320
 STD. DEV. = \$1192
 MIN. OBS. = \$ 264
 MAX. OBS. = \$2836



OTHER INDUSTRY

NO. OBS. = 5
 MEAN = \$ 409
 STD. DEV. = \$ 377
 MIN. OBS. = \$ 75
 MAX. OBS. = \$1000



ALL RESPONSES

NO. OBS. = 11
 MIN. OBS. = \$ 75
 MAX. OBS. = \$2836

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$ 887 STD. DEV. = \$879

Q17 - COST TO PREPARE A PROCESS PLAN FOR A NEW NON-CYLINDRICAL PART HAVING 10 OPERATIONS

MISSILE PRIMES & SUBS

NO. OBS. = 2
 MEAN = \$ 160
 STD. DEV. = \$ 57
 MIN. OBS. = \$ 120
 MAX. OBS. = \$ 200



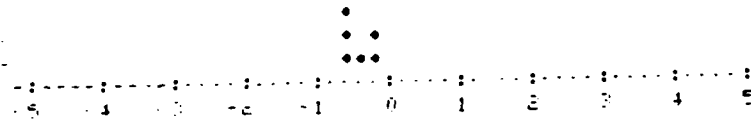
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = \$ 455
 STD. DEV. = \$ 482
 MIN. OBS. = \$ 80
 MAX. OBS. = \$1240



OTHER INDUSTRY

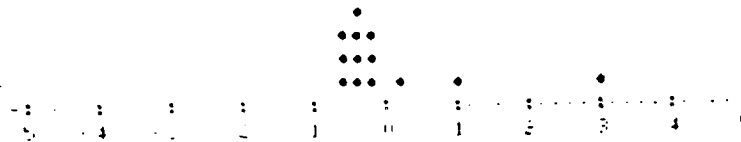
NO. OBS. = 6
 MEAN = \$ 83
 STD. DEV. = \$ 59
 MIN. OBS. = \$ 18
 MAX. OBS. = \$ 150



ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = \$ 18
 MAX. OBS. = \$1240

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$ 238

STD. DEV. = \$ 334

Q17 - COST TO PREPARE A PROCESS PLAN FOR A NEW NON-CYLINDRICAL PART HAVING 25 OPERATIONS

MISSILE PRIMES & SUBS

NO. OBS. = 2
MEAN = \$775
STD. DEV. = \$672
MIN. OBS. = \$300
MAX. OBS. = \$1250

OTHER AEROSPACE

NO. OBS. = 5
MEAN = \$938
STD. DEV. = \$959
MIN. OBS. = \$132
MAX. OBS. = \$2380

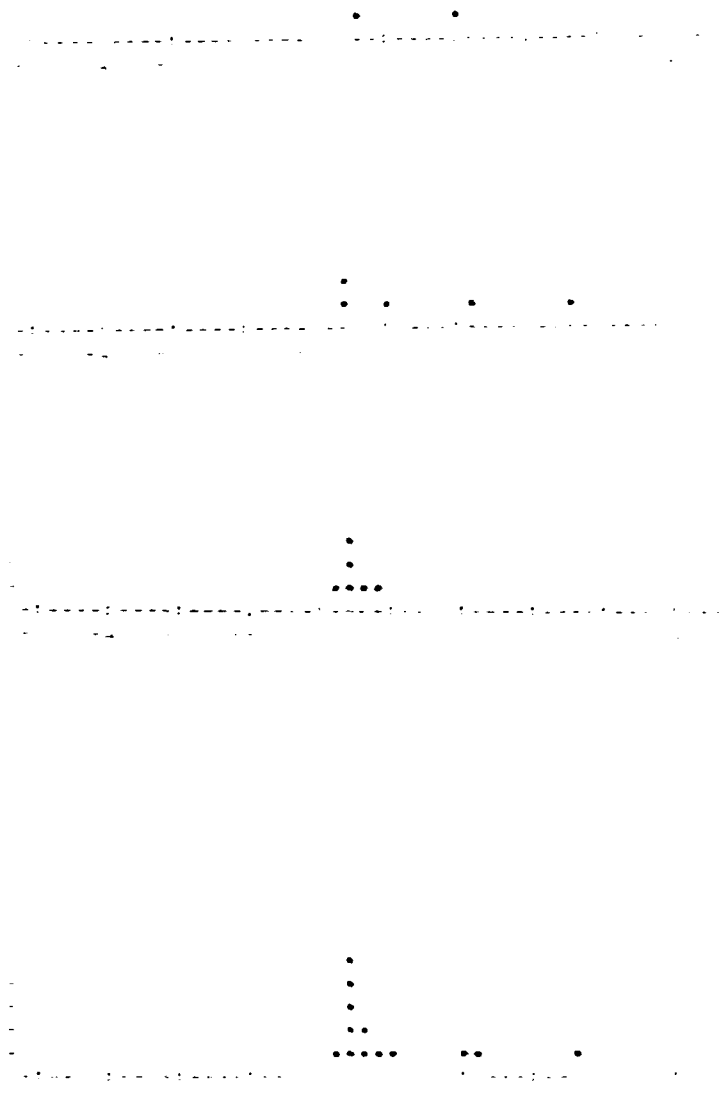
OTHER INDUSTRY

NO. OBS. = 6
MEAN = \$173
STD. DEV. = \$143
MIN. OBS. = \$18
MAX. OBS. = \$375

ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = \$18
MAX. OBS. = \$2380

OBSERVATIONS



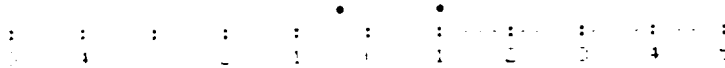
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$560 STD. DEV. = \$704

Q17 - COST TO PREPARE A PROCESS PLAN FOR A NEW NON-CYLINDRICAL PART HAVING 50 OPERATIONS

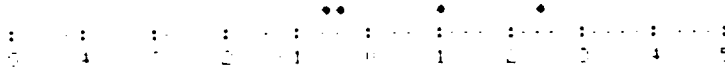
MISSILE PRIMES & SUBS

NO. OBS. = 2
 MEAN = \$1850
 STD. DEV. = \$1768
 MIN. OBS. = \$600
 MAX. OBS. = \$2100



OTHER AEROSPACE

NO. OBS. = 4
 MEAN = \$2221
 STD. DEV. = \$2223
 MIN. OBS. = \$308
 MAX. OBS. = \$5100



OTHER INDUSTRY

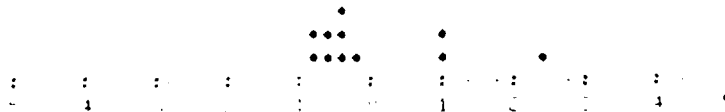
NO. OBS. = 5
 MEAN = \$439
 STD. DEV. = \$380
 MIN. OBS. = \$75
 MAX. OBS. = \$1000



OBSERVATIONS

ALL RESPONSES

NO OBS. = 11
 MIN. OBS. = \$75
 MAX. OBS. = \$5100

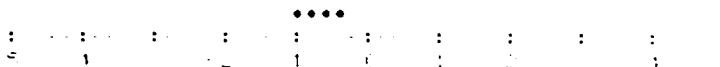


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$1344 STD. DEV. = \$1619

Q19 - PERCENTAGE OF COSTS ATTRIBUTABLE TO MATERIAL FOR NON-CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

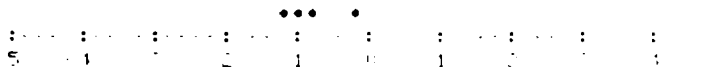
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 11.8%
 STD. DEV. = 5.6%
 MIN. OBS. = 5.0%
 MAX. OBS. = 18.0%



OTHER AEROSPACE

NO. OBS. = 4
 MEAN = 9.0%
 STD. DEV. = 7.6%
 MIN. OBS. = 1.8%
 MAX. OBS. = 19.2%



OTHER INDUSTRY

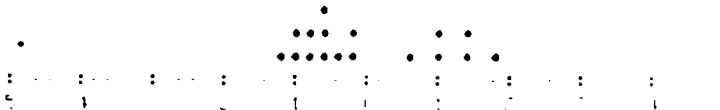
NO. OBS. = 9
 MEAN = 36.8%
 STD. DEV. = 17.3%
 MIN. OBS. = 12.0%
 MAX. OBS. = 60.0%



OBSERVATIONS

ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = 1.8%
 MAX. OBS. = 60.0%

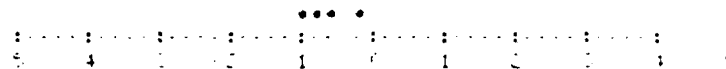


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 24.4 STD. DEV. = 18.8

Q19 - PERCENTAGE OF COSTS ATTRIBUTABLE TO MATERIAL FOR CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 11.8%
 STD. DEV. = 5.6%
 MIN. OBS. = 5%
 MAX. OBS. = 18%



OTHER AEROSPACE

NO. OBS. = 5
 MEAN = 10.2%
 STD. DEV. = 6.2%
 MIN. OBS. = 1.8%
 MAX. OBS. = 19.2%



OTHER INDUSTRY

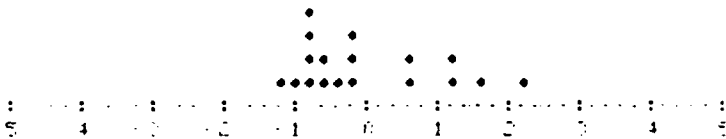
NO. OBS. = 9
 MEAN = 35.2%
 STD. DEV. = 16.6%
 MIN. OBS. = 12.0%
 MAX. OBS. = 60.0%



ALL RESPONSES

NO. OBS. = 18
 MIN. OBS. = 1.8%
 MAX. OBS. = 60.0%

OBSERVATIONS



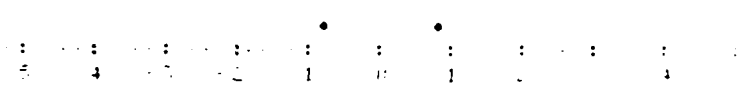
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 23.0% STD. DEV. = 17.3%

Q18 - AVERAGE COST TO PREPARE A PROCESS PLAN FOR STUDY PURPOSES -- NON-CYLINDRICAL PARTS

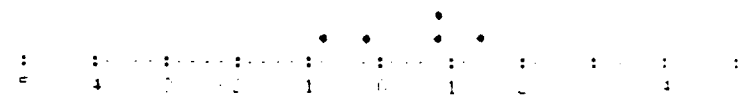
MISSILE PRIMES & SUBS

NO. OBS. = 2
 MEAN = \$118
 STD. DEV. = \$116
 MIN. OBS. = \$ 36
 MAX. OBS. = \$200



OTHER AEROSPACE

NO. OBS. = 5
 MEAN = \$157
 STD. DEV. = \$ 81
 MIN. OBS. = \$ 50
 MAX. OBS. = \$250



OTHER INDUSTRY

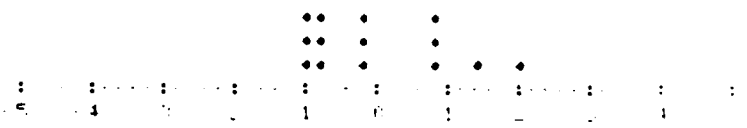
NO. OBS. = 7
 MEAN = \$ 87
 STD. DEV. = \$ 99
 MIN. OBS. = \$ 16
 MAX. OBS. = \$300



ALL RESPONSES

NO. OBS. = 14
 MIN. OBS. = \$ 16
 MAX. OBS. = \$300

OBSERVATIONS



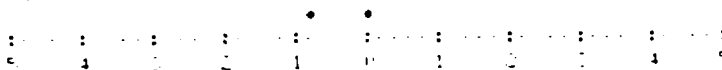
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$ 116.6 STD. DEV. = \$ 93.1

Q18 - AVERAGE COST TO PREPARE A PROCESS PLAN FOR STUDY PURPOSES -- CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 2
 MEAN = \$ 80.5
 STD. DEV. = \$ 63
 MIN. OBS. = \$ 36
 MAX. OBS. = \$125



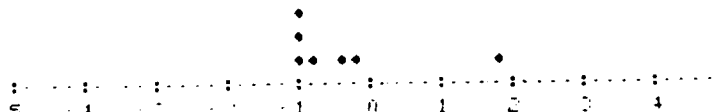
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = \$194
 STD. DEV. = \$ 87
 MIN. OBS. = \$ 80
 MAX. OBS. = \$300



OTHER INDUSTRY

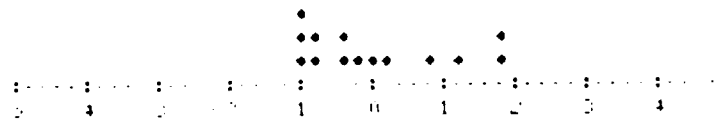
NO. OBS. = 7
 MEAN = \$ 89
 STD. DEV. = \$ 99
 MIN. OBS. = \$ 16
 MAX. OBS. = \$300



OBSERVATIONS

ALL RESPONSES

NO. OBS. = 14
 MIN. OBS. = \$ 16
 MAX. OBS. = \$300



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

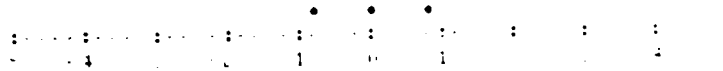
MEAN = \$ 124

STD. DEV. = \$ 100.4

Q18 - AVERAGE COST TO MODIFY AN EXISTING PROCESS PLAN -- NON-CYLINDRICAL MACHINED PARTS

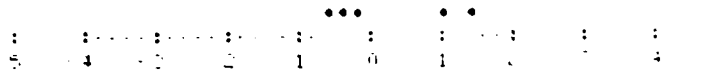
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = \$170
 STD. DEV. = \$132
 MIN. OBS. = \$36
 MAX. OBS. = \$300



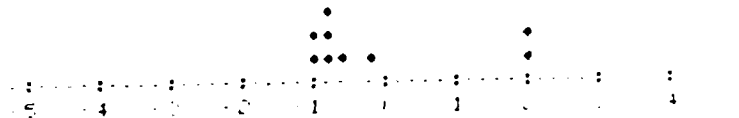
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = \$217
 STD. DEV. = \$147
 MIN. OBS. = \$85
 MAX. OBS. = \$400



OTHER INDUSTRY

NO. OBS. = 9
 MEAN = \$149
 STD. DEV. = \$203.2
 MIN. OBS. = \$10
 MAX. OBS. = \$500



ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = \$10
 MAX. OBS. = \$500

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$173 STD. DEV. = \$171

Q18 - AVERAGE COST TO MODIFY AN EXISTING PROCESS PLAN -- CYLINDRICAL MACHINED PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = \$112
 STD. DEV. = \$83
 MIN. OBS. = \$36
 MAX. OBS. = \$200



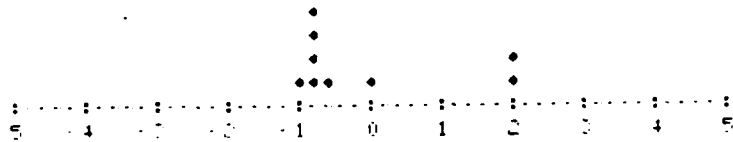
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = \$228
 STD. DEV. = \$143
 MIN. OBS. = \$70
 MAX. OBS. = \$400



OTHER INDUSTRY

NO. OBS. = 9
 MEAN = \$149
 STD. DEV. = \$204
 MIN. OBS. = \$10
 MAX. OBS. = \$500



ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = \$10
 MAX. OBS. = \$500

OBSERVATIONS

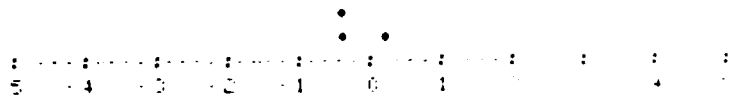


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$166 STD. DEV. = \$169

Q18 - AVERAGE COST TO PREPARE A PROCESS PLAN FOR A NEW PART -- NON-CYLINDRICAL MACHINED PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = \$547
 STD. DEV. = \$401
 MIN. OBS. = \$240
 MAX. OBS. = \$1000



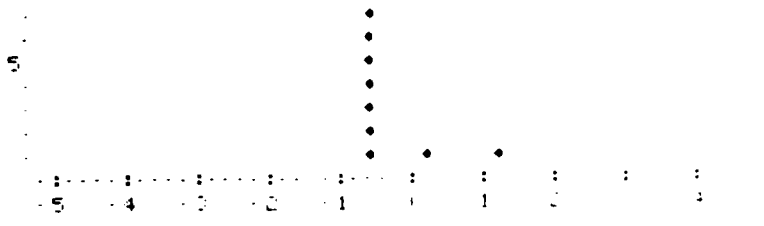
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = \$1366
 STD. DEV. = \$1537
 MIN. OBS. = \$210
 MAX. OBS. = \$4000



OTHER INDUSTRY

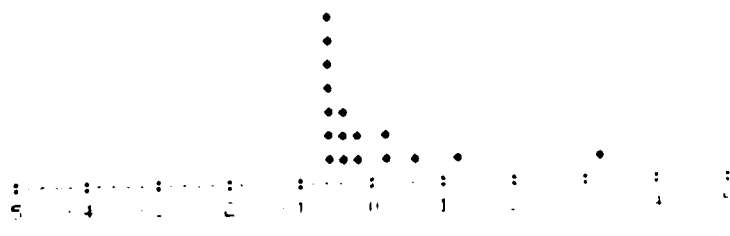
NO. OBS. = 9
 MEAN = \$399
 STD. DEV. = \$675
 MIN. OBS. = \$18
 MAX. OBS. = \$2000



ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = \$18
 MAX. OBS. = \$4000

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$709 STD. DEV. = \$1016

Q18 - AVERAGE COST TO PREPARE A PROCESS PLAN FOR A NEW PART -- CYLINDRICAL MACHINED PARTS

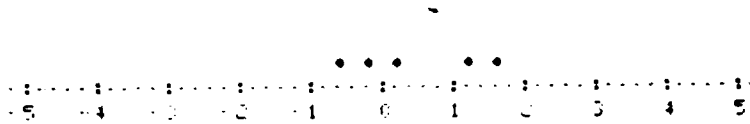
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = \$330
 STD. DEV. = \$147
 MIN. OBS. = \$240
 MAX. OBS. = \$500



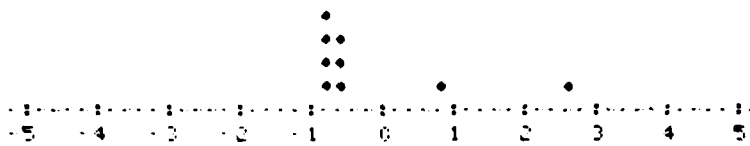
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = \$760
 STD. DEV. = \$529
 MIN. OBS. = \$180
 MAX. OBS. = \$1413



OTHER INDUSTRY

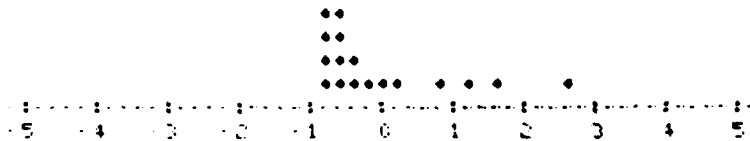
NO. OBS. = 9
 MEAN = \$398
 STD. DEV. = \$675
 MIN. OBS. = \$ 25
 MAX. OBS. = \$2000



ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = \$ 25
 MAX. OBS. = \$2000

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$492 STD. DEV. = \$577

Q17 - LEADTIME TO PREPARE A PROCESS PLAN FOR A NEW NON-CYLINDRICAL PART HAVING 50 OPERATIONS

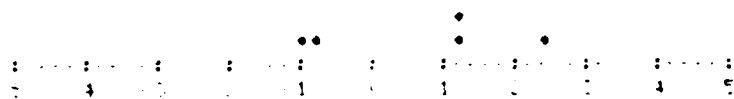
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 27 DAYS
 STD. DEV. = 6 DAYS
 MIN. OBS. = 20 DAYS
 MAX. OBS. = 30 DAYS



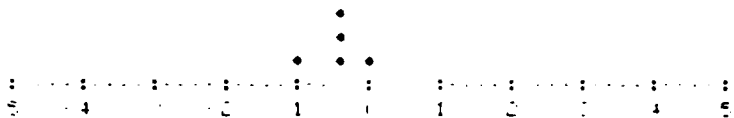
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = 44 DAYS
 STD. DEV. = 38 DAYS
 MIN. OBS. = 2 DAYS
 MAX. OBS. = 90 DAYS



OTHER INDUSTRY

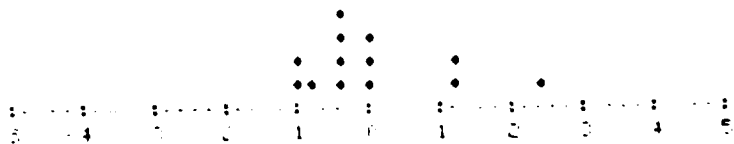
NO. OBS. = 5
 MEAN = 18 DAYS
 STD. DEV. = 10 DAYS
 MIN. OBS. = 2 DAYS
 MAX. OBS. = 28 DAYS



ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = 2 DAYS
 MAX. OBS. = 90 DAYS

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 30 DAYS STD. DEV. = 26 DAYS

Q17 - LEADTIME TO PREPARE A PROCESS PLAN FOR A NEW NON-CYLINDRICAL PART HAVING 25 OPERATIONS

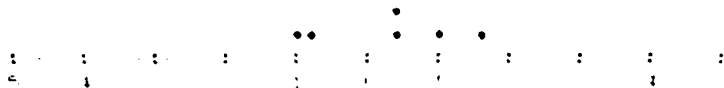
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 35 DAYS
 STD. DEV. = 37 DAYS
 MIN. OBS. = 10 DAYS
 MAX. OBS. = 90 DAYS



OTHER AEROSPACE

NO. OBS. = 6
 MEAN = 29 DAYS
 STD. DEV. = 23 DAYS
 MIN. OBS. = 1 DAY
 MAX. OBS. = 60 DAYS



OTHER INDUSTRY

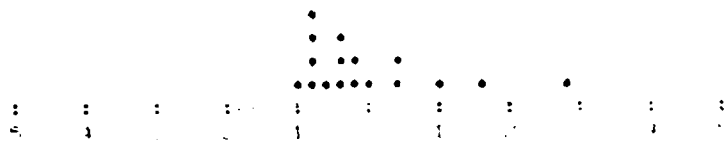
NO. OBS. = 7
 MEAN = 10 DAYS
 STD. DEV. = 8 DAYS
 MIN. OBS. = 2 DAYS
 MAX. OBS. = 21 DAYS



ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = 1 DAY
 MAX. OBS. = 90 DAYS

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 23 DAYS STD. DEV. = 24 DAYS

Q17 - LEADTIME TO PREPARE A PROCESS PLAN FOR A NEW NON-CYLINDRICAL PART HAVING 10 OPERATIONS

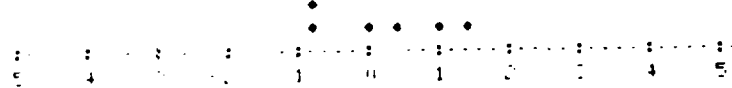
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 22 days
 STD. DEV. = 26 days
 MIN. OBS. = 1 day
 MAX. OBS. = 60 days



OTHER AEROSPACE

NO. OBS. = 6
 MEAN = 17 days
 STD. DEV. = 14 days
 MIN. OBS. = 0.5 days
 MAX. OBS. = 35 days



OTHER INDUSTRY

NO. OBS. = 7
 MEAN = 7 days
 STD. DEV. = 5 days
 MIN. OBS. = 2 days
 MAX. OBS. = 14 days



ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = 0.5 days
 MAX. OBS. = 60 days

OBSERVATIONS

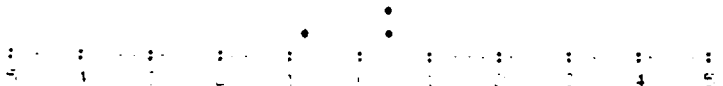


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 14 days STD. DEV. = 15 days

Q17 - LEADTIME TO PREPARE A PROCESS PLAN FOR A NEW CYLINDRICAL PART HAVING 50 OPERATIONS

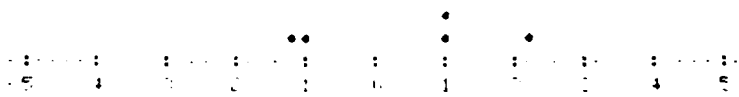
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 23 DAYS
 STD. DEV. = 12 DAYS
 MIN. OBS. = 10 DAYS
 MAX. OBS. = 30 DAYS



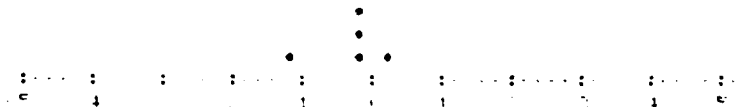
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = 30 DAYS
 STD. DEV. = 25 DAYS
 MIN. OBS. = 2 DAYS
 MAX. OBS. = 60 DAYS



OTHER INDUSTRY

NO. OBS. = 5
 MEAN = 18 DAYS
 STD. DEV. = 10 DAYS
 MIN. OBS. = 2 DAYS
 MAX. OBS. = 28 DAYS



ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = 2 DAYS
 MAX. OBS. = 60 DAYS



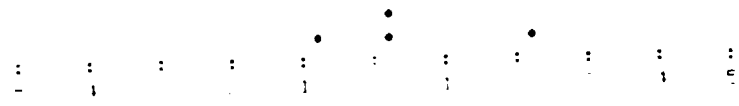
OBSERVATIONS

STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 24 DAYS STD. DEV. = 17 DAYS

Q17 - LEADTIME TO PREPARE A PROCESS PLAN FOR A NEW CYLINDRICAL PART HAVING 25 OPERATIONS

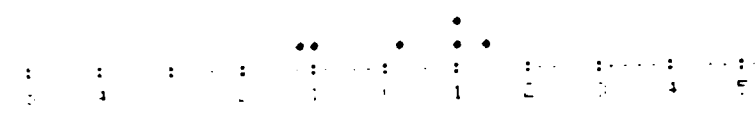
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 23 days
 STD. DEV. = 17 days
 MIN. OBS. = 5 days
 MAX. OBS. = 45 days



OTHER AEROSPACE

NO. OBS. = 6
 MEAN = 20 days
 STD. DEV. = 14 days
 MIN. OBS. = 1 day
 MAX. OBS. = 35 days



OTHER INDUSTRY

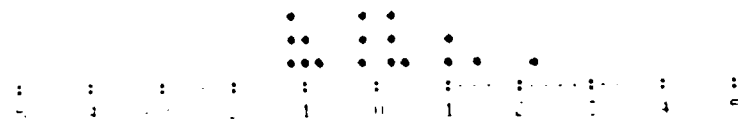
NO. OBS. = 7
 MEAN = 10 days
 STD. DEV. = 8 days
 MIN. OBS. = 2 days
 MAX. OBS. = 21 days



ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = 1 day
 MAX. OBS. = 45 days

OBSERVATIONS

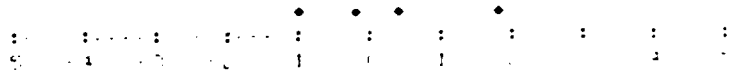


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 17 days STD. DEV. = 13 days

Q17 - LEADTIME TO PREPARE A PROCESS PLAN FOR A NEW CYLINDRICAL PART HAVING 10 OPERATIONS

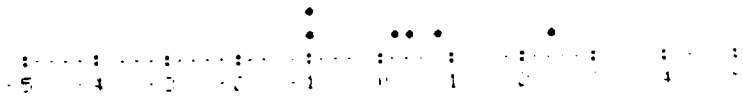
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 14 DAYS
 STD. DEV. = 12 DAYS
 MIN. OBS. = 1 DAY
 MAX. OBS. = 30 DAYS



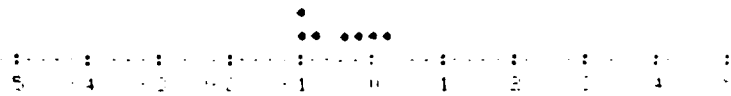
OTHER AEROSPACE

NO. OBS. = 6
 MEAN = 14 DAYS
 STD. DEV. = 13 DAYS
 MIN. OBS. = 0.5 DAYS
 MAX. OBS. = 35 DAYS



OTHER INDUSTRY

NO. OBS. = 7
 MEAN = 7 DAYS
 STD. DEV. = 5 DAYS
 MIN. OBS. = 2 DAYS
 MAX. OBS. = 14 DAYS



ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = 0.5 DAYS
 MAX. OBS. = 30 DAYS

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 11 DAYS STD. DEV. = 10 DAYS

Q19 - PERCENTAGE OF COSTS ATTRIBUTABLE TO DIRECT LABOR FOR CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

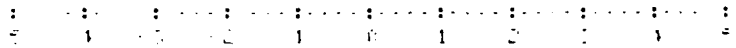
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 36.5%
 STD. DEV. = 22.4%
 MIN. OBS. = 15.0%
 MAX. OBS. = 60.8%



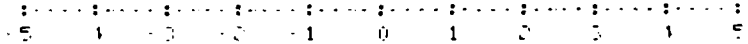
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = 33.9%
 STD. DEV. = 17.1%
 MIN. OBS. = 22.0%
 MAX. OBS. = 64.0%



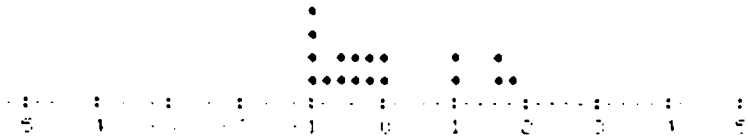
OTHER INDUSTRY

NO. OBS. = 9
 MEAN = 22.2%
 STD. DEV. = 20.1%
 MIN. OBS. = 7.0%
 MAX. OBS. = 62.0%



ALL RESPONSES

NO. OBS. = 18
 MIN. OBS. = 7%
 MAX. OBS. = 64%



OBSERVATIONS

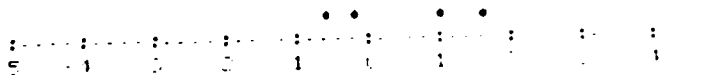
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 28.6% STD. DEV. = 19.8%

Q19 - PERCENTAGE OF COSTS ATTRIBUTABLE TO DIRECT LABOR FOR NON-CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 38.4%
 STD. DEV. = 20.3%
 MIN. OBS. = 18.0%
 MAX. OBS. = 60.8%



OTHER AEROSPACE

NO. OBS. = 4
 MEAN = 35.6%
 STD. DEV. = 21.1%
 MIN. OBS. = 22.0%
 MAX. OBS. = 67.0%



OTHER INDUSTRY

NO. OBS. = 9
 MEAN = 20.6%
 STD. DEV. = 18.0%
 MIN. OBS. = 7.0%
 MAX. OBS. = 62.0%



ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = 7.0%
 MAX. OBS. = 67.0%

OBSERVATIONS



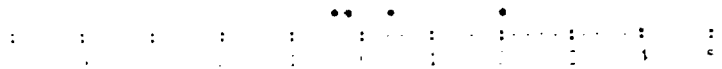
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 28.3% STD. DEV. = 19.9%

Q19 - PERCENTAGE OF COSTS ATTRIBUTABLE TO TOOLING FOR CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 10.1
 STD. DEV. = 7.0
 MIN. OBS. = 5.0
 MAX. OBS. = 20.0



OTHER AEROSPACE

NO. OBS. = 5
 MEAN = 8.3
 STD. DEV. = 10.0
 MIN. OBS. = 0.4
 MAX. OBS. = 25.0



OTHER INDUSTRY

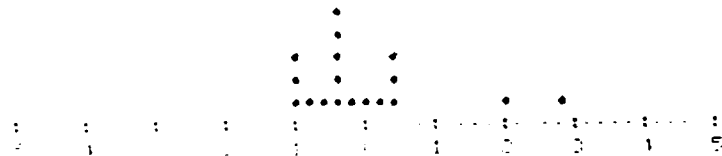
NO. OBS. = 9
 MEAN = 5.7
 STD. DEV. = 3.3
 MIN. OBS. = 0.5
 MAX. OBS. = 10.0



ALL RESPONSES

NO. OBS. = 18
 MIN. OBS. = 4
 MAX. OBS. = 25.0

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 7.1 STD. DEV. = 6.5

Q19 - PERCENTAGE OF COSTS ATTRIBUTABLE TO TOOLING FOR NON-CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

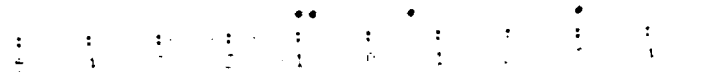
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 8.1%
 STD. DEV. = 4.7%
 MIN. OBS. = 5.0%
 MAX. OBS. = 15.0%



OTHER AEROSPACE

NO. OBS. = 4
 MEAN = 9.4%
 STD. DEV. = 11.2%
 MIN. OBS. = 0.4%
 MAX. OBS. = 25.0%



OTHER INDUSTRY

NO. OBS. = 9
 MEAN = 5.1%
 STD. DEV. = 3.3%
 MIN. OBS. = 0.5%
 MAX. OBS. = 10.0%



ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = 0.4%
 MAX. OBS. = 25%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 6.8% STD DEV. = 6.1%

Q19 - PERCENTAGE OF COSTS ATTRIBUTABLE TO SCRAP AND REWORK FOR CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 6.6%
 STD. DEV. = 5.3%
 MIN. OBS. = 2.0%
 MAX. OBS. = 14.3%



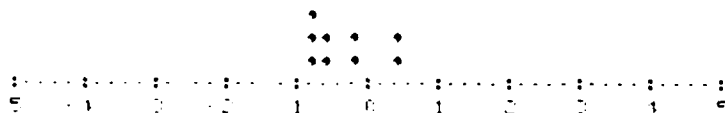
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = 3.5%
 STD. DEV. = 2.0%
 MIN. OBS. = 0.9%
 MAX. OBS. = 6.0%



OTHER INDUSTRY

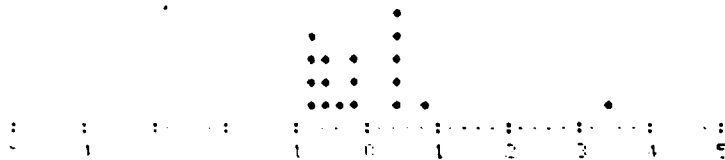
NO. OBS. = 9
 MEAN = 2.5%
 STD. DEV. = 1.6%
 MIN. OBS. = 1.0%
 MAX. OBS. = 5.0%



ALL RESPONSES

NO. OBS. = 18
 MIN. OBS. = 0.9%
 MAX. OBS. = 14.3%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 3.7% STD. DEV. = 3.2%

Q19 - PERCENTAGE OF COSTS ATTRIBUTABLE TO SCRAP AND REWORK FOR NON-CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 6.6%
 STD. DEV. = 5.3%
 MIN. OBS. = 2.0%
 MAX. OBS. = 14.3%



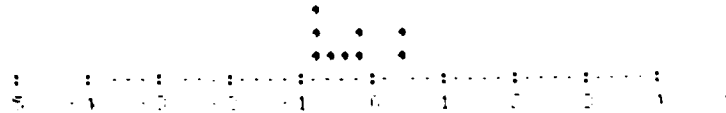
OTHER AEROSPACE

NO. OBS. = 4
 MEAN = 2.9%
 STD. DEV. = 1.7%
 MIN. OBS. = 0.9%
 MAX. OBS. = 5.0%



OTHER INDUSTRY

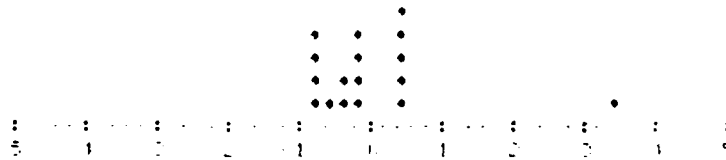
NO. OBS. = 9
 MEAN = 2.5%
 STD. DEV. = 1.6%
 MIN. OBS. = 1.0%
 MAX. OBS. = 5.0%



ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = 0.9%
 MAX. OBS. = 14.3%

OBSERVATIONS



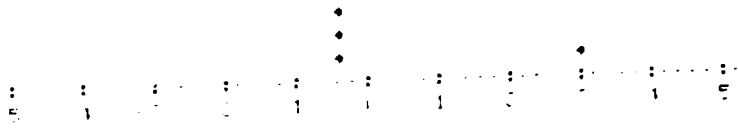
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 3.5% STD. DEV. = 3.2%

Q19 - PERCENTAGE OF COSTS ATTRIBUTABLE TO PROCESS PLANNING FOR CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

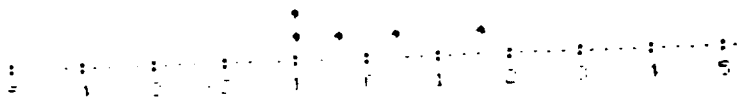
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 11.3%
 STD. DEV. = 12.5%
 MIN. OBS. = 5%
 MAX. OBS. = 30%



OTHER AEROSPACE

NO. OBS. = 5
 MEAN = 7.2%
 STD. DEV. = 8.2%
 MIN. OBS. = 0.4%
 MAX. OBS. = 20%



OTHER INDUSTRY

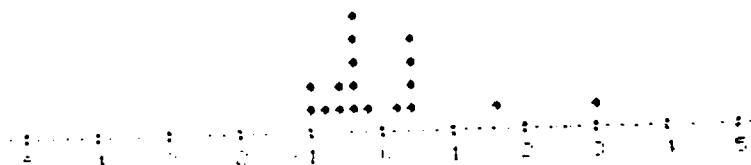
NO. OBS. = 9
 MEAN = 6.4%
 STD. DEV. = 3.4%
 MIN. OBS. = 3.0%
 MAX. OBS. = 10%



ALL RESPONSES

NO. OBS. = 18
 MIN. OBS. = 7.7%
 MAX. OBS. = 9.0%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 7.7% STD. DEV. = 7.2%

Q19 - PERCENTAGE OF COSTS ATTRIBUTABLE TO PROCESS PLANNING FOR NON-CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

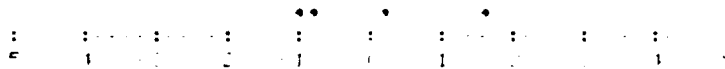
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 11.3%
 STD. DEV. = 12.5%
 MIN. OBS. = 5.0%
 MAX. OBS. = 30.0%



OTHER AEROSPACE

NO. OBS. = 4
 MEAN = 8.0%
 STD. DEV. = 9.1%
 MIN. OBS. = 0.4%
 MAX. OBS. = 20.0%



OTHER INDUSTRY

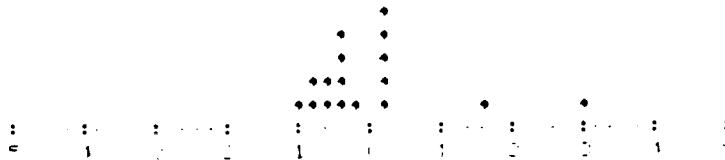
NO. OBS. = 9
 MEAN = 6.4%
 STD. DEV. = 3.4%
 MIN. OBS. = 2.0%
 MAX. OBS. = 10.0%



ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = 0.4%
 MAX. OBS. = 30%

OBSERVATIONS



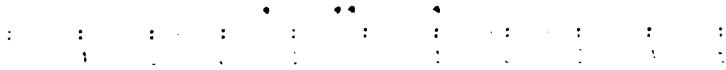
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 8.0% STD. DEV. = 7.4%

Q19 - PERCENTAGE OF COSTS ATTRIBUTABLE TO OVERHEAD, PROFIT, ETC., FOR CYLINDRICAL PARTS
MANUFACTURED IN-HOUSE

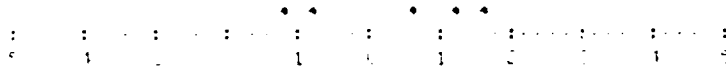
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 23.8
 STD. DEV. = 20.6
 MIN. OBS. = 0
 MAX. OBS. = 50



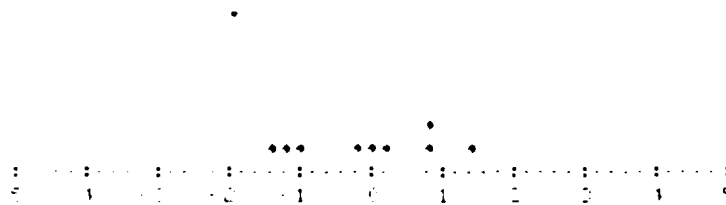
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = 36.8
 STD. DEV. = 27.0
 MIN. OBS. = 5
 MAX. OBS. = 64.9



OTHER INDUSTRY

NO. OBS. = 9
 MEAN = 28.6
 STD. DEV. = 21.1
 MIN. OBS. = 0
 MAX. OBS. = 59



ALL RESPONSES

NO. OBS. = 18
 MIN. OBS. = 0
 MAX. OBS. = 64.9

OBSERVATIONS



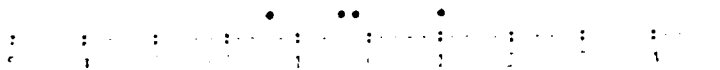
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 29.8 STD. DEV. = 21.9

Q19 - PERCENTAGE OF COSTS ATTRIBUTABLE TO OVERHEAD, PROFIT, ETC., FOR NON-CYLINDRICAL PARTS
MANUFACTURED IN-HOUSE

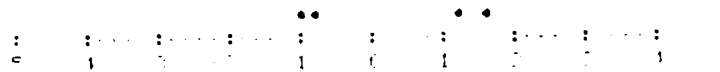
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 23.8%
 STD. DEV. = 20.6%
 MIN. OBS. = 0%
 MAX. OBS. = 50%



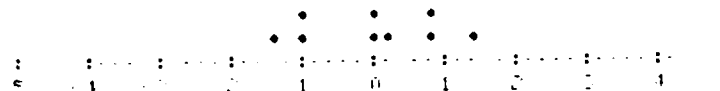
OTHER AEROSPACE

NO OBS. = 4
 MEAN = 34.5%
 STD. DEV. = 30.3%
 MIN. OBS. = 5%
 MAX. OBS. = 63%



OTHER INDUSTRY

NO. OBS. = 9
 MEAN = 28.6%
 STD. DEV. = 21.1%
 MIN. OBS. = 0%
 MAX. OBS. = 59%



OBSERVATIONS

ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = 0
 MAX. OBS. = 63%

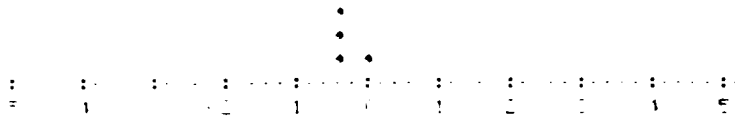


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 28.9% STD. DEV. = 22.1%

Q20 - APPROXIMATE ANNUAL VALUE OF WORK IN PROCESS INVENTORY FOR CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$ 5.9 MIL.
 STD. DEV. = \$ 9.4 MIL.
 MIN. OBS. = \$ 0.7 MIL.
 MAX. OBS. = \$ 20 MIL.



OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$10.1 MIL.
 STD. DEV. = \$ 7.7 MIL.
 MIN. OBS. = \$ 1.3 MIL.
 MAX. OBS. = \$15.0 MIL.



OTHER INDUSTRY

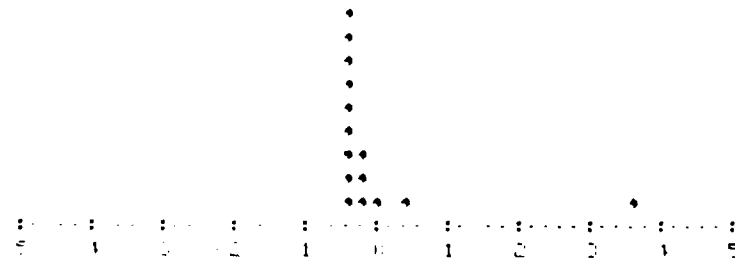
NO. OBS. = 8
 MEAN = \$35.5 MIL.
 STD. DEV. = \$78.9 MIL.
 MIN. OBS. = \$ 0.1 MIL.
 MAX. OBS. = \$226 MIL.



ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = \$0.1 MIL.
 MAX. OBS. = \$226 MIL.

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$22.5 MIL. STD. DEV. = \$57.8 MIL.

Q20 - APPROXIMATE ANNUAL VALUE OF WORK IN PROCESS INVENTORY FOR NON-CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$13.9 MIL.
 STD. DEV. = \$ 24.1 MIL.
 MIN. OBS. = \$ 0.6 MIL.
 MAX. OBS. = \$ 50.0 MIL.



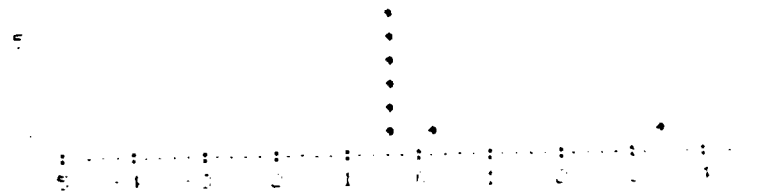
OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$6.0 MIL.
 STD. DEV. = \$3.6 MIL.
 MIN. OBS. = \$3.0 MIL.
 MAX. OBS. = \$10.0 MIL.



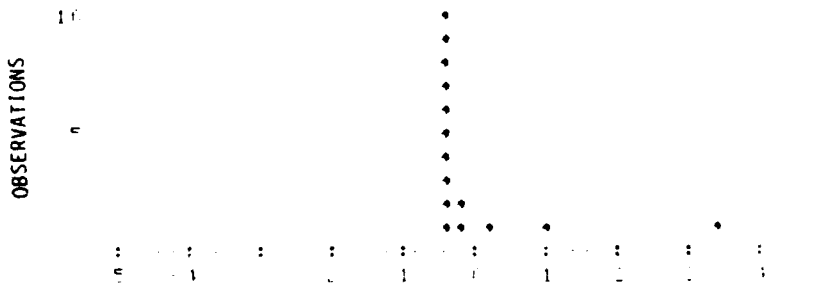
OTHER INDUSTRY

NO. OBS. = 8
 MEAN = \$19.5 MIL.
 STD. DEV. = \$46.4 MIL.
 MIN. OBS. = \$ 0.1 MIL.
 MAX. OBS. = \$133 MIL.



ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = \$ 0.1 MIL.
 MAX. OBS. = \$ 133 MIL.



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$15.3 MIL. STD. DEV. = \$ 35.1 MIL

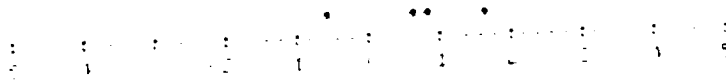
RESPONSES TO QUESTIONS 21 AND 22

	MISSILE PRIME AND SUBS.		OTHER AEROSPACE		OTHER INDUSTRY		TOTAL	
	YES	NO	YES	NO	YES	NO	YES	NO
Q21 - DOES YOUR PLANT USE COMPUTER ASSISTED PROCESS PLANNING AND/OR GROUP TECHNOLOGY FOR AREAS OTHER THAN MACHINED PARTS?	1	3	6	1	3	6	10	10
Q22 - HAS YOUR COMPANY PERFORMED STUDIES RELATING TO PROCESS PLANNING ECONOMICS OR THE COSTS OF MANUFACTURING MACHINED PARTS?	2	2	7	0	4	5	13	7

Q23 - PERCENT CHANGE IN PROCESS PLANNING COSTS FOR CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -13.6%
 STD. DEV. = 20.6%
 MIN. OBS. = -40%
 MAX. OBS. = 10%



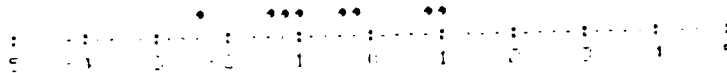
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = -22.6%
 STD. DEV. = 14.5%
 MIN. OBS. = -49%
 MAX. OBS. = -5%



OTHER INDUSTRY

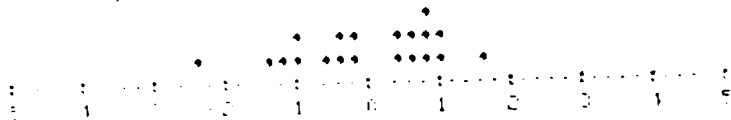
NO. OBS. = 8
 MEAN = -39.7%
 STD. DEV. = 26.1%
 MIN. OBS. = -80%
 MAX. OBS. = -3%



OBSERVATIONS

ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = -80%
 MAX. OBS. = 10%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = -27.7% STD. DEV. = 22.5%

23 - PERCENT CHANGE IN PREPARING DOCUMENTATION FOR CYLINDRICAL PARTS -- SYSTEM 1

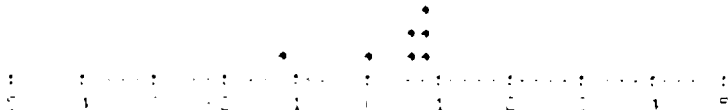
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -8.8
 STD. DEV. = 13.1
 MIN. OBS. = -20
 MAX. OBS. = 10



OTHER AEROSPACE

NO. OBS. = 7
 MEAN = -9.0
 STD. DEV. = 14.7
 MIN. OBS. = -40
 MAX. OBS. = 0



OTHER INDUSTRY

NO. OBS. = 7
 MEAN = -27.1
 STD. DEV. = 25.1
 MIN. OBS. = -75
 MAX. OBS. = 0



ALL RESPONSES

NO. OBS. = 18
 MIN. OBS. = -75
 MAX. OBS. = 10

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = -16 STD. DEV. = 20.3

Q23 - PERCENT CHANGE IN PERFORMING TOLERANCE ANALYSES FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

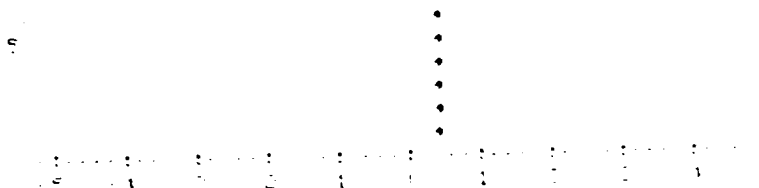
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -23.8%
 STD. DEV. = 34.5%
 MIN. OBS. = -75%
 MAX. OBS. = 0%



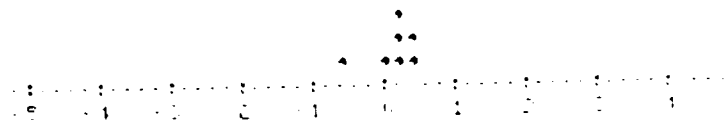
OTHER AEROSPACE

NO. OBS. = 6
 MEAN = -8.3%
 STD. DEV. = 0.2%
 MIN. OBS. = -0.5%
 MAX. OBS. = 0%



OTHER INDUSTRY

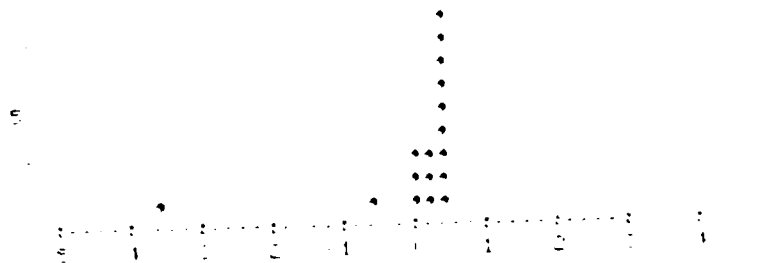
NO. OBS. = 7
 MEAN = -6.6%
 STD. DEV. = 6.8%
 MIN. OBS. = -20%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = -75%
 MAX. OBS. = 0%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = - 8.3% STD. DEV. = 18.1%

Q23 - PERCENT CHANGE IN PERFORMING TOLERANCE ANALYSES FOR CYLINDRICAL PARTS -- SYSTEM 1

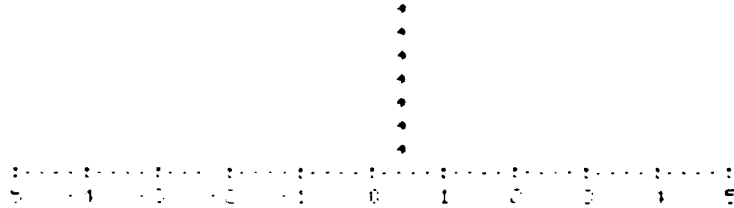
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -23.8%
 STD. DEV. = 34.5%
 MIN. OBS. = -75%
 MAX. OBS. = 0%



OTHER AEROSPACE

NO. OBS. = 7
 MEAN = -0.1%
 STD. DEV. = 0.2%
 MIN. OBS. = -0.5%
 MAX. OBS. = 0%



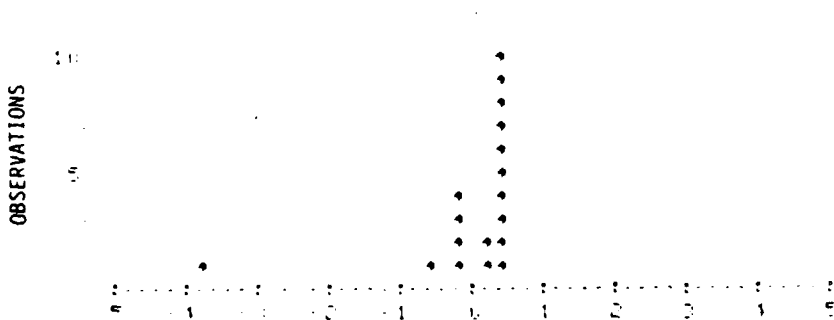
OTHER INDUSTRY

NO. OBS. = 7
 MEAN = -7.3%
 STD. DEV. = 6.8%
 MIN. OBS. = -20%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 18
 MIN. OBS. = -75%
 MAX. OBS. = 0%



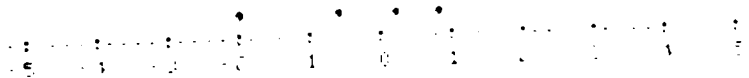
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -8.1% STD. DEV. = 17.6%

Q23 - PERCENT CHANGE IN GENERATING TIME STANDARDS FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -21.3%
 STD. DEV. = 21.7%
 MIN. OBS. = -50 %
 MAX. OBS. = 0 %



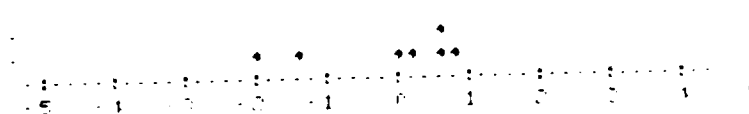
OTHER AEROSPACE

NO. OBS. = 6
 MEAN = -7.5%
 STD. DEV. = 11.6%
 MIN. OBS. = -30%
 MAX. OBS. = 0%



OTHER INDUSTRY

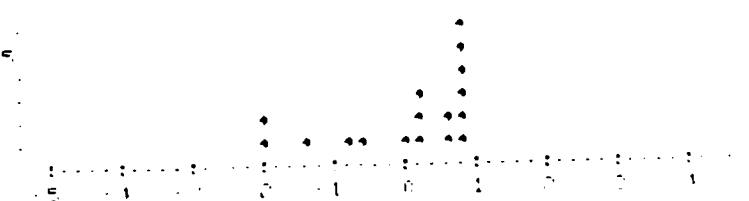
NO. OBS. = 7
 MEAN = -17.9%
 STD. DEV. = 19.3%
 MIN. OBS. = -50 %
 MAX. OBS. = 0 %



ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = -50%
 MAX. OBS. = 0%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -15.0%

STD. DEV. = 19.3%

Q23 - PERCENT CHANGE IN GENERATING TIME STANDARDS FOR CYLINDRICAL PARTS -- SYSTEM 1

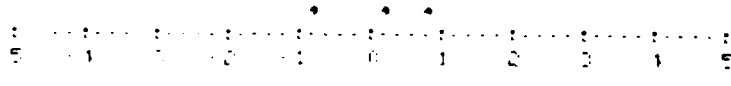
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -21.3%
 STD. DEV. = 21.7%
 MIN. OBS. = - 50 %
 MAX. OBS. = 0 %



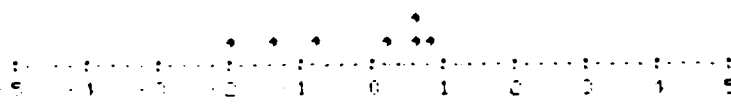
OTHER AEROSPACE

NO. OBS. = 7
 MEAN = -6.4%
 STD. DEV. = 11.0%
 MIN. OBS. = - 30%
 MAX. OBS. = 0%



OTHER INDUSTRY

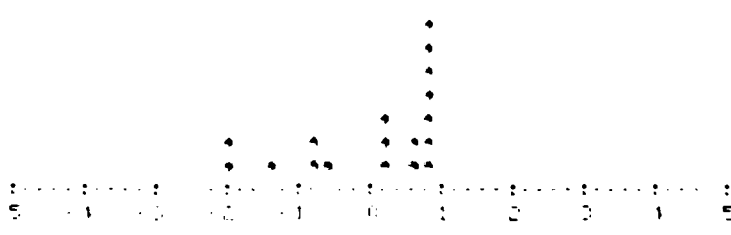
NO. OBS. = 7
 MEAN = -20.0%
 STD. DEV. = 19.8%
 MIN. OBS. = - 50%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 18
 MIN. OBS. = - 50%
 MAX. OBS. = 0%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

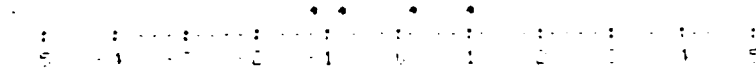
MEAN = - 15.0%

STD. DEV. = 17.7%

Q23 - PERCENT CHANGE IN DETERMINING PROCESS PARAMETERS FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

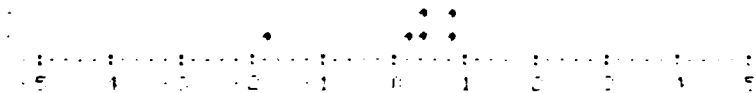
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -16.3%
 STD. DEV. = 13.8%
 MIN. OBS. = -30%
 MAX. OBS. = 0%



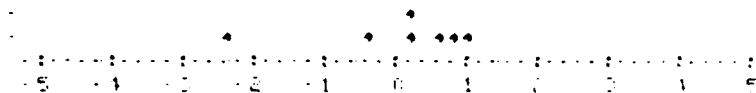
OTHER AEROSPACE

NO. OBS. = 6
 MEAN = -11.7%
 STD. DEV. = 14.3%
 MIN. OBS. = -40%
 MAX. OBS. = 1%



OTHER INDUSTRY

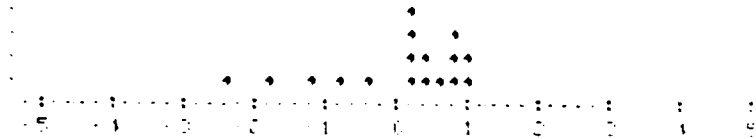
NO. OBS. = 7
 MEAN = -13.9%
 STD. DEV. = 17.2%
 MIN. OBS. = -50%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = -50%
 MAX. OBS. = 0%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = -13.6% STD. DEV. = 14.6%

Q23 - PERCENT CHANGE IN DETERMINING PROCESS PARAMETERS FOR CYLINDRICAL PARTS -- SYSTEM 1

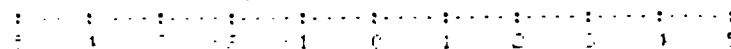
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -16.3%
 STD. DEV. = 13.8%
 MIN. OBS. = -30%
 MAX. OBS. = 0%



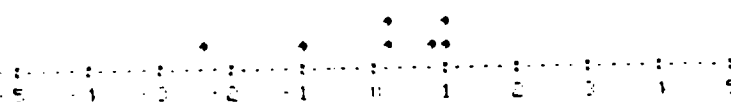
OTHER AEROSPACE

NO. OBS. = 7
 MEAN = -12.4%
 STD. DEV. = 12.8%
 MIN. OBS. = -40%
 MAX. OBS. = -3%



OTHER INDUSTRY

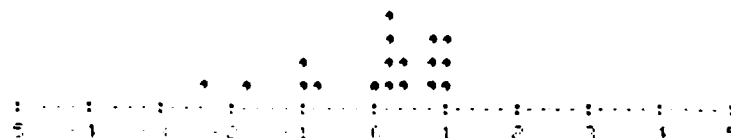
NO. OBS. = 7
 MEAN = -14.6%
 STD. DEV. = 18.0%
 MIN. OBS. = -50%
 MAX. OBS. = 0%



OBSERVATIONS

ALL RESPONSES

NO. OBS. = 18
 MIN. OBS. = -50%
 MAX. OBS. = 0%



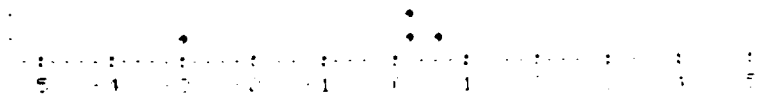
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -14.1% STD. DEV. = 14.8%

Q23 - PERCENT CHANGE IN SELECTING TOOLS FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

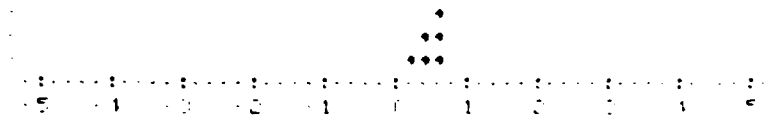
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -23.8%
 STD. DEV. = 34.5%
 MIN. OBS. = -75%
 MAX. OBS. = 0%



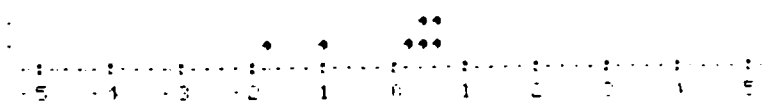
OTHER AEROSPACE

NO. OBS. = 6
 MEAN = -3.7%
 STD. DEV. = 3.5%
 MIN. OBS. = -10%
 MAX. OBS. = 0%



OTHER INDUSTRY

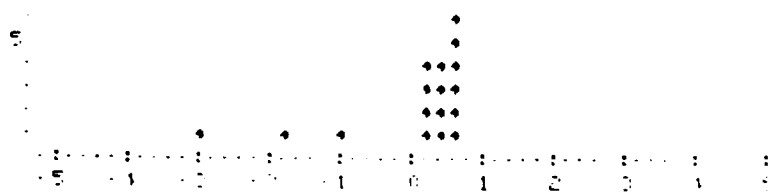
NO. OBS. = 7
 MEAN = -15.4%
 STD. DEV. = 19.2%
 MIN. OBS. = -50%
 MAX. OBS. = 1%



ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = -75%
 MAX. OBS. = 0%

OBSERVATIONS



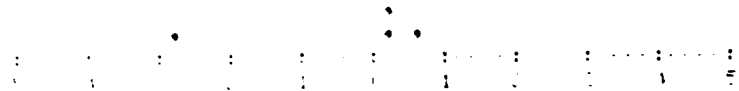
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -13.2% STD. DEV. = 20.7%

Q22 - PERCENT CHANGE IN SELECTING TOOLS FOR CYLINDRICAL PARTS -- SYSTEM 1

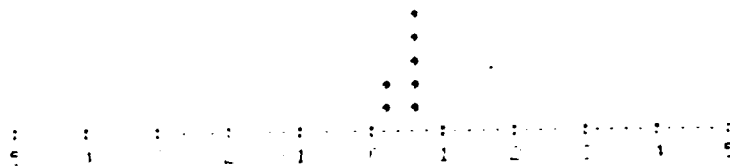
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -23.8%
 STD. DEV. = 34.5%
 MIN. OBS. = -75%
 MAX. OBS. = 0%



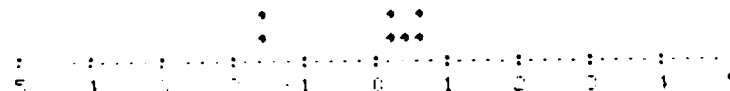
OTHER AEROSPACE

NO. OBS. = 7
 MEAN = -4.0%
 STD. DEV. = 4.2%
 MIN. OBS. = -10%
 MAX. OBS. = 0%



OTHER INDUSTRY

NO. OBS. = 7
 MEAN = -18.3%
 STD. DEV. = 21.9%
 MIN. OBS. = -50%
 MAX. OBS. = -1%



ALL RESPONSES

NO. OBS. = 18
 MIN. OBS. = -75%
 MAX. OBS. = 0%

OBSERVATIONS



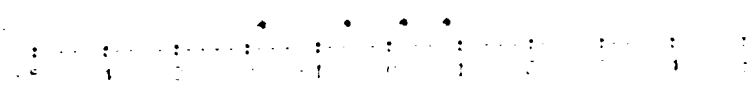
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -13.9% STD. DEV. = 21.4%

Q23 - PERCENT CHANGE IN SELECTING MACHINES FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

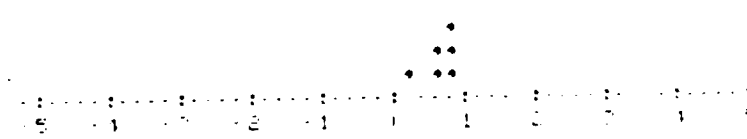
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -21.3%
 STD. DEV. = 21.7%
 MIN. OBS. = -50%
 MAX. OBS. = 0%



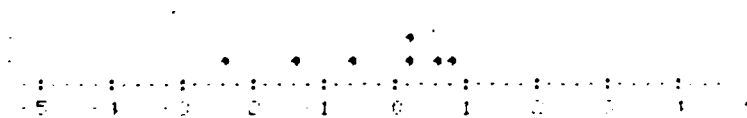
OTHER AEROSPACE

NO. OBS. = 6
 MEAN = -3.5%
 STD. DEV. = 3.6%
 MIN. OBS. = -10%
 MAX. OBS. = 0%



OTHER INDUSTRY

NO. OBS. = 7
 MEAN = -21.4%
 STD. DEV. = 21.7%
 MIN. OBS. = -60%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = -60%
 MAX. OBS. = 0%

OBSERVATIONS

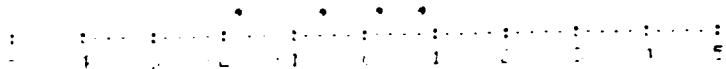


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = -15.1% STD. DEV. = 18.6%

Q23 - PERCENT CHANGE IN SELECTING MACHINES FOR CYLINDRICAL PARTS -- SYSTEM 1

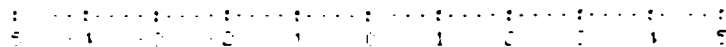
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -26.3%
 STD. DEV. = 21.7%
 MIN. OBS. = -50%
 MAX. OBS. = 0%



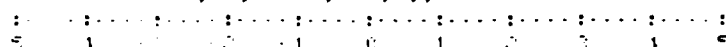
OTHER AEROSPACE

NO. OBS. = 7
 MEAN = -4.7%
 STD. DEV. = 3.8%
 MIN. OBS. = -10%
 MAX. OBS. = -1%



OTHER INDUSTRY

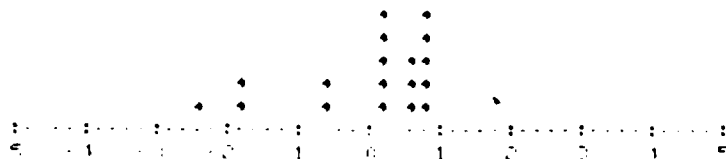
NO. OBS. = 7
 MEAN = -22.9%
 STD. DEV. = 23.4%
 MIN. OBS. = -60%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 18
 MIN. OBS. = -60%
 MAX. OBS. = 0%

OBSERVATIONS



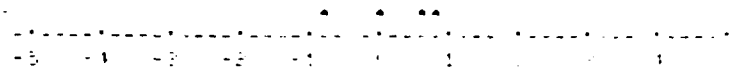
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -15.4% STD. DEV. = 19.0%

Q23 - PERCENT CHANGE IN DETERMINING OPERATION SEQUENCE FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

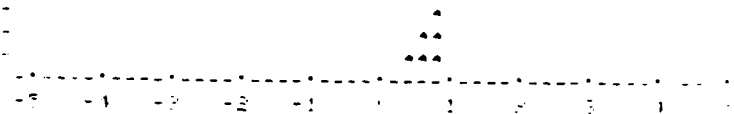
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -21.3%
 STD. DEV. = 21.7%
 MIN. OBS. = -50%
 MAX. OBS. = 0%



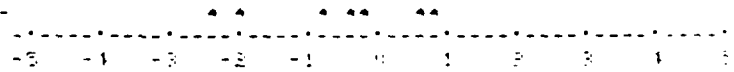
OTHER AEROSPACE

NO. OBS. = 6
 MEAN = -6.7%
 STD. DEV. = 5.9%
 MIN. OBS. = -15%
 MAX. OBS. = 0%



OTHER INDUSTRY

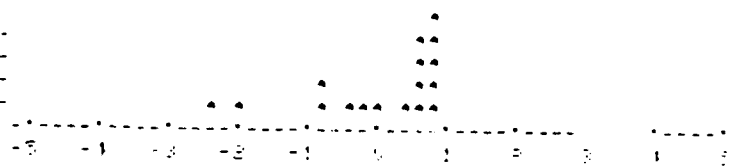
NO. OBS. = 7
 MEAN = -43.1%
 STD. DEV. = 34.5%
 MIN. OBS. = -95%
 MAX. OBS. = -2%



ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = -95%
 MAX. OBS. = 0%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

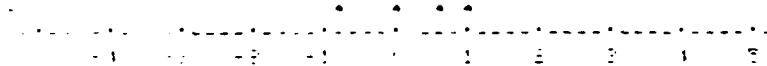
MEAN = -25.1%

STD. DEV. = 28.6%

Q23 - PERCENT CHANGE IN DETERMINING OPERATION SEQUENCE FOR CYLINDRICAL PARTS -- SYSTEM 1

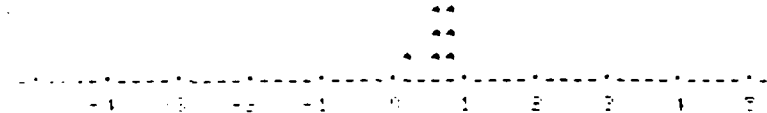
MISSILE PRIMES & TUBS

NO. OBS. = 4
 MEAN = -21.3
 STD. DEV. = 21.7%
 MIN. OBS. = - 50%
 MAX. OBS. = 0%



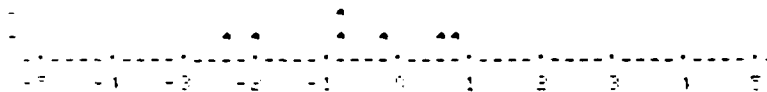
OTHER AEROSPACE

NO. OBS. = 7
 MEAN = -8.6%
 STD. DEV. = 6.1%
 MIN. OBS. = - 20%
 MAX. OBS. = - 2%



OTHER INDUSTRY

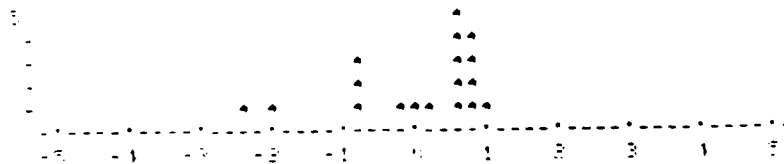
NO. OBS. = 7
 MEAN = -45.2%
 STD. DEV. = 34.3%
 MIN. OBS. = - 95%
 MAX. OBS. = - 2%



ALL RESPONSES

NO. OBS. = 18
 MIN. OBS. = - 95%
 MAX. OBS. = 0%

OBSERVATIONS

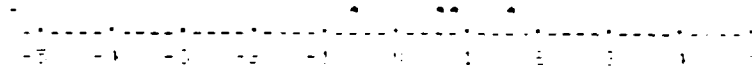


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = -25.7% STD. DEV. = 28.2%

Q23 - PERCENT CHANGE IN PROCESS PLANNING COSTS FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

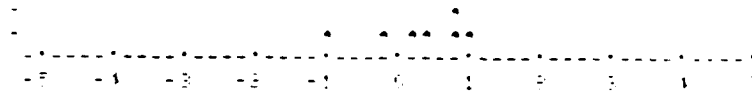
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -13.6%
STD. DEV. = 20.6%
MIN. OBS. = -40%
MAX. OBS. = 10%



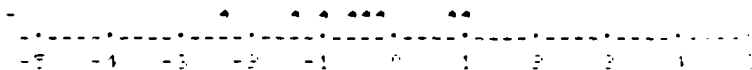
OTHER AEROSPACE

NO. OBS. = 7
MEAN = -19.7%
STD. DEV. = 15.3%
MIN. OBS. = -30%
MAX. OBS. = 5%



OTHER INDUSTRY

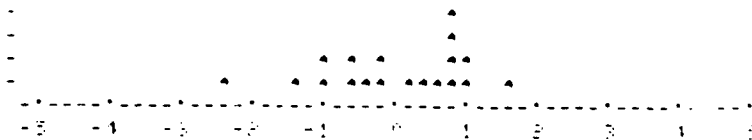
NO. OBS. = 8
MEAN = -37.8%
STD. DEV. = 25.4%
MIN. OBS. = -80%
MAX. OBS. = 3%



ALL RESPONSES

NO. OBS. = 19
MIN. OBS. = -80%
MAX. OBS. = 10%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = -37.8% STD. DEV. = 25.4%

Q23 - PERCENT CHANGE IN PREPARING DOCUMENTATION FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -8.8%
STD. DEV. = 13.1%
MIN. OBS. = -20%
MAX. OBS. = 10%

OTHER AEROSPACE

NO. OBS. = 6
MEAN = -7.4%
STD. DEV. = 16.0%
MIN. OBS. = -40%
MAX. OBS. = 0%

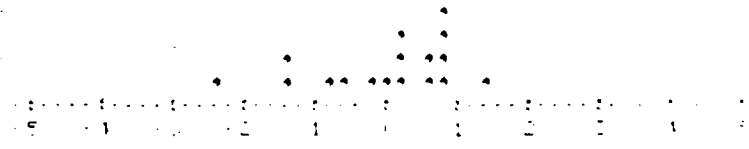
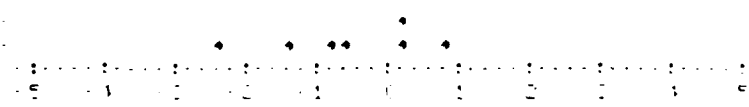
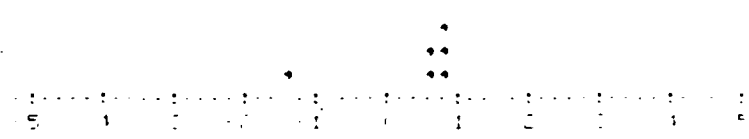
OTHER INDUSTRY

NO. OBS. = 7
MEAN = -25%
STD. DEV. = 20.6%
MIN. OBS. = -60%
MAX. OBS. = 0%

ALL RESPONSES

NO. OBS. = 17
MIN. OBS. = -60%
MAX. OBS. = 10%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -15.0%

STD. DEV. = 18.6%

Q23 - PERCENT CHANGE IN MATERIAL FOR CYLINDRICAL PARTS -- SYSTEM 1

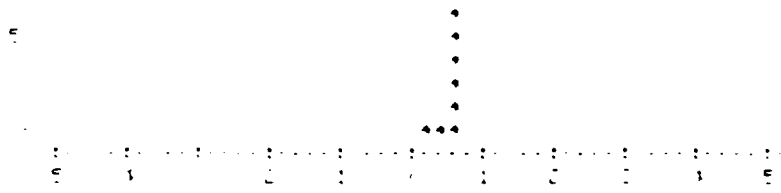
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -2.5
 STD. DEV. = 2.1%
 MIN. OBS. = - 5.
 MAX. OBS. = 0%



OTHER AEROSPACE

NO. OBS. = 8
 MEAN = -0.3
 STD. DEV. = 0.7%
 MIN. OBS. = - 2%
 MAX. OBS. = 0%



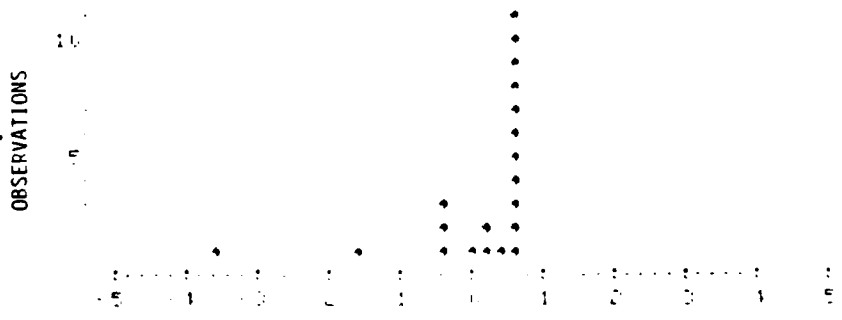
OTHER INDUSTRY

NO. OBS. = 8
 MEAN = - 5%
 STD. DEV. = 7.1%
 MIN. OBS. = - 20%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = - 20%
 MAX. OBS. = 0%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = - 2.6% STD. DEV. = 4.9%

Q23 - PERCENT CHANGE IN MATERIAL FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

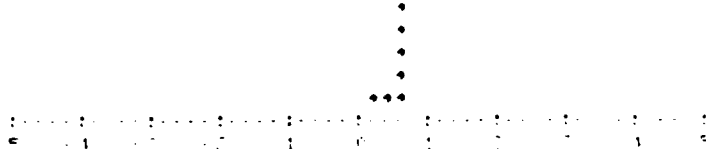
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -2.8%
 STD. DEV. = 2.0%
 MIN. OBS. = -5.0%
 MAX. OBS. = 0%



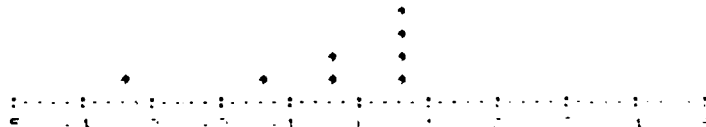
OTHER AEROSPACE

NO. OBS. = 7
 MEAN = -0.4%
 STD. DEV. = 0.7%
 MIN. OBS. = -2.0%
 MAX. OBS. = 0%



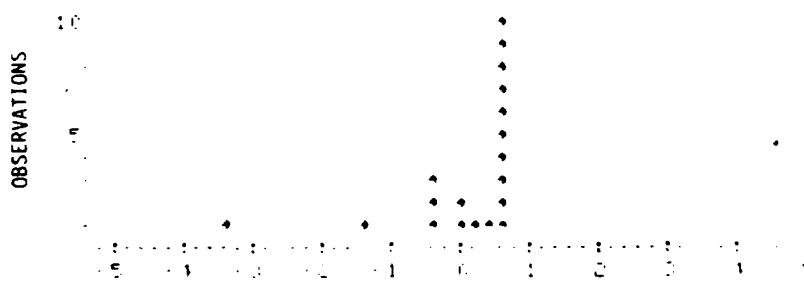
OTHER INDUSTRY

NO. OBS. = 8
 MEAN = - 5%
 STD. DEV. = 7.1%
 MIN. OBS. = - 20%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 19
 MIN. OBS. = - 20%
 MAX. OBS. = 0%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

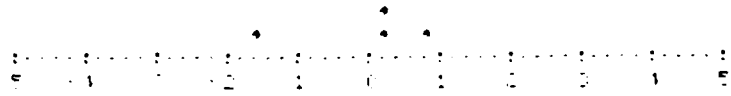
MEAN = - 2.8%

STD. DEV. = 5.0%

Q23 - PERCENT CHANGE IN DIRECT LABOR FOR CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -5.2%
 STD. DEV. = 6.7%
 MIN. OBS. = -15%
 MAX. OBS. = 0%



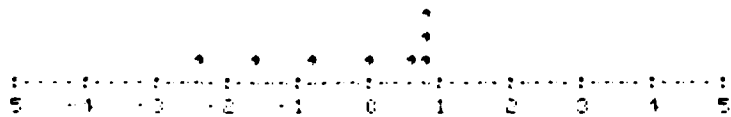
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = -3.3%
 STD. DEV. = 5.4%
 MIN. OBS. = -15%
 MAX. OBS. = 0%



OTHER INDUSTRY

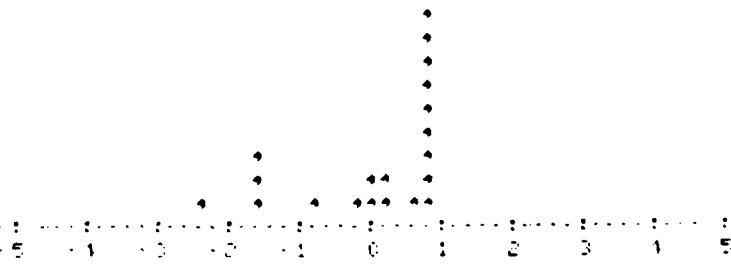
NO. OBS. = 8
 MEAN = -6.4%
 STD. DEV. = 7.8%
 MIN. OBS. = -20%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = -20%
 MAX. OBS. = 0%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

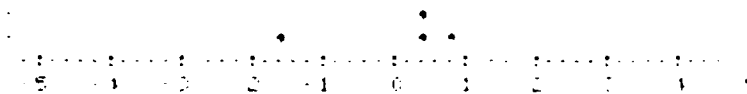
MEAN = -4%

STD. DEV. = 6.5%

Q23 - PERCENT CHANGE IN DIRECT LABOR FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

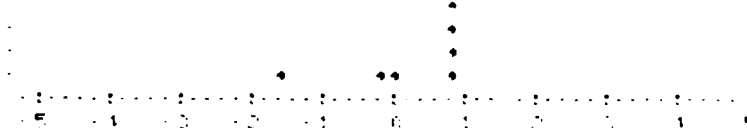
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -5.3%
 STD. DEV. = 6.7%
 MIN. OBS. = -15%
 MAX. OBS. = 0%



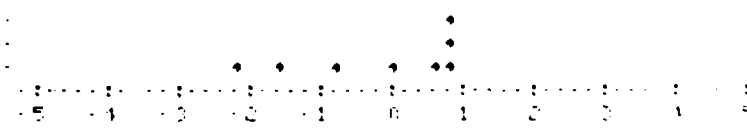
OTHER AEROSPACE

NO. OBS. = 7
 MEAN = -3.7%
 STD. DEV. = 5.6%
 MIN. OBS. = -15%
 MAX. OBS. = 0%



OTHER INDUSTRY

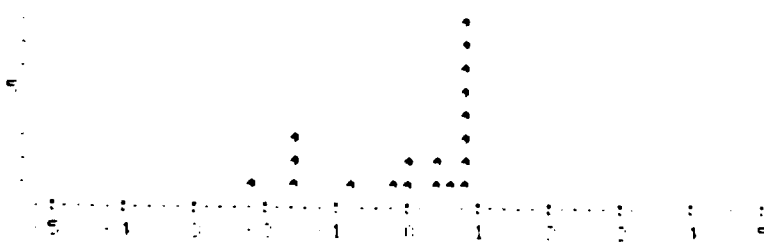
NO. OBS. = 8
 MEAN = -6.4%
 STD. DEV. = 7.8%
 MIN. OBS. = -20%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 19
 MIN. OBS. = -20%
 MAX. OBS. = 0%

OBSERVATIONS

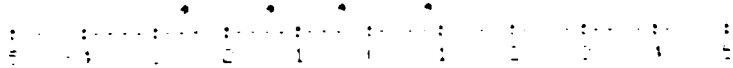


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = -5.2% STD. DEV. = 6.6%

Q23 - PERCENT CHANGE IN SCRAP AND REWORK FOR CYLINDRICAL PARTS -- SYSTEM 1

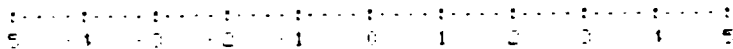
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -7.5%
 STD. DEV. = 6.5%
 MIN. OBS. = -15%
 MAX. OBS. = 0%



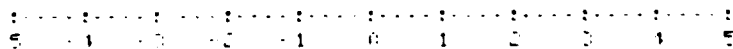
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = -1.4%
 STD. DEV. = 1.8%
 MIN. OBS. = -5%
 MAX. OBS. = 0%



OTHER INDUSTRY

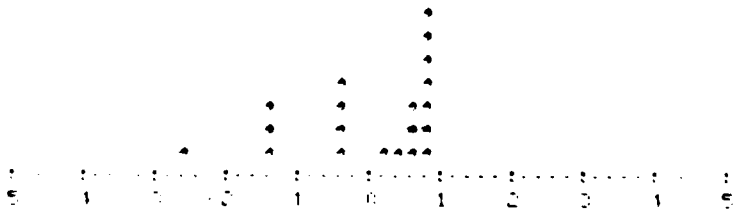
NO. OBS. = 8
 MEAN = -4%
 STD. DEV. = 4.2%
 MIN. OBS. = -10%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = -15%
 MAX. OBS. = 0%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

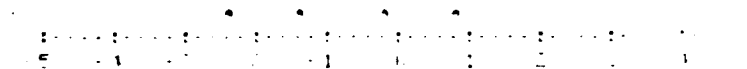
MEAN = -3.7%

STD. DEV. = 4.4%

Q23 - PERCENT CHANGE IN SCRAP AND REWORK FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

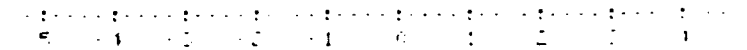
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -7.5%
 STD. DEV. = 6.5%
 MIN. OBS. = -15%
 MAX. OBS. = 0%



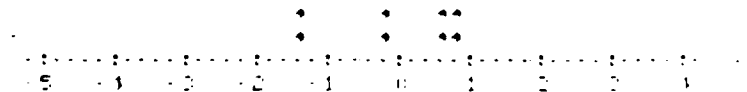
OTHER AEROSPACE

NO. OBS. = 7
 MEAN = -1.1%
 STD. DEV. = 1.9%
 MIN. OBS. = -5.0%
 MAX. OBS. = 0%



OTHER INDUSTRY

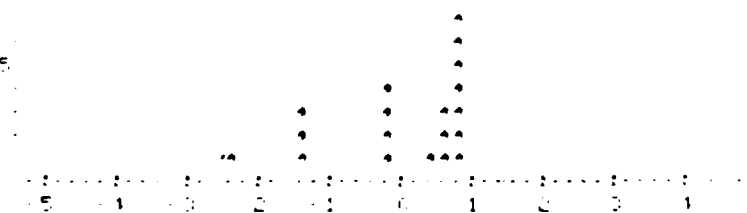
NO. OBS. = 8
 MEAN = -4%
 STD. DEV. = 4.2%
 MIN. OBS. = -10%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 19
 MIN. OBS. = -15%
 MAX. OBS. = 0%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -3.7%

STD. DEV. = 4.6%

Q23 - PERCENT CHANGE IN TOOLING FOR CYLINDRICAL PARTS -- SYSTEM 1

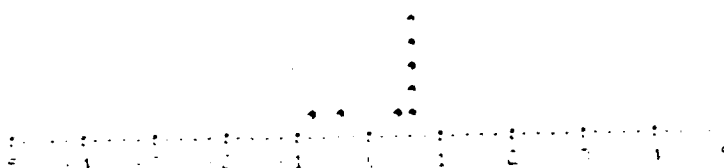
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -0.7
 STD. DEV. = 9.1
 MIN. OBS. = -20
 MAX. OBS. = 0



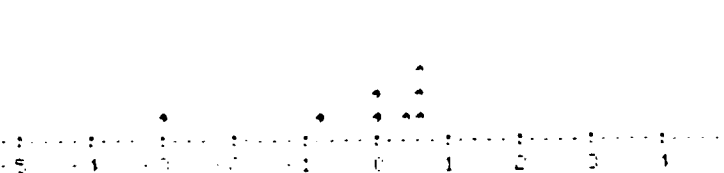
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = -2.5
 STD. DEV. = 3.9
 MIN. OBS. = -10
 MAX. OBS. = 0



OTHER INDUSTRY

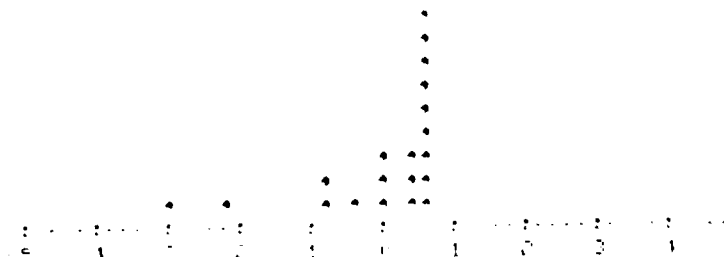
NO. OBS. = 8
 MEAN = -5.9
 STD. DEV. = 8.5
 MIN. OBS. = -25
 MAX. OBS. = 0



ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = -25
 MAX. OBS. = 0

OBSERVATIONS

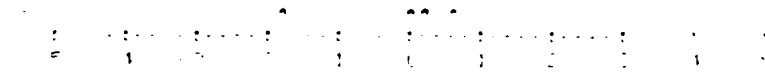


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = -4.7 STD. DEV. = 7.0

Q23 - PERCENT CHANGE IN TOOLING FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

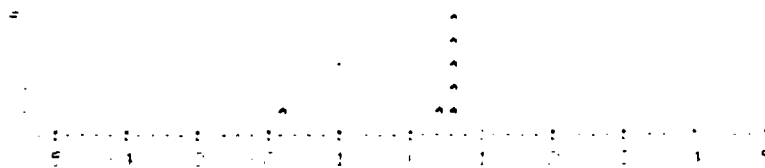
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -7%
 STD. DEV. = 8.9%
 MIN. OBS. = -20%
 MAX. OBS. = 0%



OTHER AEROSPACE

NO. OBS. = 7
 MEAN = -3.3%
 STD. DEV. = 7.4%
 MIN. OBS. = -20%
 MAX. OBS. = 0%



OTHER INDUSTRY

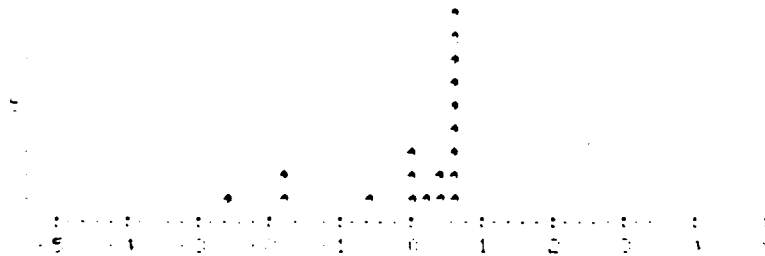
NO. OBS. = 8
 MEAN = -5.9%
 STD. DEV. = 8.5%
 MIN. OBS. = -25%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 19
 MIN. OBS. = -25%
 MAX. OBS. = 0%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = -5.2% STD. DEV. = 7.9%

Q23 - PERCENT CHANGE IN WORK IN PROCESS INVENTORY FOR CYLINDRICAL PARTS -- SYSTEM 1

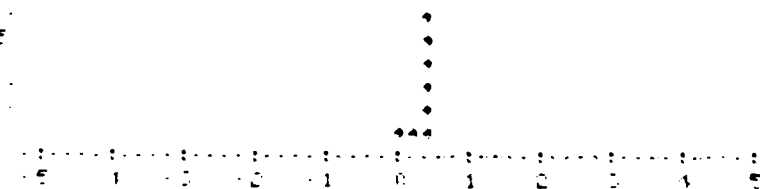
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -0.8%
 STD. DEV. = 1.5%
 MIN. OBS. = -0.3%
 MAX. OBS. = 0%



OTHER AEROSPACE

NO. OBS. = 8
 MEAN = -0.4%
 STD. DEV. = 0.7%
 MIN. OBS. = -0.2%
 MAX. OBS. = 0%



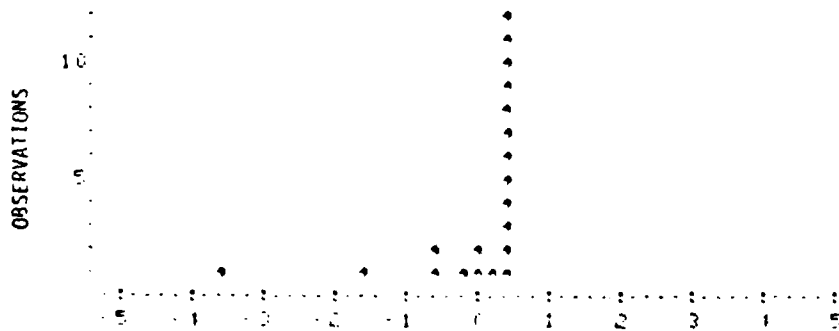
OTHER INDUSTRY

NO. OBS. = 8
 MEAN = -5.3%
 STD. DEV. = 6.9%
 MIN. OBS. = -20%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 20
 MIN. OBS. = -20%
 MAX. OBS. = 0%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

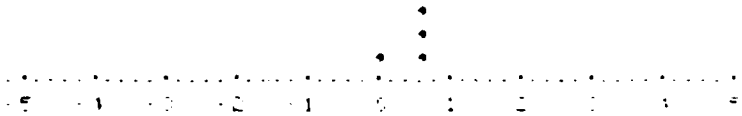
MEAN = -2.4%

STD. DEV. = 4.9%

Q23 - PERCENT CHANGE IN WORK IN PROCESS INVENTORY FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 0.8%
 STD. DEV. = 1.5%
 MIN. OBS. = -3.0%
 MAX. OBS. = 0%



OTHER AEROSPACE

NO. OBS. = 7
 MEAN = -0.4%
 STD. DEV. = 0.8%
 MIN. OBS. = -2.0%
 MAX. OBS. = 0%



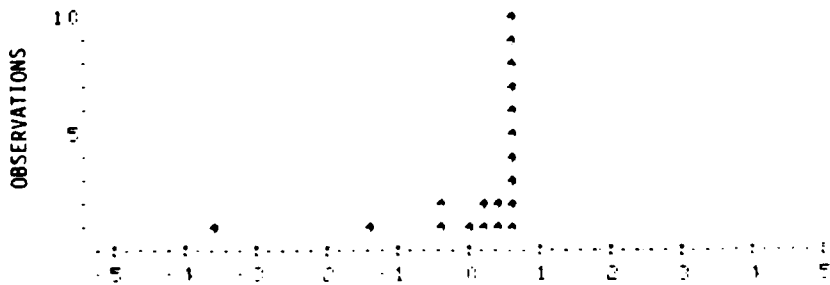
OTHER INDUSTRY

NO. OBS. = 8
 MEAN = -5.3%
 STD. DEV. = 6.9%
 MIN. OBS. = -20%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 19
 MIN. OBS. = -20%
 MAX. OBS. = 0%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = -2.6% STD. DEV. = 5.0%

Q24 - IMPACT OF SYSTEM 1 ON OTHER AREAS (RANKED ON A SCALE OF -2 TO +2, WHERE -2 = SIGNIFICANTLY
 NEGATIVE IMPACT, 0 = NO CHANGE, +2 = SIGNIFICANT IMPROVEMENT)

AREAS IMPACTED	MISSILE PRIME AND SUBS.					OTHER AEROSPACE					OTHER INDUSTRY					TOTAL				
	-2	-1	0	+1	+2	-2	-1	0	+1	+2	-2	-1	0	+1	+2	-2	-1	0	+1	+2
PRODUCTION LEADTIME			1	3				5	3				6	3				6	12	3
PROCESS PLANNING LEADTIME		1		1	2				6	2			6	3				1	13	7
MACHINE UTILIZATION			3		1			6	2			4	2	3				13	4	4
PRODUCT QUALITY			2	2				6	2			5	4					13	8	
DIRECT LABOR UTILIZATION			3	1				4	3	1		5	4					12	8	1
UNIFORMITY OF PROCESS PLANS				1	3				6	2			4	5				11	10	
COST ESTIMATING PROCEDURES			1	2	1			1	6	1			6	3				2	14	5
MAKE/BUY DECISIONS			1	3				5	3			1	6	2				7	12	2
PRODUCT STANDARDIZATION			1	2	1			4	2	2		4	3	2				9	7	5
CRITICAL LABOR SKILLS			2	2				6	2			8		1				16	4	1
MATERIAL STANDARDIZATION			1	2	1			5	2	1		5	4					11	8	2
PRODUCIBILITY OF PARTS			2	2				3	4			4	5					9	11	
PLANT LAYOUT			4					6	1	1		3	6					13	7	1
MATERIAL HANDLING			2	2				5	2	1		4	3	2				11	7	3
PRODUCTION SCHEDULING			3		1			6	1				5	4				9	6	5
CAPACITY PLANNING			2	2				6	1				5	4				8	8	4

Q25 - COST TO ACQUIRE HARDWARE -- SYSTEM 1 FOR CYLINDRICAL PARTS

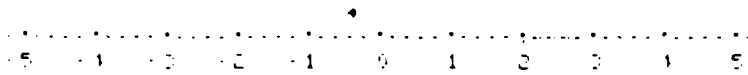
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = \$ 76K
 STD. DEV. = \$ 108K
 MIN. OBS. = \$ 8K
 MAX. OBS. = \$ 200K



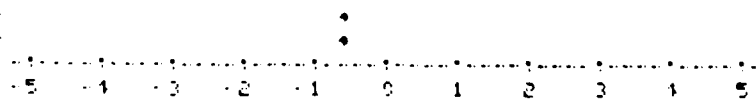
OTHER AEROSPACE

NO. OBS. = 1
 MEAN = \$ 10K
 STD. DEV. = \$ 0K
 MIN. OBS. = \$ 10K
 MAX. OBS. = \$ 10K



OTHER INDUSTRY

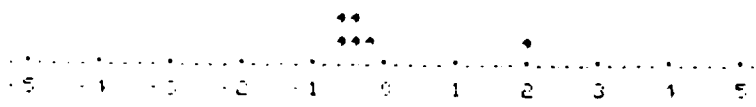
NO. OBS. = 2
 MEAN = \$ 0K
 STD. DEV. = \$ 0K
 MIN. OBS. = \$ 0K
 MAX. OBS. = \$ 0K



ALL RESPONSES

NO. OBS. = 6
 MIN. OBS. = \$ 0K
 MAX. OBS. = \$ 200K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$40K

STD. DEV. = \$79K

25 - COST TO ACQUIRE HARDWARE -- SYSTEM 1 FOR NON-CYLINDRICAL PARTS

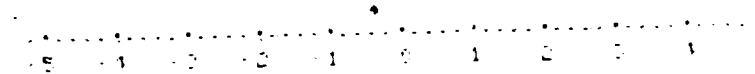
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = \$ 76K
 STD. DEV. = \$ 108K
 MIN. OBS. = \$ 8K
 MAX. OBS. = \$ 200K



OTHER AEROSPACE

NO. OBS. = 1
 MEAN = \$ 0K
 STD. DEV. = \$ 0K
 MIN. OBS. = \$ 0K
 MAX. OBS. = \$ 0K



OTHER INDUSTRY

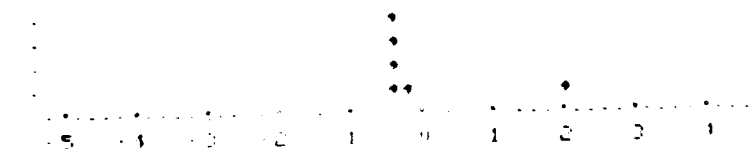
NO. OBS. = 2
 MEAN = \$ 0K
 STD. DEV. = \$ 0K
 MIN. OBS. = \$ 0K
 MAX. OBS. = \$ 0K



ALL RESPONSES

NO. OBS. = 6
 MIN. OBS. = \$ 0K
 MAX. OBS. = \$ 200K

OBSERVATIONS

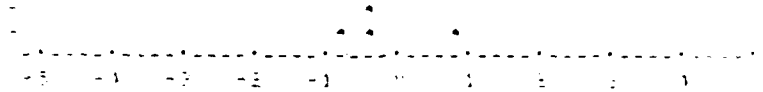


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$38K STD. DEV. = \$80K

MONTHS TO TEST SYSTEM -- SYSTEM 1 FOR NON-CYLINDRICAL PARTS

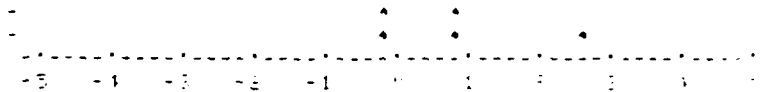
E PRIMES & SUBS

S. = 4
 = 2.8 mo.
 DEV. = 2.2 mo.
 OBS. = 1 mo.
 OBS. = 6 mo.



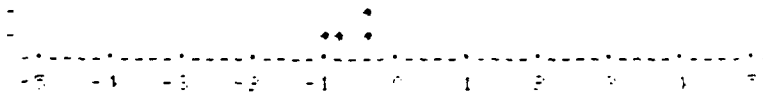
AEROSPACE

BS. = 5
 = 6 mo.
 DEV. = 3.7 mo.
 OBS. = 3 mo.
 OBS. = 12 mo.



INDUSTRY

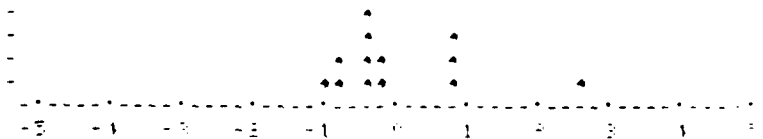
BS. = 4
 = 1.4 mo.
 DEV. = .75 mo.
 OBS. = 0.5 mo.
 OBS. = 2 mo.



OBSERVATIONS

RESPONSES

OBS. = 13
 OBS. = 0.5 mo.
 OBS. = 12 mo.

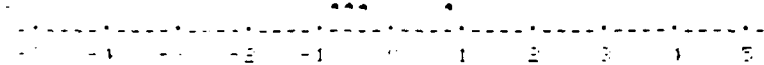


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 3.6 mo. STD. DEV. = 3.2 mo.

Q25 - MONTHS TO TEST SYSTEM -- SYSTEM 1 FOR CYLINDRICAL PARTS

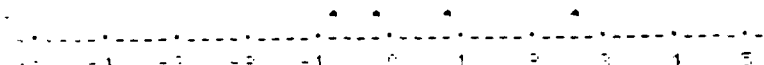
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 2.6 mo.
 STD. DEV. = 2.3 mo.
 MIN. OBS. = 1 mo.
 MAX. OBS. = 6 mo.



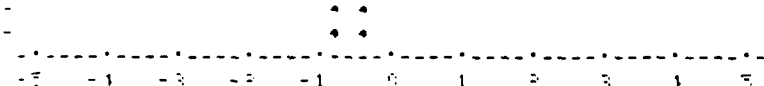
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = 5.5 mo.
 STD. DEV. = 4.3 mo.
 MIN. OBS. = 9.5 mo.
 MAX. OBS. = 12 mo.



OTHER INDUSTRY

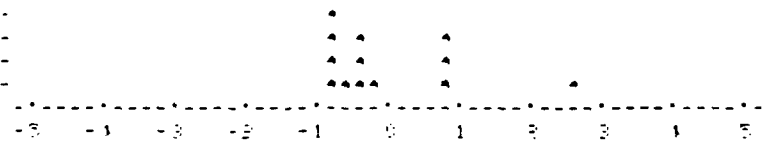
NO. OBS. = 4
 MEAN = 1.4 mo.
 STD. DEV. = 0.8 mo.
 MIN. OBS. = 0.5 mo.
 MAX. OBS. = 2 mo.



ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = 0.5 mo.
 MAX. OBS. = 2 mo.

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 3.3 mo. STD. DEV. = 3.3 mo.

125 - MONTHS TO TRAIN PERSONNEL -- SYSTEM 1 FOR NON-CYLINDRICAL PARTS

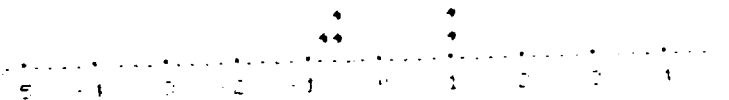
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 2.8 mo.
 STD. DEV. = 3.3 mo.
 MIN. OBS. = 1 mo.
 MAX. OBS. = 12 mo.



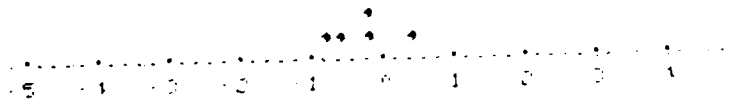
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = 2.75 mo.
 STD. DEV. = 2.9 mo.
 MIN. OBS. = .25 mo.
 MAX. OBS. = 6 mo.



OTHER INDUSTRY

NO. OBS. = 5
 MEAN = 1.7 mo.
 STD. DEV. = 1.5 mo.
 MIN. OBS. = 0.1 mo.
 MAX. OBS. = 4 mo.



OBSERVATIONS

ALL RESPONSES

NO. OBS. = 14
 MIN. OBS. = 0.1 mo.
 MAX. OBS. = 12 mo.

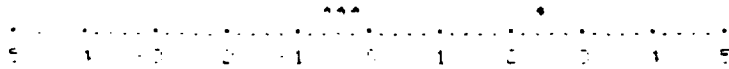


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 2.8 mo. STD. DEV. = 3.3 mo.

Q25 - MONTHS TO TRAIN PERSONNEL -- SYSTEM 1 FOR CYLINDRICAL PARTS

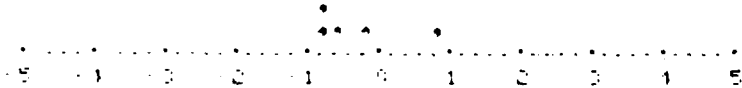
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 4.1 mo.
 STD. DEV. = 5.26 mo.
 MIN. OBS. = 1 mo.
 MAX. OBS. = 12 mo.



OTHER AEROSPACE

NO. OBS. = 5
 MEAN = 1.9 mo.
 STD. DEV. = 2.4 mo.
 MIN. OBS. = 0.25 mo.
 MAX. OBS. = 6 mo.



OTHER INDUSTRY

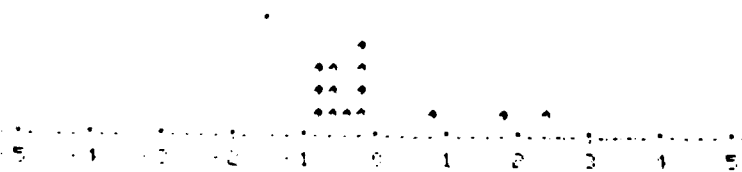
NO. OBS. = 5
 MEAN = 2.9 mo.
 STD. DEV. = 4.1 mo.
 MIN. OBS. = 0.1 mo.
 MAX. OBS. = 10 mo.



OBSERVATIONS

ALL RESPONSES

NO. OBS. = 14
 MIN. OBS. = 0.1 mo.
 MAX. OBS. = 12 mo.



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 2.9 mo.

STD. DEV. = 3.8 mo.

125 - MONTHS TO ESTABLISH INITIAL DATA FILES -- SYSTEM 1 FOR NON-CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 5.75 mo.
STD. DEV. = 2.1 mo.
MIN. OBS. = 3 mo.
MAX. OBS. = 8 mo.

OTHER AEROSPACE

NO. OBS. = 5
MEAN = 8.6 mo.
STD. DEV. = 4.7 mo.
MIN. OBS. = 3 mo.
MAX. OBS. = 12 mo.

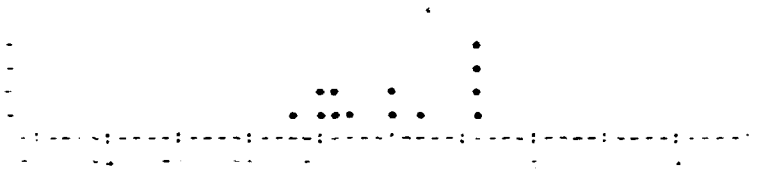
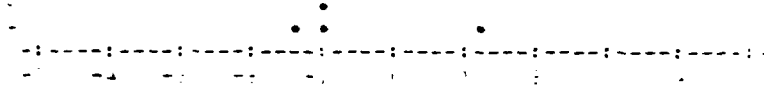
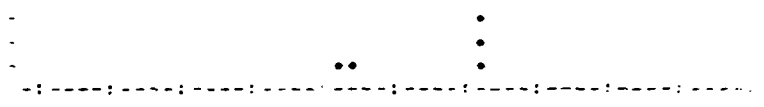
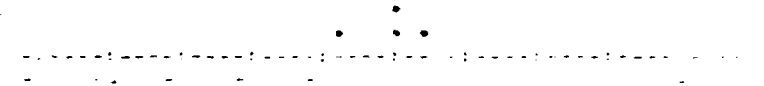
OTHER INDUSTRY

NO. OBS. = 4
MEAN = 4 mo.
STD. DEV. = 5.4 mo.
MIN. OBS. = 0 mo.
MAX. OBS. = 12 mo.

ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = 0 mo.
MAX. OBS. = 12 mo.

OBSERVATIONS

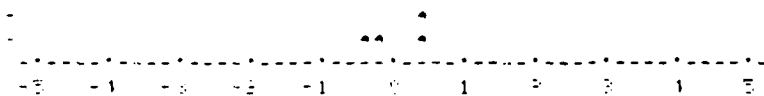


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 6.3 mo. STD. DEV. = 4.4 mo.

Q25 - MONTHS TO ESTABLISH INITIAL DATA FILES -- SYSTEM 1 FOR CYLINDRICAL PARTS

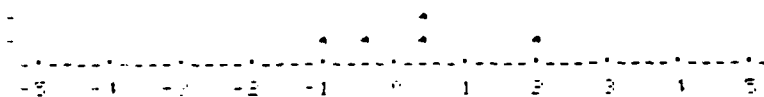
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 4.75 mo.
 STD. DEV. = 1.5 mo.
 MIN. OBS. = 3 mo.
 MAX. OBS. = 6 mo.



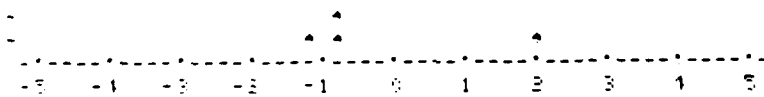
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = 5.6 mo.
 STD. DEV. = 4.2 mo.
 MIN. OBS. = 1 mo.
 MAX. OBS. = 12 mo.



OTHER INDUSTRY

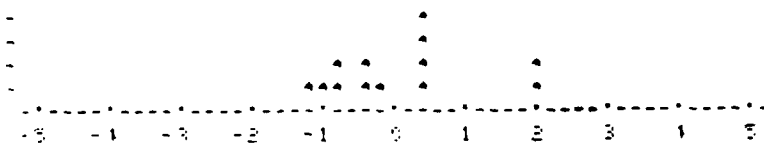
NO. OBS. = 4
 MEAN = 4 mo.
 STD. DEV. = 5.4 mo.
 MIN. OBS. = 0 mo.
 MAX. OBS. = 12 mo.



OBSERVATIONS

ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = 0 mo.
 MAX. OBS. = 12 mo.



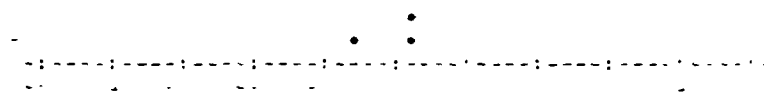
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 4.3 mo. STD. DEV. = 3.76 mo.

Q25 - MONTHS TO ACQUIRE HARDWARE -- SYSTEM 1 FOR NON-CYLINDRICAL PARTS

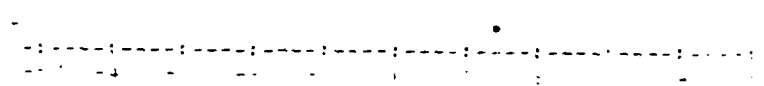
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 7.3 mo.
STD. DEV. = 1.2 mo.
MIN. OBS. = 1 mo.
MAX. OBS. = 3 mo.



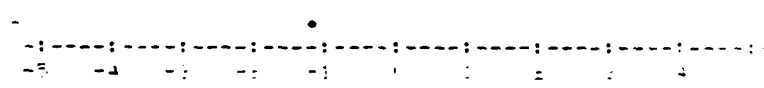
OTHER AEROSPACE

NO. OBS. = 1 mo.
MEAN = 6.0 mo.
STD. DEV. = 10 mo.
MIN. OBS. = 6 mo.
MAX. OBS. = 6 mo.



OTHER INDUSTRY

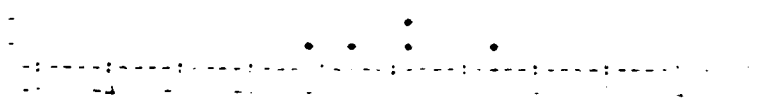
NO. OBS. = 1 mo.
MEAN = 0 mo.
STD. DEV. = 0 mo.
MIN. OBS. = 0 mo.
MAX. OBS. = 0 mo.



OBSERVATIONS

ALL RESPONSES

NO. OBS. = 5
MIN. OBS. = 0 mo.
MAX. OBS. = 6 mo.



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 2.6 mo. STD. DEV. = 2.3 mo.

Q25 - MONTHS TO ACQUIRE HARDWARE -- SYSTEM 1 FOR CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 2.3 mo.
STD. DEV. = 1.2 mo.
MIN. OBS. = 1 mo.
MAX. OBS. = 3 mo.

OTHER AEROSPACE

NO. OBS. = 1
MEAN = 6 mo.
STD. DEV. = 0 mo.
MIN. OBS. = 6 mo.
MAX. OBS. = 6 mo.

OTHER INDUSTRY

NO. OBS. = 1
MEAN = 0 mo.
STD. DEV. = 0 mo.
MIN. OBS. = 0 mo.
MAX. OBS. = 0 mo.

ALL RESPONSES

NO. OBS. = 5
MIN. OBS. = 0 mo.
MAX. OBS. = 6 mo.

OBSERVATIONS

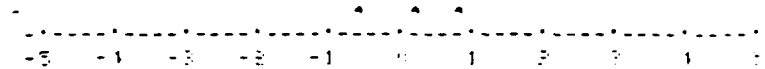
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 2.6 mo. STD. DEV. = 2.3 mo.

Q25 - COST TO TEST SYSTEM -- SYSTEM 1 FOR NON-CYLINDRICAL PARTS

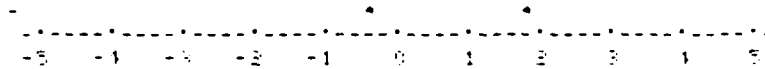
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = \$9.8K
 STD. DEV. = \$4.8K
 MIN. OBS. = \$5.0K
 MAX. OBS. = \$14.5K



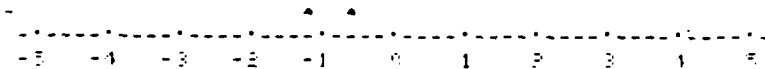
OTHER AEROSPACE

NO. OBS. = 2
 MEAN = \$13.2K
 STD. DEV. = \$9.6K
 MIN. OBS. = \$6.4K
 MAX. OBS. = \$20K



OTHER INDUSTRY

NO. OBS. = 2
 MEAN = \$3.0K
 STD. DEV. = \$2.9K
 MIN. OBS. = \$1.0K
 MAX. OBS. = \$5.0K



ALL RESPONSES

NO. OBS. = 7
 MIN. OBS. = \$1K
 MAX. OBS. = \$20K

OBSERVATIONS

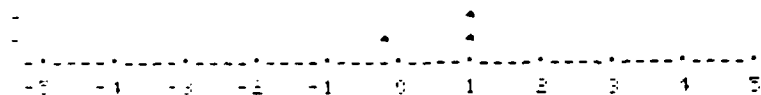


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$8.8K STD. DEV. = \$6.5K

Q25 - COST TO TEST SYSTEM -- SYSTEM 1 FOR CYLINDRICAL PARTS

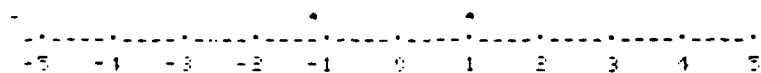
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = \$8.6K
 STD. DEV. = \$3.1K
 MIN. OBS. = \$10.8K
 MAX. OBS. = \$5K



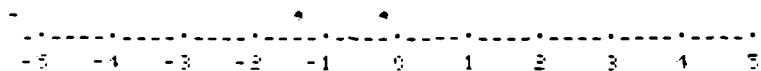
OTHER AEROSPACE

NO. OBS. = 2
 MEAN = \$5.5K
 STD. DEV. = \$6.4K
 MIN. OBS. = \$ 1K
 MAX. OBS. = \$ 10K



OTHER INDUSTRY

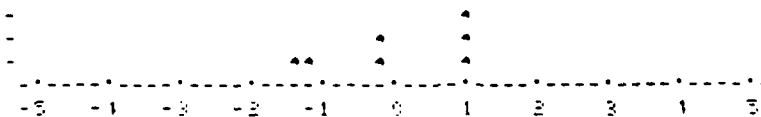
NO. OBS. = 2
 MEAN = \$2.5K
 STD. DEV. = \$3.5K
 MIN. OBS. = \$0.05K
 MAX. OBS. = \$ 5K



ALL RESPONSES

NO. OBS. = 7
 MIN. OBS. = \$0.05K
 MAX. OBS. = \$10.8K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

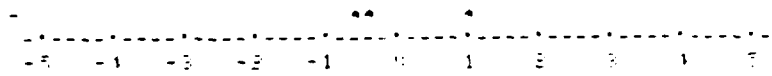
MEAN = \$ 5.9K

STD. DEV. = \$ 4.4K

Q25 - COST TO TRAIN PERSONNEL -- SYSTEM 1 FOR NON-CYLINDRICAL PARTS

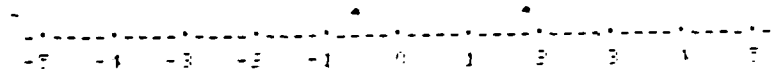
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = \$8.5K
 STD. DEV. = \$ 10K
 MIN. OBS. = \$ 2K
 MAX. OBS. = \$2.0K



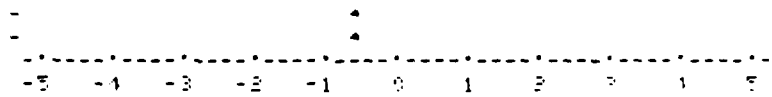
OTHER AEROSPACE

NO. OBS. = 2
 MEAN = \$16.5K
 STD. DEV. = \$19.1K
 MIN. OBS. = \$ 3K
 MAX. OBS. = \$ 30K



OTHER INDUSTRY

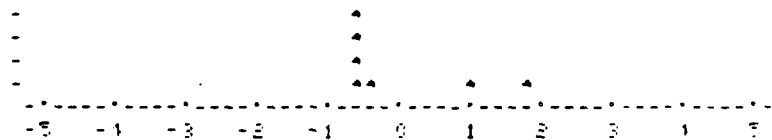
NO. OBS. = 2
 MEAN = \$ 1.5K
 STD. DEV. = \$.7K
 MIN. OBS. = \$ 1.0K
 MAX. OBS. = \$ 2K



ALL RESPONSES

NO. OBS. = 7
 MIN. OBS. = \$ 1K
 MAX. OBS. = \$ 20K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

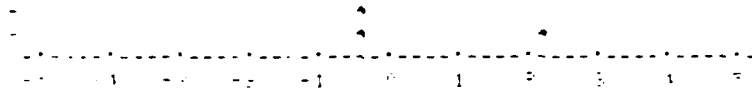
MEAN = \$8.8K

STD. DEV. = \$11.4K

Q25 - COST TO TRAIN PERSONNEL -- SYSTEM 1 FOR CYLINDRICAL PARTS

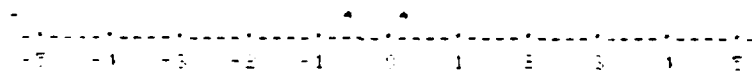
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = \$ 8.2K
 STD. DEV. = \$10.3K
 MIN. OBS. = \$ 2K
 MAX. OBS. = \$ 20K



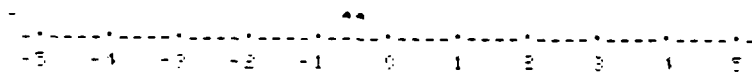
OTHER AEROSPACE

NO. OBS. = 2
 MEAN = \$ 3.5K
 STD. DEV. = \$ 3.5K
 MIN. OBS. = \$ 1K
 MAX. OBS. = \$ 6K



OTHER INDUSTRY

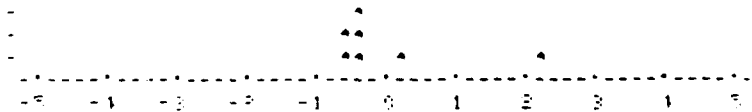
NO. OBS. = 2
 MEAN = \$ 1.0K
 STD. DEV. = \$ 1.3K
 MIN. OBS. = \$ 0.1K
 MAX. OBS. = \$ 2K



ALL RESPONSES

NO. OBS. = 7
 MIN. OBS. = \$ 0.1K
 MAX. OBS. = \$ 20K

OBSERVATIONS

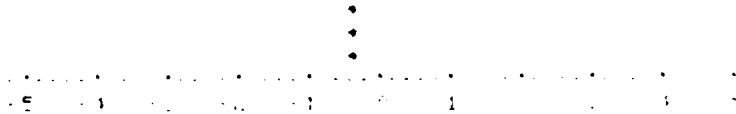


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$ 4.8K STD. DEV. = \$ 7.0K

Q25 - COST TO ESTABLISH INITIAL DATA FILES -- SYSTEM 1 FOR NON-CYLINDRICAL PARTS

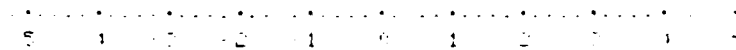
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = \$38.7K
STD. DEV. = \$ 10K
MIN. OBS. = \$31.2K
MAX. OBS. = \$ 50K



OTHER AEROSPACE

NO. OBS. = 1
MEAN = \$ 8K
STD. DEV. = \$ 0K
MIN. OBS. = \$ 8K
MAX. OBS. = \$ 8K



OTHER INDUSTRY

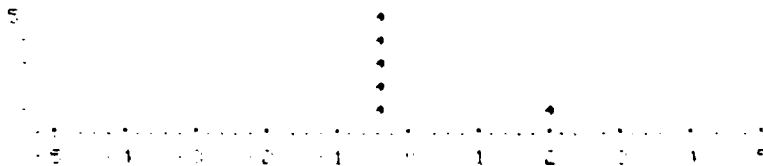
NO. OBS. = 2
MEAN = \$1425K
STD. DEV. = \$2016K
MIN. OBS. = \$ 0K
MAX. OBS. = \$2850K



ALL RESPONSES

NO. OBS. = 6
MIN. OBS. = \$ 0K
MAX. OBS. = \$2850K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$ 495.7K STD. DEV. = \$ 1153.5K

Q25 - COST TO ESTABLISH INITIAL DATA FILES -- SYSTEM 1 FOR CYLINDRICAL PARTS

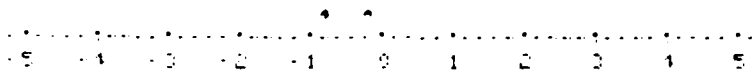
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = \$ 33K
STD. DEV. = \$14.7K
MIN. OBS. = \$ 24K
MAX. OBS. = \$ 50K



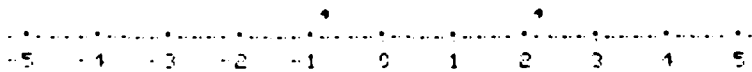
OTHER AEROSPACE

NO. OBS. = 2
MEAN = \$13.5K
STD. DEV. = \$16.3K
MIN. OBS. = \$ 2K
MAX. OBS. = \$ 25K



OTHER INDUSTRY

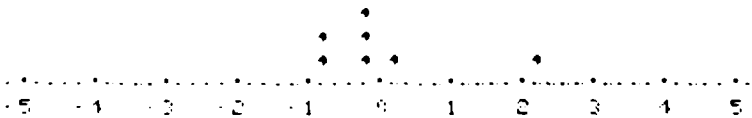
NO. OBS. = 2
MEAN = \$ 75K
STD. DEV. = \$106.1K
MIN. OBS. = \$ 0K
MAX. OBS. = \$ 150K



ALL RESPONSES

NO. OBS. = 7
MIN. OBS. = \$ 0K
MAX. OBS. = \$ 150K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$39.9K

STD. DEV. = \$51.6K

Q25 - ANNUAL COMPUTER CHARGES AND PROGRAM MAINTENANCE -- SYSTEM 1 FOR CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$22.2K
 STD. DEV. = \$20.6K
 MIN. OBS. = \$ 5K
 MAX. OBS. = \$51.6K

OTHER AEROSPACE

NO. OBS. = 5
 MEAN = \$34.2K
 STD. DEV. = \$42.7K
 MIN. OBS. = \$ 3K
 MAX. OBS. = \$ 100K

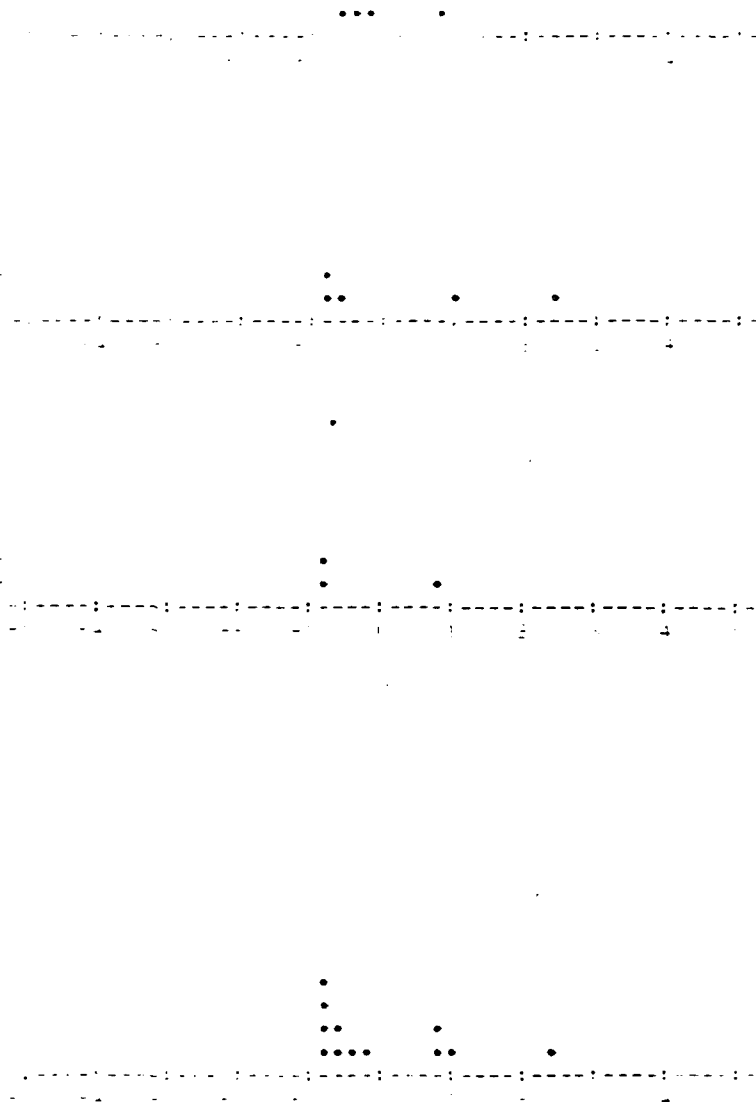
OTHER INDUSTRY

NO. OBS. = 3
 MEAN = \$17.0K
 STD. DEV. = \$28.6K
 MIN. OBS. = \$ 0.5K
 MAX. OBS. = \$ 50K

ALL RESPONSES

NO. OBS. = 12
 MIN. OBS. = \$ 0.5K
 MAX. OBS. = \$ 100K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$25.9K STD. DEV. = \$31.4K

Q25 - ANNUAL COMPUTER CHARGES AND PROGRAM MAINTENANCE -- SYSTEM 1 FOR NON-CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = \$26.2K
STD. DEV. = \$20.9K
MIN. OBS. = \$ 10K
MAX. OBS. = \$56.8K

OTHER AEROSPACE

NO. OBS. = 5
MEAN = \$92.9K
STD. DEV. = \$ 172K
MIN. OBS. = \$ 4.5K
MAX. OBS. = \$ 400K

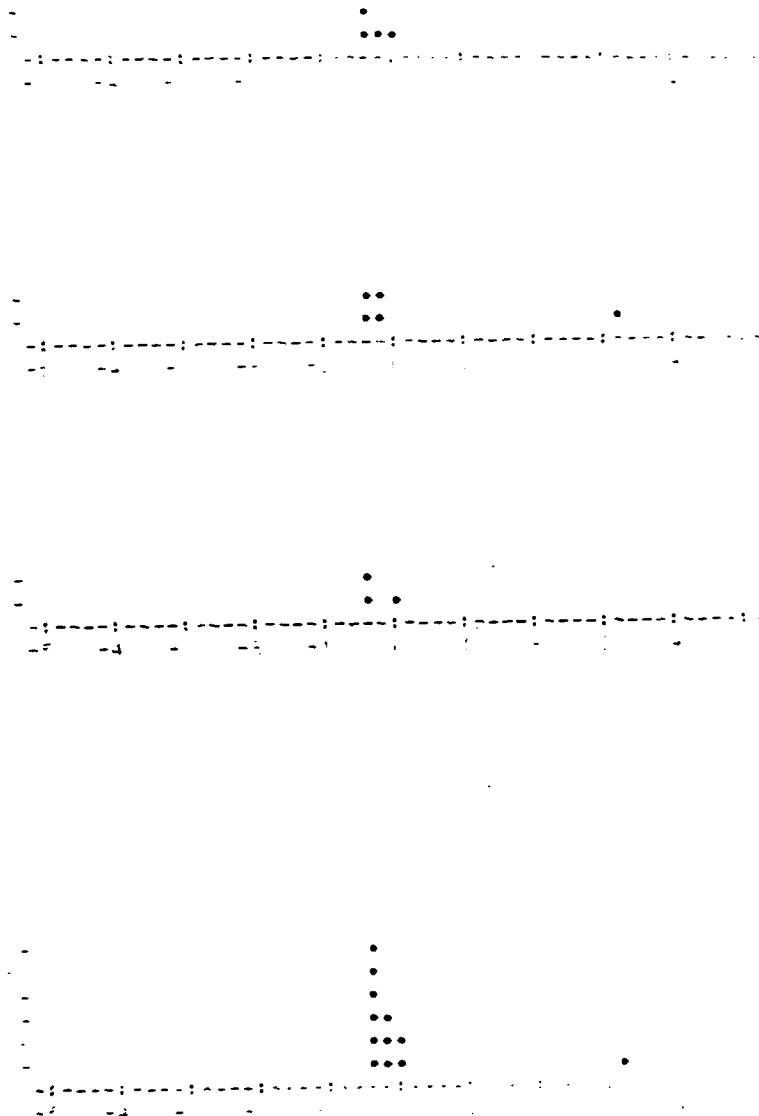
OTHER INDUSTRY

NO. OBS. = 3
MEAN = \$19.7K
STD. DEV. = \$26.6K
MIN. OBS. = \$ 0.5K
MAX. OBS. = \$ 50K

ALL RESPONSES

NO. OBS. = 12
MIN. OBS. = \$0.5K
MAX. OBS. = \$400K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = \$52.4K STD. DEV. \$110.8K

Q25 - ANNUAL COST TO UPDATE DATA FILES -- SYSTEM 1 FOR CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = \$ 7.0K
STD. DEV. = \$ 5.0K
MIN. OBS. = \$ 0.8K
MAX. OBS. = \$ 10K

OTHER AEROSPACE

NO. OBS. = 5
MEAN = \$23.7K
STD. DEV. = \$42.8K
MIN. OBS. = \$ 2K
MAX. OBS. = \$ 100K

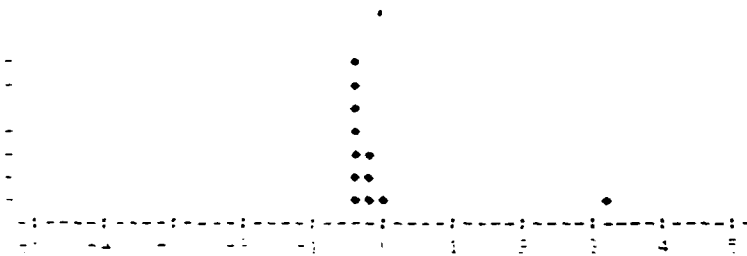
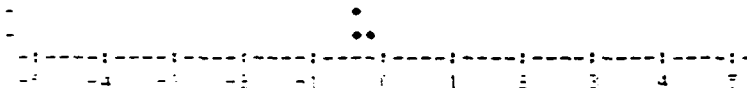
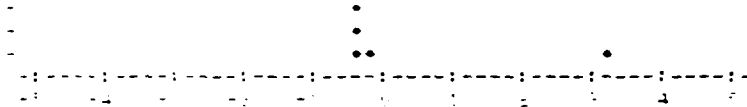
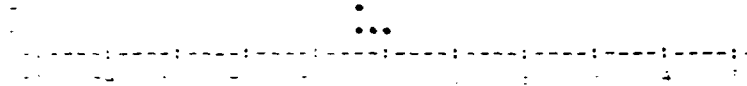
OTHER INDUSTRY

NO. OBS. = 3
MEAN = \$ 5.0K
STD. DEV. = \$ 5.0K
MIN. OBS. = \$0.05K
MAX. OBS. = \$ 10K

ALL RESPONSES

NO. OBS. = 12
MIN. OBS. = \$0.05K
MAX. OBS. = \$ 100K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

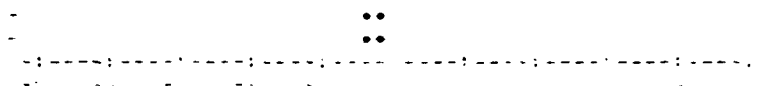
MEAN = \$13.4K

STD. DEV. = \$27.6K

Q25 - ANNUAL COST TO UPDATE DATA FILES -- SYSTEM 1 FOR NON-CYLINDRICAL PARTS

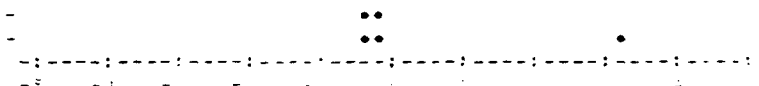
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$ 9K
 STD. DEV. = \$ 6.7K
 MIN. OBS. = \$ 1.6K
 MAX. OBS. = \$ 15K



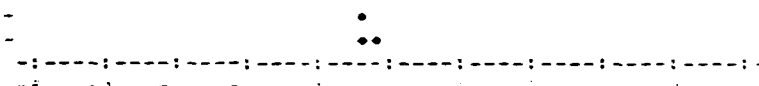
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = \$85.3K
 STD. DEV. = \$ 176K
 MIN. OBS. = \$ 6K
 MAX. OBS. = \$ 400K



OTHER INDUSTRY

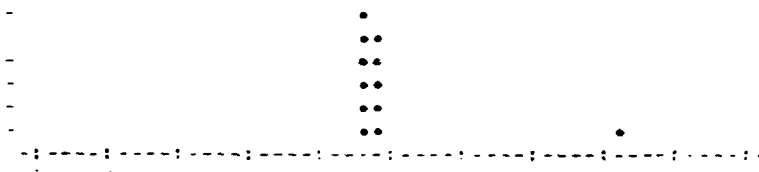
NO. OBS. = 3
 MEAN = \$ 5.3K
 STD. DEV. = \$ 4.5K
 MIN. OBS. = \$0.95K
 MAX. OBS. = \$ 10K



ALL RESPONSES

NO. OBS. = 12
 MIN. OBS. = \$0.95K
 MAX. OBS. = \$ 400K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$39.9K

STD. DEV. = \$113.5K

Q27 - PERCENT CHANGE IN PROCESS PLANNING FOR CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = -26.7%
 STD. DEV. = 20.8%
 MIN. OBS. = -50%
 MAX. OBS. = -10%



OTHER AEROSPACE

NO. OBS. = 7
 MEAN = -30.7%
 STD. DEV. = 19.1%
 MIN. OBS. = -60%
 MAX. OBS. = -2%



OTHER INDUSTRY

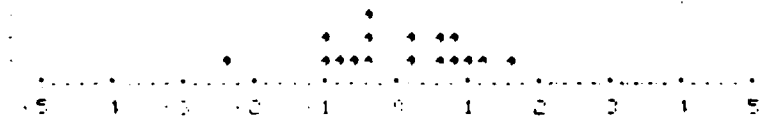
NO. OBS. = 7
 MEAN = -52.1%
 STD. DEV. = 23.9%
 MIN. OBS. = -93%
 MAX. OBS. = -15%



ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = -93%
 MAX. OBS. = -2%

OBSERVATIONS



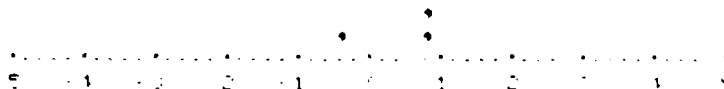
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -38.8% STD. DEV. = 23.2%

Q27 - PERCENT CHANGE IN PROCESS PLANNING FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = -30%
 STD. DEV. = 17.3%
 MIN. OBS. = -50%
 MAX. OBS. = -20%



OTHER AEROSPACE

NO. OBS. = 6
 MEAN = -31.1%
 STD. DEV. = 21.7%
 MIN. OBS. = -60%
 MAX. OBS. = -3%



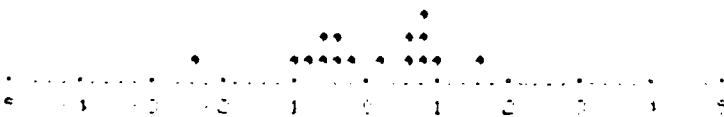
OTHER INDUSTRY

NO. OBS. = 7
 MEAN = -50%
 STD. DEV. = 23.8%
 MIN. OBS. = -93%
 MAX. OBS. = -15%



ALL RESPONSES

NO. OBS. = 16
 MIN. OBS. = -93%
 MAX. OBS. = -3%



OBSERVATIONS

STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -39.2% STD. DEV. = 22.8%

Q27 - PERCENT CHANGE IN DETERMINING OPERATION SEQUENCES FOR CYLINDRICAL PARTS -- SYSTEM 2

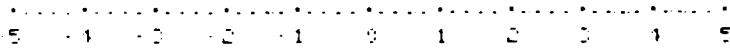
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = -40%
 STD. DEV. = 35%
 MIN. OBS. = -75%
 MAX. OBS. = -5%



OTHER AEROSPACE

NO. OBS. = 6
 MEAN = -11.7%
 STD. DEV. = 10.7%
 MIN. OBS. = -25%
 MAX. OBS. = -3%



OTHER INDUSTRY

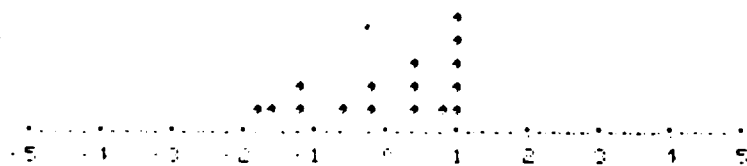
NO. OBS. = 7
 MEAN = -55%
 STD. DEV. = 33.4%
 MIN. OBS. = -95%
 MAX. OBS. = -10%



ALL RESPONSES

NO. OBS. = 16
 MIN. OBS. = -95%
 MAX. OBS. = -5%

OBSERVATIONS



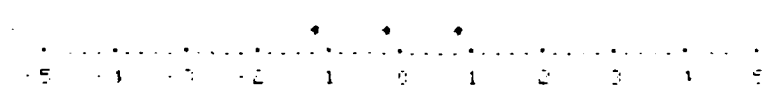
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -35.8% STD. DEV. = 32.7%

Q27 - PERCENT CHANGE IN DETERMINING OPERATION SEQUENCES FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

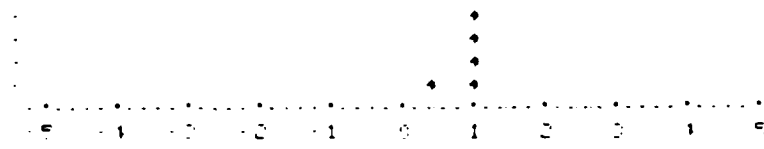
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = -41%
 STD. DEV. = 33.5%
 MIN. OBS. = -75%
 MAX. OBS. = -8%



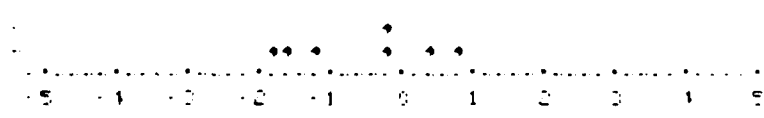
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = -8.4%
 STD. DEV. = 9.3%
 MIN. OBS. = -25%
 MAX. OBS. = -3%



OTHER INDUSTRY

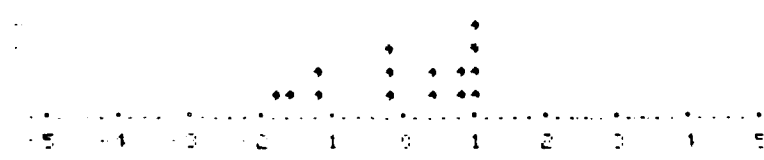
NO. OBS. = 7
 MEAN = -52.9%
 STD. DEV. = 33.7%
 MIN. OBS. = -95%
 MAX. OBS. = -10%



ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = -95%
 MAX. OBS. = -8%

OBSERVATIONS

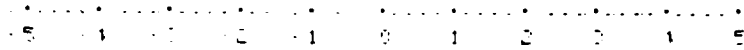


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = -35.7% STD. DEV. = 33.1%

Q27 - PERCENT CHANGE IN MACHINE SELECTION FOR CYLINDRICAL PARTS -- SYSTEM 2

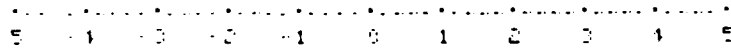
MISSILE PRIMES & SUBS

NO. OBS. = 2
 MEAN = -58.0%
 STD. DEV. = 24.7%
 MIN. OBS. = -75%
 MAX. OBS. = 40%



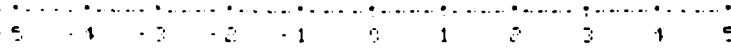
OTHER AEROSPACE

NO. OBS. = 6
 MEAN = -10.3%
 STD. DEV. = 12.0%
 MIN. OBS. = -25%
 MAX. OBS. = 0%



OTHER INDUSTRY

NO. OBS. = 7
 MEAN = -33.0%
 STD. DEV. = 29.0%
 MIN. OBS. = -80%
 MAX. OBS. = -10%



OBSERVATIONS

ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = -80%
 MAX. OBS. = 0%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

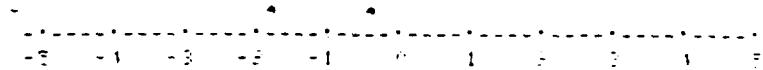
MEAN = -27.1%

STD. DEV. = 27.0%

Q27 - PERCENT CHANGE IN MACHINE SELECTION FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

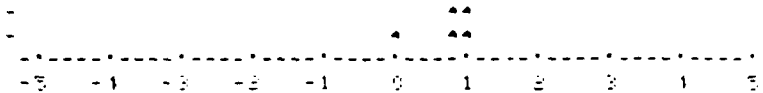
MISSILE PRIMES & SUBS

NO. OBS. = 2
 MEAN = -57.5%
 STD. DEV. = 24.7%
 MIN. OBS. = -75%
 MAX. OBS. = -40%



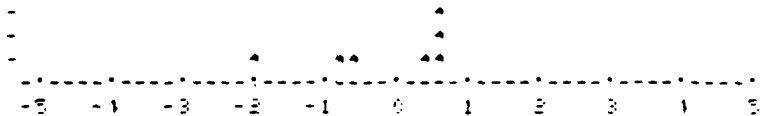
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = -7.4%
 STD. DEV. = 10.1%
 MIN. OBS. = -25%
 MAX. OBS. = 0%



OTHER INDUSTRY

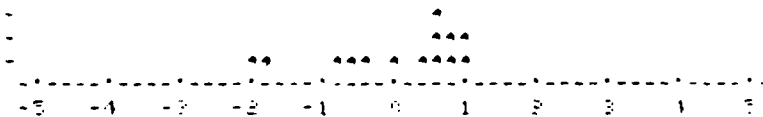
NO. OBS. = 7
 MEAN = -31.4%
 STD. DEV. = 27.5%
 MIN. OBS. = -80%
 MAX. OBS. = -10%



ALL RESPONSES

NO. OBS. = 14
 MIN. OBS. = -80%
 MAX. OBS. = 0%

OBSERVATIONS



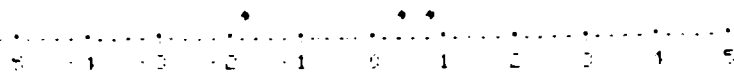
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -26.6% STD. DEV. = 27%

Q27 - PERCENT CHANGE IN SELECTING TOOLING FOR CYLINDRICAL PARTS -- SYSTEM 2

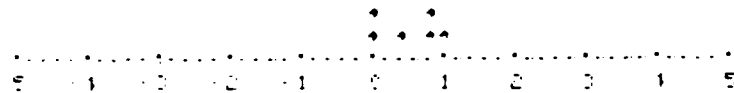
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = -31.3%
 STD. DEV. = 38.5%
 MIN. OBS. = -75%
 MAX. OBS. = -2%



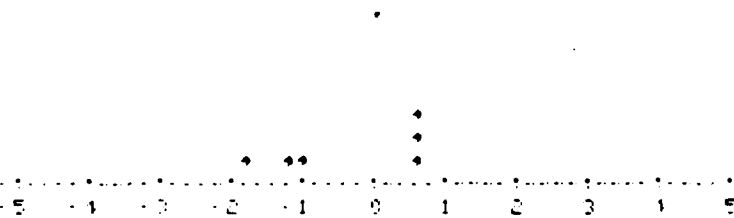
OTHER AEROSPACE

NO. OBS. = 6
 MEAN = -11.8%
 STD. DEV. = 11.4%
 MIN. OBS. = -25%
 MAX. OBS. = 0%



OTHER INDUSTRY

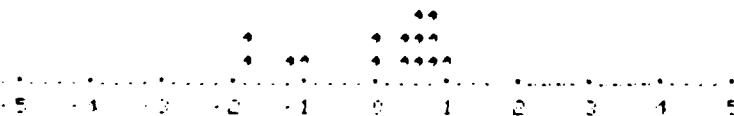
NO. OBS. = 6
 MEAN = -36.7%
 STD. DEV. = 29.9%
 MIN. OBS. = -75%
 MAX. OBS. = -10%



ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = -75%
 MAX. OBS. = 0%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = -25.7% STD. DEV. = 26.8%

027 - PERCENT CHANGE IN SELECTING TOOLING FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

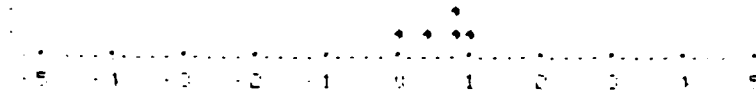
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = -31.7%
 STD. DEV. = 38.2%
 MIN. OBS. = -75%
 MAX. OBS. = -3%



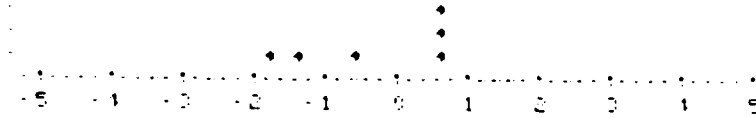
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = -9.2%
 STD. DEV. = 10.5%
 MIN. OBS. = -25%
 MAX. OBS. = 0%



OTHER INDUSTRY

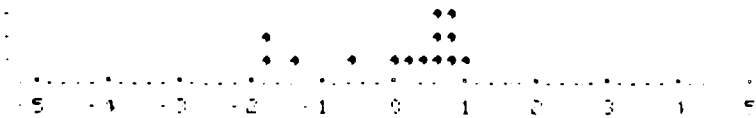
NO. OBS. = 6
 MEAN = -34.2%
 STD. DEV. = 28.7%
 MIN. OBS. = -75%
 MAX. OBS. = -10%



ALL RESPONSES

NO. OBS. = 14
 MIN. OBS. = -75%
 MAX. OBS. = 0%

OBSERVATIONS

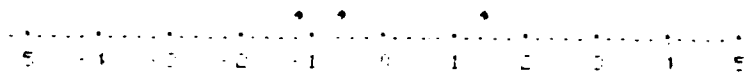


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = -24.7% STD. DEV. = 26.8%

27 - PERCENT CHANGE IN DETERMINING PROCESSING PARAMETERS FOR CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = -31%
 STD. DEV. = 24.8%
 MIN. OBS. = -50.0%
 MAX. OBS. = -3.0%



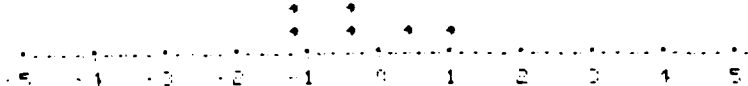
OTHER AEROSPACE

NO. OBS. = 6
 MEAN = -19.5%
 STD. DEV. = 18.2%
 MIN. OBS. = -48%
 MAX. OBS. = 0%



OTHER INDUSTRY

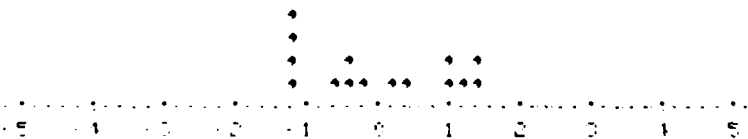
NO. OBS. = 6
 MEAN = -33.3%
 STD. DEV. = 16.0%
 MIN. OBS. = -50%
 MAX. OBS. = -10%



ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = -50%
 MAX. OBS. = 0%

OBSERVATIONS

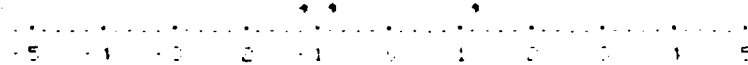


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = -27.3% STD. DEV. = 18.5%

PERCENT CHANGE IN DETERMINING PROCESSING PARAMETERS FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

E PRIMES & SUBS

S. = 3
 = -31.7%
 EV. = 23.6%
 BS. = -50%
 OBS. = -5%



AEROSPACE

BS. = 5
 = -17.6%
 DEV. = 19.4%
 OBS. = -48%
 OBS. = 0%



INDUSTRY

BS. = 6
 = -31.7%
 DEV. = 16.3%
 OBS. = -50%
 OBS. = -10%



OBSERVATIONS

RESPONSES

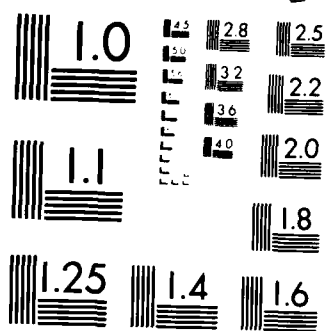
OBS. = 14
 OBS. = -50%
 OBS. = -5%



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -31.7%

STD. DEV. = 16.3%

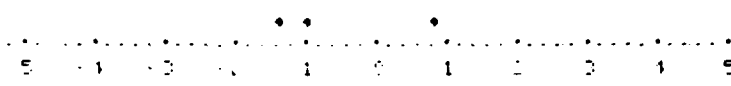


MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

Q27 - PERCENT CHANGE IN GENERATING TIME STANDARDS FOR CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = -31.7%
 STD. DEV. = 23.6%
 MIN. OBS. = -50%
 MAX. OBS. = -5%



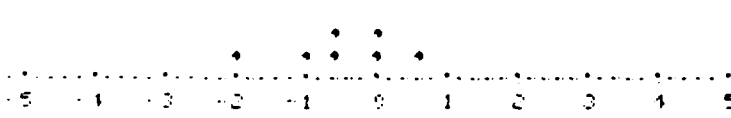
OTHER AEROSPACE

NO. OBS. = 6
 MEAN = -6%
 STD. DEV. = 9.5%
 MIN. OBS. = -25%
 MAX. OBS. = 0%



OTHER INDUSTRY

NO. OBS. = 7
 MEAN = -31.4%
 STD. DEV. = 16.5%
 MIN. OBS. = -60%
 MAX. OBS. = -10%



ALL RESPONSES

NO. OBS. = 16
 MIN. OBS. = -60%
 MAX. OBS. = 0%

OBSERVATIONS

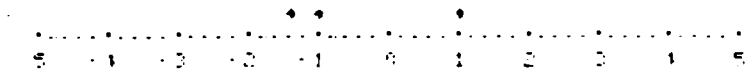


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = -21.9% STD. DEV. = 19.4%

Q27 - PERCENT CHANGE IN GENERATING TIME STANDARDS FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

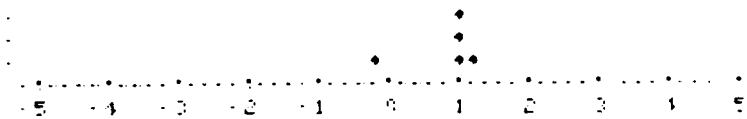
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 31.7%
 STD. DEV. = 23.6%
 MIN. OBS. = -50%
 MAX. OBS. = -5%



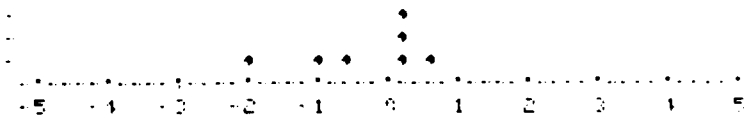
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = -7.6%
 STD. DEV. = 9.9%
 MIN. OBS. = -25%
 MAX. OBS. = 0%



OTHER INDUSTRY

NO. OBS. = 7
 MEAN = -29.3%
 STD. DEV. = 16.9%
 MIN. OBS. = -60%
 MAX. OBS. = -10%



ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = -60%
 MAX. OBS. = 0%

OBSERVATIONS

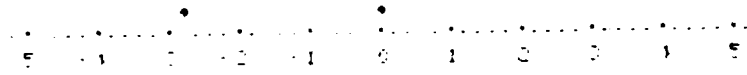


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = -22.5% STD. DEV. = 18.7%

Q27 - PERCENT CHANGE IN PERFORMING TOLERANCE ANALYSES FOR CYLINDRICAL PARTS -- SYSTEM 2

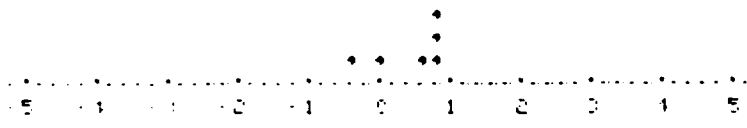
MISSILE PRIMES & SUBS

NO. OBS. = 2
 MEAN = -46%
 STD. DEV. = 41.0%
 MIN. OBS. = -7.5%
 MAX. OBS. = -17%



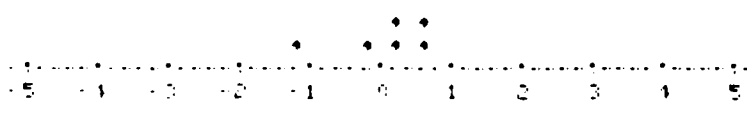
OTHER AEROSPACE

NO. OBS. = 6
 MEAN = -7.1%
 STD. DEV. = 11.0%
 MIN. OBS. = -25%
 MAX. OBS. = 0%



OTHER INDUSTRY

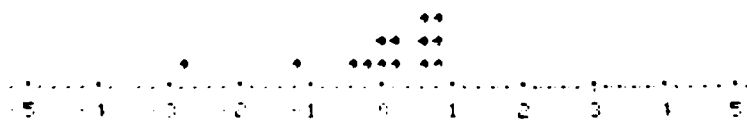
NO. OBS. = 6
 MEAN = -15%
 STD. DEV. = 13.4%
 MIN. OBS. = -40%
 MAX. OBS. = -5%



ALL RESPONSES

NO. OBS. = 14
 MIN. OBS. = -75%
 MAX. OBS. = 0%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = -16.0% STD. DEV. = 20.4%

Q27 - PERCENT CHANGE IN PERFORMING TOLERANCE ANALYSES FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS. = 2
 MEAN = -46%
 STD. DEV. = 41.0%
 MIN. OBS. = -75%
 MAX. OBS. = -17%



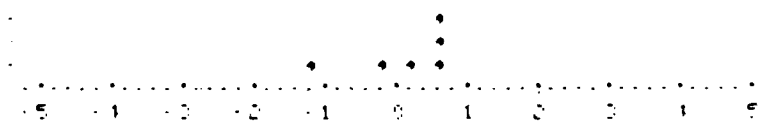
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = -6.1%
 STD. DEV. = 10.8%
 MIN. OBS. = -25%
 MAX. OBS. = 0%



OTHER INDUSTRY

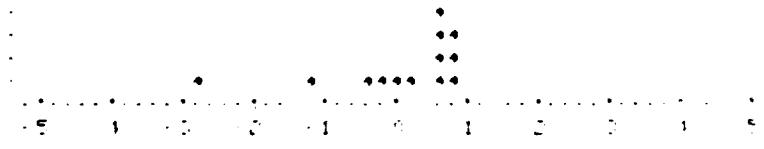
NO. OBS. = 6
 MEAN = -14.2%
 STD. DEV. = 13.9%
 MIN. OBS. = -40%
 MAX. OBS. = -5%



ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = -75%
 MAX. OBS. = 0%

OBSERVATIONS



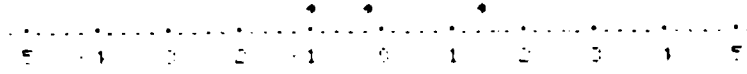
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -16.0% STD. DEV. = 21.3%

Q27 - PERCENT CHANGE IN DOCUMENTATION COSTS FOR CYLINDRICAL PARTS -- SYSTEM 2

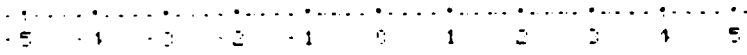
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = -25%
 STD. DEV. = 27.8%
 MIN. OBS. = -50%
 MAX. OBS. = 5%



OTHER AEROSPACE

NO. OBS. = 5
 MEAN = -14.5%
 STD. DEV. = 15.8%
 MIN. OBS. = -40%
 MAX. OBS. = -0.5%



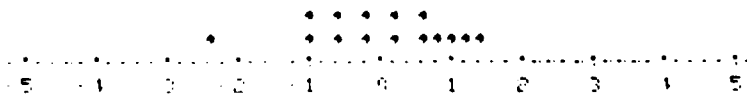
OTHER INDUSTRY

NO. OBS. = 7
 MEAN = -35.7%
 STD. DEV. = 23.7%
 MIN. OBS. = -80%
 MAX. OBS. = -10%



ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = -80%
 MAX. OBS. = 5%



OBSERVATIONS

STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -35.7

STD. DEV. = 23.7%

Q27 - PERCENT CHANGE IN DOCUMENTATION COSTS FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

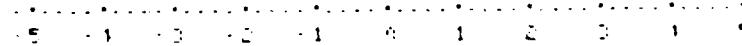
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = -28.3%
 STD. DEV. = 29.3%
 MIN. OBS. = -50%
 MAX. OBS. = 5%



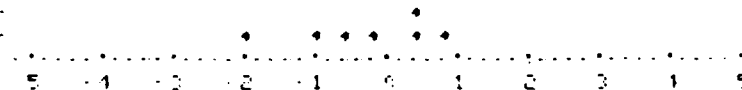
OTHER AEROSPACE

NO. OBS. = 4
 MEAN = -14.4%
 STD. DEV. = 18.3%
 MIN. OBS. = -40%
 MAX. OBS. = -0.5%



OTHER INDUSTRY

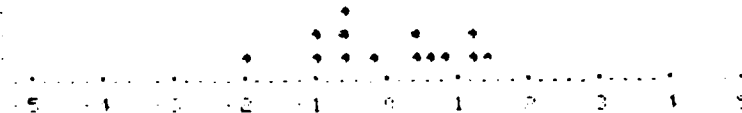
NO. OBS. = 7
 MEAN = -34.3%
 STD. DEV. = 20.7%
 MIN. OBS. = -70%
 MAX. OBS. = -10%



ALL RESPONSES

NO. OBS. = 14
 MIN. OBS. = -70%
 MAX. OBS. = 5%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -27.3% STD. DEV. = 22.0%

Q27 - PERCENT CHANGE IN MATERIAL FOR CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = -4.3%
 STD. DEV. = 1.2%
 MIN. OBS. = -5%
 MAX. OBS. = -3%



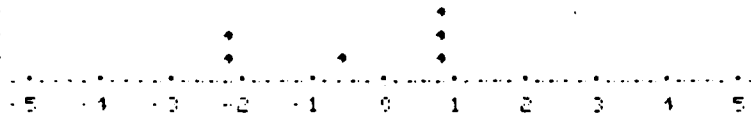
OTHER AEROSPACE

NO. OBS. = 7
 MEAN = -0.5%
 STD. DEV. = 1.1%
 MIN. OBS. = -3%
 MAX. OBS. = -0.5%



OTHER INDUSTRY

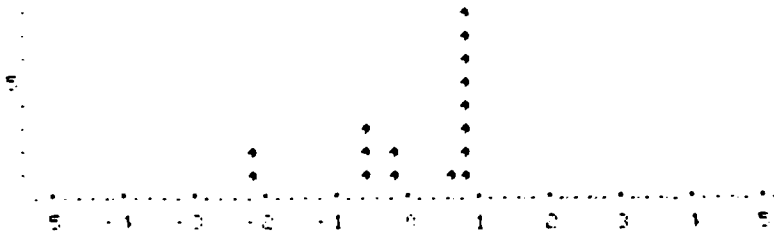
NO. OBS. = 6
 MEAN = -4.2%
 STD. DEV. = 4.9%
 MIN. OBS. = -10%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 16
 MIN. OBS. = -10%
 MAX. OBS. = 0%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -2.6% STD. DEV. = 3.5%

Q27 - PERCENT CHANGE IN MATERIAL FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

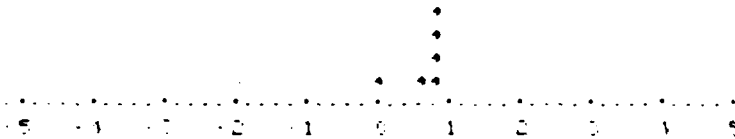
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = -4.3%
 STD. DEV. = 1.2%
 MIN. OBS. = -15%
 MAX. OBS. = -5%



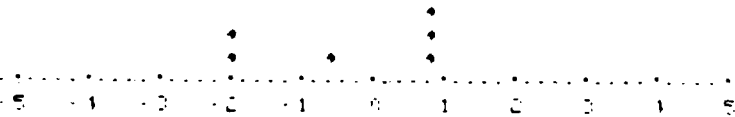
OTHER AEROSPACE

NO. OBS. = 6
 MEAN = -0.6%
 STD. DEV. = 1.2%
 MIN. OBS. = -3%
 MAX. OBS. = 0%



OTHER INDUSTRY

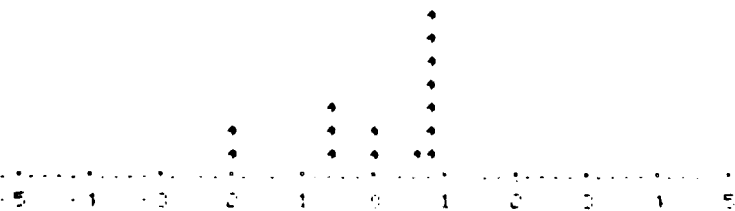
NO. OBS. = 6
 MEAN = -4.2%
 STD. DEV. = 4.9%
 MIN. OBS. = -10%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = -15%
 MAX. OBS. = 0%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -2.8%

STD. DEV. = 3.6%

Q27 - PERCENT CHANGE IN DIRECT LABOR FOR CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -7%
 STD. DEV. = 5.6%
 MIN. OBS. = -15%
 MAX. OBS. = -2%



OTHER AEROSPACE

NO. OBS. = 7
 MEAN = -7.6%
 STD. DEV. = 7.9%
 MIN. OBS. = -20%
 MAX. OBS. = 0%



OTHER INDUSTRY

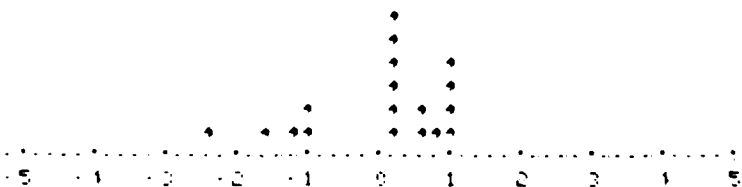
NO. OBS. = 7
 MEAN = -7.0%
 STD. DEV. = 9.6%
 MIN. OBS. = -25%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 18
 MIN. OBS. = -25%
 MAX. OBS. = 0%

OBSERVATIONS



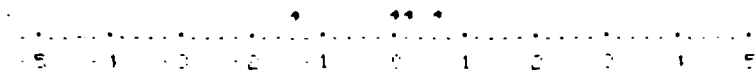
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -7.2% STD. DEV. = 7.7%

Q27 - PERCENT CHANGE IN DIRECT LABOR FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

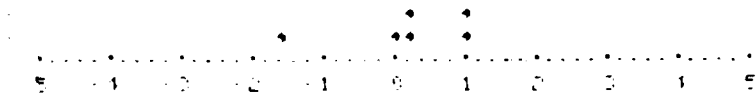
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -7%
 STD. DEV. = 5.6%
 MIN. OBS. = -15%
 MAX. OBS. = -2%



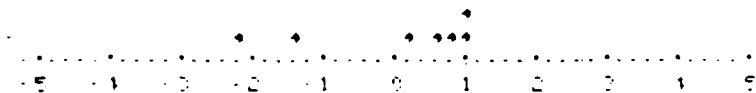
OTHER AEROSPACE

NO. OBS. = 6
 MEAN = -5.5%
 STD. DEV. = 6.3%
 MIN. OBS. = -17%
 MAX. OBS. = 0%



OTHER INDUSTRY

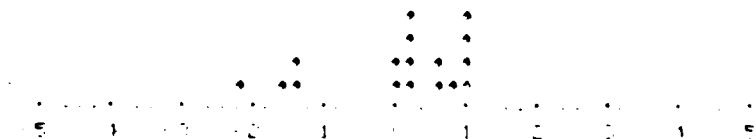
NO. OBS. = 7
 MEAN = -6.1%
 STD. DEV. = 8.1%
 MIN. OBS. = -25%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = -25%
 MAX. OBS. = 0%

OBSERVATIONS

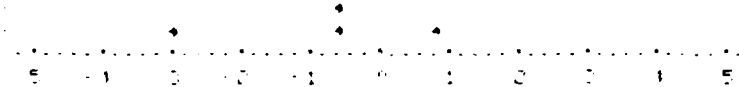


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = -6.1% STD. DEV = 6.5%

Q27 - PERCENT CHANGE IN SCRAP AND REWORK FOR CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -11.5%
 STD. DEV. = 9.9%
 MIN. OBS. = -25%
 MAX. OBS. = -1%



OTHER AEROSPACE

NO. OBS. = 7
 MEAN = -4.1%
 STD. DEV. = 4.4%
 MIN. OBS. = -10%
 MAX. OBS. = 0%



OTHER INDUSTRY

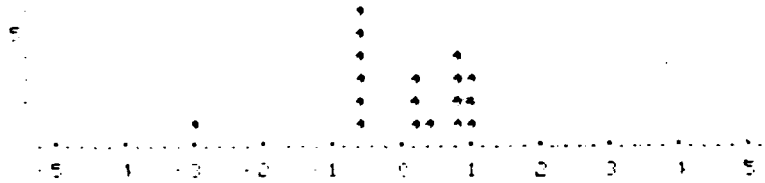
NO. OBS. = 7
 MEAN = -4.6%
 STD. DEV. = 4.2%
 MIN. OBS. = -10%
 MAX. OBS. = -5%



ALL RESPONSES

NO. OBS. = 18
 MIN. OBS. = -25%
 MAX. OBS. = 0%

OBSERVATIONS

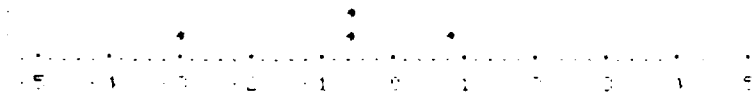


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = -5.9% STD. DEV. = 6.3%

27 - PERCENT CHANGE IN SCRAP AND REWORK FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

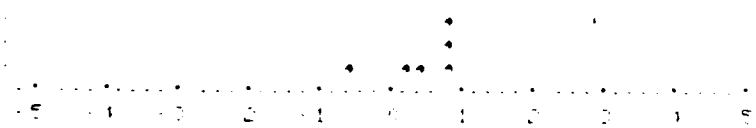
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -11.5%
 STD. DEV. = 9.9%
 MIN. OBS. = -25%
 MAX. OBS. = -1%



OTHER AEROSPACE

NO. OBS. = 6
 MEAN = -3.2%
 STD. DEV. = 3.8%
 MIN. OBS. = -10%
 MAX. OBS. = 0%



OTHER INDUSTRY

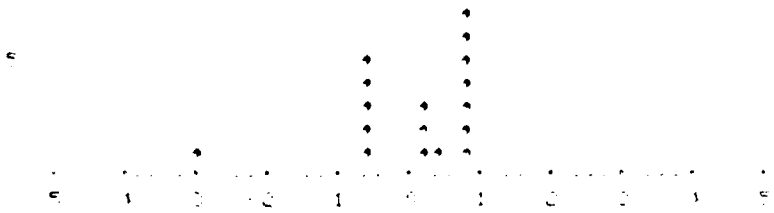
NO. OBS. = 7
 MEAN = -4.6%
 STD. DEV. = 4.2%
 MIN. OBS. = -10%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = -25%
 MAX. OBS. = 0%

OBSERVATIONS



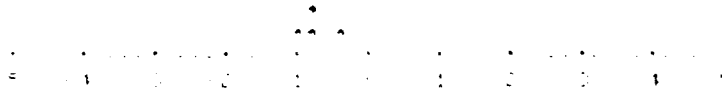
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -5.7% STD. DEV. = 6.4%

Q29 - MONTHS TO ACQUIRE HARDWARE -- SYSTEM 2 FOR CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 3.0 mo.
STD. DEV. = 0.8 mo.
MIN. OBS. = 2 mo.
MAX. OBS. = 4 mo.



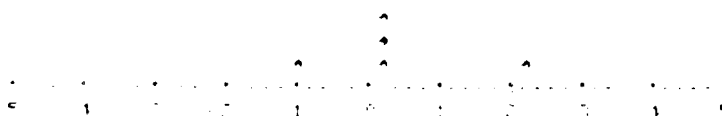
OTHER AEROSPACE

NO. OBS. = 2
MEAN = 7.3 mo.
STD. DEV. = 1.8 mo.
MIN. OBS. = 6 mo.
MAX. OBS. = 8.5 mo.



OTHER INDUSTRY

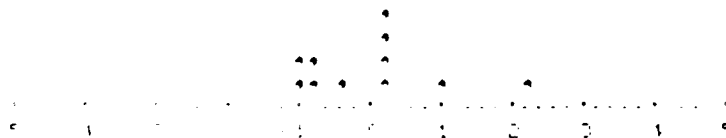
NO. OBS. = 5
MEAN = 6.4 mo.
STD. DEV. = 3.6 mo.
MIN. OBS. = 2 mo.
MAX. OBS. = 12 mo.



ALL RESPONSES

NO. OBS. = 11
MIN. OBS. = 2 mo
MAX. OBS. = 12 mo.

OBSERVATIONS



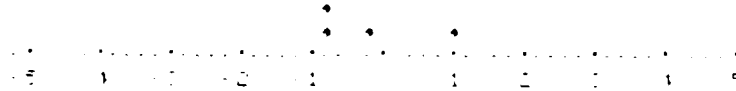
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 5.3 mo STD. DEV. = 3.0 mo.

Q29 - COST TO TEST SYSTEM -- SYSTEM 2 FOR NON-CYLINDRICAL PARTS

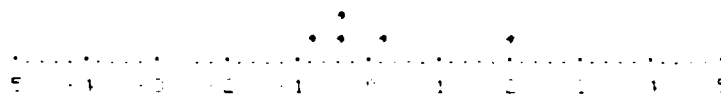
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$14.6K
 STD. DEV. = \$14.4K
 MIN. OBS. = \$ 4K
 MAX. OBS. = \$ 35K



OTHER AEROSPACE

NO. OBS. = 5
 MEAN = \$20.5K
 STD. DEV. = \$17.5K
 MIN. OBS. = \$ 6K
 MAX. OBS. = \$ 50K



OTHER INDUSTRY

NO. OBS. = 7
 MEAN = \$19.1K
 STD. DEV. = \$18.8K
 MIN. OBS. = \$ 2K
 MAX. OBS. = \$ 50K



ALL RESPONSES

NO. OBS. = 16
 MIN. OBS. = \$ 2K
 MAX. OBS. = \$ 50K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$10.4K STD. DEV. = \$16.4K

Q29 - COST TO TEST SYSTEM -- SYSTEM 2 FOR CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$10.7K
 STD. DEV. = \$10.2K
 MIN. OBS. = \$ 2K
 MAX. OBS. = \$ 25K



OTHER AEROSPACE

NO. OBS. = 6
 MEAN = \$13.3K
 STD. DEV. = \$ 6.4K
 MIN. OBS. = \$ 4K
 MAX. OBS. = \$ 20K



OTHER INDUSTRY

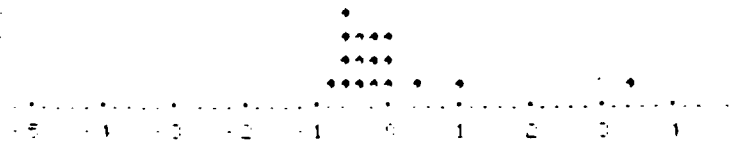
NO. OBS. = 7
 MEAN = \$25.4K
 STD. DEV. = \$35.6K
 MIN. OBS. = \$ 0.3K
 MAX. OBS. = \$ 100K



ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = \$0.3K
 MAX. OBS. = \$100K

OBSERVATIONS



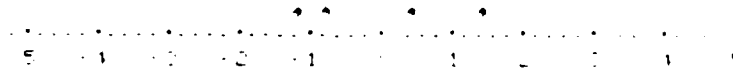
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$17.7K STD. DEV. = \$23.5K

Q29 - COST TO TRAIN PERSONNEL -- SYSTEM 2 FOR NON-CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$10.0K
 STD. DEV. = \$ 7.9K
 MIN. OBS. = \$ 2.5K
 MAX. OBS. = \$ 20K



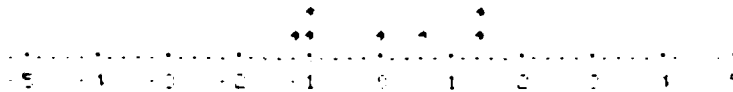
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = \$10.7K
 STD. DEV. = \$ 6.0K
 MIN. OBS. = \$ 4K
 MAX. OBS. = \$17.5K



OTHER INDUSTRY

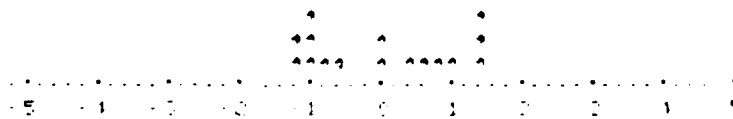
NO. OBS. = 7
 MEAN = \$10.4K
 STD. DEV. = \$ 8.0K
 MIN. OBS. = \$ 2K
 MAX. OBS. = \$ 20K



ALL RESPONSES

NO. OBS. = 16
 MIN. OBS. = \$ 2K
 MAX. OBS. = \$ 20K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

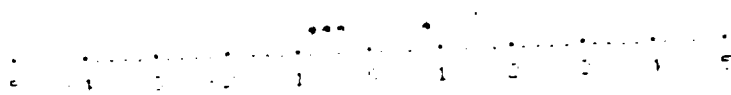
MEAN = \$10.4K

STD. DEV. = \$6.9K

Q29 - COST TO TRAIN PERSONNEL -- SYSTEM 2 FOR CYLINDRICAL PARTS

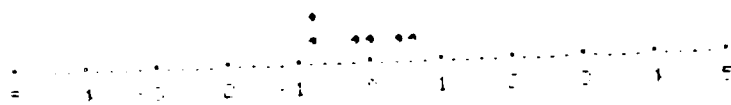
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$ 8.5K
 STD. DEV. = \$ 7.9K
 MIN. OBS. = \$ 2.5K
 MAX. OBS. = \$ 20K



OTHER AEROSPACE

NO. OBS. = 6
 MEAN = \$ 9.6K
 STD. DEV. = \$ 6.5K
 MIN. OBS. = \$ 2.0K
 MAX. OBS. = \$ 17.5K



OTHER INDUSTRY

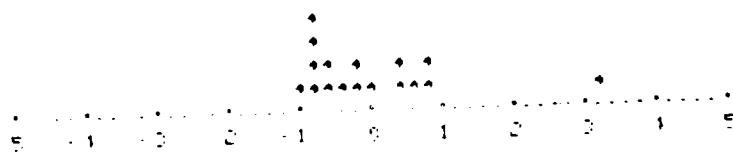
NO. OBS. = 7
 MEAN = \$14.3K
 STD. DEV. = \$17.3K
 MIN. OBS. = \$ 0.2K
 MAX. OBS. = \$ 50K



OBSERVATIONS

ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = \$ 0.2K
 MAX. OBS. = \$ 50K



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$11.25K STD. DEV = \$12.0K

Q29 - COST TO ESTABLISH INITIAL DATA FILES -- SYSTEM 2 FOR NON-CYLINDRICAL PARTS

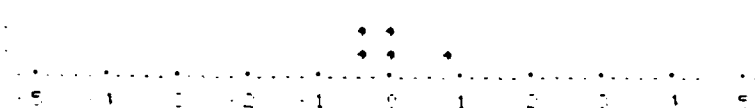
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$35.8K
 STD. DEV. = \$15.9K
 MIN. OBS. = \$ 13K
 MAX. OBS. = \$ 50K



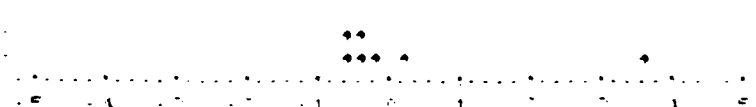
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = \$87.8K
 STD. DEV. = \$69.7K
 MIN. OBS. = \$ 27K
 MAX. OBS. = \$ 200K



OTHER INDUSTRY

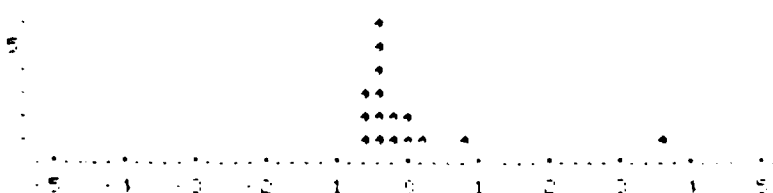
NO. OBS. = 7
 MEAN = \$118.5K
 STD. DEV. = \$216.0K
 MIN. OBS. = \$ 5K
 MAX. OBS. = \$ 600K



ALL RESPONSES

NO. OBS. = 16
 MIN. OBS. = \$5K
 MAX. OBS. = \$600K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

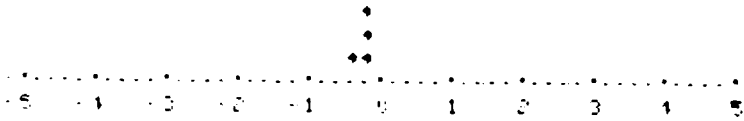
MEAN = \$88.2K

STD. DEV. = \$145.5K

Q29 - COST TO ESTABLISH INITIAL DATA FILES -- SYSTEM 2 FOR CYLINDRICAL PARTS

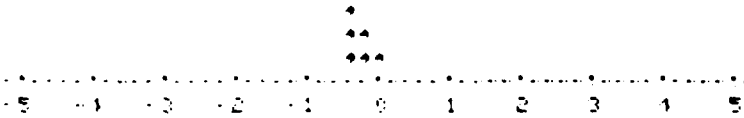
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$33.1K
 STD. DEV. = \$18.7K
 MIN. OBS. = \$ 6.5K
 MAX. OBS. = \$ 50K



OTHER AEROSPACE

NO. OBS. = 6
 MEAN = \$43.7K
 STD. DEV. = \$36.9K
 MIN. OBS. = \$12.0K
 MAX. OBS. = \$ 100K



OTHER INDUSTRY

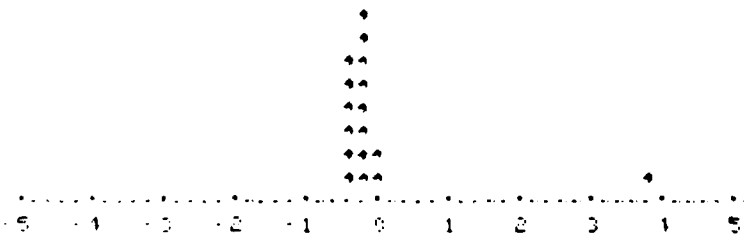
NO. OBS. = 7
 MEAN = \$231.5K
 STD. DEV. = \$516.9K
 MIN. OBS. = \$ 0.5K
 MAX. OBS. = \$1400K



ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = \$0.5K
 MAX. OBS. = \$1400K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

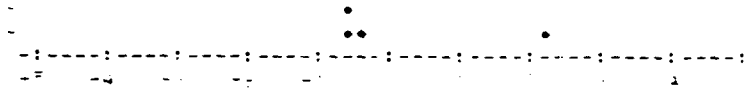
MEAN = \$118.5K

STD. DEV. = \$332.0K

Q29 - COST TO ACQUIRE HARDWARE -- SYSTEM 2 FOR NON-CYLINDRICAL PARTS

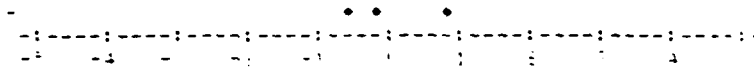
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = \$101.8K
STD. DEV. = \$165.7K
MIN. OBS. = \$12.0K
MAX. OBS. = \$350.0K



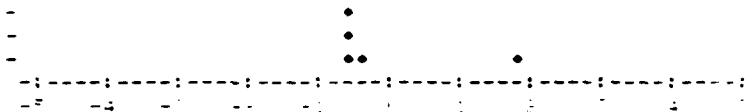
OTHER AEROSPACE

NO. OBS. = 3
MEAN =
STD. DEV. =
MIN. OBS. = \$ 27K
MAX. OBS. = \$ 200K



OTHER INDUSTRY

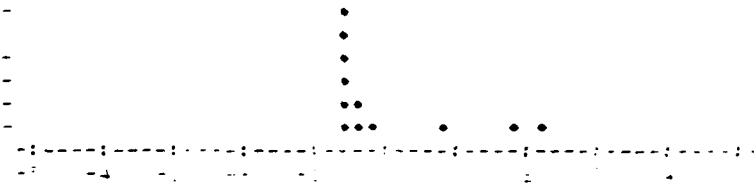
NO. OBS. = 5
MEAN = \$76.8K
STD. DEV. = \$125.9K
MIN. OBS. = \$ 9.0K
MAX. OBS. = \$ 300K



ALL RESPONSES

NO. OBS. = 12
MIN. OBS. = \$ 9.0K
MAX. OBS. = \$ 300K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$91K

STD. DEV. = \$122K

Q29 - COST TO ACQUIRE HARDWARE -- SYSTEM 2 FOR NON-CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$99.3K
 STD. DEV. = \$167.0K
 MIN. OBS. = \$ 7.5K
 MAX. OBS. = \$ 350K



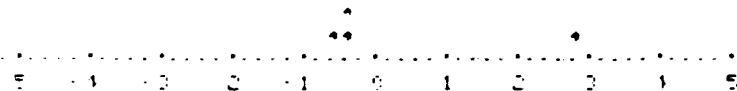
OTHER AEROSPACE

NO. OBS. = 4
 MEAN = \$56.2K
 STD. DEV. = \$97.9K
 MIN. OBS. = \$12.9K
 MAX. OBS. = \$ 200K



OTHER INDUSTRY

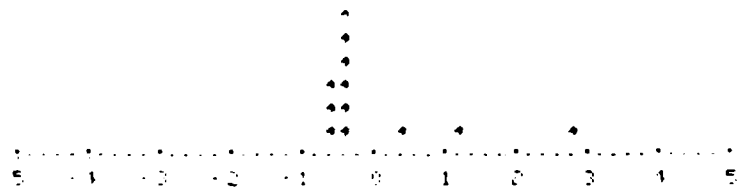
NO. OBS. = 4
 MEAN = \$193.8K
 STD. DEV. = \$338.0K
 MIN. OBS. = \$ 10K
 MAX. OBS. = \$ 700K



ALL RESPONSES

NO. OBS. = 12
 MIN. OBS. = \$ 7.5K
 MAX. OBS. = \$ 700K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$116.6K STD. DEV. = \$212.1K

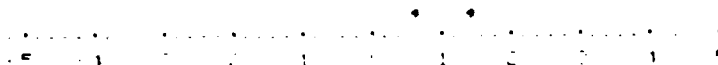
Q28 - IMPACT OF SYSTEM 2 ON OTHER AREAS (RANKED ON A SCALE OF -2 to +2, WHERE -2 = SIGNIFICANTLY NEGATIVE IMPACT, 0 = NO CHANGE, +2 = SIGNIFICANT IMPROVEMENT)

AREAS IMPACTED	MISSILE PRIME AND SUBS.					OTHER AEROSPACE					OTHER INDUSTRY					TOTAL							
	-2	-1	0	+1	+2	-2	-1	0	+1	+2	-2	-1	0	+1	+2	-2	-1	0	+1	+2			
PRODUCTION LEADTIME				1	3			1	6					5	4				1	12	7		
PROCESS PLANNING LEADTIME				1	3				5	2				3	6					9	11		
MACHINE UTILIZATION			2	1	1			3	4				3	2	4					8	7	5	
PRODUCT QUALITY			2	2				4	3				5	4						11	9		
DIRECT LABOR UTILIZATION			2	2				4	3				5	4						11	9		
UNIFORMITY OF PROCESS PLANS					4				3	4				3	6						6	14	
COST ESTIMATING PROCEDURES				2	1				6	1				1	3	5				1	11	7	
MAKE/BUY DECISIONS				2					1	6				1	3	5					1	6	11
PRODUCT STANDARDIZATION				2	1					5	2			3	3	3					3	10	6
CRITICAL LABOR SKILLS			1	2					4	2	1			1	7					1	12	4	2
MATERIAL STANDARDIZATION				2	1				4	2	1			5	3	1					9	7	3
PRODUCIBILITY OF PARTS			1	3					3	3	1			4	5						8	11	1
PLANT LAYOUT				3	1				4	2	1			2	6	1					9	9	2
MATERIAL HANDLING				1	2				5	1	1			1	6	2					7	9	3
PRODUCTION SCHEDULING				2				1		5	2				4	5					7	6	6
CAPACITY PLANNING				1	3				4	3				4	5						5	10	5

Q27 - PERCENT CHANGE IN WORK IN PROCESS INVENTORY FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

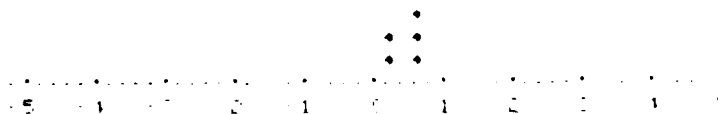
MISSILE PRIMES & SUBS

NO. OBS. = 2
 MEAN = 2.5%
 STD. DEV. = 3.5%
 MIN. OBS. = 0%
 MAX. OBS. = 5%



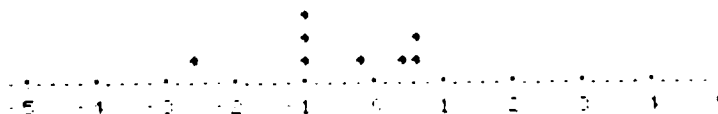
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = -0.8%
 STD. DEV. = 1.1%
 MIN. OBS. = -2%
 MAX. OBS. = 0%



OTHER INDUSTRY

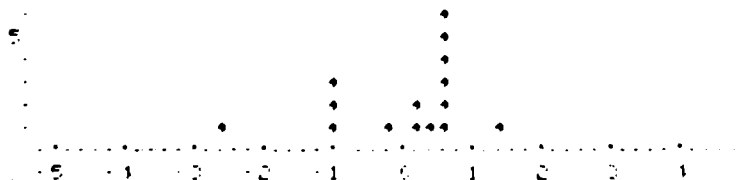
NO. OBS. = 8
 MEAN = -6.9%
 STD. DEV. = 7%
 MIN. OBS. = -20%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = -20%
 MAX. OBS. = 5%

OBSERVATIONS



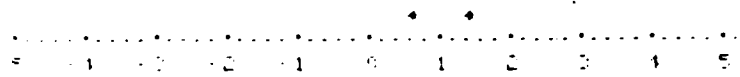
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -3.6% STD. DEV. = 6.3%

Q27 - PERCENT CHANGE IN WORK IN PROCESS INVENTORY FOR CYLINDRICAL PARTS -- SYSTEM 2

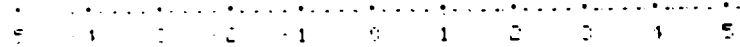
MISSILE PRIMES & SUBS

NO. OBS. = 2
 MEAN = 2.5%
 STD. DEV. = 3.5%
 MIN. OBS. = 0%
 MAX. OBS. = 5%



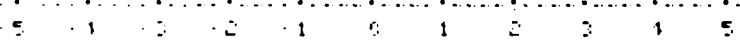
OTHER AEROSPACE

NO. OBS. = 6
 MEAN = -.7%
 STD. DEV. = 1.0%
 MIN. OBS. = -2%
 MAX. OBS. = 0%



OTHER INDUSTRY

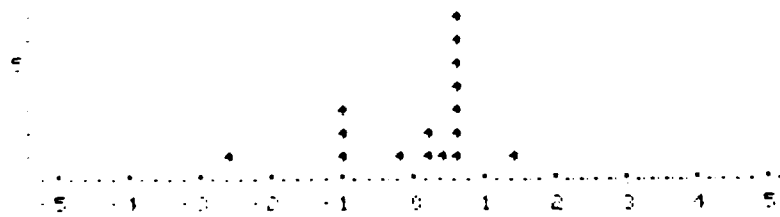
NO. OBS. = 8
 MEAN = -6.9%
 STD. DEV. = 7%
 MIN. OBS. = -20%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 16
 MIN. OBS. = -20%
 MAX. OBS. = 5%

OBSERVATIONS



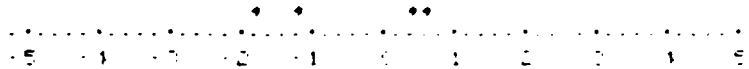
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -3.5% STD. DEV. = 6.2%

Q27 - PERCENT CHANGE IN TOOLING FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

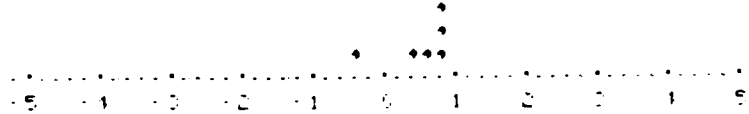
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -10%
 STD. DEV. = 8.9%
 MIN. OBS. = -20%
 MAX. OBS. = -2%



OTHER AEROSPACE

NO. OBS. = 6
 MEAN = -2.7%
 STD. DEV. = 3.8%
 MIN. OBS. = -10%
 MAX. OBS. = 0%



OTHER INDUSTRY

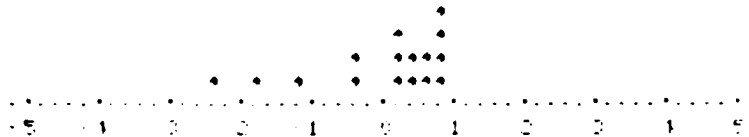
NO. OBS. = 6
 MEAN = -8.3%
 STD. DEV. = 8.8%
 MIN. OBS. = -25%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 16
 MIN. OBS. = -25%
 MAX. OBS. = 0%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -6.6%

STD. DEV. = 7.5%

Q27 - PERCENT CHANGE IN TOOLING FOR CYLINDRICAL PARTS -- SYSTEM 2

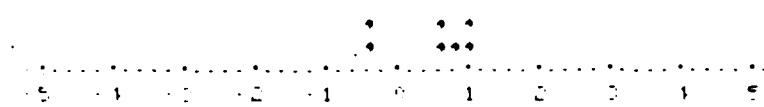
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -10%
 STD. DEV. = 8.9%
 MIN. OBS. = -20%
 MAX. OBS. = -2%



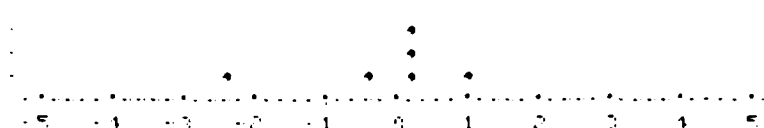
OTHER AEROSPACE

NO. OBS. = 7
 MEAN = -3.7%
 STD. DEV. = 4.4%
 MIN. OBS. = -10%
 MAX. OBS. = 0%



OTHER INDUSTRY

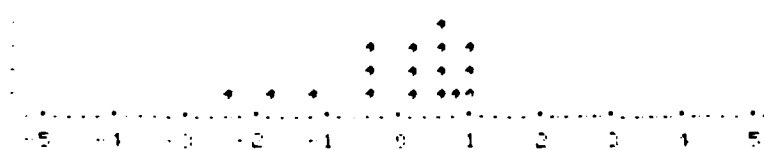
NO. OBS. = 6
 MEAN = -8.3%
 STD. DEV. = 9.8%
 MIN. OBS. = -25%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = -25%
 MAX. OBS. = 0%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -6.8%

STD. DEV. = 7.3%

Q29 - MONTHS TO ACQUIRE HARDWARE -- SYSTEM 2 FOR NON-CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 3.0 mo.
STD. DEV. = 0.8 mo.
MIN. OBS. = 2 mo.
MAX. OBS. = 4 mo.

OTHER AEROSPACE

NO. OBS. = 2
MEAN = 15.0 mo.
STD. DEV. = 12.7 mo.
MIN. OBS. = 6 mo.
MAX. OBS. = 24 mo.

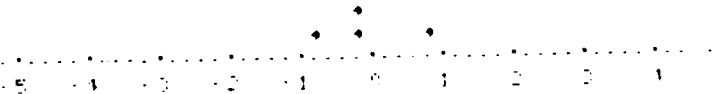
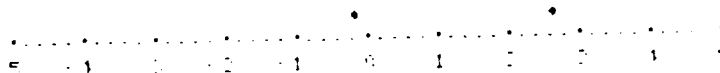
OTHER INDUSTRY

NO. OBS. = 4
MEAN = 6.5 mo.
STD. DEV. = 4.1 mo.
MIN. OBS. = 2 mo.
MAX. OBS. = 12 mo.

ALL RESPONSES

NO. OBS. = 10
MIN. OBS. = 2 mo.
MAX. OBS. = 24 mo.

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 6.8 mo.

STD. DEV. = 6.8 mo.

Q29 - MONTHS TO ESTABLISH DATA FILES FOR CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 5.6 mo.
STD. DEV. = 2.1 mo.
MIN. OBS. = 3 mo.
MAX. OBS. = 8 mo.



OTHER AEROSPACE

NO. OBS. = 6
MEAN = 7.6 mo.
STD. DEV. = 3.6 mo.
MIN. OBS. = 3.5 mo.
MAX. OBS. = 12 mo.



OTHER INDUSTRY

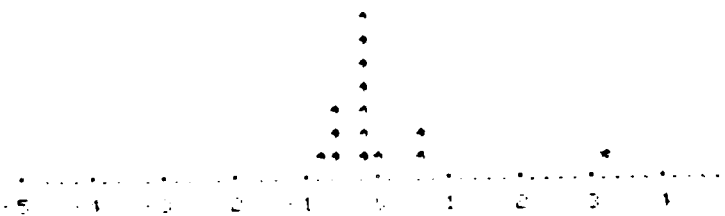
NO. OBS. = 5
MEAN = 9.4 mo.
STD. DEV. = 11.7 mo.
MIN. OBS. = 2 mo.
MAX. OBS. = 30 mo.



ALL RESPONSES

NO. OBS. = 15
MIN. OBS. = 2 mo.
MAX. OBS. = 30 mo.

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 7.7 mo.

STD. DEV. = 6.8 mo.

Q29 - MONTHS TO ESTABLISH DATA FILES FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 6.8 mo.
 STD. DEV. = 3.0 mo.
 MIN. OBS. = 3 mo.
 MAX. OBS. = 10 mo.



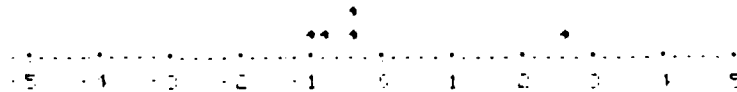
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = 11.6 mo.
 STD. DEV. = 7.8 mo.
 MIN. OBS. = 4 mo.
 MAX. OBS. = 24 mo.



OTHER INDUSTRY

NO. OBS. = 5
 MEAN = 9.4 mo.
 STD. DEV. = 11.7 mo.
 MIN. OBS. = 2 mo.
 MAX. OBS. = 30 mo.



ALL RESPONSES

NO. OBS. = 14
 MIN. OBS. = 2 mo.
 MAX. OBS. = 30 mo.

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 9.4 mo. STD. DEV. = 8.2 mo.

Q29 - MONTHS TO TRAIN PERSONNEL IN USE OF SYSTEM 2 FOR CYLINDRICAL PARTS

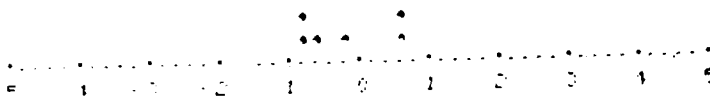
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 4.1 mo.
 STD. DEV. = 5.3 mo.
 MIN. OBS. = 1 mo.
 MAX. OBS. = 12 mo.



OTHER AEROSPACE

NO. OBS. = 6
 MEAN = 2.8 mo.
 STD. DEV. = 2.6 mo.
 MIN. OBS. = 0.5 mo.
 MAX. OBS. = 6 mo.



OTHER INDUSTRY

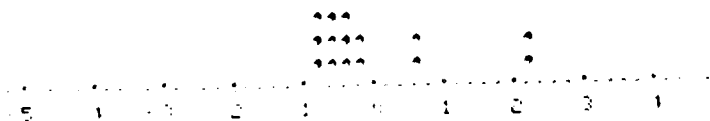
NO. OBS. = 5
 MEAN = 3.7 mo.
 STD. DEV. = 4.8 mo.
 MIN. OBS. = 0.25 mo.
 MAX. OBS. = 12 mo.



ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = 0.25 mo.
 MAX. OBS. = 12 mo.

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 3.5 mo. STD. DEV. = 3.9 mo.

Q29 - MONTHS TO TRAIN PERSONNEL IN USE OF SYSTEM 2 FOR NON-CYLINDRICAL PARTS

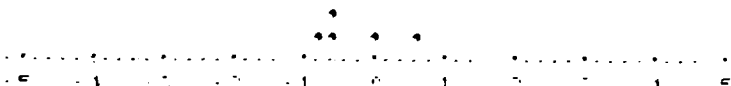
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 4.1 mo.
STD. DEV. = 5.3 mo.
MIN. OBS. = 1 mo.
MAX. OBS. = 12 mo.



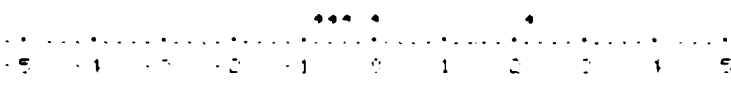
OTHER AEROSPACE

NO. OBS. = 5
MEAN = 2.3 mo.
STD. DEV. = 2.3 mo.
MIN. OBS. = 0.5 mo.
MAX. OBS. = 6 mo.



OTHER INDUSTRY

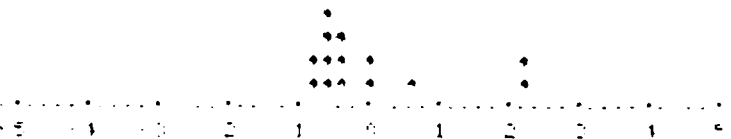
NO. OBS. = 5
MEAN = 3.7 mo.
STD. DEV. = 4.8 mo.
MIN. OBS. = 0.3 mo.
MAX. OBS. = 12 mo.



ALL RESPONSES

NO. OBS. = 14
MIN. OBS. = 0.3 mo.
MAX. OBS. = 12 mo.

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 3.3 mo.

STD. DEV. = 4.0 mo.

Q29 - MONTHS TO TEST SYSTEM FOR CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 2.9 mo.
 STD. DEV. = 2.3 mo.
 MIN. OBS. = 1 mo.
 MAX. OBS. = 6 mo.



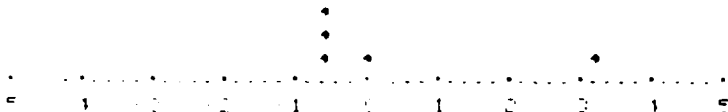
OTHER AEROSPACE

NO. OBS. = 6
 MEAN = 6.5 mo.
 STD. DEV. = 4.5 mo.
 MIN. OBS. = 2 mo.
 MAX. OBS. = 12 mo.



OTHER INDUSTRY

NO. OBS. = 5
 MEAN = 8.4 mo.
 STD. DEV. = 12.2 mo.
 MIN. OBS. = 2 mo.
 MAX. OBS. = 30 mo.



ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = 1 mo.
 MAX. OBS. = 30 mo.

OBSERVATIONS



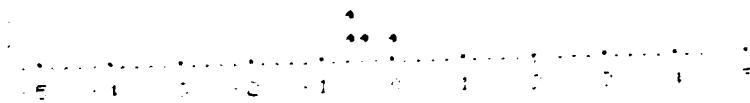
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 6.2 mo. STD. DEV. = 7.5 mo.

Q29 - MONTHS TO TEST SYSTEM FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 2.9 mo.
 STD. DEV. = 2.3 mo.
 MIN. OBS. = 1 mo.
 MAX. OBS. = 6 mo.



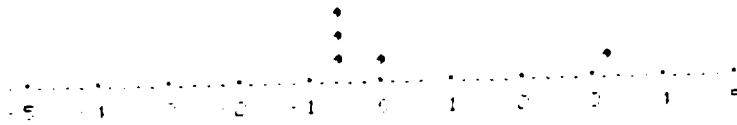
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = 5.6 mo.
 STD. DEV. = 3.8 mo.
 MIN. OBS. = 3 mo.
 MAX. OBS. = 12 mo.



OTHER INDUSTRY

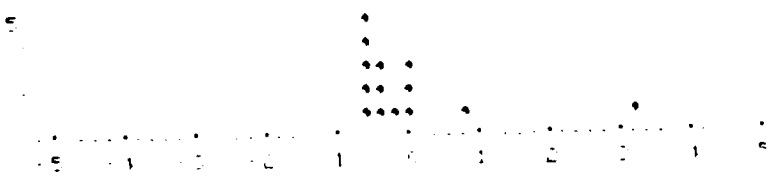
NO. OBS. = 5
 MEAN = 8.4 mo.
 STD. DEV. = 12.2 mo.
 MIN. OBS. = 2 mo.
 MAX. OBS. = 30 mo.



ALL RESPONSES

NO. OBS. = 14
 MIN. OBS. = 1 mo.
 MAX. OBS. = 30 mo.

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 5.8 mo.

STD. DEV. = 7.6 mo.

Q29 - ANNUAL COMPUTER CHARGES AND MAINTENANCE COST FOR CYLINDRICAL PARTS -- SYSTEM 2

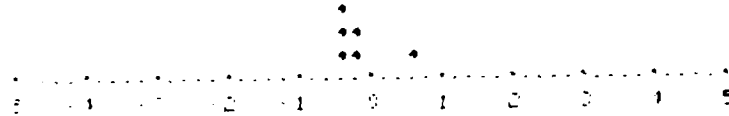
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$ 38.2K
 STD. DEV. = \$ 17.6K
 MIN. OBS. = \$ 24.0K
 MAX. OBS. = \$ 65.6K



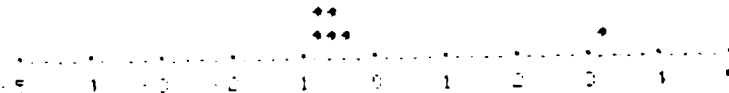
OTHER AEROSPACE

NO. OBS. = 6
 MEAN = \$ 23.8K
 STD. DEV. = \$ 14.2K
 MIN. OBS. = \$ 12.0K
 MAX. OBS. = \$ 50.0K



OTHER INDUSTRY

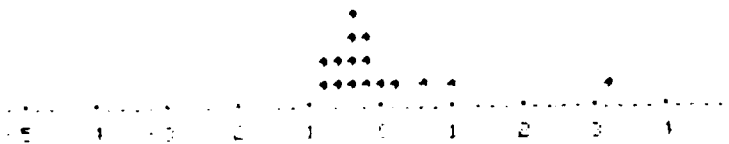
NO. OBS. = 6
 MEAN = \$ 28.8K
 STD. DEV. = \$ 54.7K
 MIN. OBS. = \$ 0.7K
 MAX. OBS. = \$140.0K



ALL RESPONSES

NO. OBS. = 16
 MIN. OBS. = \$ 0.7K
 MAX. OBS. = \$140.0K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

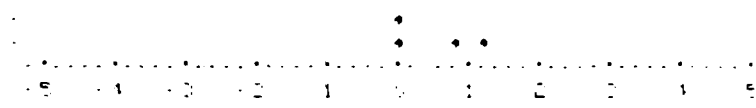
MEAN = \$ 28.9K

STD. DEV. = \$ 34.1K

Q29 - ANNUAL COMPUTER CHARGES AND MAINTENANCE COST FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

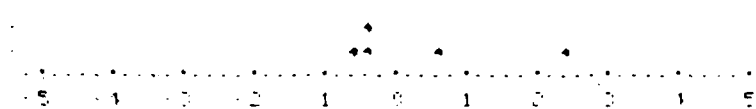
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$50.0K
 STD. DEV. = \$17.1K
 MIN. OBS. = \$35.0K
 MAX. OBS. = \$68.8K



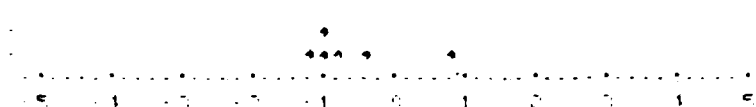
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = \$43.8K
 STD. DEV. = \$33.6K
 MIN. OBS. = \$20.0K
 MAX. OBS. = \$100.0K



OTHER INDUSTRY

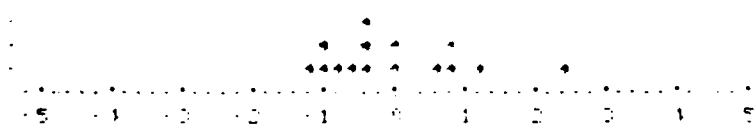
NO. OBS. = 6
 MEAN = \$19.3K
 STD. DEV. = \$21.4K
 MIN. OBS. = \$ 0.7K
 MAX. OBS. = \$60.0K



ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = \$ 0.7K
 MAX. OBS. = \$100.0K

OBSERVATIONS

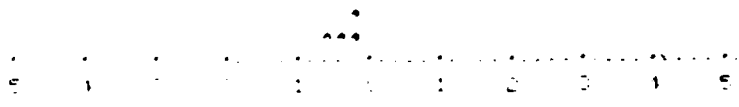


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$ 35.6K STD. DEV. = \$ 27.8K

Q29 - ANNUAL COST TO UPDATE DATA FILES FOR CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$11.3K
 STD. DEV. = \$ 7.6K
 MIN. OBS. = \$ 1.0K
 MAX. OBS. = \$18.0K



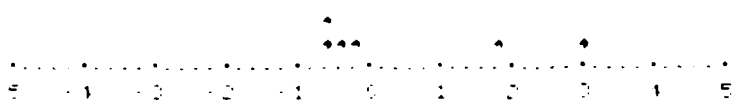
OTHER AEROSPACE

NO. OBS. = 6
 MEAN = \$18.3K
 STD. DEV. = \$18.0K
 MIN. OBS. = \$ 4.0K
 MAX. OBS. = \$50.0K



OTHER INDUSTRY

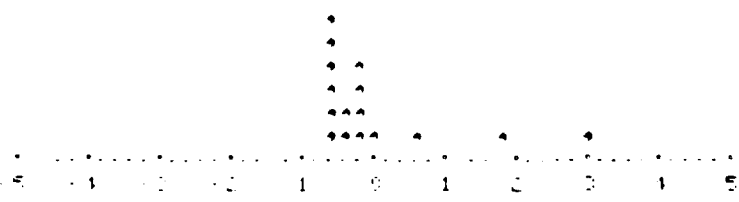
NO. OBS. = 6
 MEAN = \$45.6K
 STD. DEV. = \$58.7K
 MIN. OBS. = \$ 0.1K
 MAX. OBS. = \$140.0K



ALL RESPONSES

NO. OBS. = 16
 MIN. OBS. = \$ 0.1K
 MAX. OBS. = \$140.0K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$ 26.8K STD. DEV. = \$ 38.9K

Q29 - ANNUAL COST TO UPDATE DATA FILES FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

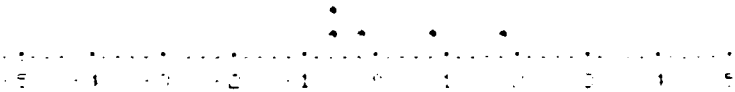
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = \$13.8K
STD. DEV. = \$ 9.8K
MIN. OBS. = \$ 2.0K
MAX. OBS. = \$24.0K



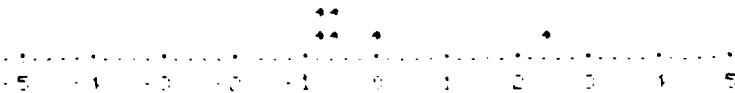
OTHER AEROSPACE

NO. OBS. = 5
MEAN = \$21.1K
STD. DEV. = \$19.2K
MIN. OBS. = \$ 6.0K
MAX. OBS. = \$50.0K



OTHER INDUSTRY

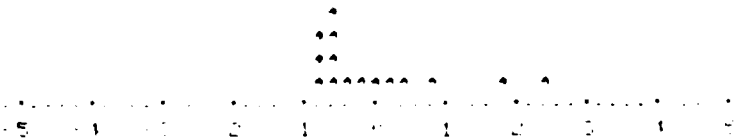
NO. OBS. = 6
MEAN = \$16.1K
STD. DEV. = \$ 2.2K
MIN. OBS. = \$ 1.9K
MAX. OBS. = \$60.0K



ALL RESPONSES

NO. OBS. = 15
MIN. OBS. = \$ 1.9K
MAX. OBS. = \$60.0K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = \$ 17.1K STD. DEV. = \$ 17.7K

31 - PERCENT CHANGE IN PROCESS PLANNING FOR CYLINDRICAL PARTS -- SYSTEM 3

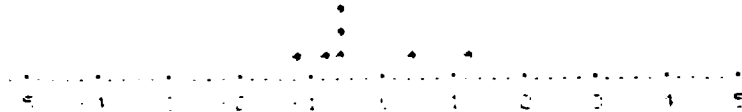
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = -45%
 STD. DEV. = 23%
 MIN. OBS. = -70%
 MAX. OBS. = -25%



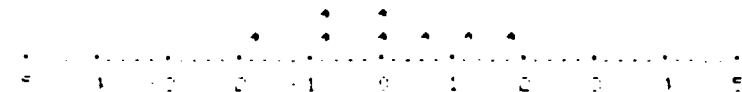
OTHER AEROSPACE

NO. OBS. = 7
 MEAN = -65%
 STD. DEV. = 17%
 MIN. OBS. = -84%
 MAX. OBS. = -35%



OTHER INDUSTRY

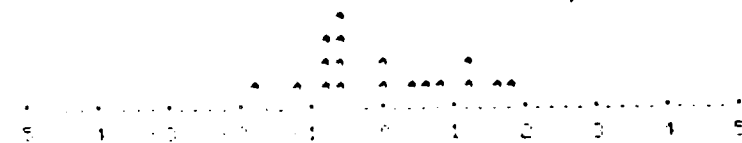
NO. OBS. = 8
 MEAN = -58%
 STD. DEV. = 24%
 MIN. OBS. = -95%
 MAX. OBS. = -20%



ALL RESPONSES

NO. OBS. = 18
 MIN. OBS. = -95%
 MAX. OBS. = -20%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -58% STD. DEV. = 21%

Q31 - PERCENT CHANGE IN PROCESS PLANNING FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

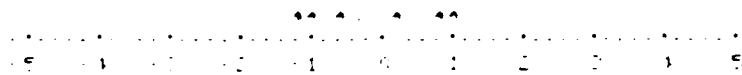
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = -45%
STD. DEV. = 33%
MIN. OBS. = -70%
MAX. OBS. = -25%



OTHER AEROSPACE

NO. OBS. = 6
MEAN = -60%
STD. DEV. = 21%
MIN. OBS. = -84%
MAX. OBS. = -35%



OTHER INDUSTRY

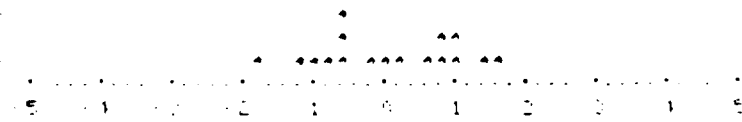
NO. OBS. = 8
MEAN = -57%
STD. DEV. = 24%
MIN. OBS. = -95%
MAX. OBS. = -20%



ALL RESPONSES

NO. OBS. = 17
MIN. OBS. = -95%
MAX. OBS. = -20%

OBSERVATIONS

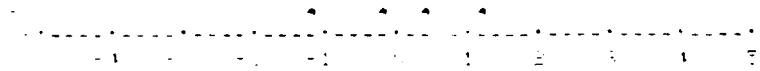


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = -56% STD. DEV. = 22%

11 - PERCENT CHANGE IN DETERMINING OPERATION SEQUENCES FOR CYLINDRICAL PARTS -- SYSTEM 3

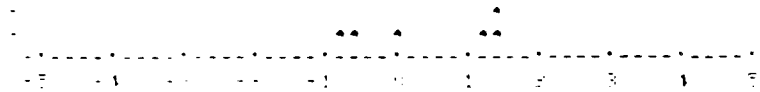
ISSILE PRIMES & SUBS

O. OBS. = 4
 EAN = -49%
 TD. DEV. = 33%
 IN. OBS. = -90%
 AX. OBS. = -10%



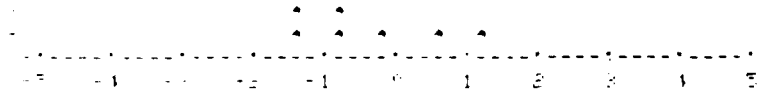
OTHER AEROSPACE

O. OBS. = 6
 EAN = -36%
 TD. DEV. = 35%
 IN. OBS. = -80%
 AX. OBS. = -4%



OTHER INDUSTRY

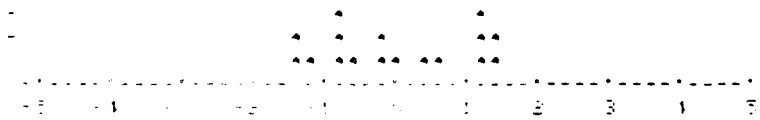
O. OBS. = 7
 EAN = -64%
 TD. DEV. = 32%
 IN. OBS. = -95%
 AX. OBS. = -10%



OBSERVATIONS

ALL RESPONSES

O. OBS. = 17
 IN. OBS. = -95%
 AX. OBS. = -4%

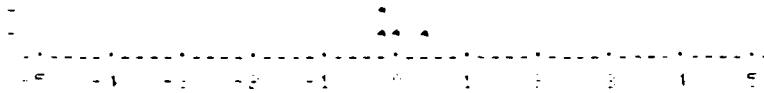


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = -51% STD. DEV. = 34%

Q31 - PERCENT REDUCTION IN MATERIAL COST FOR CYLINDRICAL PARTS -- SYSTEM 3

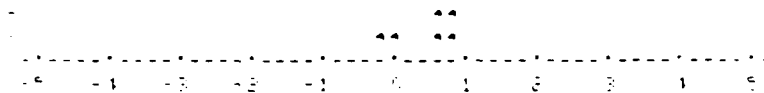
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = - 4.0%
 STD. DEV. = 1.4%
 MIN. OBS. = - 5%
 MAX. OBS. = - 2%



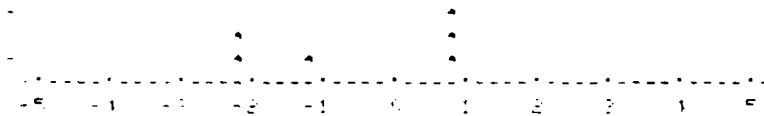
OTHER AEROSPACE

NO. OBS. = 6
 MEAN = - 1.8%
 STD. DEV. = 2.1%
 MIN. OBS. = - 5%
 MAX. OBS. = 0%



OTHER INDUSTRY

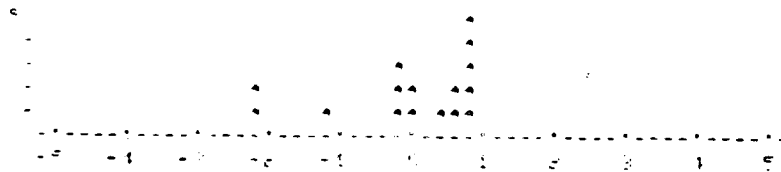
NO. OBS. = 6
 MEAN = - 6.7%
 STD. DEV. = 7.5%
 MIN. OBS. = -15%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 16
 MIN. OBS. = -15%
 MAX. OBS. = 0%

OBSERVATIONS

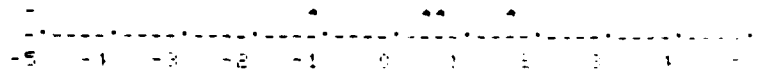


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = - 4.2% STD. DEV. = 5.0%

Q31 - PERCENT REDUCTION IN DOCUMENTATION COSTS FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

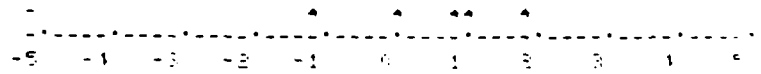
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -45%
 STD. DEV. = 35%
 MIN. OBS. = -90%
 MAX. OBS. = -5%



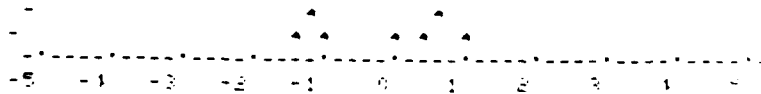
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = -40%
 STD. DEV. = 34%
 MIN. OBS. = -90%
 MAX. OBS. = -2%



OTHER INDUSTRY

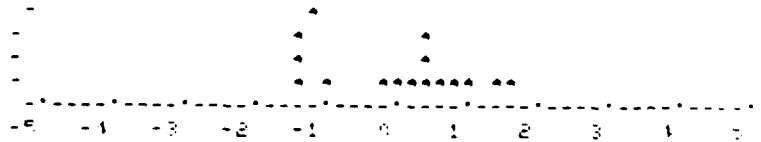
NO. OBS. = 7
 MEAN = -59%
 STD. DEV. = 29%
 MIN. OBS. = -90%
 MAX. OBS. = -20%



ALL RESPONSES

NO. OBS. = 16
 MIN. OBS. = -90%
 MAX. OBS. = -2%

OBSERVATIONS

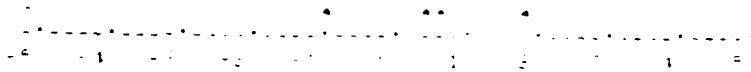


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = -50% STD. DEV. = 31%

Q31 - PERCENT REDUCTION IN DOCUMENTATION COSTS FOR CYLINDRICAL PARTS -- SYSTEM 3

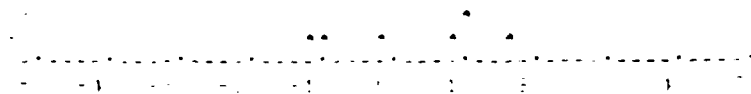
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -45%
STD. DEV. = 35%
MIN. OBS. = -90%
MAX. OBS. = -5%



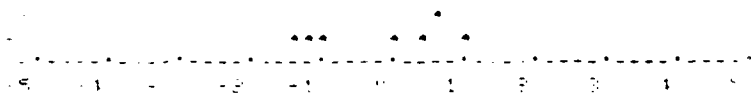
OTHER AEROSPACE

NO. OBS. = 6
MEAN = -48%
STD. DEV. = 35%
MIN. OBS. = -90%
MAX. OBS. = -2%



OTHER INDUSTRY

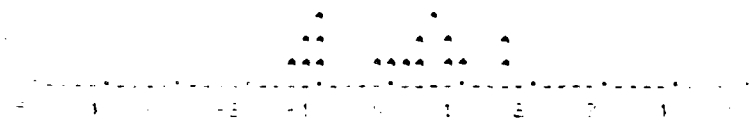
NO. OBS. = 7
MEAN = -59%
STD. DEV. = 29%
MIN. OBS. = -95%
MAX. OBS. = -20%



OBSERVATIONS

ALL RESPONSES

NO. OBS. = 17
MIN. OBS. = -95%
MAX. OBS. = -2%



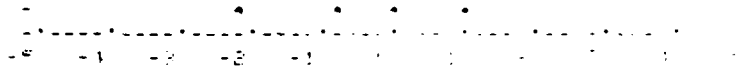
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -52% STD. DEV. = 31%

Q31 - PERCENT REDUCTION IN PERFORMING TOLERANCE ANALYSES FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

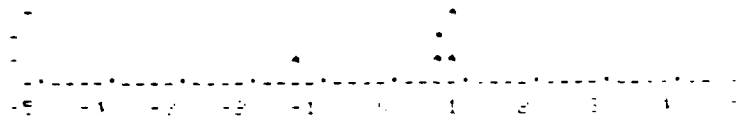
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -36%
 STD. DEV. = 30%
 MIN. OBS. = -75%
 MAX. OBS. = -3%



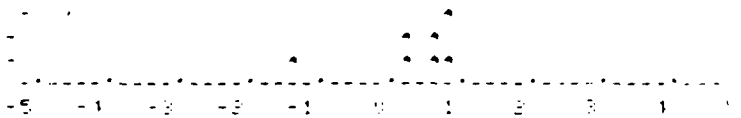
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = -13%
 STD. DEV. = 21%
 MIN. OBS. = -50%
 MAX. OBS. = -2%



OTHER INDUSTRY

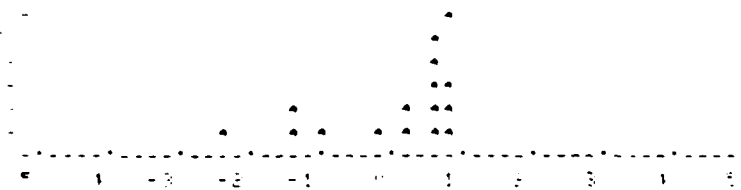
NO. OBS. = 7
 MEAN = -14%
 STD. DEV. = 17%
 MIN. OBS. = -50%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 16
 MIN. OBS. = -75%
 MAX. OBS. = 0%

OBSERVATIONS



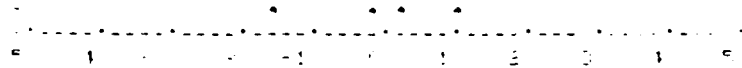
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -19% STD. DEV. = 22%

Q31 - PERCENT REDUCTION IN PERFORMING TOLERANCE ANALYSES FOR CYLINDRICAL PARTS -- SYSTEM 3

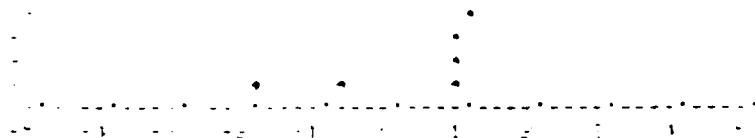
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = -36%
STD. DEV. = 30%
MIN. OBS. = -75%
MAX. OBS. = -3%



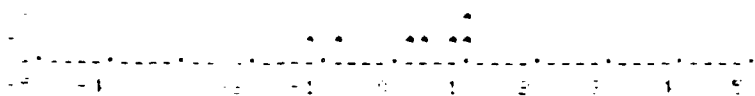
OTHER AEROSPACE

NO. OBS. = 6
MEAN = -25%
STD. DEV. = 35%
MIN. OBS. = -95%
MAX. OBS. = -2%



OTHER INDUSTRY

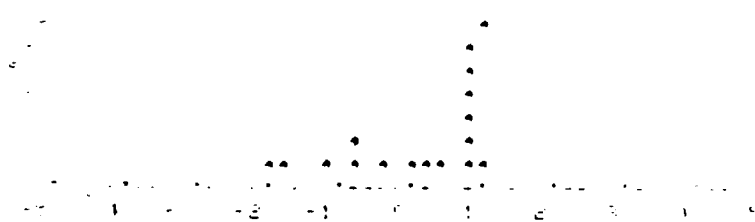
NO. OBS. = 7
MEAN = -22%
STD. DEV. = 23%
MIN. OBS. = -50%
MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 17
MIN. OBS. = -95%
MAX. OBS. = 0%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

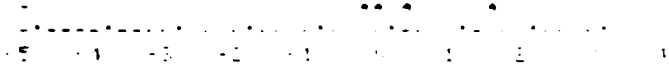
MEAN = -26%

STD. DEV. = 28%

Q31 - PERCENT REDUCTION IN PREPARING TIME STANDARDS FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

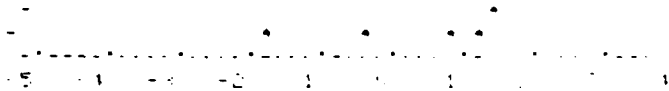
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -38%
 STD. DEV. = 23%
 MIN. OBS. = -55%
 MAX. OBS. = -5%



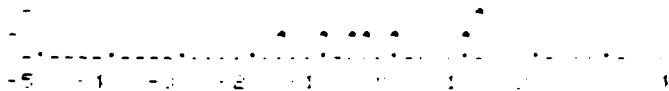
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = -34%
 STD. DEV. = 36%
 MIN. OBS. = -90%
 MAX. OBS. = -5%



OTHER INDUSTRY

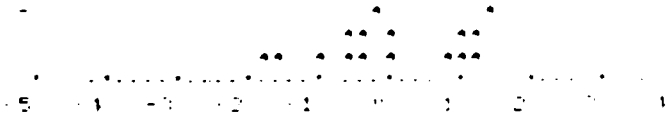
NO. OBS. = 7
 MEAN = -49%
 STD. DEV. = 28%
 MIN. OBS. = -85%
 MAX. OBS. = -10%



ALL RESPONSES

NO. OBS. = 16
 MIN. OBS. = -90%
 MAX. OBS. = -5%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = -41% STD. DEV. = 28%

Q31 - PERCENT REDUCTION IN PREPARING TIME STANDARDS FOR CYLINDRICAL PARTS -- SYSTEM 3

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -38%
 STD. DEV. = 23%
 MIN. OBS. = -55%
 MAX. OBS. = -5%



OTHER AEROSPACE

NO. OBS. = 6
 MEAN = -33%
 STD. DEV. = 27%
 MIN. OBS. = -70%
 MAX. OBS. = -5%



OTHER INDUSTRY

NO. OBS. = 7
 MEAN = -49%
 STD. DEV. = 28%
 MIN. OBS. = -85%
 MAX. OBS. = -10%



ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = -85%
 MAX. OBS. = -5%

OBSERVATIONS

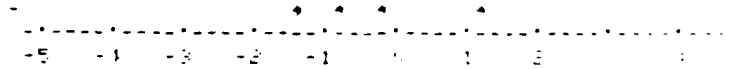


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = -41% STD. DEV. = 26%

Q31 - PERCENT REDUCTION IN DETERMINING PROCESS PARAMETERS FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

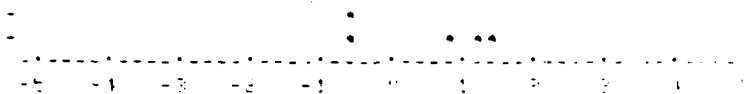
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -48%
 STD. DEV. = 30%
 MIN. OBS. = -75%
 MAX. OBS. = -5%



OTHER AEROSPACE

NO. OBS. = 5
 MEAN = -24%
 STD. DEV. = 24%
 MIN. OBS. = -50%
 MAX. OBS. = 0%



OTHER INDUSTRY

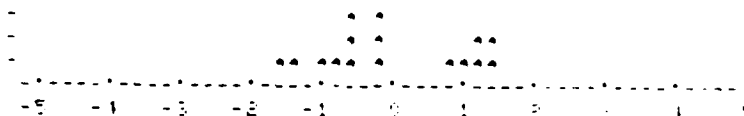
NO. OBS. = 7
 MEAN = -40%
 STD. DEV. = 28%
 MIN. OBS. = -80%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 16
 MIN. OBS. = -80%
 MAX. OBS. = 0%

OBSERVATIONS



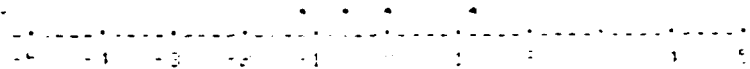
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -36% STD. DEV. = 27%

Q31 - PERCENT REDUCTION IN DETERMINING PROCESS PARAMETERS FOR CYLINDRICAL PARTS -- SYSTEM 3

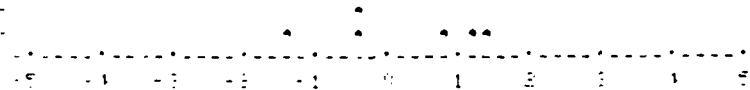
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -44%
 STD. DEV. = 20%
 MIN. OBS. = -75%
 MAX. OBS. = -5%



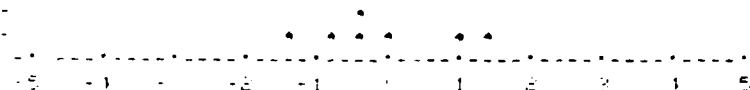
OTHER AEROSPACE

NO. OBS. = 6
 MEAN = -33%
 STD. DEV. = 32%
 MIN. OBS. = -80%
 MAX. OBS. = 0%



OTHER INDUSTRY

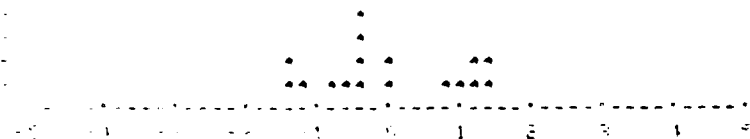
NO. OBS. = 7
 MEAN = -41%
 STD. DEV. = 28%
 MIN. OBS. = -80%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = -80%
 MAX. OBS. = 0%

OBSERVATIONS



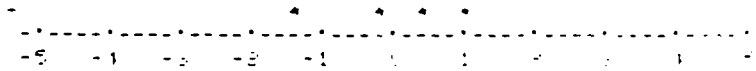
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -39% STD. DEV. = 28%

Q31 - PERCENT REDUCTION IN SELECTING TOOLS FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

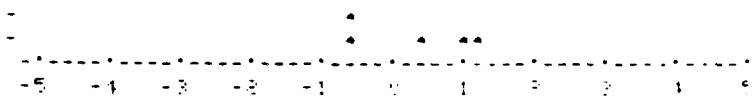
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -36%
 STD. DEV. = 30%
 MIN. OBS. = -75%
 MAX. OBS. = -5%



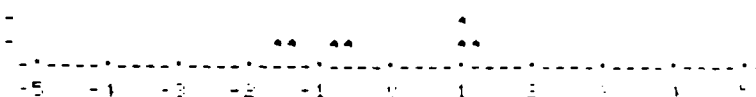
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = -29%
 STD. DEV. = 22%
 MIN. OBS. = -50%
 MAX. OBS. = 4%



OTHER INDUSTRY

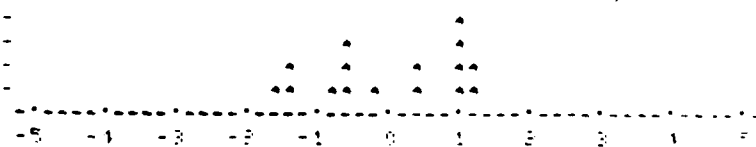
NO. OBS. = 7
 MEAN = -41%
 STD. DEV. = 33%
 MIN. OBS. = -80%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 16
 MIN. OBS. = -80%
 MAX. OBS. = 0%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = -36% STD. DEV. = 28%

Q31 - PERCENT REDUCTION IN SELECTING TOOLS FOR CYLINDRICAL PARTS -- SYSTEM 3

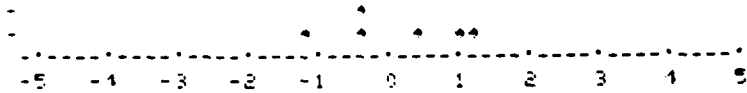
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -36%
 STD. DEV. = 80%
 MIN. OBS. = -75%
 MAX. OBS. = -5%



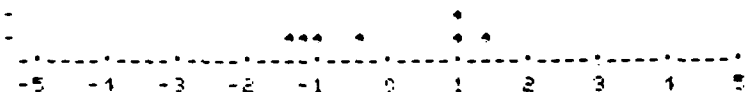
OTHER AEROSPACE

NO. OBS. = 6
 MEAN = -35%
 STD. DEV. = 26%
 MIN. OBS. = -70%
 MAX. OBS. = -4%



OTHER INDUSTRY

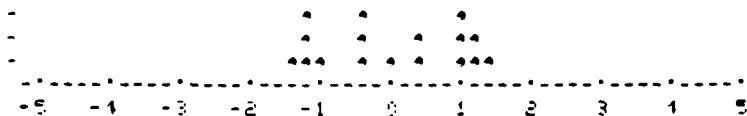
NO. OBS. = 7
 MEAN = -41%
 STD. DEV. = 34%
 MIN. OBS. = -80%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = -80%
 MAX. OBS. = 0%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

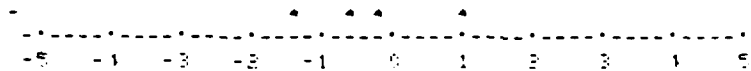
MEAN = -38%

STD. DEV. = 34%

Q31 - PERCENT CHANGE IN SELECTING MACHINES FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

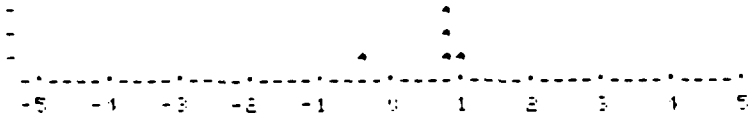
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -43%
 STD. DEV. = 31%
 MIN. OBS. = -75%
 MAX. OBS. = -2%



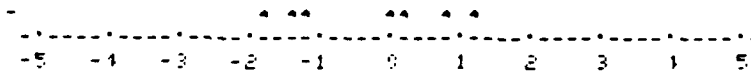
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = -16%
 STD. DEV. = 19%
 MIN. OBS. = -50%
 MAX. OBS. = -3%



OTHER INDUSTRY

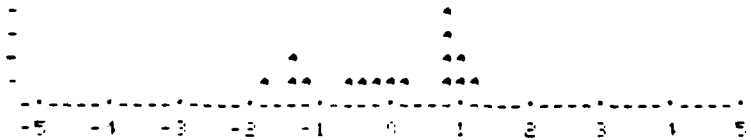
NO. OBS. = 7
 MEAN = -44%
 STD. DEV. = 35%
 MIN. OBS. = -90%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 16
 MIN. OBS. = -90%
 MAX. OBS. = 0%

OBSERVATIONS

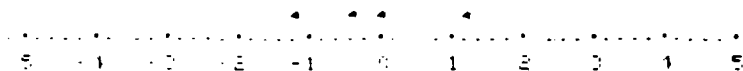


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = -35% STD. DEV. = 31%

Q31 - PERCENT CHANGE IN SELECTING MACHINES FOR CYLINDRICAL PARTS -- SYSTEM 3

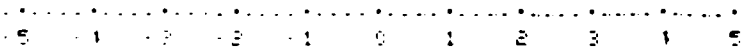
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -43%
 STD. DEV. = 31%
 MIN. OBS. = -75%
 MAX. OBS. = -2%



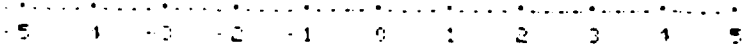
OTHER AEROSPACE

NO. OBS. = 6
 MEAN = -29%
 STD. DEV. = 35%
 MIN. OBS. = -90%
 MAX. OBS. = -3%



OTHER INDUSTRY

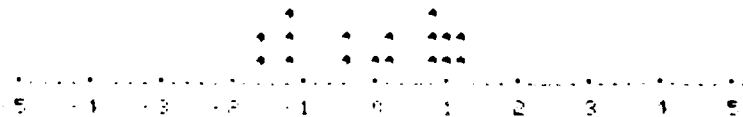
NO. OBS. = 7
 MEAN = -45%
 STD. DEV. = 35%
 MIN. OBS. = -90%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = -90%
 MAX. OBS. = 0%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -39%

STD. DEV. = 33%

Q31 - PERCENT CHANGE IN DETERMINING OPERATION SEQUENCES FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

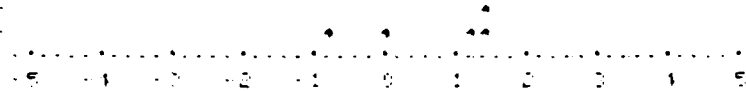
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -49%
 STD. DEV. = 33%
 MIN. OBS. = -90%
 MAX. OBS. = -10%



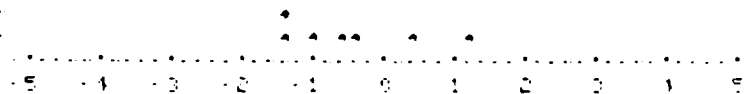
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = -29%
 STD. DEV. = 32%
 MIN. OBS. = -75%
 MAX. OBS. = -4%



OTHER INDUSTRY

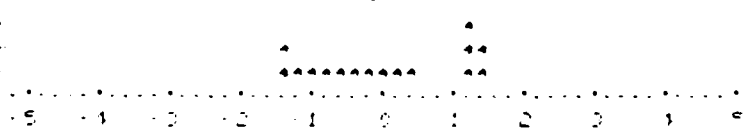
NO. OBS. = 7
 MEAN = -63%
 STD. DEV. = 32%
 MIN. OBS. = -95%
 MAX. OBS. = -10%



ALL RESPONSES

NO. OBS. = 16
 MIN. OBS. = -95%
 MAX. OBS. = -4%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

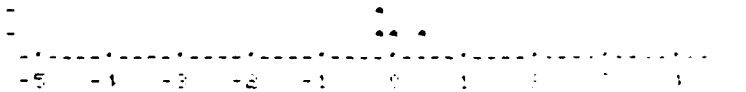
MEAN = -49%

STD. DEV. = 34%

Q31 - PERCENT REDUCTION IN MATERIAL COST FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

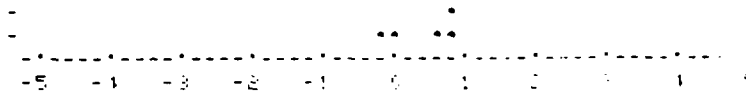
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = - 4.0%
 STD. DEV. = 1.4%
 MIN. OBS. = - 5%
 MAX. OBS. = - 2%



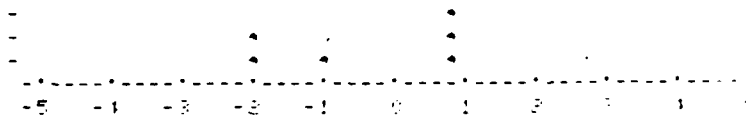
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = - 2.0%
 STD. DEV. = 2.3%
 MIN. OBS. = - 5%
 MAX. OBS. = 0%



OTHER INDUSTRY

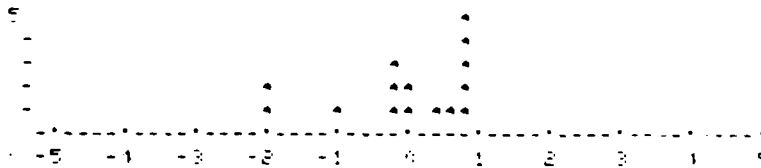
NO. OBS. = 6
 MEAN = - 6.7%
 STD. DEV. = 7.5%
 MIN. OBS. = -15%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = -15%
 MAX. OBS. = 0%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = - 4.4%

STD. DEV. = 5.2%

031 - PERCENT REDUCTION IN DIRECT LABOR COST FOR CYLINDRICAL PARTS -- SYSTEM 3

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = - 9.8%
STD. DEV. = - 4.1%
MIN. OBS. = -15%
MAX. OBS. = - 5%

OTHER AEROSPACE

NO. OBS. = 7
MEAN = -10.0%
STD. DEV. = 6.0%
MIN. OBS. = -20%
MAX. OBS. = - 2%

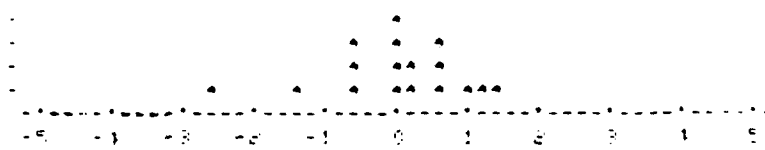
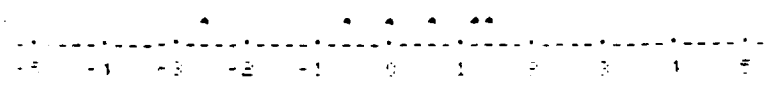
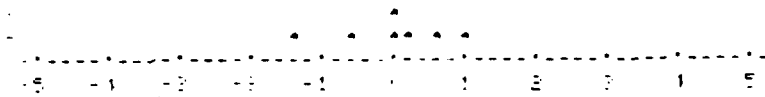
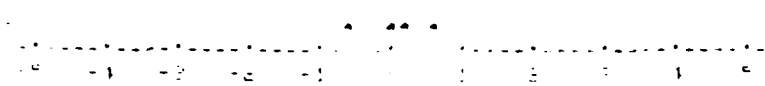
OTHER INDUSTRY

NO. OBS. = 6
MEAN = -10.2%
STD. DEV. = 11.2%
MIN. OBS. = -30%
MAX. OBS. = 0%

ALL RESPONSES

NO. OBS. = 17
MIN. OBS. = -30%
MAX. OBS. = 0%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = - 10.0%

STD. DEV. = 7.5%

Q31 - PERCENT REDUCTION IN DIRECT LABOR COST FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

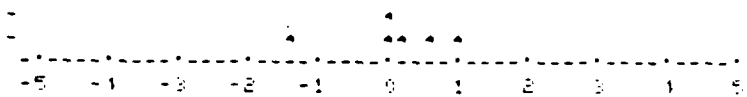
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = - 9.8%
 STD. DEV. = 4.1%
 MIN. OBS. = -10%
 MAX. OBS. = - 5%



OTHER AEROSPACE

NO. OBS. = 6
 MEAN = - 9.2%
 STD. DEV. = 6.1%
 MIN. OBS. = -20%
 MAX. OBS. = - 2%



OTHER INDUSTRY

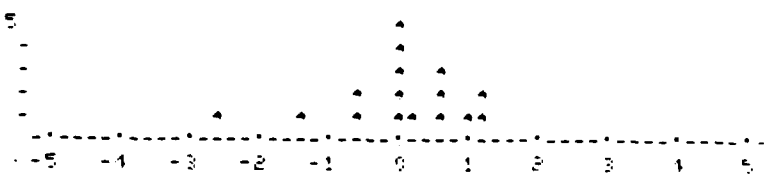
NO. OBS. = 6
 MEAN = -10.2%
 STD. DEV. = 11.2%
 MIN. OBS. = -30%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 16
 MIN. OBS. = -30%
 MAX. OBS. = 0%

OBSERVATIONS

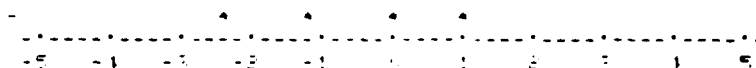


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = - 9.7% STD. DEV. = 7.6%

Q31 - PERCENT REDUCTION IN SCRAP AND REWORK COST FOR CYLINDRICAL PARTS -- SYSTEM 3

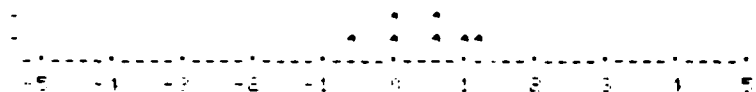
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -15.3%
 STD. DEV. = 12.5%
 MIN. OBS. = -30%
 MAX. OBS. = -1%



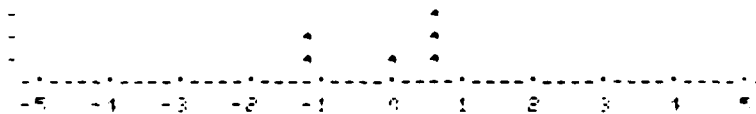
OTHER AEROSPACE

NO. OBS. = 7
 MEAN = -6.6%
 STD. DEV. = 5.4%
 MIN. OBS. = -15%
 MAX. OBS. = 0%



OTHER INDUSTRY

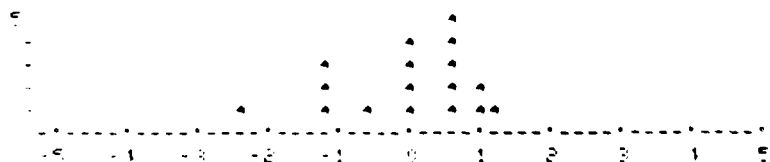
NO. OBS. = 6
 MEAN = -10.8%
 STD. DEV. = 7.4%
 MIN. OBS. = -20%
 MAX. OBS. = -5%



ALL RESPONSES

NO. OBS. = 17
 MIN. OBS. = -30%
 MAX. OBS. = 0%

OBSERVATIONS

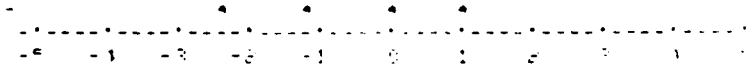


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = -10.1% STD. DEV. = 8.3%

Q31 - PERCENT REDUCTION IN SCRAP AND REWORK COST FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -15.3%
 STD. DEV. = 12.5%
 MIN. OBS. = -30%
 MAX. OBS. = -1%



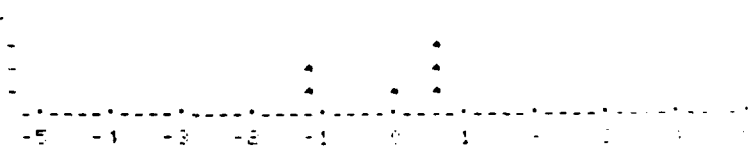
OTHER AEROSPACE

NO. OBS. = 6
 MEAN = -6%
 STD. DEV. = 5.7%
 MIN. OBS. = -15%
 MAX. OBS. = 0%



OTHER INDUSTRY

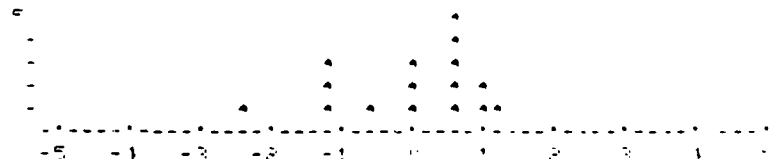
NO. OBS. = 6
 MEAN = -10.8%
 STD. DEV. = 7.4%
 MIN. OBS. = -20%
 MAX. OBS. = -5%



ALL RESPONSES

NO. OBS. = 16
 MIN. OBS. = -30%
 MAX. OBS. = 0%

OBSERVATIONS

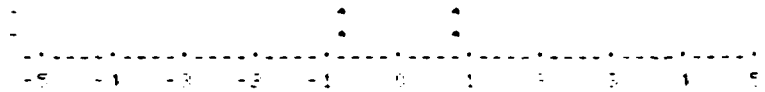


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = -10.1% STD. DEV. = 8.6%

Q31 - PERCENT REDUCTION IN TOOLING COST FOR CYLINDRICAL PARTS -- SYSTEM 3

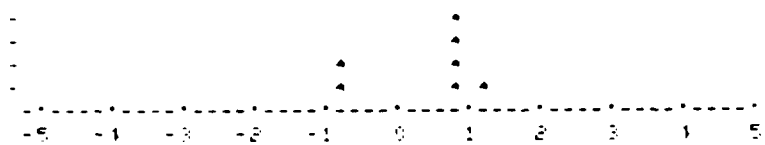
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -12.5%
 STD. DEV. = 8.7%
 MIN. OBS. = -20%
 MAX. OBS. = -5%



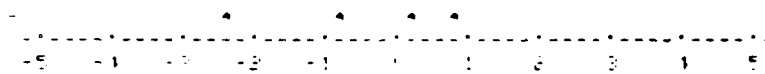
OTHER AEROSPACE

NO. OBS. = 7
 MEAN = -8.7%
 STD. DEV. = 7.8%
 MIN. OBS. = -20%
 MAX. OBS. = -1%



OTHER INDUSTRY

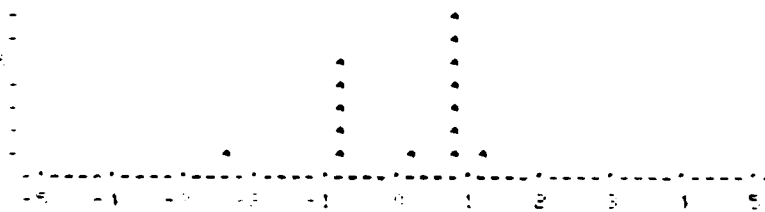
NO. OBS. = 4
 MEAN = -17.5%
 STD. DEV. = 13.2%
 MIN. OBS. = -35%
 MAX. OBS. = -5%



ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = -35%
 MAX. OBS. = -1%

OBSERVATIONS

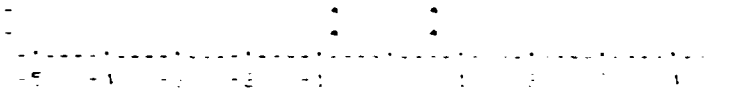


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = -12.1% STD. DEV. = 9.7%

Q31 - PERCENT REDUCTION IN TOOLING COST FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

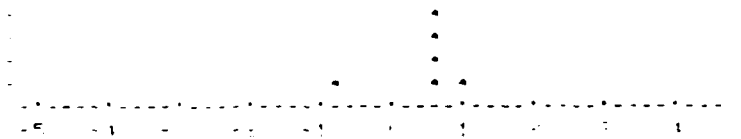
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = -12.5%
 STD. DEV. = 8.7%
 MIN. OBS. = -20%
 MAX. OBS. = -5%



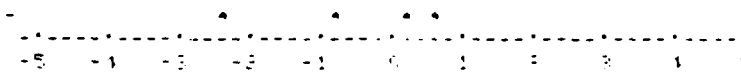
OTHER AEROSPACE

NO. OBS. = 6
 MEAN = -6.8%
 STD. DEV. = 6.6%
 MIN. OBS. = -20%
 MAX. OBS. = -1%



OTHER INDUSTRY

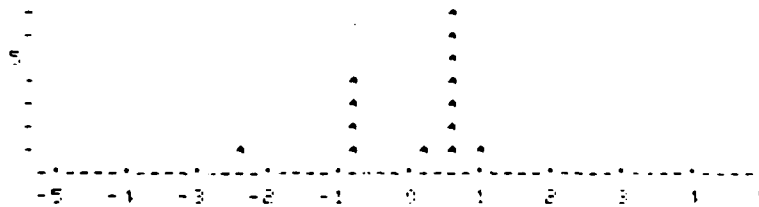
NO. OBS. = 4
 MEAN = -17.5%
 STD. DEV. = 13.2%
 MIN. OBS. = -35%
 MAX. OBS. = -5%



ALL RESPONSES

NO. OBS. = 14
 MIN. OBS. = -35%
 MAX. OBS. = -1%

OBSERVATIONS



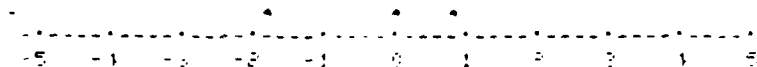
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -11.5% STD. DEV. = 9.8%

Q31 - PERCENT REDUCTION IN WORK IN PROCESS INVENTORY FOR CYLINDRICAL PARTS -- SYSTEM 3

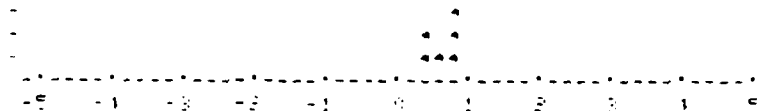
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = -9%
 STD. DEV. = 10.1%
 MIN. OBS. = -20%
 MAX. OBS. = 0%



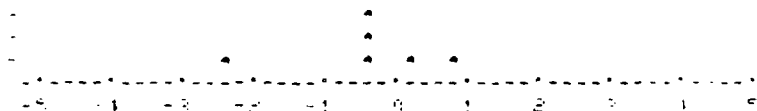
OTHER AEROSPACE

NO. OBS. = 6
 MEAN = -1.3%
 STD. DEV. = 1.5%
 MIN. OBS. = -3%
 MAX. OBS. = 0%



OTHER INDUSTRY

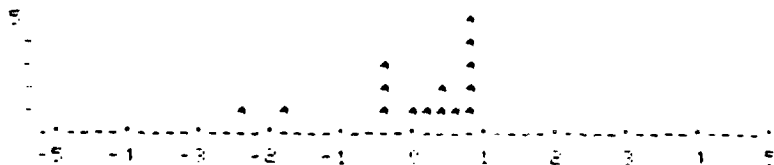
NO. OBS. = 6
 MEAN = -10%
 STD. DEV. = 8.4%
 MIN. OBS. = -25%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = -25%
 MAX. OBS. = 0%

OBSERVATIONS



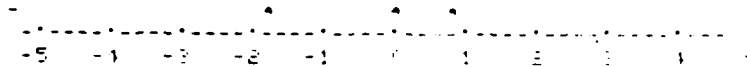
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -6.3% STD. DEV. = 7.7%

Q31 - PERCENT REDUCTION IN WORK IN PROCESS INVENTORY FOR NGW-CYLINDRICAL PARTS -- SYSTEM 3

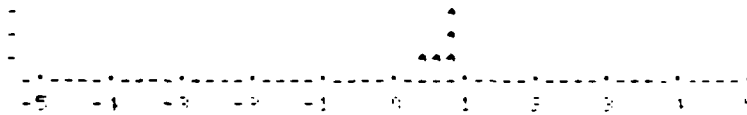
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = -9%
 STD. DEV. = 10.1%
 MIN. OBS. = -20%
 MAX. OBS. = 0%



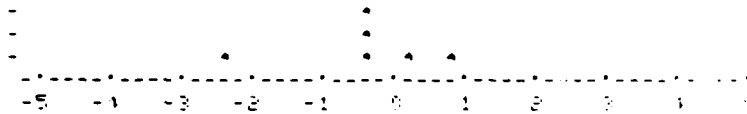
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = -1%
 STD. DEV. = 1.4%
 MIN. OBS. = -3%
 MAX. OBS. = 0%



OTHER INDUSTRY

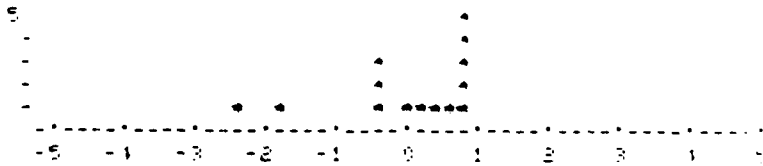
NO. OBS. = 6
 MEAN = -10%
 STD. DEV. = 9.4%
 MIN. OBS. = -25%
 MAX. OBS. = 0%



ALL RESPONSES

NO. OBS. = 14
 MIN. OBS. = -25%
 MAX. OBS. = 0%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -6.6% STD. DEV. = 7.9%

Q32 - IMPACT OF SYSTEM 3 ON OTHER AREAS (RANKED ON A SCALE OF -2 TO +2, WHERE -2 = SIGNIFICANTLY NEGATIVE IMPACT, 0 = NO CHANGE, +2 = SIGNIFICANT IMPROVEMENT)

AREAS IMPACTED	MISSILE PRIME AND SUBS.					OTHER AEROSPACE					OTHER INDUSTRY					TOTAL							
	-2	-1	0	+1	+2	-2	-1	0	+1	+2	-2	-1	0	+1	+2	-2	-1	0	+1	+2			
PRODUCTION LEADTIME				2	2			1	2	4				4	4					1	8	10	
PROCESS PLANNING LEADTIME					4					7				2	6						2	17	
MACHINE UTILIZATION				2	2			1	2	4				1	2	5					2	6	9
PRODUCT QUALITY			1	3				1	5	1				3	5						5	13	1
DIRECT LABOR UTILIZATION			1	2	1			1	3	2				2	5	1					4	10	4
UNIFORMITY OF PROCESS PLANS					4				1	6				1	7						2	17	
COST ESTIMATING PROCEDURES				1	3				1	6				2	6							4	15
MAKE/BUY DECISIONS				2	1			1	5	1				1	1	6					2	8	8
PRODUCT STANDARDIZATION				1	2				4	3				3	1	4					3	6	9
CRITICAL LABOR SKILLS				2	1			2	3	2				6	1	1					8	6	4
MATERIAL STANDARDIZATION				3	1			2	3	2				4	3	1					6	9	4
PRODUCIBILITY OF PARTS			1	2	1			1	3	3				2	4	2					4	9	6
PLANT LAYOUT			2	2				3	1	3				2	5	1					7	8	4
MATERIAL HANDLING			1	2				1	4	2				1	5	2					3	11	4
PRODUCTION SCHEDULING				2	2			2	3	2				3	5						2	8	9
CAPACITY PLANNING				3	1			2	2	3				3	5						2	8	9

Q33 - HARDWARE COSTS -- SYSTEM 3 FOR CYLINDRICAL PARTS

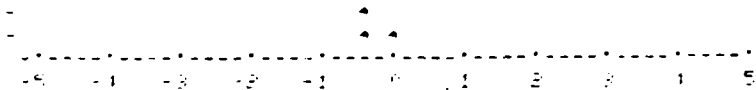
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$178.0K
 STD. DEV. = \$251.0K
 MIN. OBS. = \$12.0K
 MAX. OBS. = \$550.0K



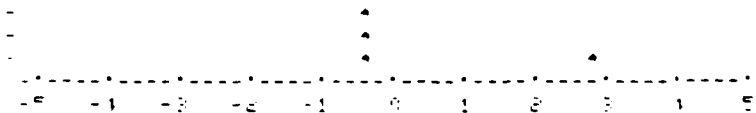
OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$82.0K
 STD. DEV. = \$103.0K
 MIN. OBS. = \$15.0K
 MAX. OBS. = \$200.0K



OTHER INDUSTRY

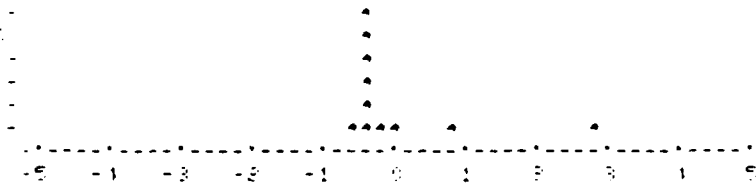
NO. OBS. = 4
 MEAN = \$377.0K
 STD. DEV. = \$683.0K
 MIN. OBS. = \$20.0K
 MAX. OBS. = \$1,400K



ALL RESPONSES

NO. OBS. = 11
 MIN. OBS. = \$12.0K
 MAX. OBS. = \$1,400K

OBSERVATIONS



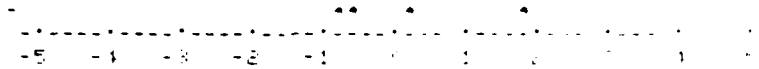
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$224.0K STD. DEV. = \$421.0K

Q33 - HARDWARE COSTS -- SYSTEM 3 FOR NON-CYLINDRICAL PARTS

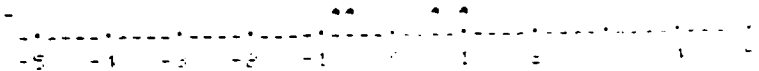
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$203.0K
 STD. DEV. = \$245K
 MIN. OBS. = \$12K
 MAX. OBS. = \$550K



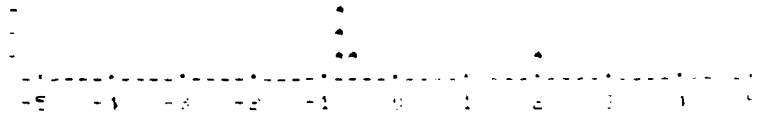
OTHER AEROSPACE

NO. OBS. = 4
 MEAN = \$190.0K
 STD. DEV. = \$190.0K
 MIN. OBS. = \$15.0K
 MAX. OBS. = \$400K



OTHER INDUSTRY

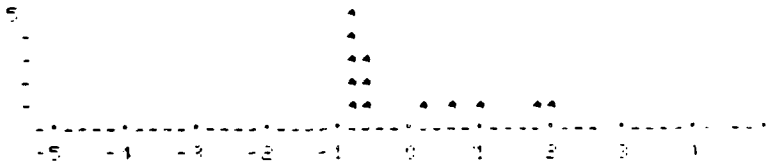
NO. OBS. = 5
 MEAN = \$137.0K
 STD. DEV. = \$259.0K
 MIN. OBS. = \$12.0K
 MAX. OBS. = \$600.0K



ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = 12K
 MAX. OBS. = \$600.0K

OBSERVATIONS



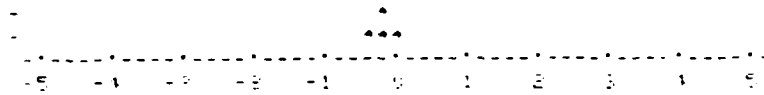
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$174.0K STD. DEV. = \$217.0K

Q33 - COSTS TO ESTABLISH INITIAL DATA FILES -- SYSTEM 3 FOR CYLINDRICAL PARTS

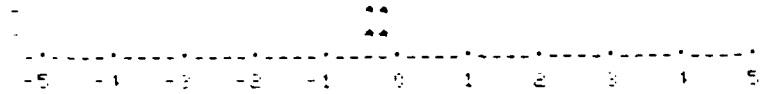
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$109.0K
 STD. DEV. = \$127.5K
 MIN. OBS. = \$36.0K
 MAX. OBS. = \$300.0K



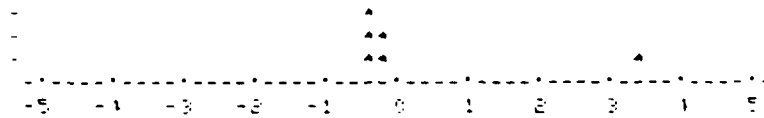
OTHER AEROSPACE

NO. OBS. = 4
 MEAN = \$52.8K
 STD. DEV. = \$45.3K
 MIN. OBS. = \$ 1.2K
 MAX. OBS. = \$100.0K



OTHER INDUSTRY

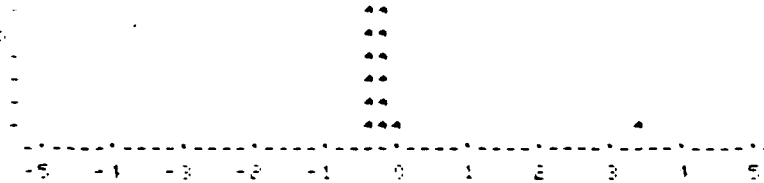
NO. OBS. = 6
 MEAN = \$625.8K
 STD. DEV. = \$1,409K
 MIN. OBS. = \$ 1.0K
 MAX. OBS. = \$3,500K



ALL RESPONSES

NO. OBS. = 14
 MIN. OBS. = \$ 1.0K
 MAX. OBS. = \$3,500K

OBSERVATIONS



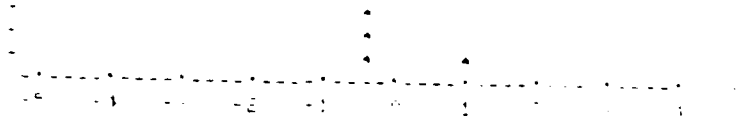
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$314.4K STD. DEV. = \$919.9K

Q33 - COSTS TO ESTABLISH INITIAL DATA FILES -- SYSTEM 3 FOR NON-CYLINDRICAL PARTS

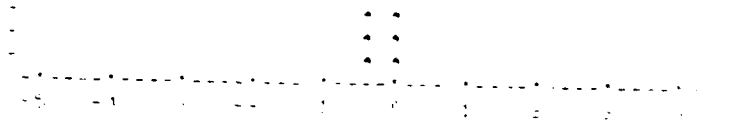
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$188.8K
 STD. DEV. = \$274.4K
 MIN. OBS. = \$40.0K
 MAX. OBS. = \$600K



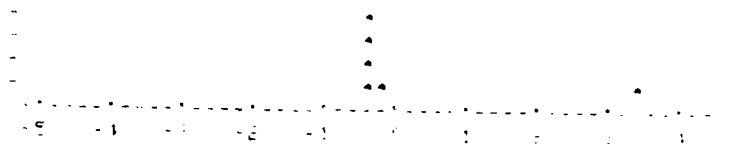
OTHER AEROSPACE

NO. OBS. = 6
 MEAN = \$128.5K
 STD. DEV. = \$72.3K
 MIN. OBS. = \$45.0K
 MAX. OBS. = \$200.0K



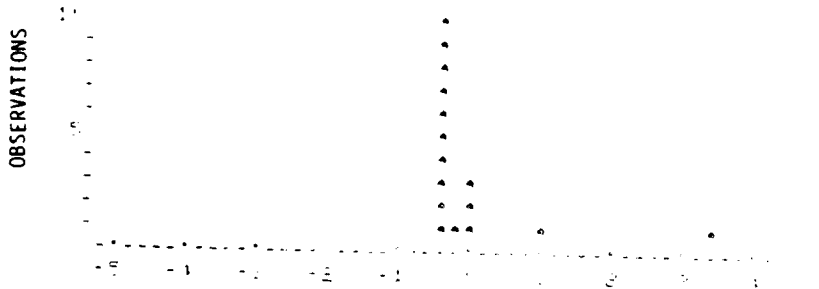
OTHER INDUSTRY

NO. OBS. = 6
 MEAN = \$289.7K
 STD. DEV. = \$594.0K
 MIN. OBS. = \$19.0K
 MAX. OBS. = \$1,500K



ALL RESPONSES

NO. OBS. = 16
 MIN. OBS. = \$19.0K
 MAX. OBS. = \$1,500K



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

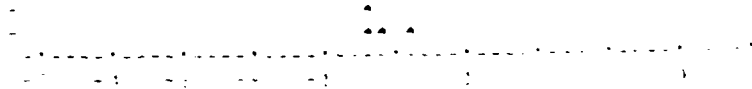
MEAN = \$204.0K

STD. DEV = \$373.8K

13 - COST PER YEAR FOR COMPUTER CHARGES AND PROGRAM MAINTENANCE -- SYSTEM 3 FOR NON-CYLINDRICAL PARTS

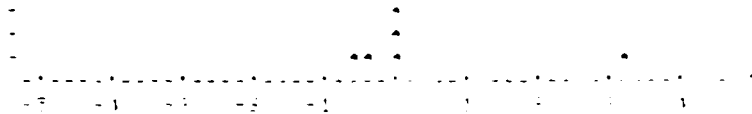
MISSILE PRIMES & SUBS

N. OBS. = 4
 MEAN = \$66.7K
 STD. DEV. = \$24.1K
 MIN. OBS. = \$48.0K
 MAX. OBS. = \$100.0K



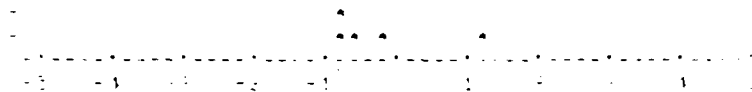
OTHER AEROSPACE

N. OBS. = 6
 MEAN = \$115.0K
 STD. DEV. = \$141.0K
 MIN. OBS. = \$15.0K
 MAX. OBS. = \$400.0K



OTHER INDUSTRY

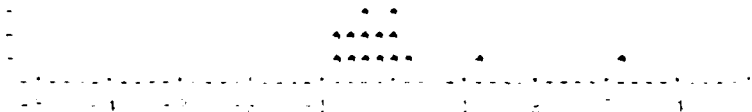
N. OBS. = 5
 MEAN = \$56.8K
 STD. DEV. = \$82.9K
 MIN. OBS. = \$ 7.0K
 MAX. OBS. = \$200.0K



ALL RESPONSES

N. OBS. = 15
 MIN. OBS. = \$ 7.0K
 MAX. OBS. = \$400.0K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$82.7K STD. DEV. = \$100.2K

Q33 - COST PER YEAR FOR COMPUTER CHARGES AND PROGRAM MAINTENANCE -- SYSTEM 3 FOR CYLINDRICAL PARTS

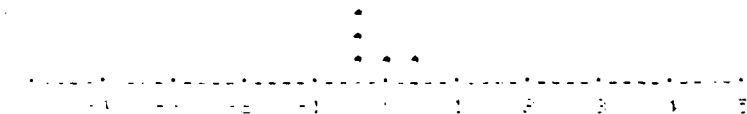
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$49.9K
 STD. DEV. = \$11.3K
 MIN. OBS. = \$36.0K
 MAX. OBS. = \$63.6K



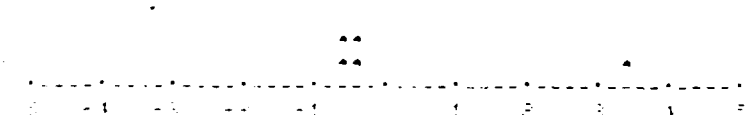
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = \$42.6K
 STD. DEV. = \$34.7K
 MIN. OBS. = \$15.0K
 MAX. OBS. = \$100.0K



OTHER INDUSTRY

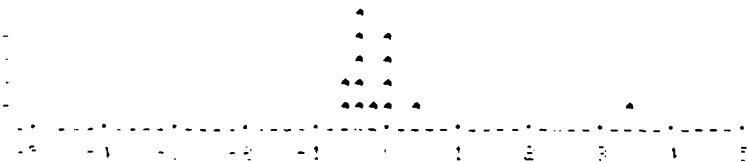
NO. OBS. = 5
 MEAN = \$77.6K
 STD. DEV. = \$152.5K
 MIN. OBS. = \$ 1.0K
 MAX. OBS. = \$350.0K



ALL RESPONSES

NO. OBS. = 14
 MIN. OBS. = \$ 1.0K
 MAX. OBS. = \$350.0K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$57.2K STD. DEV. = \$884K

Q33 - MONTHS TO TEST SYSTEM -- SYSTEM 3 FOR NON-CYLINDRICAL PARTS

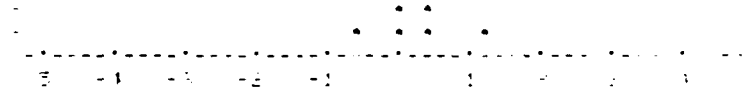
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 3.6 mo.
 STD. DEV. = 1.9 mo.
 MIN. OBS. = 1.5 mo.
 MAX. OBS. = 6.0 mo.



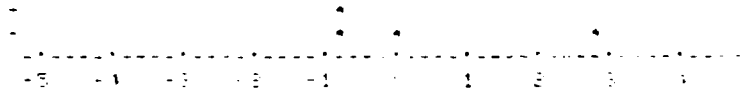
OTHER AEROSPACE

NO. OBS. = 6
 MEAN = 7.2 mo.
 STD. DEV. = 3.0 mo.
 MIN. OBS. = 3.0 mo.
 MAX. OBS. = 12.0 mo.



OTHER INDUSTRY

NO. OBS. = 4
 MEAN = 7.5 mo.
 STD. DEV. = 8.5 mo.
 MIN. OBS. = 2.0 mo.
 MAX. OBS. = 20.0 mo.



ALL RESPONSES

NO. OBS. = 14
 MIN. OBS. = 1.5 mo.
 MAX. OBS. = 20.0 mo.

OBSERVATIONS



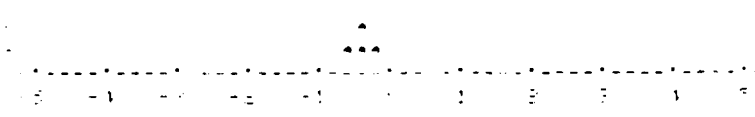
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 6.3 mo. STD. DEV. = 4.9 mo.

Q33 - MONTHS TO TEST SYSTEM -- SYSTEM 3 FOR CYLINDRICAL PARTS

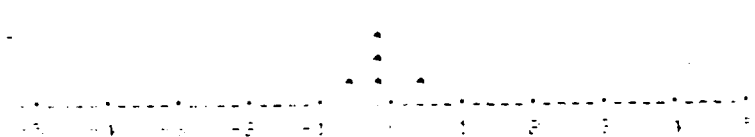
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 3.4 mo.
STD. DEV. = 1.9 mo.
MIN. OBS. = 1.5 mo.
MAX. OBS. = 6.0 mo.



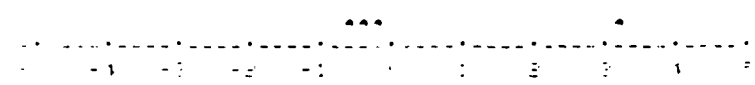
OTHER AEROSPACE

NO. OBS. = 5
MEAN = 6.2 mo.
STD. DEV. = 3.9 mo.
MIN. OBS. = 1.0 mo.
MAX. OBS. = 12.0 mo.



OTHER INDUSTRY

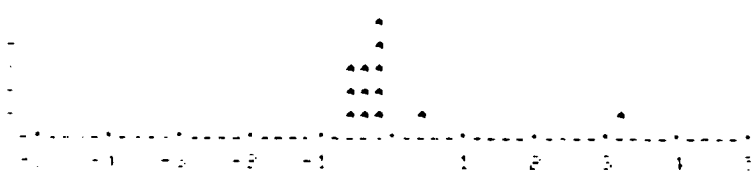
NO. OBS. = 4
MEAN = 12.8 mo.
STD. DEV. = 18.4 mo.
MIN. OBS. = 2.0 mo.
MAX. OBS. = 40.0 mo.



ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = 1.0 mo.
MAX. OBS. = 40.0 mo.

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 7.3 mo. STD. DEV. = 10.2 mo.

Q33 - MONTHS TO TRAIN PERSONNEL -- SYSTEM 3 FOR NON-CYLINDRICAL PARTS

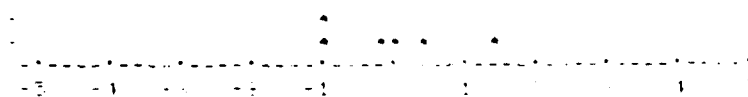
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 5.4 mo.
STD. DEV. = 4.9 mo.
MIN. OBS. = 1.5 mo.
MAX. OBS. = 12.0 mo.



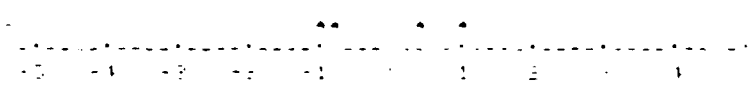
OTHER AEROSPACE

NO. OBS. = 6
MEAN = 4.5 mo.
STD. DEV. = 3.4 mo.
MIN. OBS. = 1.0 mo.
MAX. OBS. = 10.0 mo.



OTHER INDUSTRY

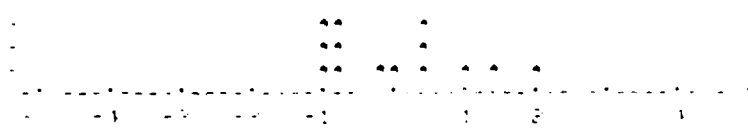
NO. OBS. = 4
MEAN = 4.3 mo.
STD. DEV. = 3.3 mo.
MIN. OBS. = 1.0 mo.
MAX. OBS. = 8.0 mo.



ALL RESPONSES

NO. OBS. = 14
MIN. OBS. = 1.0 mo.
MAX. OBS. = 12.0 mo.

OBSERVATIONS



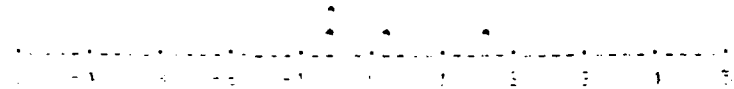
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 4.7 mo. STD. DEV. = 3.6 mo.

Q33 - MONTHS TO TRAIN PERSONNEL -- SYSTEM 3 FOR CYLINDRICAL PARTS

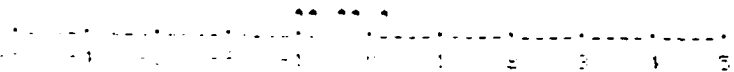
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 5.4 mo.
STD. DEV. = 4.9 mo.
MIN. OBS. = 1.5 mo.
MAX. OBS. = 12.0 mo.



OTHER AEROSPACE

NO. OBS. = 5
MEAN = 2.9 mo.
STD. DEV. = 2.2 mo.
MIN. OBS. = 0.5 mo.
MAX. OBS. = 6.0 mo.



OTHER INDUSTRY

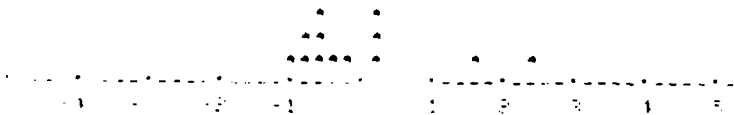
NO. OBS. = 4
MEAN = 6.3 mo.
STD. DEV. = 6.8 mo.
MIN. OBS. = 1.0 mo.
MAX. OBS. = 16.0 mo.



OBSERVATIONS

ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = 0.5 mo.
MAX. OBS. = 16.0 mo.



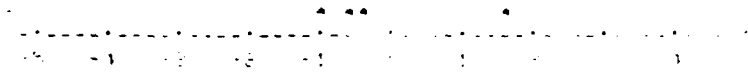
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 4.7 mo. STD. DEV. = 4.6 mo.

Q33 - MONTHS TO ESTABLISH DATA FILES -- SYSTEM 3 FOR NON-CYLINDRICAL PARTS

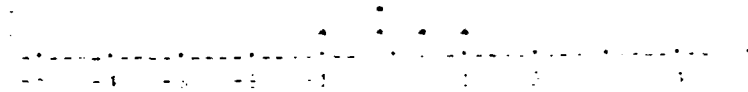
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 12.0 mo.
STD. DEV. = 8.2 mo.
MIN. OBS. = 6.0 mo.
MAX. OBS. = 24.0 mo.



OTHER AEROSPACE

NO. OBS. = 5
MEAN = 13.0 mo.
STD. DEV. = 5.1 mo.
MIN. OBS. = 6.0 mo.
MAX. OBS. = 20.0 mo.



OTHER INDUSTRY

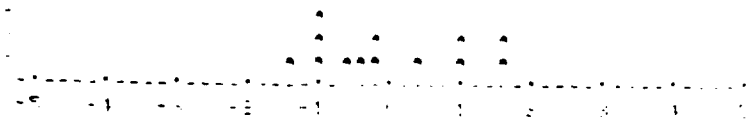
NO. OBS. = 4
MEAN = 13.4 mo.
STD. DEV. = 10.3 mo.
MIN. OBS. = 3.0 mo.
MAX. OBS. = 24.0 mo.



ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = 3.0 mo.
MAX. OBS. = 24.0 mo.

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 12.8 mo. STD. DEV. = 7.2 mo.

Q33 - MONTHS TO ESTABLISH DATA FILES -- SYSTEM 3 FOR CYLINDRICAL PARTS

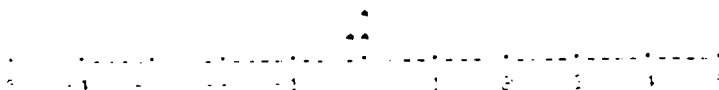
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 11.0 mo.
STD. DEV. = 8.7 mo.
MIN. OBS. = 6.0 mo.
MAX. OBS. = 24.0 mo.



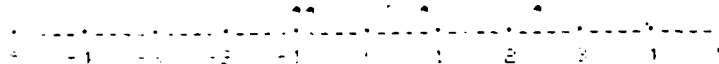
OTHER AEROSPACE

NO. OBS. = 3
MEAN = 13.7 mo.
STD. DEV. = 1.5 mo.
MIN. OBS. = 12.0 mo.
MAX. OBS. = 14.0 mo.



OTHER INDUSTRY

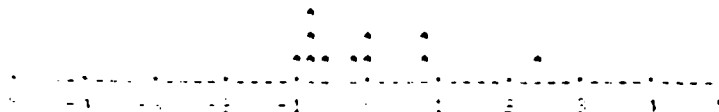
NO. OBS. = 4
MEAN = 18.3 mo.
STD. DEV. = 17.2 mo.
MIN. OBS. = 3.0 mo.
MAX. OBS. = 40.0 mo.



ALL RESPONSES

NO. OBS. = 11
MIN. OBS. = 3.0 mo.
MAX. OBS. = 40.0 mo.

OBSERVATIONS



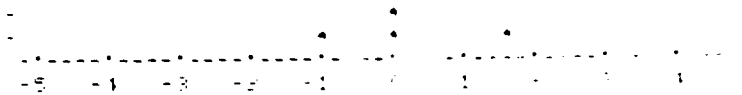
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 14.4 mo. STD. DEV. = 11.1 mo.

Q33 - MONTHS TO ACQUIRE HARDWARE -- SYSTEM 3 FOR NON-CYLINDRICAL PARTS

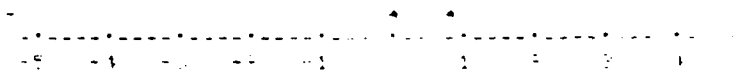
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = 6.5 mo.
STD. DEV. = 4.0 mo.
MIN. OBS. = 2.0 mo.
MAX. OBS. = 12.0 mo.



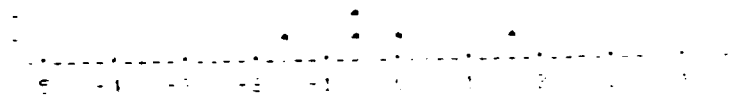
OTHER AEROSPACE

NO. OBS. = 2
MEAN = 7.5 mo.
STD. DEV. = 2.0 mo.
MIN. OBS. = 6.0 mo.
MAX. OBS. = 9.0 mo.



OTHER INDUSTRY

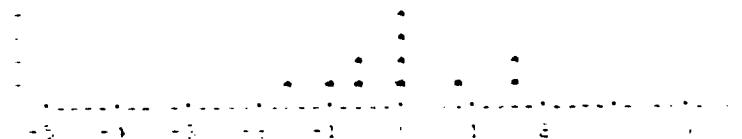
NO. OBS. = 5
MEAN = 5.2 mo.
STD. DEV. = 4.4 mo.
MIN. OBS. = 0 mo.
MAX. OBS. = 12.0 mo.



ALL RESPONSES

NO. OBS. = 11
MIN. OBS. = 0 mo.
MAX. OBS. = 12 mo.

OBSERVATIONS



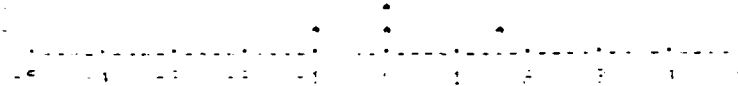
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 6.1 mo. STD. DEV. = 3.8 mo.

Q33 - MONTHS TO ACQUIRE HARDWARE -- SYSTEM 3 FOR CYLINDRICAL PARTS

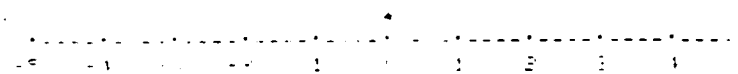
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 6.5 mo.
 STD. DEV. = 4.1 mo.
 MIN. OBS. = 2 mo.
 MAX. OBS. = 12 mo.



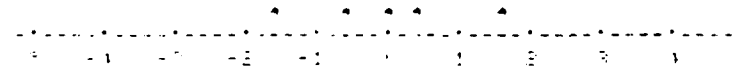
OTHER AEROSPACE

NO. OBS. = 1
 MEAN = 6 mo.
 STD. DEV. = 0 mo.
 MIN. OBS. = 6 mo.
 MAX. OBS. = 6 mo.



OTHER INDUSTRY

NO. OBS. = 5
 MEAN = 6 mo.
 STD. DEV. = 4.5 mo.
 MIN. OBS. = 0 mo.
 MAX. OBS. = 12 mo.



ALL RESPONSES

NO. OBS. = 10
 MIN. OBS. = 0 mo.
 MAX. OBS. = 12 mo.

OBSERVATIONS



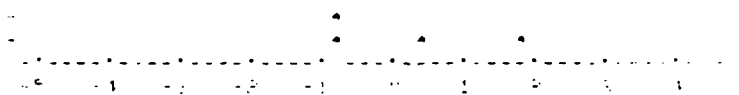
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 6.2 mo. STD. DEV. = 3.8 mo.

Q33 - COST TO TEST SYSTEM -- SYSTEM 3 FOR NON-CYLINDRICAL PARTS

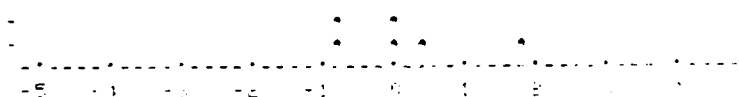
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = \$43.6K
STD. DEV. = \$41.6K
MIN. OBS. = \$10.0K
MAX. OBS. = \$14.5K



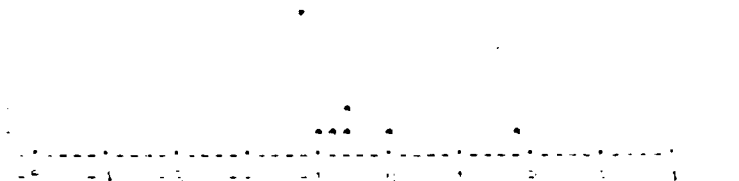
OTHER AEROSPACE

NO. OBS. = 6
MEAN = \$41.5K
STD. DEV. = \$32.8K
MIN. OBS. = \$10.0K
MAX. OBS. = \$100.0K



OTHER INDUSTRY

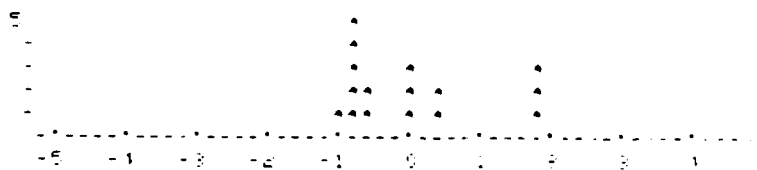
NO. OBS. = 6
MEAN = \$ 318K
STD. DEV. = \$35.5K
MIN. OBS. = \$ 6.0K
MAX. OBS. = \$100.0K



ALL RESPONSES

NO. OBS. = 16
MIN. OBS. = \$6.0K
MAX. OBS. = \$100.0K

OBSERVATIONS



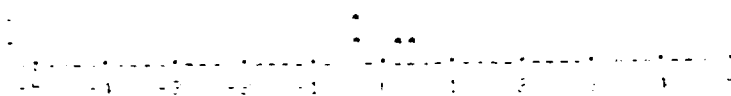
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$38.4K STD. DEV. = \$34.6K

Q33 - COST TO TEST SYSTEM -- SYSTEM 3 FOR CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$27.7K
 STD. DEV. = \$20.4K
 MIN. OBS. = \$10.0K
 MAX. OBS. = \$20.0K



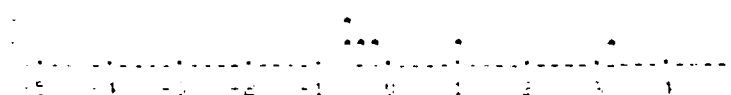
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = \$15.4K
 STD. DEV. = \$ 9.3K
 MIN. OBS. = \$ 2.0K
 MAX. OBS. = \$25.0K



OTHER INDUSTRY

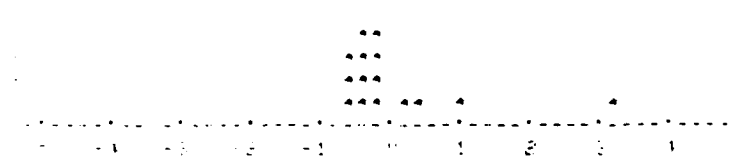
NO. OBS. = 6
 MEAN = \$53.6K
 STD. DEV. = \$77.2K
 MIN. OBS. = \$ 0.5K
 MAX. OBS. = \$20.0K



ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = \$ 0.5K
 MAX. OBS. = \$50.0K

OBSERVATIONS



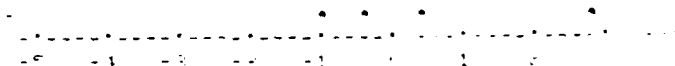
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$34.0K STD. DEV. = \$50.4K

Q33 - COSTS TO TRAIN PERSONNEL -- SYSTEM 3 FOR NON-CYLINDRICAL PARTS

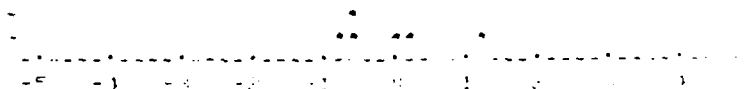
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = \$31.9K
STD. DEV. = \$34.0K
MIN. OBS. = \$ 2.5K
MAX. OBS. = \$80.0K



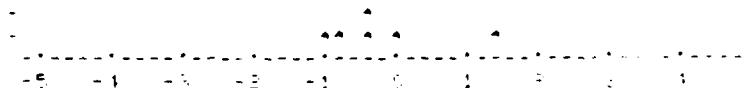
OTHER AEROSPACE

NO. OBS. = 6
MEAN = \$19.5K
STD. DEV. = \$14.8K
MIN. OBS. = \$ 6.0K
MAX. OBS. = \$45.0K



OTHER INDUSTRY

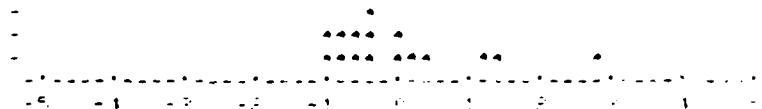
NO. OBS. = 6
MEAN = \$18.0K
STD. DEV. = \$16.9K
MIN. OBS. = \$ 2.9K
MAX. OBS. = \$50.0K



ALL RESPONSES

NO. OBS. = 16
MIN. OBS. = \$ 2.5K
MAX. OBS. = \$80.0K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$22.0K

STD. DEV. = \$20.8K

Q3 - COSTS TO TRAIN PERSONNEL -- SYSTEM 3 FOR CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$21.9K
 STD. DEV. = \$16.5K
 MIN. OBS. = \$ 2.5K
 MAX. OBS. = \$40.0K

OTHER AEROSPACE

NO. OBS = 5
 MEAN = \$ 9.8 K
 STD. DEV. = \$ 5.7K
 MIN. OBS. = \$ 2.0K
 MAX. OBS. = \$18.0K

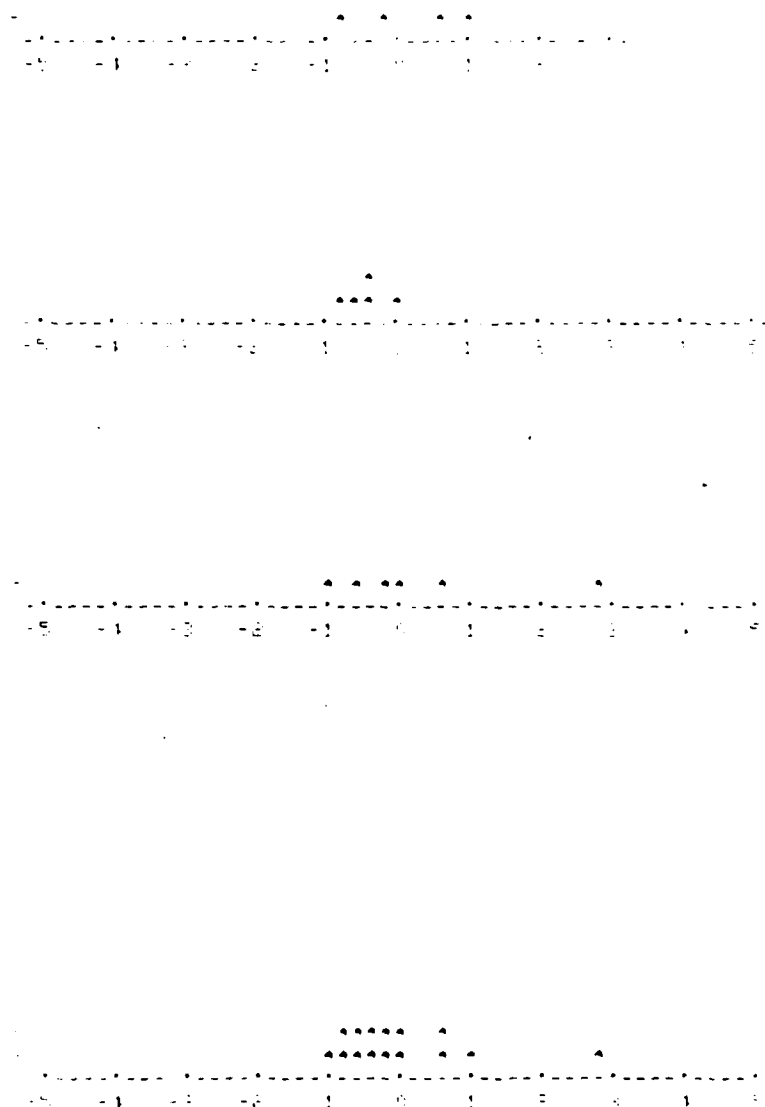
OTHER INDUSTRY

NO. OBS. = 6
 MEAN = \$24.7K
 STD. DEV. = \$27.0K
 MIN. OBS. = \$ 0.2K
 MAX. OBS. = \$75.0K

ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = \$ 0.2k
 MAX. OBS. = \$75.0K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$19.0K STD. DEV. = \$19.1K

Q33 - COST PER YEAR FOR UPDATING DATA FILES -- SYSTEM 3 FOR CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = \$17.5K
STD. DEV. = \$ 6.0K
MIN. OBS. = \$10.0K
MAX. OBS. = \$24.0K

OTHER AEROSPACE

NO. OBS. = 5
MEAN = \$34.2K
STD. DEV. = \$38.4K
MIN. OBS. = \$ 4.0K
MAX. OBS. = \$100.0K

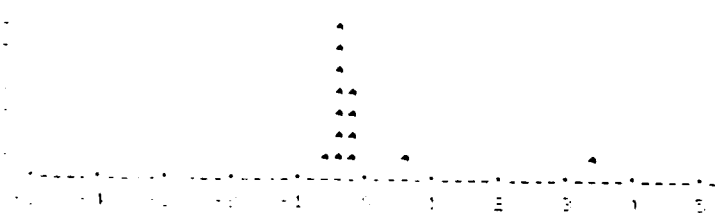
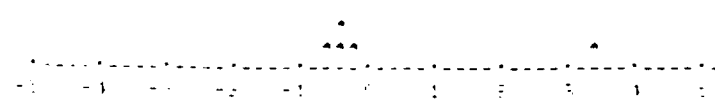
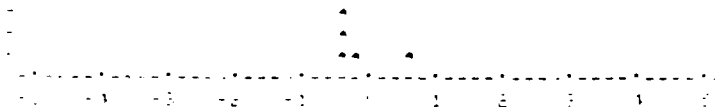
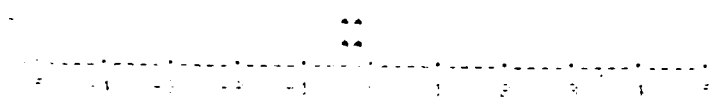
OTHER INDUSTRY

NO. OBS. = 5
MEAN = \$80.7K
STD. DEV. = \$151.0K
MIN. OBS. = \$ 0.5K
MAX. OBS. = \$350.0K

ALL RESPONSES

NO. OBS. = 14
MIN. OBS. = \$ 0.5K
MAX. OBS. = \$350.0K

OBSERVATIONS



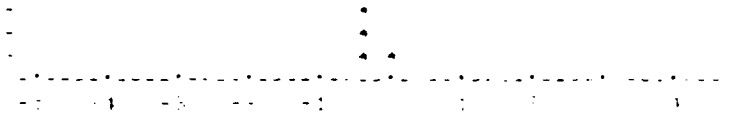
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$46.0K STD. DEV. = \$90.8K

Q33 - COST PER YEAR FOR UPDATING DATA FILES -- SYSTEM 3 FOR NON-CYLINDRICAL PARTS

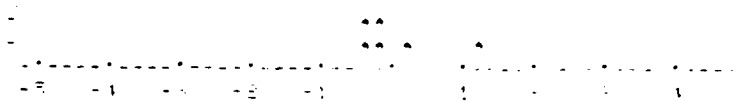
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$23.8K
 STD. DEV. = \$ 8.1K
 MIN. OBS. = \$19.2K
 MAX. OBS. = \$36.0K



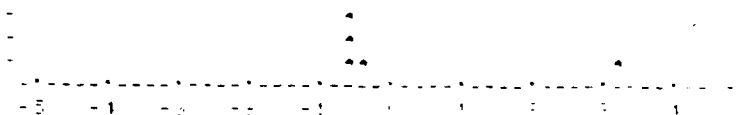
OTHER AEROSPACE

NO. OBS. = 6
 MEAN = \$39.8K
 STD. DEV. = \$32.3K
 MIN. OBS. = \$15.0K
 MAX. OBS. = \$100.0K



OTHER INDUSTRY

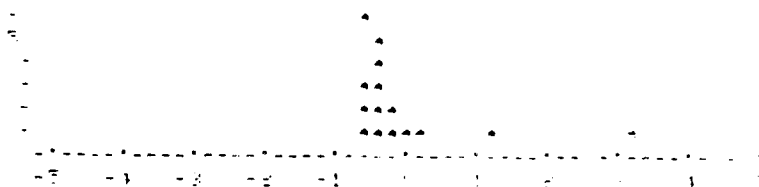
NO. OBS. = 5
 MEAN = \$49.3K
 STD. DEV. = \$84.3K
 MIN. OBS. = \$ 9.5K
 MAX. OBS. = \$200.0K



ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = \$ 9.5K
 MAX. OBS. = \$200.0K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$38.7K STD. DEV. = \$50.2K

APPENDIX C

INTERMEDIATE DATA CALCULATIONS

This appendix contains some of the intermediate calculations which were made using the basic data contained in Appendix B.

The questionnaire was structured in such a manner as to facilitate the calculation of numerous values which would be useful in checking the validity of the data submitted and providing additional information for the benefit analysis. All of the intermediate calculations which were made are not contained in this appendix. Some turned out to be only marginally useful for the purposes of this report, and for the sake of brevity they are not included in this report.

As was the case in Appendix B, each of the intermediate calculations underwent computer analysis and the number of observations, means, standard deviations, etc., were calculated by industry grouping and for all responses. Histograms are also provided, and it should again be emphasized that scale zero point for horizontal axes for all plots on the same page is standard deviations from the mean for all responses and not individual subgroupings.

Each intermediate calculation has been given an appropriate title to indicate the meaning of the information. Space limitations and

terminology make it almost impossible to provide a detailed explanation of the basis for each calculation; however, a brief description of how some of the numbers were derived is discussed below.

One series of calculations dealt with determining such annual costs as the value of machined parts manufactured in-house, the amount expended for process planning, direct labor, material, tooling, etc. This was done using a top-down approach whereby the data at a very gross level could be linked together to come up with values for these parameters. Briefly, the calculations were made in the following manner. The value of products shipped were multiplied by the percentage of that value which represented machines parts to determine the dollar value of machined parts. The value of machined parts purchased from outside sources was then subtracted from that value to yield the approximate value of machined parts manufactured in-house. This number was then multiplied by the appropriate cost breakdown percentages provided by the respondents to end up with gross approximations of the annual dollars expended for process planning, etc.

Using a bottoms-up approach we were able to determine some of the same information from other data provided by the respondent and compare the two values.

In the case of process planning costs, these comparisons varied widely (see pages C-55 and C-56).

Other calculations included such information as:

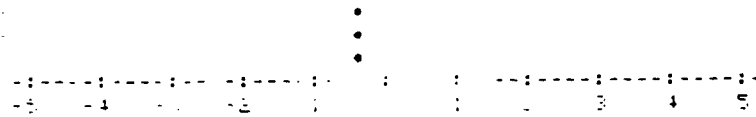
- The percentage of process planning costs by type of plan.
- The ratio of new and modified process plans prepared to the number of different parts manufactured on an annual basis.
- The average dollar value of machined parts by industry type.

It should be noted that many of these calculations can only yield gross approximations to the values in question and that many of the responses varied widely. However, the calculations were beneficial in shedding light on the situation and were useful during the benefit analysis.

APPROXIMATE ANNUAL DOLLAR VALUE OF CYLINDRICAL MACHINE PARTS IN PRODUCTS SHIPPED FROM PLANT

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = \$6.0 MIL
 STD. DEV. = \$5.6 MIL
 MIN. OBS. = \$2.6 MIL
 MAX. OBS. = \$12.5 MIL



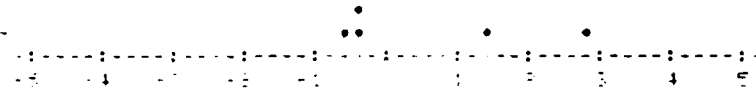
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = \$20.0 MIL
 STD. DEV. = \$13.7 MIL
 MIN. OBS. = \$ 2.0 MIL
 MAX. OBS. = \$39.6 MIL



OTHER INDUSTRY

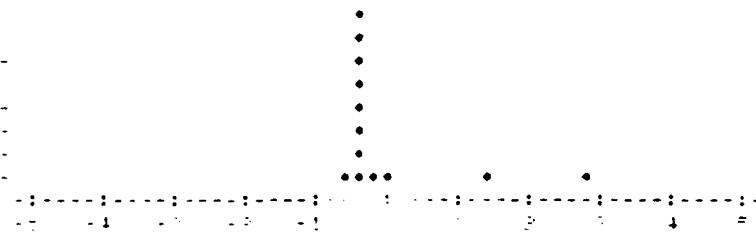
NO. OBS. = 5
 MEAN = \$102 MIL
 STD. DEV. = \$143 MIL
 MIN. OBS. = \$0.5 MIL
 MAX. OBS. = \$312 MIL



ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = \$0.5 MIL
 MAX. OBS. = \$312 MIL

OBSERVATIONS

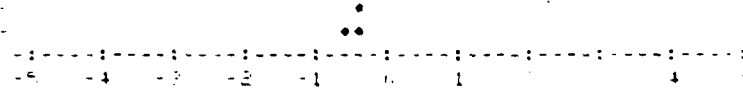


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$ 48 MIL STD. DEV. = \$ 94 MIL

APPROXIMATE ANNUAL DOLLAR VALUE OF NON-CYLINDRICAL MACHINED PARTS IN PRODUCTS SHIPPED FROM PLANT

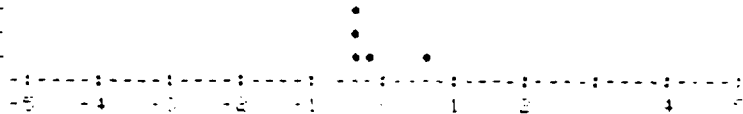
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = \$5.3 mil.
 STD. DEV. = \$2.6 mil.
 MIN. OBS. = \$2.4 mil.
 MAX. OBS. = \$7.5 mil.



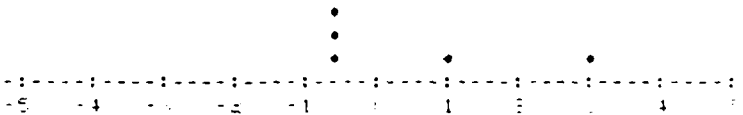
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = \$22.6 mil.
 STD. DEV. = \$24.2 mil.
 MIN. OBS. = \$8.0 mil.
 MAX. OBS. = \$65 mil.



OTHER INDUSTRY

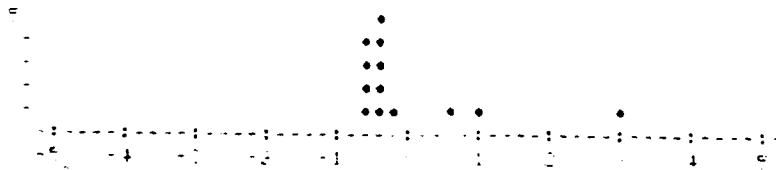
NO. OBS. = 5
 MEAN = \$54.7 mil.
 STD. DEV. = \$79.8 mil.
 MIN. OBS. = \$0.5 mil.
 MAX. OBS. = \$184 mil.



ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = \$0.5 mil.
 MAX. OBS. = \$184 mil.

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$31.0 mil. STD. DEV. = \$52.4 mil.

APPROXIMATE ANNUAL DOLLAR VOLUME OF CYLINDRICAL MACHINED PARTS MANUFACTURED IN-HOUSE

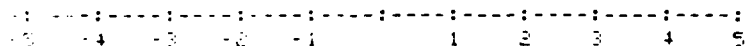
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = \$4.0 mil.
 STD. DEV. = \$4.8 mil.
 MIN. OBS. = \$0.4 mil.
 MAX. OBS. = \$9.5 mil.



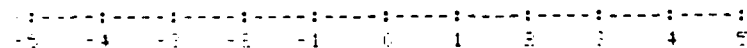
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = \$18.6 mil.
 STD. DEV. = \$13.0 mil.
 MIN. OBS. = \$1.9 mil.
 MAX. OBS. = \$36.4 mil.



OTHER INDUSTRY

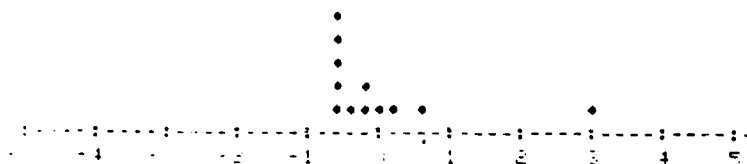
NO. OBS. = 4
 MEAN = \$30.3 mil.
 STD. DEV. = \$57.8 mil.
 MIN. OBS. = \$0.4 mil.
 MAX. OBS. = \$117 mil.



ALL RESPONSES

NO. OBS. = 12
 MIN. OBS. = \$0.4 mil.
 MAX. OBS. = \$117 mil.

OBSERVATIONS



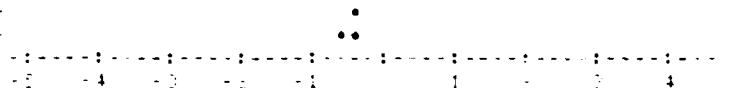
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$18.9 mil. STD. DEV. = \$32.9 mil.

APPROXIMATE ANNUAL DOLLAR VOLUME OF NON-CYLINDRICAL MACHINED PARTS MANUFACTURED IN-HOUSE

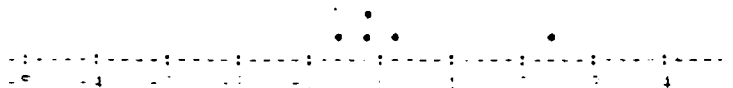
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = \$3.8 mil.
 STD. DEV. = \$3.2 mil.
 MIN. OBS. = \$0.3 mil.
 MAX. OBS. = \$6.5 mil.



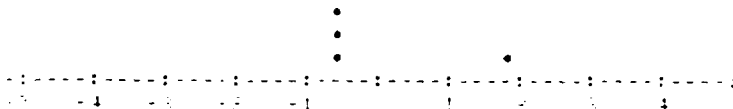
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = \$20.7 mil.
 STD. DEV. = \$25.0 mil.
 MIN. OBS. = \$2.0 mil.
 MAX. OBS. = \$64.4 mil.



OTHER INDUSTRY

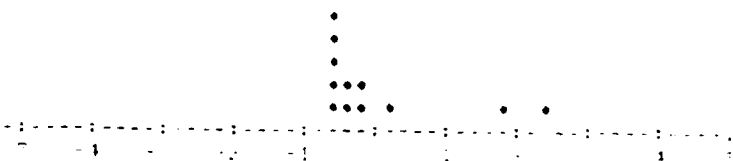
NO. OBS. = 4
 MEAN = \$14.1 mil.
 STD. DEV. = \$23.9 mil.
 MIN. OBS. = \$0.4 mil.
 MAX. OBS. = \$50.0 mil.



ALL RESPONSES

NO. OBS. = 12
 MIN. OBS. = \$0.3 mil.
 MAX. OBS. = \$64.4 mil.

OBSERVATIONS



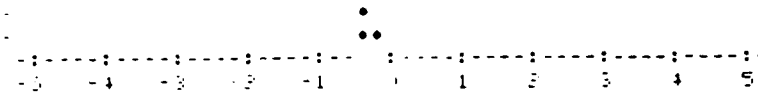
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$14.3 mil. STD. DEV. = \$20.9 mil.

APPROXIMATE DOLLAR VALUE OF A CYLINDRICAL MACHINED PART MANUFACTURED IN-HOUSE

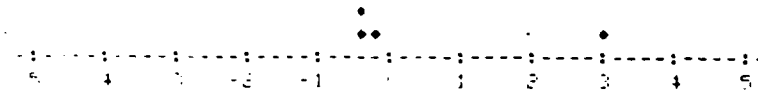
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = \$1068
 STD. DEV. = \$1817
 MIN. OBS. = \$7.5
 MAX. OBS. = \$3166



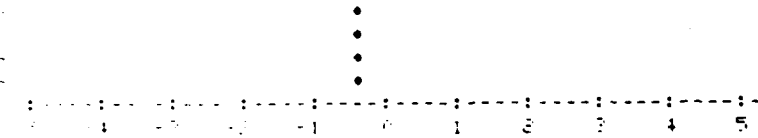
OTHER AEROSPACE

NO. OBS. = 4
 MEAN = \$14725
 STD. DEV. = \$29029
 MIN. OBS. = \$4.8
 MAX. OBS. = \$58266



OTHER INDUSTRY

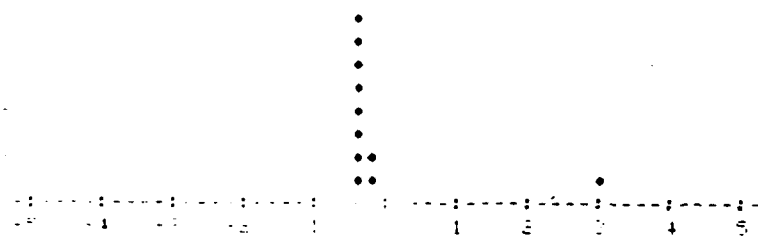
NO. OBS. = 4
 MEAN = \$159
 STD. DEV. = \$197
 MIN. OBS. = \$14.4
 MAX. OBS. = \$450



ALL RESPONSES

NO. OBS. = 11
 MIN. OBS. = \$4.8
 MAX. OBS. = \$58266

OBSERVATIONS



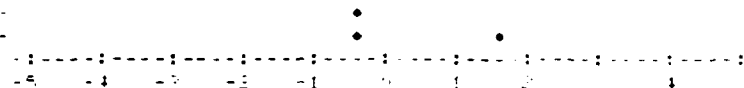
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$5704 STD. DEV. = \$17458

APPROXIMATE DOLLAR VALUE OF A NON-CYLINDRICAL MACHINED PART MANUFACTURED IN-HOUSE

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = \$2174
 STD. DEV. = \$3747
 MIN. OBS. = \$7.5
 MAX. OBS. = \$6500



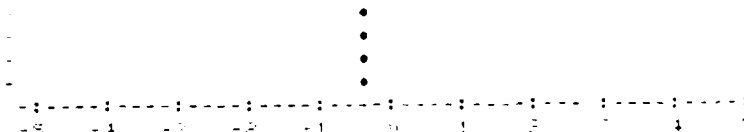
OTHER AEROSPACE

NO. OBS. = 4
 MEAN = \$2318
 STD. DEV. = \$4190
 MIN. OBS. = \$0.7
 MAX. OBS. = \$8586



OTHER INDUSTRY

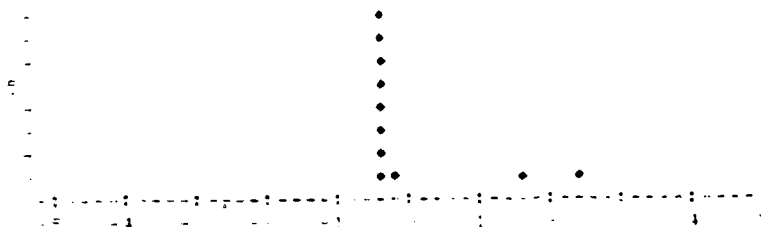
NO. OBS. = 4
 MEAN = \$73
 STD. DEV. = \$56
 MIN. OBS. = \$9.4
 MAX. OBS. = \$128



OBSERVATIONS

ALL RESPONSES

NO. OBS. = 11
 MIN. OBS. = \$7.5
 MAX. OBS. = \$8586



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$1462 STD. DEV. = \$3048

VALIDITY CHECK BETWEEN NUMBER OF NEW PART NUMBERS INDICATED IN Q7 AND NUMBER OF PROCESS PLANS
 PREPARED FOR NEW PARTS AS INDICATED IN Q13 -- CYLINDRICAL PARTS (Q7-Q13)

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 50
 STD. DEV. = 87
 MIN. OBS. = 0
 MAX. OBS. = 150



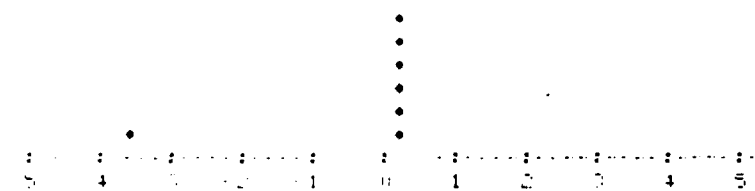
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = -14.4
 STD. DEV. = 194
 MIN. OBS. = -400
 MAX. OBS. = 290



OTHER INDUSTRY

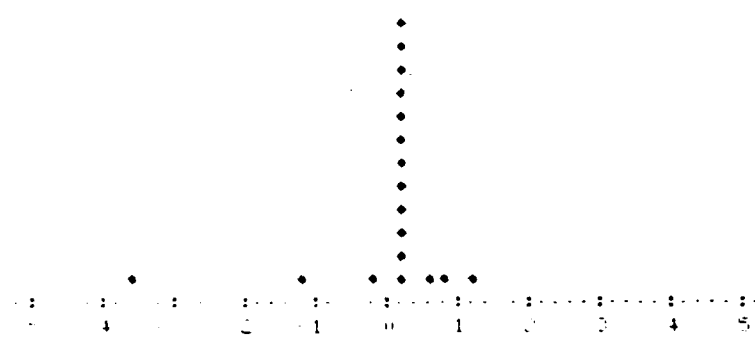
NO. OBS. = 7
 MEAN = -143
 STD. DEV. = 378
 MIN. OBS. = -1000
 MAX. OBS. = 0



OBSERVATIONS

ALL RESPONSES

NO. OBS. = 18
 MIN. OBS. = -1000
 MAX. OBS. = 290



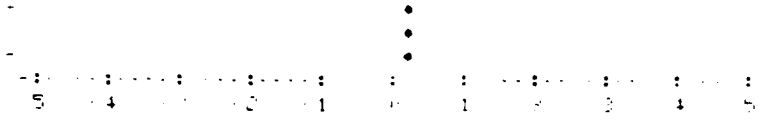
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -53.6 STD. DEV. = 270

DITY CHECK BETWEEN NUMBER OF NEW PART NUMBERS INDICATED IN Q7 AND NUMBER OF PROCESS PLANS
 ARED FOR NEW PARTS AS INDICATED IN Q13 -- NON-CYLINDRICAL PARTS (Q7-Q13)

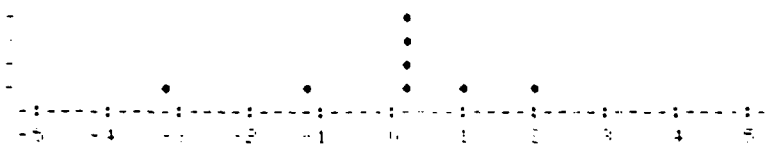
FILE PRIMES & SUBS

OBS. = 3
 I = 8.3
 DEV. = 14.4
 OBS. = 0
 OBS. = 25



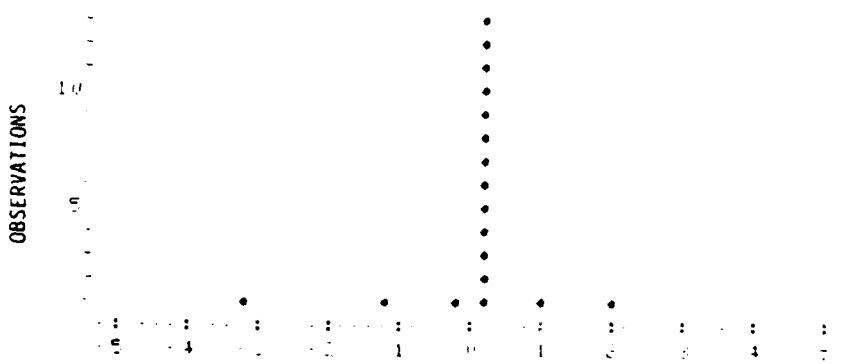
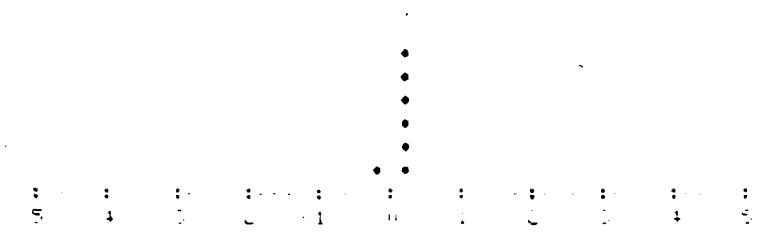
ER AEROSPACE

OBS. = 8
 N = -32.5
 DEV. = 234
 OBS. = -500
 OBS. = 285



ER INDUSTRY

OBS. = 7
 N = -5.7
 DEV. = 15.1
 OBS. = -40
 OBS. = 0



RESPONSES

OBS. = 18
 I. OBS. = -500
 O. OBS. = 285

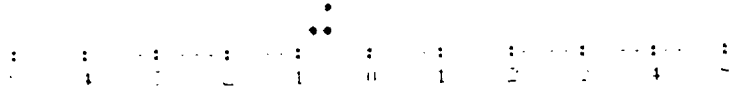
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = -15.3 STD. DEV. = 151

APPROXIMATE ANNUAL COST FOR PREPARING TOTALLY NEW PROCESS PLANS FOR CYLINDRICAL MACHINED PARTS

MISSILE PRIMES & SUBS

O. OBS. = 3
 EAN = \$ 32.3K
 TD. DEV. = \$ 13.6K
 IN. OBS. = \$ 24K
 AX. OBS. = \$ 48K



OTHER AEROSPACE

O. OBS. = 5
 EAN = \$ 135K
 TD. DEV. = \$ 106K
 IN. OBS. = \$ 12K
 AX. OBS. = \$ 300K



OTHER INDUSTRY

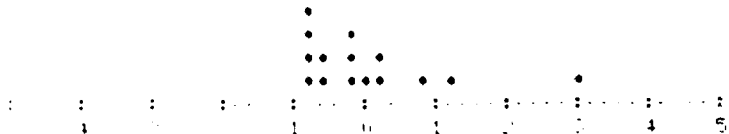
O. OBS. = 7
 EAN = \$ 158K
 TD. DEV. = \$ 187K
 IN. OBS. = \$ 1.8K
 AX. OBS. = \$ 544K



OBSERVATIONS

ALL RESPONSES

O. OBS. = 15
 IN. OBS. = \$ 1.8K
 AX. OBS. = \$ 544K



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$125K STD. DEV. = \$144K

AD-A151 997

COMPUTERIZED PRODUCTION PROCESS PLANNING VOLUME 3
APPENDICES A B AND C TO BENEFIT ANALYSIS(U) IIT
RESEARCH INST CHICAGO IL H H SHU ET AL. NOV 76

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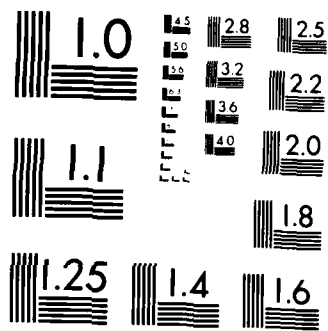
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963 A

APPROXIMATE ANNUAL COST FOR PREPARING TOTALLY NEW PROCESS PLANS FOR NON-CYLINDRICAL MACHINED PARTS

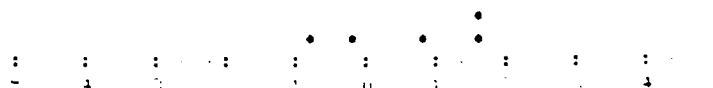
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = \$ 65.7K
 STD. DEV. = \$ 33.3K
 MIN. OBS. = \$ 30K
 MAX. OBS. = \$ 96K



OTHER AEROSPACE

NO. OBS. = 5
 MEAN = \$ 185K
 STD. DEV. = \$ 121K
 MIN. OBS. = \$ 30K
 MAX. OBS. = \$ 300K



OTHER INDUSTRY

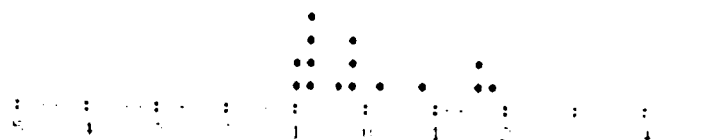
NO. OBS. = 7
 MEAN = \$ 85.5K
 STD. DEV. = \$ 116K
 MIN. OBS. = \$ 0.3K
 MAX. OBS. = \$ 325K



ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = \$ 0.3K
 MAX. OBS. = \$ 325K

OBSERVATIONS

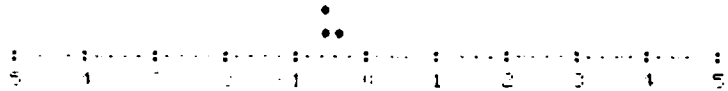


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$ 115K STD. DEV. = \$113K

APPROXIMATE ANNUAL COST FOR MODIFYING PROCESS PLANS FOR CYLINDRICAL MACHINED PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = \$ 8.9K
 STD. DEV. = \$ 9.6K
 MIN. OBS. = \$ 0.4K
 MAX. OBS. = \$19.2K



OTHER AEROSPACE

NO. OBS. = 5
 MEAN = \$ 181K
 STD. DEV. = \$ 253K
 MIN. OBS. = \$12.0K
 MAX. OBS. = \$ 630K



OTHER INDUSTRY

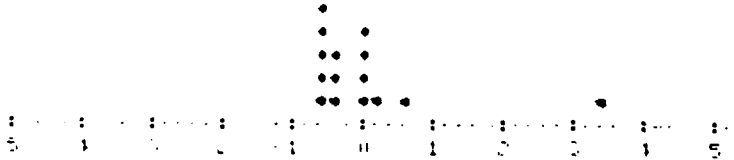
NO. OBS. = 7
 MEAN = \$ 57.9K
 STD. DEV. = \$ 69.7K
 MIN. OBS. = \$ 0.8 K
 MAX. OBS. = \$ 175 K



ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = \$ 0.4K
 MAX. OBS. = \$ 630K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$89.3K

STD. DEV. = \$159K

APPROXIMATE ANNUAL COST FOR MODIFYING PROCESS PLANS FOR NON-CYLINDRICAL MACHINED PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = \$ 40K
 STD. DEV. = \$ 58K
 MIN. OBS. = \$ 0.7K
 MAX. OBS. = \$ 106K



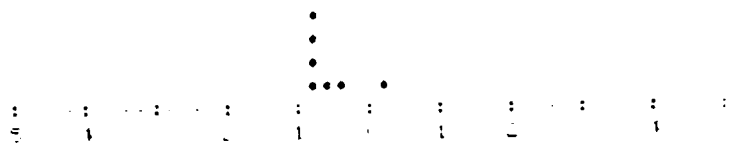
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = \$ 194K
 STD. DEV. = \$ 104K
 MIN. OBS. = \$ 50K
 MAX. OBS. = \$ 297K



OTHER INDUSTRY

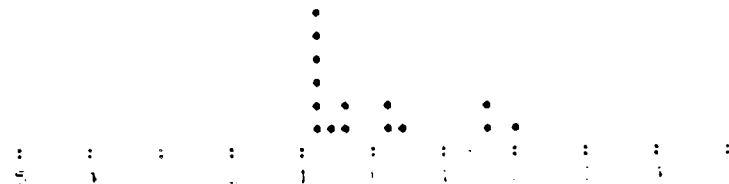
NO. OBS. = 7
 MEAN = \$ 28K
 STD. DEV. = \$ 37K
 MIN. OBS. = \$ 0.6K
 MAX. OBS. = \$ 105K



ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = \$ 0.6K
 MAX. OBS. = \$ 297K

OBSERVATIONS

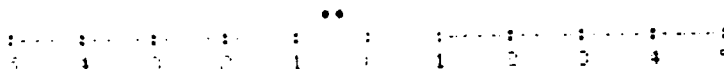


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$ 86K STD. DEV. = \$ 102K

APPROXIMATE ANNUAL COSTS FOR PREPARING STUDY PLANS FOR CYLINDRICAL MACHINED PARTS

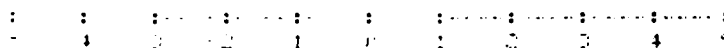
MISSILE PRIMES & SUBS

NO. OBS. = 2
 MEAN = \$ 16K
 STD. DEV. = \$ 13K
 MIN. OBS. = \$ 7K
 MAX. OBS. = \$ 25K



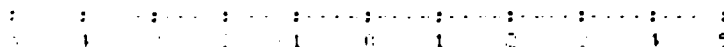
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = \$ 81K
 STD. DEV. = \$ 74K
 MIN. OBS. = \$ 3K
 MAX. OBS. = \$160K



OTHER INDUSTRY

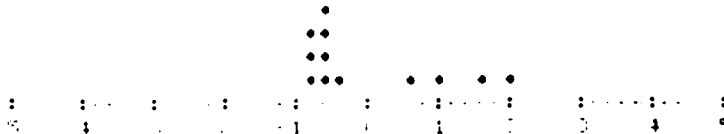
NO. OBS. = 5
 MEAN = \$ 18K
 STD. DEV. = \$ 37K
 MIN. OBS. = \$ 0
 MAX. OBS. = \$ 84K



ALL RESPONSES

NO. OBS. = 12
 MIN. OBS. = \$ 0
 MAX. OBS. = \$ 160K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$ 44K STD. DEV. = \$ 60K

APPROXIMATE ANNUAL COSTS FOR PREPARING STUDY PLANS FOR NON-CYLINDRICAL MACHINED PARTS

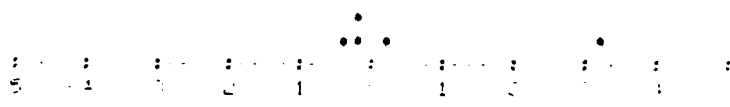
MISSILE PRIMES & SUBS

NO. OBS. = 2
 MEAN = \$ 27K
 STD. DEV. = \$ 18K
 MIN. OBS. = \$ 14K
 MAX. OBS. = \$ 40K



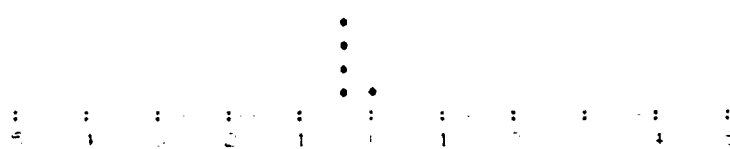
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = \$ 148K
 STD. DEV. = \$ 230K
 MIN. OBS. = \$ 0.5K
 MAX. OBS. = \$ 555K



OTHER INDUSTRY

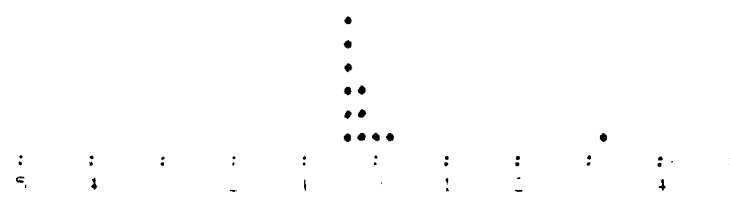
NO. OBS. = 5
 MEAN = \$ 13K
 STD. DEV. = \$ 24K
 MIN. OBS. = \$ 0
 MAX. OBS. = \$ 56K



ALL RESPONSES

NO. OBS. = 12
 MIN. OBS. = \$ 0
 MAX. OBS. = \$ 555K

OBSERVATIONS

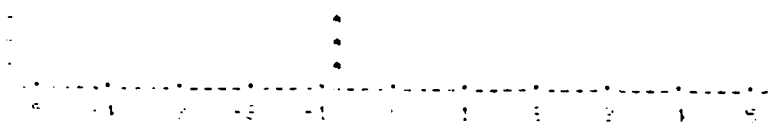


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$ 71K STD. DEV. = \$ 155K

APPROXIMATE ANNUAL PROCESS PLANNING COSTS FOR CYLINDRICAL MACHINED PARTS

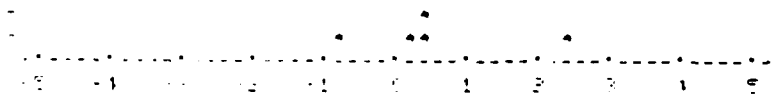
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = \$ 52K
 STD. DEV. = \$ 8K
 MIN. OBS. = \$ 43K
 MAX. OBS. = \$ 57K



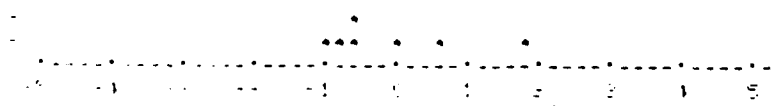
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = \$ 397K
 STD. DEV. = \$ 307K
 MIN. OBS. = \$ 28K
 MAX. OBS. = \$ 880K



OTHER INDUSTRY

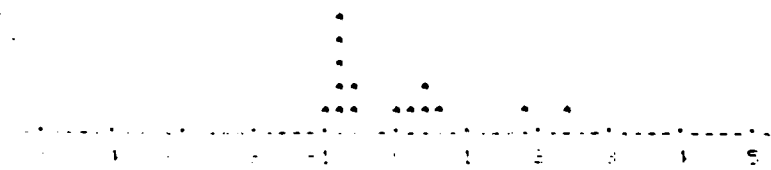
NO. OBS. = 7
 MEAN = \$ 229K
 STD. DEV. = \$ 261K
 MIN. OBS. = \$ 3K
 MAX. OBS. = \$ 724K



ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = \$ 3K
 MAX. OBS. = \$ 880K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

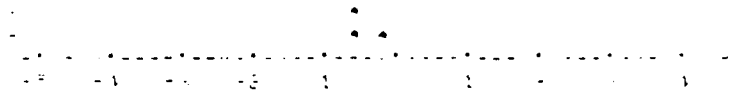
MEAN = \$ 250K

STD. DEV. = \$ 296K

APPROXIMATE ANNUAL PROCESS PLANNING COSTS FOR NON-CYLINDRICAL MACHINED PARTS

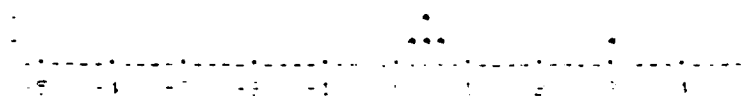
MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = \$ 124K
STD. DEV. = \$ 48K
MIN. OBS. = \$ 83K
MAX. OBS. = \$ 178K



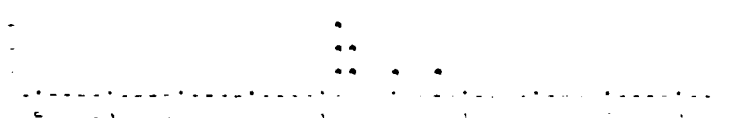
OTHER AEROSPACE

NO. OBS. = 5
MEAN = \$ 527K
STD. DEV. = \$ 350K
MIN. OBS. = \$ 305K
MAX. OBS. = \$1146K



OTHER INDUSTRY

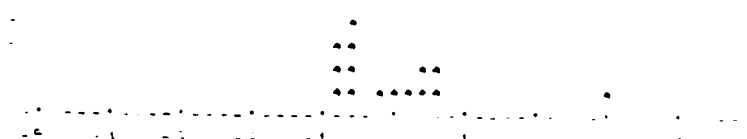
NO. OBS. = 7
MEAN = \$ 123K
STD. DEV. = \$ 158K
MIN. OBS. = \$ 3K
MAX. OBS. = \$ 432K



ALL RESPONSES

NO. OBS. = 15
MIN. OBS. = \$ 3K
MAX. OBS. = \$ 1146K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = \$ 258K STD. DEV. = \$ 291K

APPROXIMATE AVERAGE COST PER PROCESS PLAN PREPARED FOR CYLINDRICAL MACHINED PARTS

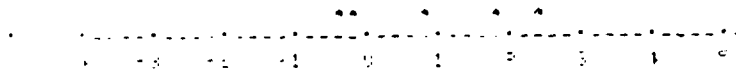
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = \$182
 STD. DEV. = \$ 65
 MIN. OBS. = \$136
 MAX. OBS. = \$257



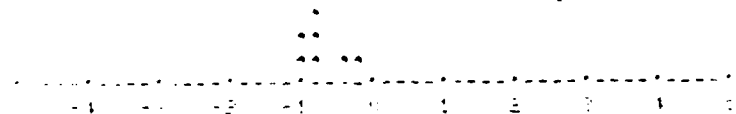
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = \$326
 STD. DEV. = \$197
 MIN. OBS. = \$116
 MAX. OBS. = \$580



OTHER INDUSTRY

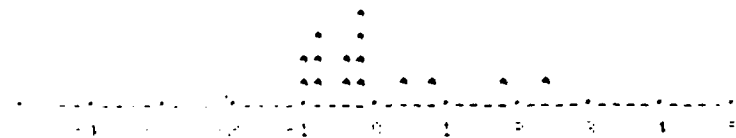
NO. OBS. = 7
 MEAN = \$ 64
 STD. DEV. = \$ 50
 MIN. OBS. = \$ 17
 MAX. OBS. = \$156



ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = \$ 17
 MAX. OBS. = \$580

OBSERVATIONS



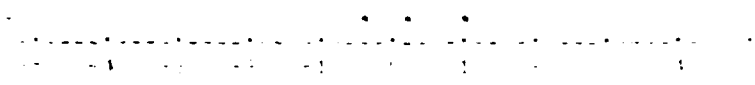
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$175 STD. DEV. = \$165

APPROXIMATE AVERAGE COST PER PROCESS PLAN PREPARED FOR NON-CYLINDRICAL MACHINED PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = \$252
STD. DEV. = \$125
MIN. OBS. = \$136
MAX. OBS. = \$384



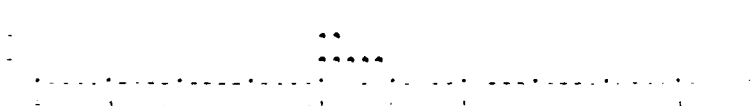
OTHER AEROSPACE

NO. OBS. = 5
MEAN = \$352
STD. DEV. = \$202
MIN. OBS. = \$145
MAX. OBS. = \$599



OTHER INDUSTRY

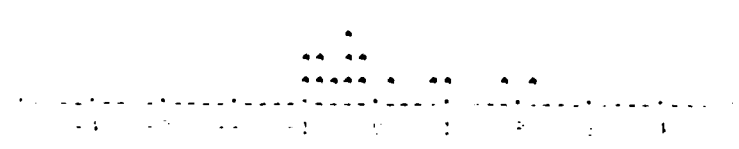
NO. OBS. = 7
MEAN = \$ 87
STD. DEV. = \$ 60
MIN. OBS. = \$ 23
MAX. OBS. = \$175



ALL RESPONSES

NO. OBS. = 15
MIN. OBS. = \$ 23
MAX. OBS. = \$599

OBSERVATIONS

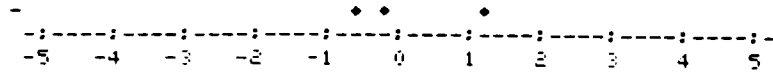


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = \$208 STD. DEV. = \$175

APPROPRIATE PERCENTAGE OF PROCESS PLANNING COSTS ATTRIBUTABLE TO PREPARING PLANS FOR NEW CYLINDRICAL PARTS

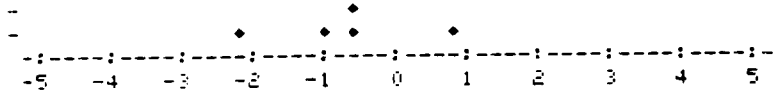
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 62.0%
 STD. DEV. = 21.0%
 MIN. OBS. = 43.9%
 MAX. OBS. = 86.4%



OTHER AEROSPACE

NO. OBS. = 5
 MEAN = 41.9%
 STD. DEV. = 24.5%
 MIN. OBS. = 10.2%
 MAX. OBS. = 78.3%



OTHER INDUSTRY

NO. OBS. = 7
 MEAN = 69.2%
 STD. DEV. = 16.5%
 MIN. OBS. = 53.8%
 MAX. OBS. = 94.3%



ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = 10.2%
 MAX. OBS. = 94.3%



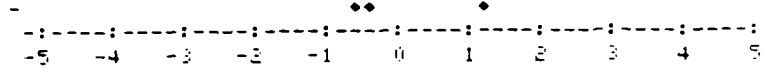
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 58.6% STD. DEV. = 22.7%

APPROPRIATE PERCENTAGE OF PROCESS PLANNING COSTS ATTRIBUTABLE TO PREPARING PLANS FOR NEW NON-CYLINDRICAL PARTS

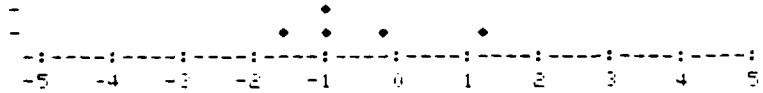
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 54.2%
 STD. DEV. = 28.0%
 MIN. OBS. = 31.1%
 MAX. OBS. = 86.4%



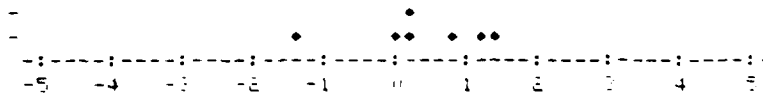
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = 38.5%
 STD. DEV. = 29.9%
 MIN. OBS. = 9.8%
 MAX. OBS. = 85.6%



OTHER INDUSTRY

NO. OBS. = 7
 MEAN = 62.5%
 STD. DEV. = 27.1%
 MIN. OBS. = 11.8%
 MAX. OBS. = 94.3%



ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = 9.8%
 MAX. OBS. = 94.3%

OBSERVATIONS

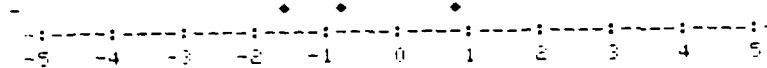


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 52.8% STD. DEV. = 29.3%

APPROXIMATE PERCENTAGE OF PROCESS PLANNING COSTS ATTRIBUTABLE TO MODIFYING EXISTING PLANS FOR CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 19.1%
 STD. DEV. = 22.7%
 MIN. OBS. = 0.6%
 MAX. OBS. = 44.4%



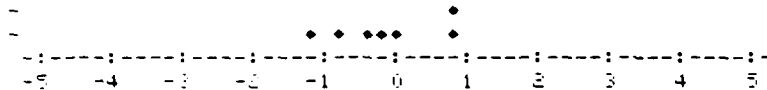
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = 37.7%
 STD. DEV. = 20.7%
 MIN. OBS. = 20.9%
 MAX. OBS. = 71.6%



OTHER INDUSTRY

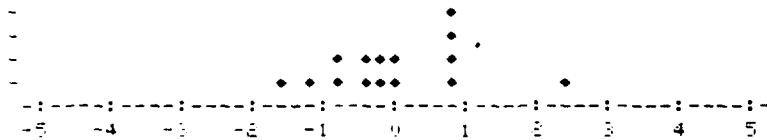
NO. OBS. = 7
 MEAN = 25.7%
 STD. DEV. = 14.3%
 MIN. OBS. = 5.7%
 MAX. OBS. = 43.8%



ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = 0.6%
 MAX. OBS. = 71.6%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 28.4%

STD. DEV. = 18.3%

APPROXIMATE RATIO OF NEW PLUS MODIFIED PLANS PREPARED ANNUALLY FOR CYLINDRICAL PARTS TO NUMBER OF CYLINDRICAL PARTS PRODUCED ANNUALLY (BY PART NUMBER, NOT TOTAL VOLUME)

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 0.411
 STD. DEV. = 0.242
 MIN. OBS. = 0.140
 MAX. OBS. = 0.605

OTHER AEROSPACE

NO. OBS. = 4
 MEAN = 1.440
 STD. DEV. = 0.407
 MIN. OBS. = 0.929
 MAX. OBS. = 1.805

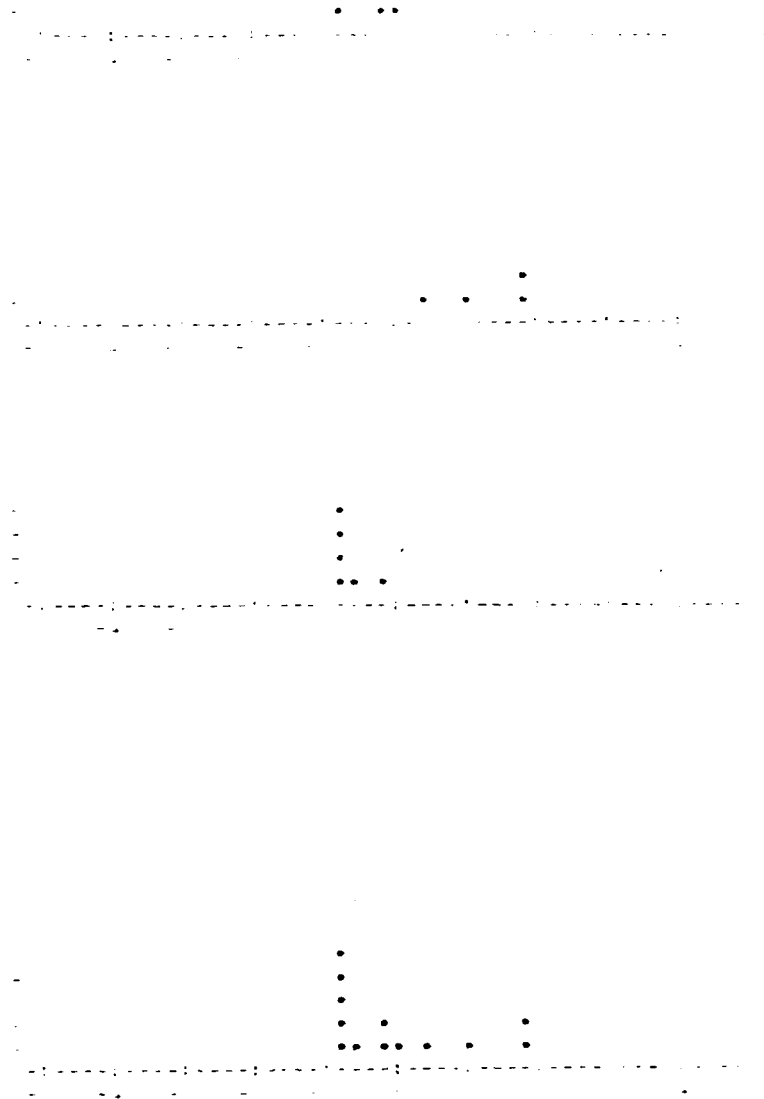
OTHER INDUSTRY

NO. OBS. = 6
 MEAN = 0.224
 STD. DEV. = 0.150
 MIN. OBS. = 0.110
 MAX. OBS. = 0.500

ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = 0.110
 MAX. OBS. = 1.805

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 0.641

STD. DEV. = 0.616

APPROXIMATE RATIO OF MODIFIED PROCESS PLANS PREPARED ANNUALLY FOR NON-CYLINDRICAL PARTS TO NUMBER OF NON-CYLINDRICAL PARTS PRODUCED ANNUALLY (BY PART NUMBER, NOT TOTAL VOLUME)

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 0.395
STD. DEV. = 0.533
MIN. OBS. = 0.007
MAX. OBS. = 1.003

OTHER AEROSPACE

NO. OBS. = 4
MEAN = 0.909
STD. DEV. = 0.535
MIN. OBS. = 0.286
MAX. OBS. = 1.591

OTHER INDUSTRY

NO. OBS. = 6
MEAN = 0.008
STD. DEV. = 0.007
MIN. OBS. = 0.023
MAX. OBS. = 0.211

ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = 0.007
MAX. OBS. = 1.591

OBSERVATIONS

STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = 0.406 STD. DEV. = 0.516

APPROXIMATE RATIO OF MODIFIED PROCESS PLANS PREPARED ANNUALLY FOR CYLINDRICAL PARTS TO NUMBER OF CYLINDRICAL PARTS PRODUCED ANNUALLY (BY PART NUMBER, NOT TOTAL VOLUME)

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 0.181
 STD. DEV. = 0.202
 MIN. OBS. = 0.007
 MAX. OBS. = 0.403

OTHER AEROSPACE

NO. OBS. = 4
 MEAN = 1.156
 STD. DEV. = 0.381
 MIN. OBS. = 0.714
 MAX. OBS. = 1.593

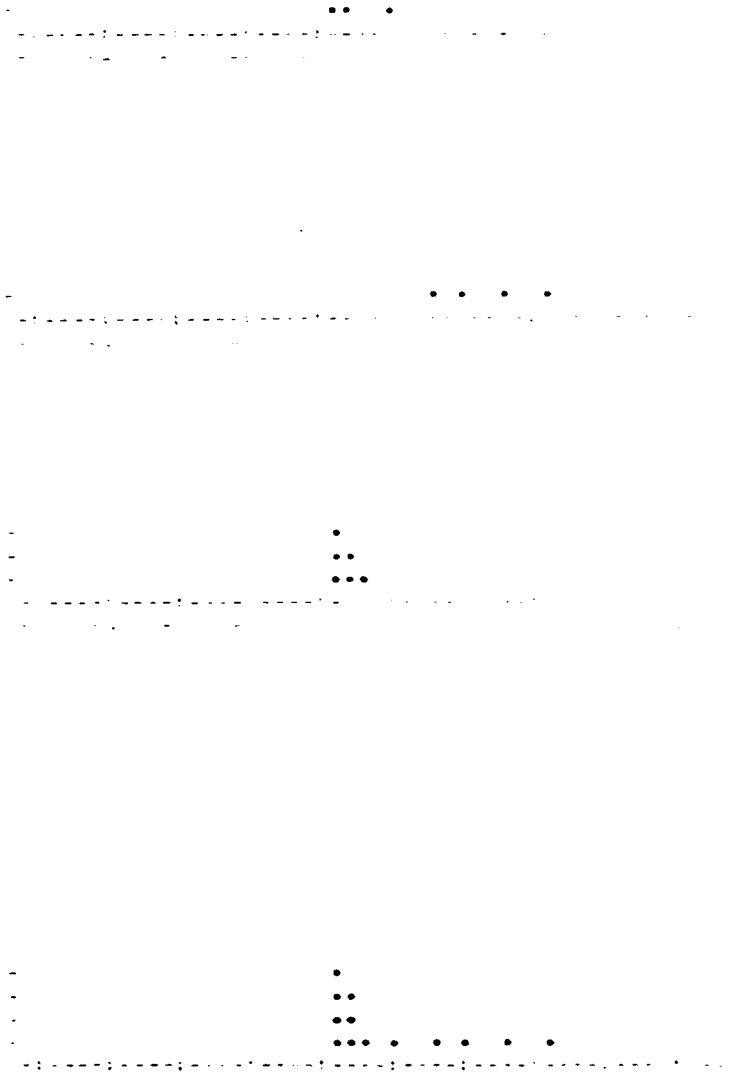
OTHER INDUSTRY

NO. OBS. = 6
 MEAN = 0.076
 STD. DEV. = 0.054
 MIN. OBS. = 0.024
 MAX. OBS. = 0.167

ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = 0.007
 MAX. OBS. = 1.593

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 0.432 STD. DEV. = 0.549

APPROXIMATE RATIO OF PROCESS PLANS FOR NEW NON-CYLINDRICAL PARTS TO NUMBER OF NON-CYLINDRICAL PARTS PRODUCED ANNUALLY (BY PART NUMBERS, NOT TOTAL VOLUME)

MISSILE PRIMES & SUBS

NO. OBS. = 3
MEAN = 0.260
STD. DEV. = 0.164
MIN. OBS. = 0.133
MAX. OBS. = 0.445

OTHER AEROSPACE

NO. OBS. = 4
MEAN = 0.152
STD. DEV. = 0.108
MIN. OBS. = 0.081
MAX. OBS. = 0.313

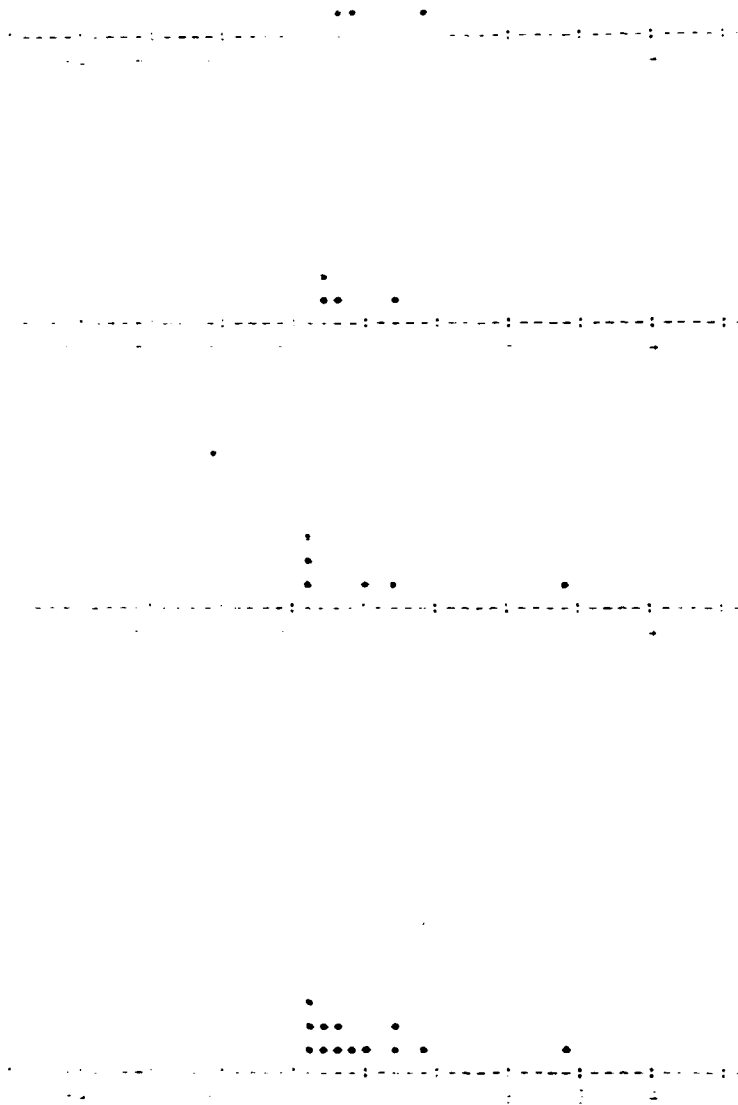
OTHER INDUSTRY

NO. OBS. = 6
MEAN = 0.271
STD. DEV. = 0.346
MIN. OBS. = 0.027
MAX. OBS. = 0.929

ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = 0.027
MAX. OBS. = 0.929

OBSERVATIONS



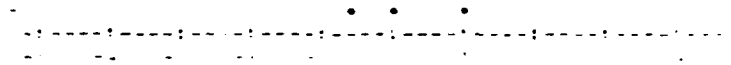
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 0.232 STD. DEV. = 0.246

APPROXIMATE RATIO OF PROCESS PLANS FOR NEW CYLINDRICAL PARTS TO NUMBER OF CYLINDRICAL PARTS
PRODUCED ANNUALLY (BY PART NUMBERS, NOT TOTAL VOLUME)

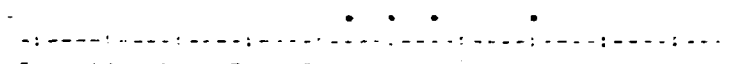
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 0.231
 STD. DEV. = 0.115
 MIN. OBS. = 0.133
 MAX. OBS. = 0.358



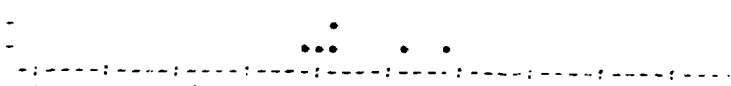
OTHER AEROSPACE

NO. OBS. = 4
 MEAN = 0.284
 STD. DEV. = 0.152
 MIN. OBS. = 0.133
 MAX. OBS. = 0.488



OTHER INDUSTRY

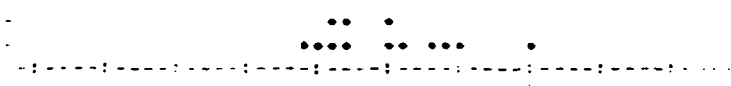
NO. OBS. = 6
 MEAN = 0.148
 STD. DEV. = 0.115
 MIN. OBS. = 0.050
 MAX. OBS. = 0.333



ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = 0.050
 MAX. OBS. = 0.488

OBSERVATIONS



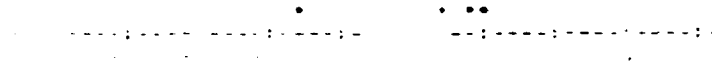
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 0.209 STD. DEV. = 0.141

APPROXIMATE RATIO OF PROCESS PLANS FOR STUDY PURPOSES FOR NON-CYLINDRICAL PARTS TO TOTAL NUMBER OF PROCESS PLANS OF ALL TYPES PREPARED ANNUALLY FOR NON-CYLINDRICAL PARTS

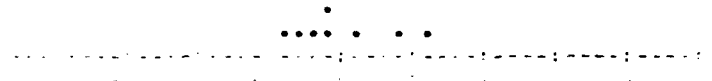
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 0.436
 STD. DEV. = 0.244
 MIN. OBS. = 0.078
 MAX. OBS. = 0.607



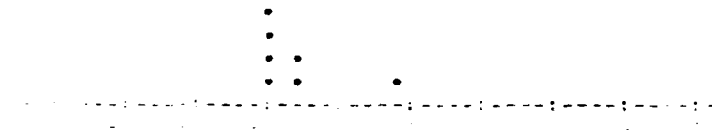
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 0.206
 STD. DEV. = 0.151
 MIN. OBS. = 0.017
 MAX. OBS. = 0.471



OTHER INDUSTRY

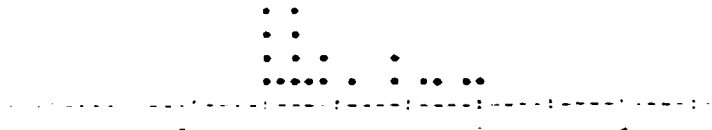
NO. OBS. = 7
 MEAN = 0.071
 STD. DEV. = 0.133
 MIN. OBS. = 0.000
 MAX. OBS. = 0.367



ALL RESPONSES

NO. OBS. = 19
 MIN. OBS. = 0.000
 MAX. OBS. = 0.607

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 0.205 STD. DEV. = 0.209

APPROXIMATE RATIO OF PROCESS PLANS FOR STUDY PURPOSES FOR CYLINDRICAL PARTS TO TOTAL NUMBER OF PROCESS PLANS OF ALL TYPES PREPARED ANNUALLY FOR CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 0.447
 STD. DEV. = 0.210
 MIN. OBS. = 0.143
 MAX. OBS. = 0.617

OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 0.218
 STD. DEV. = 0.187
 MIN. OBS. = 0.015
 MAX. OBS. = 0.572

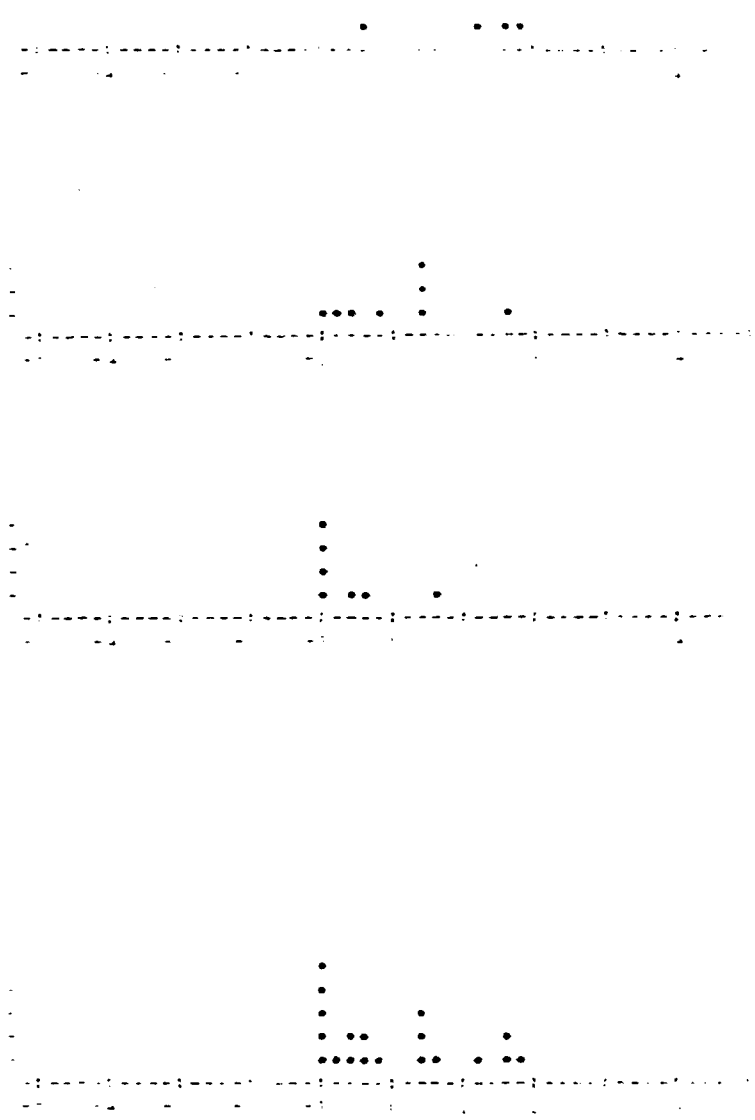
OTHER INDUSTRY

NO. OBS. = 7
 MEAN = 0.073
 STD. DEV. = 0.120
 MIN. OBS. = 0.000
 MAX. OBS. = 0.326

ALL RESPONSES

NO. OBS. = 19
 MIN. OBS. = 0.000
 MAX. OBS. = 0.617

OBSERVATIONS

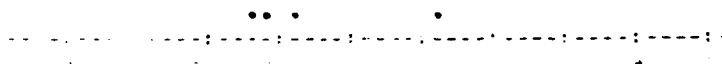


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 0.213 STD. DEV. = 0.215

APPROXIMATE RATIO OF PROCESS PLANS MODIFIED FOR NON-CYLINDRICAL PARTS TO TOTAL NUMBER OF PROCESS PLANS OF ALL TYPES PREPARED ANNUALLY FOR NON-CYLINDRICAL PARTS.

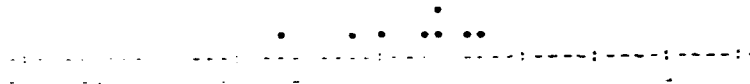
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 0.279
 STD. DEV. = 0.335
 MIN. OBS. = 0.024
 MAX. OBS. = 0.768



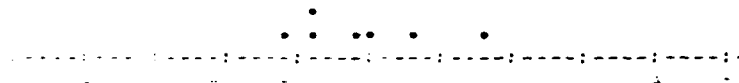
OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 0.564
 STD. DEV. = 0.263
 MIN. OBS. = 0.058
 MAX. OBS. = 0.855



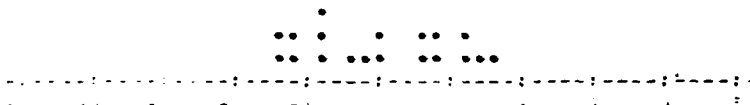
OTHER INDUSTRY

NO. OBS. = 7
 MEAN = 0.416
 STD. DEV. = 0.274
 MIN. OBS. = 0.130
 MAX. OBS. = 0.900



ALL RESPONSES

NO. OBS. = 19
 MIN. OBS. = 0.024
 MAX. OBS. = 0.900



OBSERVATIONS

STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 0.449 STD. DEV. = 0.289

APPROXIMATE RATIO OF PROCESS PLANS MODIFIED FOR CYLINDRICAL PARTS TO TOTAL NUMBER OF PROCESS PLANS OF ALL TYPES PREPARED ANNUALLY FOR CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 0.222
 STD. DEV. = 0.243
 MIN. OBS. = 0.024
 MAX. OBS. = 0.571

OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 0.507
 STD. DEV. = 0.230
 MIN. OBS. = 0.058
 MAX. OBS. = 0.714

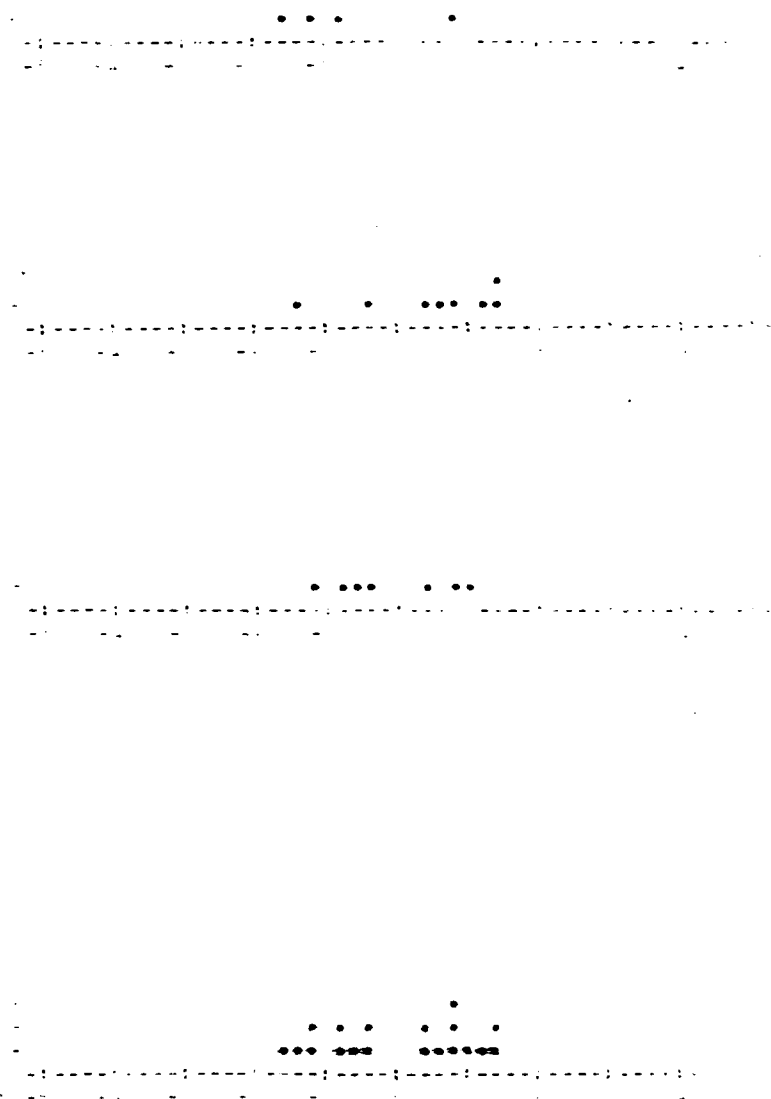
OTHER INDUSTRY

NO. OBS. = 7
 MEAN = 0.362
 STD. DEV. = 0.195
 MIN. OBS. = 0.130
 MAX. OBS. = 0.625

ALL RESPONSES

NO. OBS. = 19
 MIN. OBS. = 0.024
 MAX. OBS. = 0.714

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 0.394 STD. DEV. = 0.236

APPROXIMATE RATIO OF PROCESS PLANS FOR NEW NON-CYLINDRICAL PARTS TO TOTAL NUMBER OF PROCESS PLANS OF ALL TYPES PREPARED ANNUALLY FOR NON-CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 0.285
 STD. DEV. = 0.145
 MIN. OBS. = 0.154
 MAX. OBS. = 0.488

OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 0.230
 STD. DEV. = 0.228
 MIN. OBS. = 0.055
 MAX. OBS. = 0.768

OTHER INDUSTRY

NO. OBS. = 7
 MEAN = 0.513
 STD. DEV. = 0.264
 MIN. OBS. = 0.100
 MAX. OBS. = 0.870

ALL RESPONSES

NO. OBS. = 19
 MIN. OBS. = 0.055
 MAX. OBS. = 0.870

OBSERVATIONS

STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 0.346 STD. DEV. = 0.254

APPROXIMATE RATIO OF PROCESS PLANS FOR NEW CYLINDRICAL PARTS TO TOTAL NUMBER OF PROCESS PLANS
OF ALL TYPES PREPARED ANNUALLY FOR CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = 0.331
 STD. DEV. = 0.105
 MIN. OBS. = 0.270
 MAX. OBS. = 0.488

OTHER AEROSPACE

NO. OBS. = 8
 MEAN = 0.276
 STD. DEV. = 0.220
 MIN. OBS. = 0.055
 MAX. OBS. = 0.768

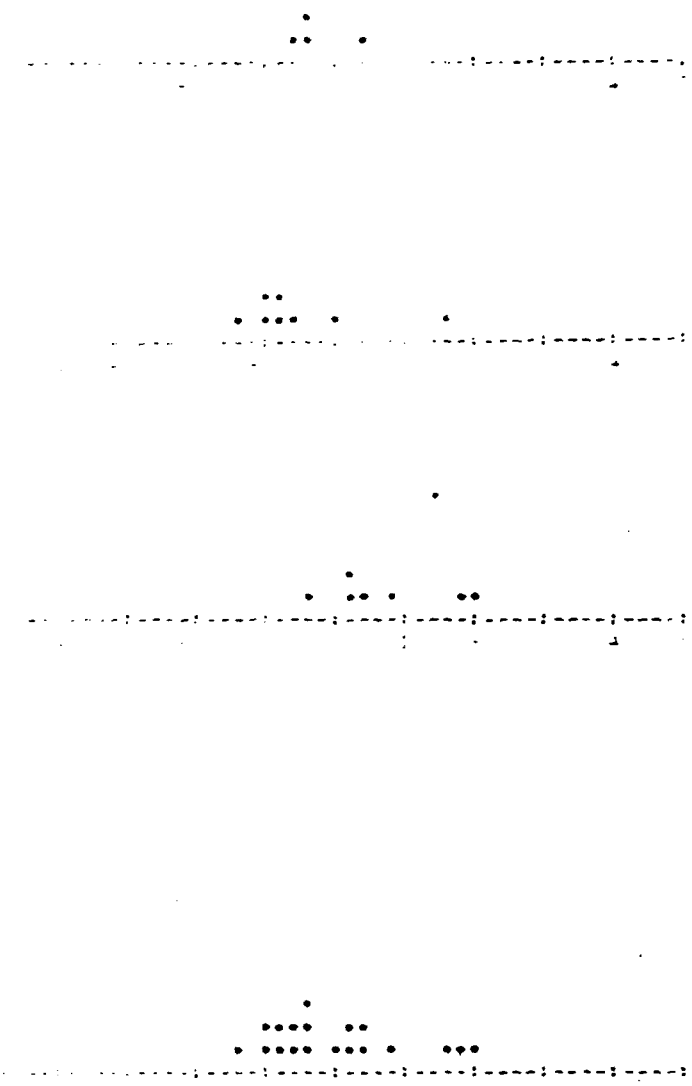
OTHER INDUSTRY

NO. OBS. = 7
 MEAN = 0.564
 STD. DEV. = 0.203
 MIN. OBS. = 0.313
 MAX. OBS. = 0.870

ALL RESPONSES

NO. OBS. = 19
 MIN. OBS. = 0.055
 MAX. OBS. = 0.870

OBSERVATIONS

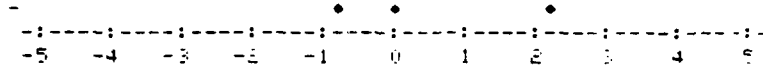


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 0.394 STD. DEV. = 0.230

APPROXIMATE PERCENTAGE OF PROCESS PLANNING COSTS ATTRIBUTABLE TO PREPARING STUDY PLANS FOR NON-CYLINDRICAL PARTS

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 20.4%
 STD. DEV. = 24.9%
 MIN. OBS. = 13%
 MAX. OBS. = 48.1%



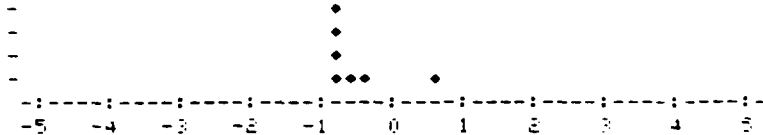
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = 19.1%
 STD. DEV. = 18.4%
 MIN. OBS. = 0.1%
 MAX. OBS. = 48.4%



OTHER INDUSTRY

NO. OBS. = 7
 MEAN = 4.8%
 STD. DEV. = 8.7%
 MIN. OBS. = 0%
 MAX. OBS. = 23.9%



ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = 0%
 MAX. OBS. = 48.4%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

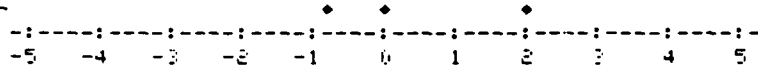
MEAN = 12.7%

STD. DEV. = 16.6%

APPROXIMATE PERCENTAGE OF PROCESS PLANNING COSTS ATTRIBUTABLE TO PREPARING STUDY PLANS FOR CYLINDRICAL PARTS

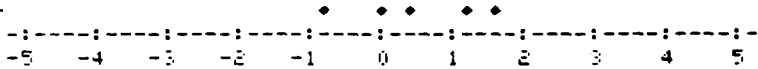
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 19%
 STD. DEV. = 22.6%
 MIN. OBS. = 13%
 MAX. OBS. = 44%



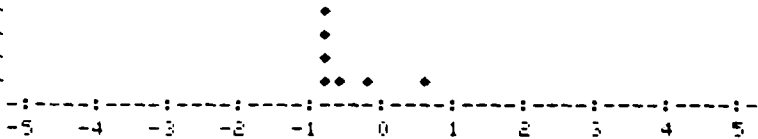
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = 20.4%
 STD. DEV. = 14.5%
 MIN. OBS. = 0.8%
 MAX. OBS. = 37.7%



OTHER INDUSTRY

NO. OBS. = 7
 MEAN = 5.1%
 STD. DEV. = 8%
 MIN. OBS. = 0%
 MAX. OBS. = 30%



ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = 0%
 MAX. OBS. = 30%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

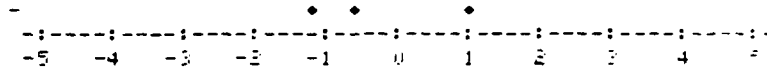
MEAN = 13%

STD. DEV. = 14.8%

APPROXIMATE PERCENTAGE OF PROCESS PLANNING COSTS ATTRIBUTABLE TO MODIFYING EXISTING PLANS FOR NON-CYLINDRICAL PARTS

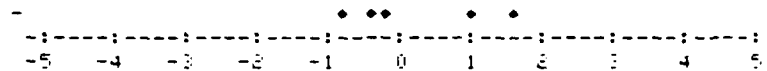
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 25.5%
 STD. DEV. = 30.9%
 MIN. OBS. = 0.6%
 MAX. OBS. = 60.0%



OTHER AEROSPACE

NO. OBS. = 5
 MEAN = 42.4%
 STD. DEV. = 28.2%
 MIN. OBS. = 14.3%
 MAX. OBS. = 80.3%



OTHER INDUSTRY

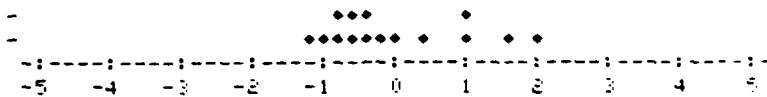
NO. OBS. = 7
 MEAN = 32.8%
 STD. DEV. = 27.5%
 MIN. OBS. = 5.7%
 MAX. OBS. = 88.2%



ALL RESPONSES

NO. OBS. = 15
 MIN. OBS. = 0.6%
 MAX. OBS. = 88.2%

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 34.5% STD. DEV. = 27.0%

APPROXIMATE RATIO OF NEW PLUS MODIFIED PLANS PREPARED ANNUALLY FOR NON-CYLINDRICAL PARTS TO NUMBER OF NON-CYLINDRICAL PARTS PRODUCED ANNUALLY (BY PART NUMBER, NOT TOTAL VOLUME)

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 0.654
 STD. DEV. = 0.532
 MIN. OBS. = 0.140
 MAX. OBS. = 1.203

OTHER AEROSPACE

NO. OBS. = 4
 MEAN = 1.061
 STD. DEV. = 0.543
 MIN. OBS. = 0.386
 MAX. OBS. = 1.705

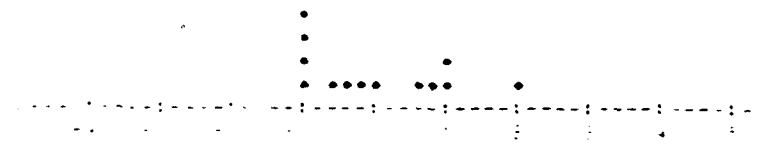
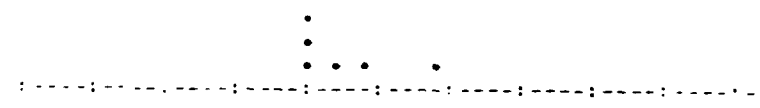
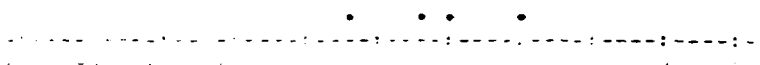
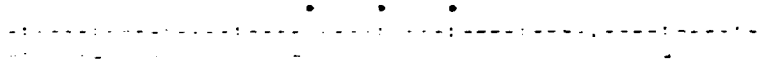
OTHER INDUSTRY

NO. OBS. = 6
 MEAN = 0.359
 STD. DEV. = 0.365
 MIN. OBS. = 0.073
 MAX. OBS. = 1.014

ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = 0.073
 MAX. OBS. = 1.705

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = 0.643 STD. DEV. = 0.527

APPROXIMATE ANNUAL DOLLAR VALUE OF MATERIAL COSTS FOR CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

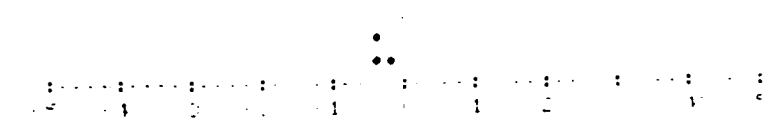
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$ 0.6 MIL.
 STD. DEV. = \$ 0.8 MIL.
 MIN. OBS. = \$ 0.05 MIL.
 MAX. OBS. = \$ 1.7 MIL.



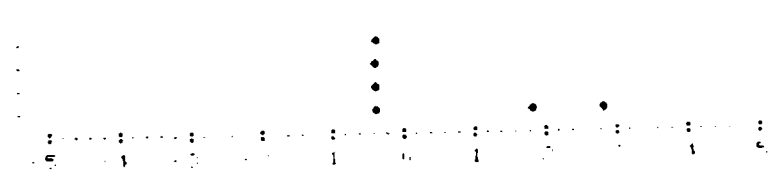
OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$ 1.5 MIL.
 STD. DEV. = \$ 1.1 MIL.
 MIN. OBS. = \$ 0.4 MIL.
 MAX. OBS. = \$ 2.5 MIL.



OTHER INDUSTRY

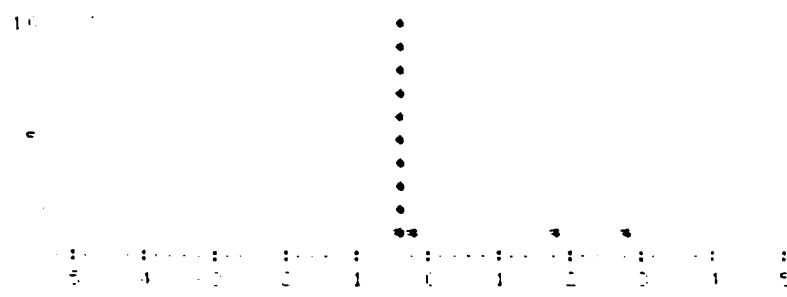
NO. OBS. = 6
 MEAN = \$14.9 MIL.
 STD. DEV. = \$23.3 MIL.
 MIN. OBS. = \$ 0.05 MIL.
 MAX. OBS. = \$52.7 MIL.



ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = \$ 0.05 MIL.
 MAX. OBS. = \$52.7 MIL.

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

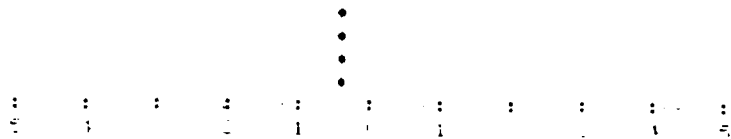
MEAN = \$ 7.4 MIL.

STD. DEV. = \$16.7 MIL.

APPROXIMATE ANNUAL DOLLAR VALUE OF MATERIAL COSTS FOR NON-CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

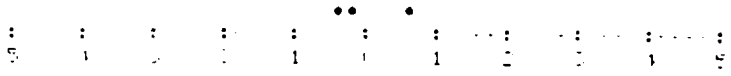
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$ 0.6 MIL.
 STD. DEV. = \$ 0.5 MIL.
 MIN. OBS. = \$ 0.04 MIL.
 MAX. OBS. = \$ 1.2 MIL.



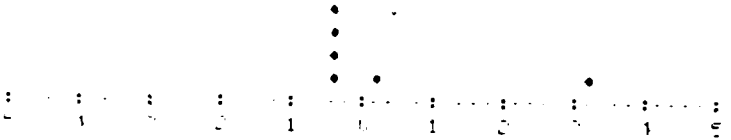
OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$ 2.9 MIL.
 STD. DEV. = \$ 3.1 MIL.
 MIN. OBS. = \$ 0.5 MIL.
 MAX. OBS. = \$ 6.4 MIL.



OTHER INDUSTRY

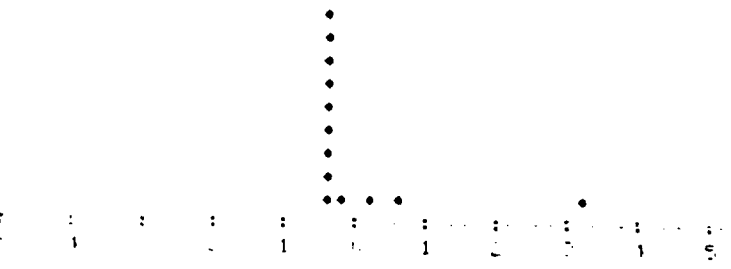
NO. OBS. = 6
 MEAN = \$ 4.7 MIL.
 STD. DEV. = \$ 8.8 MIL.
 MIN. OBS. = \$ 0.2 MIL.
 MAX. OBS. = \$22.5 MIL.



OBSERVATIONS

ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = \$ 0.04 MIL.
 MAX. OBS. = \$22.5 M.



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$ 3.0 MIL. STD. DEV. = \$ 6.1 MIL.

APPROXIMATE ANNUAL DOLLAR VALUE OF DIRECT LABOR COSTS FOR CYLINDRICAL MACHINED PARTS MANUFACTURED IN-HOUSE

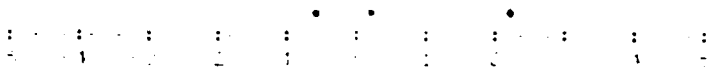
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$ 1.2 MIL.
 STD. DEV. = \$ 0.7 MIL.
 MIN. OBS. = \$ 0.2 MIL.
 MAX. OBS. = \$ 1.9 MIL.



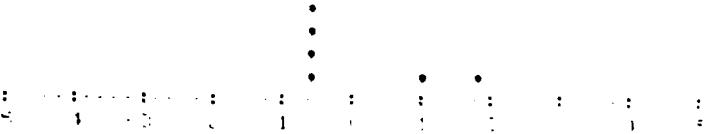
OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$ 7.1 MIL.
 STD. DEV. = \$ 8.0 MIL.
 MIN. OBS. = \$ 0.4 MIL.
 MAX. OBS. = \$16.0 MIL.



OTHER INDUSTRY

NO. OBS. = 6
 MEAN = \$ 4.0 MIL.
 STD. DEV. = \$ 6.0 MIL.
 MIN. OBS. = \$ 0.03 MIL.
 MAX. OBS. = \$14.0 MIL.



ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = \$ 0.03 MIL.
 MAX. OBS. = \$16.0 MIL.

OBSERVATIONS

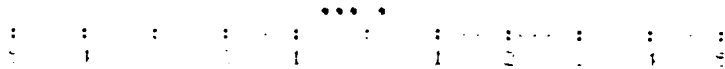


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$ 3.8 MIL. STD. DEV. = \$5.6 MIL.

APPROXIMATE ANNUAL DOLLAR VALUE OF DIRECT LABOR COSTS FOR NON-CYLINDRICAL MACHINED PARTS MANUFACTURED IN-HOUSE

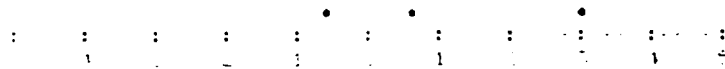
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$ 2.0 MIL.
 STD. DEV. = \$ 1.7 MIL.
 MIN. OBS. = \$ 0.2 MIL.
 MAX. OBS. = \$ 4.2 MIL.



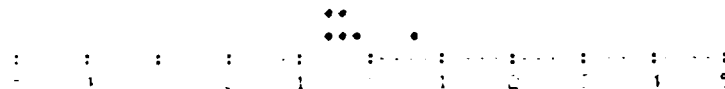
OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$ 8.3 MIL.
 STD. DEV. = \$ 9.0 MIL.
 MIN. OBS. = \$ 0.4 MIL.
 MAX. OBS. = \$18.0 MIL.



OTHER INDUSTRY

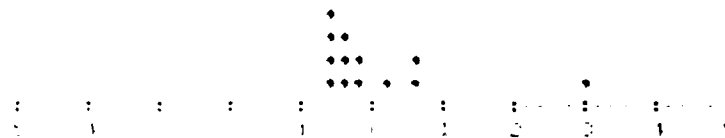
NO. OBS. = 6
 MEAN = \$ 1.7 MIL.
 STD. DEV. = \$ 2.2 MIL.
 MIN. OBS. = \$ 0.03 MIL.
 MAX. OBS. = \$ 6.0 MIL.



ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = \$0.03 MIL.
 MAX. OBS. = \$18.0 MIL.

OBSERVATIONS

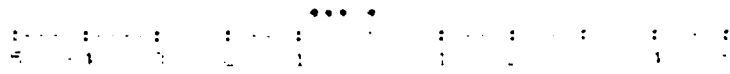


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$ 3.3 MIL. STD. DEV. = \$ 4.9 MIL.

APPROXIMATE ANNUAL DOLLAR VALUE OF TOOLING COSTS FOR CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

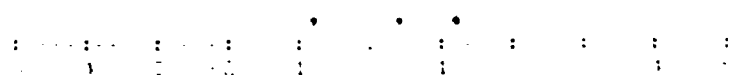
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$ 0.7 MIL.
 STD. DEV. = \$ 0.9 MIL.
 MIN. OBS. = \$ 0.02 MIL.
 MAX. OBS. = \$ 1.9 MIL.



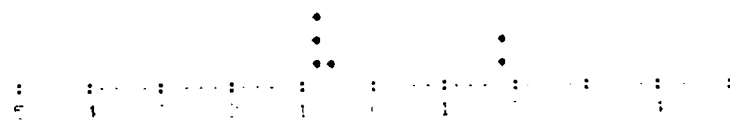
OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$ 2.3 MIL.
 STD. DEV. = \$ 2.2 MIL.
 MIN. OBS. = \$ 0.008 MIL.
 MAX. OBS. = \$ 4.4 MIL.



OTHER INDUSTRY

NO. OBS. = 6
 MEAN = \$ 2.0 MIL.
 STD. DEV. = \$ 3.0 MIL.
 MIN. OBS. = \$ 0.004 MIL.
 MAX. OBS. = \$ 6.0 MIL.



ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = \$ 0.004 MIL.
 MAX. OBS. = \$ 6.0 MIL.

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$ 1.7 MIL.

STD. DEV. = \$ 2.3 MIL.

APPROXIMATE ANNUAL DOLLAR VALUE OF TOOLING COSTS FOR NON-CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

MISSILE PRIMES & SJBS

NO. OBS. = 4
 MEAN = \$ 0.8 MIL.
 STD. DEV. = \$ 1.2 MIL.
 MIN. OBS. = \$ 0.01 MIL.
 MAX. OBS. = \$ 2.5 MIL.



OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$ 5.7 MIL.
 STD. DEV. = \$ 9.0 MIL.
 MIN. OBS. = \$ 0.004 MIL.
 MAX. OBS. = \$ 16.1 MIL.



OTHER INDUSTRY

NO. OBS. = 6
 MEAN = \$ 0.6 MIL.
 STD. DEV. = \$ 0.9 MIL.
 MIN. OBS. = \$ 0.004 MIL.
 MAX. OBS. = \$ 2.5 MIL.



ALL RESPONSES

NO. OBS. = 6
 MIN. OBS. = \$ 0.004 MIL.
 MAX. OBS. = \$ 16.1 MIL.

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$ 1.9 MIL. STD. DEV. = \$ 4.4 MIL.

APPROXIMATE ANNUAL DOLLAR VALUE OF SCRAP AND REWORK COSTS FOR CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

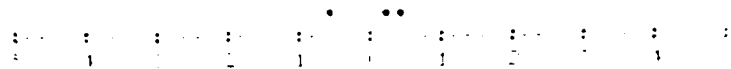
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$ 0.2 MIL.
 STD. DEV. = \$ 0.2 MIL.
 MIN. OBS. = \$ 0.05 MIL.
 MAX. OBS. = \$ 0.5 MIL.



OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$ 0.5 MIL.
 STD. DEV. = \$ 0.5 MIL.
 MIN. OBS. = \$ 0.02 MIL.
 MAX. OBS. = \$ 0.9 MIL.



OTHER INDUSTRY

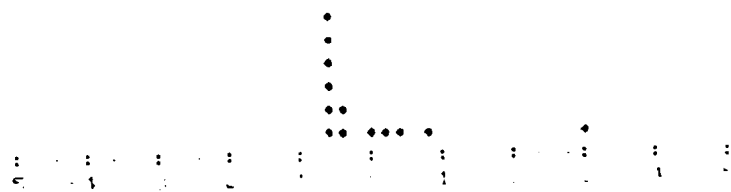
NO. OBS. = 6
 MEAN = \$ 0.7 MIL.
 STD. DEV. = \$ 1.2 MIL.
 MIN. OBS. = \$ 0.004 MIL.
 MAX. OBS. = \$ 3.0 MIL.



ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = \$ 0.004 MIL.
 MAX. OBS. = \$ 3.0 MIL.

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$ 0.5 MIL. STD. DEV. = \$ 0.8 MIL.

APPROXIMATE ANNUAL DOLLAR VALUE OF SCRAP AND REWORK COSTS FOR NON-CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$ 0.3 MIL.
 STD. DEV. = \$ 0.4 MIL.
 MIN. OBS. = \$ 0.04 MIL.
 MAX. OBS. = \$ 0.8 MIL.



OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$ 1.2 MIL.
 STD. DEV. = \$ 1.8 MIL.
 MIN. OBS. = \$ 0.09 MIL.
 MAX. OBS. = \$ 3.2 MIL.



OTHER INDUSTRY

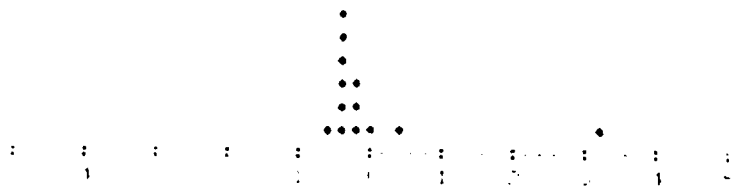
NO. OBS. = 6
 MEAN = \$ 0.2 MIL.
 STD. DEV. = \$ 0.2 MIL.
 MIN. OBS. = \$ 0.004 MIL.
 MAX. OBS. = \$ 0.5 MIL.



ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = \$ 0.004 MIL.
 MAX. OBS. = \$ 3.2 MIL.

OBSERVATIONS



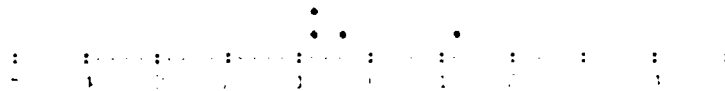
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$ 0.5 MIL. STD. DEV. = \$ 0.9 MIL.

APPROXIMATE ANNUAL DOLLAR VALUE OF PROCESS PLANNING COSTS FOR CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

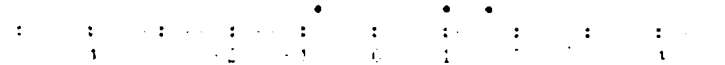
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$ 0.9 MIL.
 STD. DEV. = \$ 1.3 MIL.
 MIN. OBS. = \$0.02 MIL.
 MAX. OBS. = \$ 2.8 MIL.



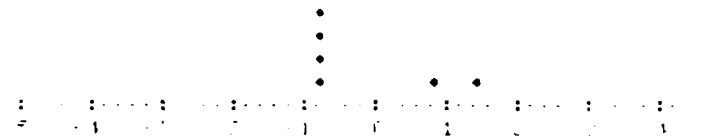
OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$ 2.0 MIL.
 STD. DEV. = \$ 1.8 MIL.
 MIN. OBS. = \$ 0.01 MIL.
 MAX. OBS. = \$ 3.5 MIL.



OTHER INDUSTRY

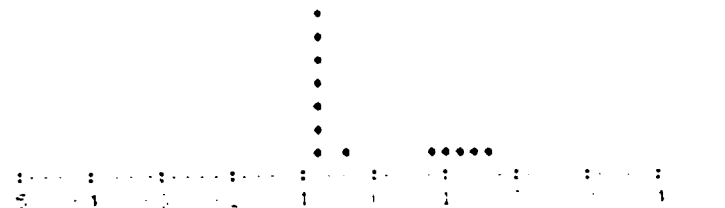
NO. OBS. = 6
 MEAN = \$ 0.9 MIL.
 STD. DEV. = \$ 1.4 MIL.
 MIN. OBS. = \$ 0.04 MIL.
 MAX. OBS. = \$ 3.0 MIL.



ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = \$ 0.01 MIL.
 MAX. OBS. = \$ 3.5 MIL.

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$ 1.2 MIL. STD. DEV. = \$ 1.4 MIL.

APPROXIMATE ANNUAL DOLLAR VALUE OF PROCESS PLANNING COSTS FOR NON-CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

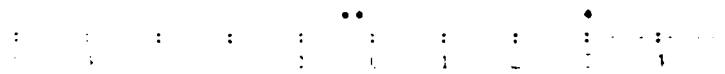
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$ 1.4 MIL.
 STD. DEV. = \$ 2.5 MIL.
 MIN. OBS. = \$0.01 MIL.
 MAX. OBS. = \$ 5.1 MIL.



OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$ 4.6 MIL.
 STD. DEV. = \$ 7.2 MIL.
 MIN. OBS. = \$0.04 MIL.
 MAX. OBS. = \$12.9 MIL.



OTHER INDUSTRY

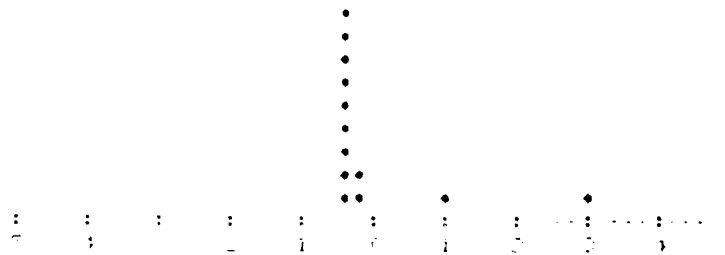
NO. OBS. = 6
 MEAN = \$ 0.3 MIL.
 STD. DEV. = \$ 0.4 MIL.
 MIN. OBS. = \$ 0.04 MIL.
 MAX. OBS. = \$ 0.38 MIL.



ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = \$ 0.01 MIL.
 MAX. OBS. = \$12.9 MIL.

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$ 1.7 MIL

STD. DEV. = \$ 3.6 MIL.

APPROXIMATE ANNUAL DOLLAR VALUE OF OVERHEAD, PROFIT, ETC., COSTS FOR CYLINDRICAL PARTS MANUFACTURED IN-HOUSE

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$ 1.8 MIL.
 STD. DEV. = \$ 2.1 MIL.
 MIN. OBS. = \$ 0
 MAX. OBS. = \$ 4.8 MIL.



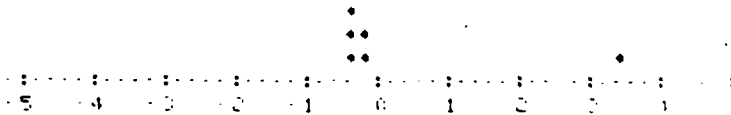
OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$ 1.5 MIL.
 STD. DEV. = \$ 0.5 MIL.
 MIN. OBS. = \$ 1.1 MIL.
 MAX. OBS. = \$ 2.1 MIL.



OTHER INDUSTRY

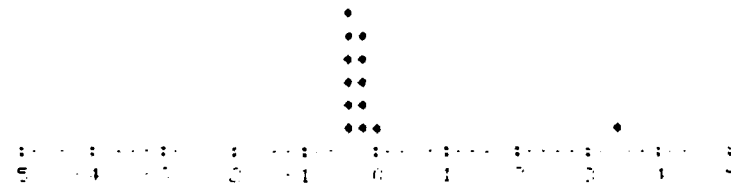
NO. OBS. = 6
 MEAN = \$ 7.7 MIL.
 STD. DEV. = \$16.3 MIL.
 MIN. OBS. = \$0.02 MIL.
 MAX. OBS. = \$ 41 MIL.



ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = \$ 0
 MAX. OBS. = \$ 41 MIL.

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$ 4.4 MIL.

STD. DEV. = \$11.0 MIL.

APPROXIMATE ANNUAL DOLLAR VALUE OF OVERHEAD, PROFIT, ETC., COSTS FOR NON-CYLINDRICAL PARTS
MANUFACTURED IN-HOUSE

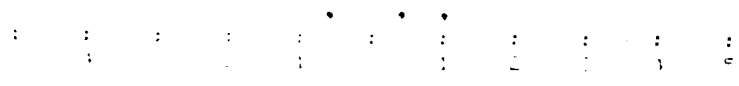
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$ 1.9 MIL.
 STD. DEV. = \$ 1.7 MIL.
 MIN. OBS. = \$ 0
 MAX. OBS. = \$ 3.4 MIL.



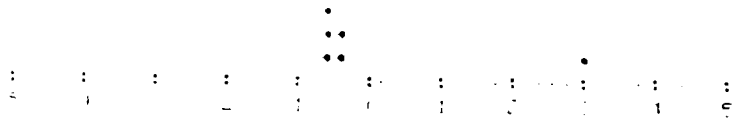
OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$ 4.6 MIL.
 STD. DEV. = \$ 3.7 MIL.
 MIN. OBS. = \$ 0.5 MIL.
 MAX. OBS. = \$ 7.7 MIL.



OTHER INDUSTRY

NO. OBS. = 6
 MEAN = \$ 3.6 MIL.
 STD. DEV. = \$ 6.9 MIL.
 MIN. OBS. = \$ 0.1 MIL.
 MAX. OBS. = \$ 17.5 MIL.



ALL RESPONSES

NO. OBS. = 13
 MIN OBS. = \$ 0
 MAX. OBS. = \$ 17.5 MIL.

OBSERVATIONS

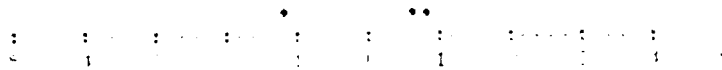


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$ 3.3 MIL. STD. DEV. = \$ 4.9 MIL.

APPROXIMATE DIFFERENCE BETWEEN PROCESS PLANNING COSTS DERIVED FROM Q13 AND Q18 AND PROCESS PLANNING COSTS DERIVED FROM Q19 (FOR CYLINDRICAL PARTS MANUFACTURED IN-HOUSE)

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = \$-1.1 mil.
 STD. DEV. = \$ 1.5 mil.
 MIN. OBS. = \$-2.8 mil.
 MAX. OBS. = \$-0.1 mil.



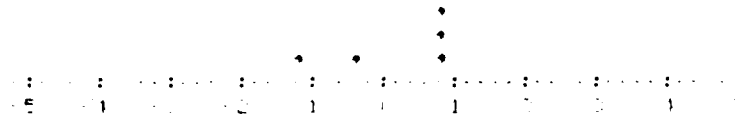
OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$-1.6 mil.
 STD. DEV. = \$ 1.9 mil.
 MIN. OBS. = \$-3.5 mil.
 MAX. OBS. = \$ 0.3 mil.



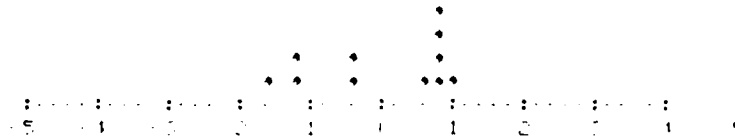
OTHER INDUSTRY

NO. OBS. = 5
 MEAN = \$-0.9 mil.
 STD. DEV. = \$ 0.3 mil.
 MIN. OBS. = \$-2.9 mil.
 MAX. OBS. = \$0.03 mil.



ALL RESPONSES

NO. OBS. = 11
 MIN. OBS. = \$-3.5 mil.
 MAX. OBS. = \$ 0.3 mil.



OBSERVATIONS

STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$-1.3 mil. STD. DEV. = \$1.4 mil.

APPROXIMATE CHANGE IN WORK IN PROCESS INVENTORY FOR CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$-4.9K
 STD. DEV. = \$ 9.8K
 MIN. OBS. = \$-19.5K
 MAX. OBS. = \$ 0K

OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$-8.3K
 STD. DEV. = \$14.4K
 MIN. OBS. = \$-2.5K
 MAX. OBS. = \$ 0K

OTHER INDUSTRY

NO. OBS. = 7
 MEAN = \$-525.6K
 STD. DEV. = \$965.6K
 MIN. OBS. = \$-2500K
 MAX. OBS. = \$ 0K

ALL RESPONSES

NO. OBS. = 14
 MIN. OBS. = \$-2500K
 MAX. OBS. = \$ 0K

OBSERVATIONS

STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$-266K

STD. DEV. = \$709.2K

APPROXIMATE CHANGE IN ANNUAL SCRAP AND REWORK FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$-25.4
 STD. DEV. = \$ 39.9K
 MIN. OBS. = \$-84.9K
 MAX. OBS. = \$ 0K

OTHER AEROSPACE

NO. OBS. = \$ 3
 MEAN = \$ 21.8K
 STD. DEV. = \$ 36.9K
 MIN. OBS. = \$-64.4K
 MAX. OBS. = \$ 0K

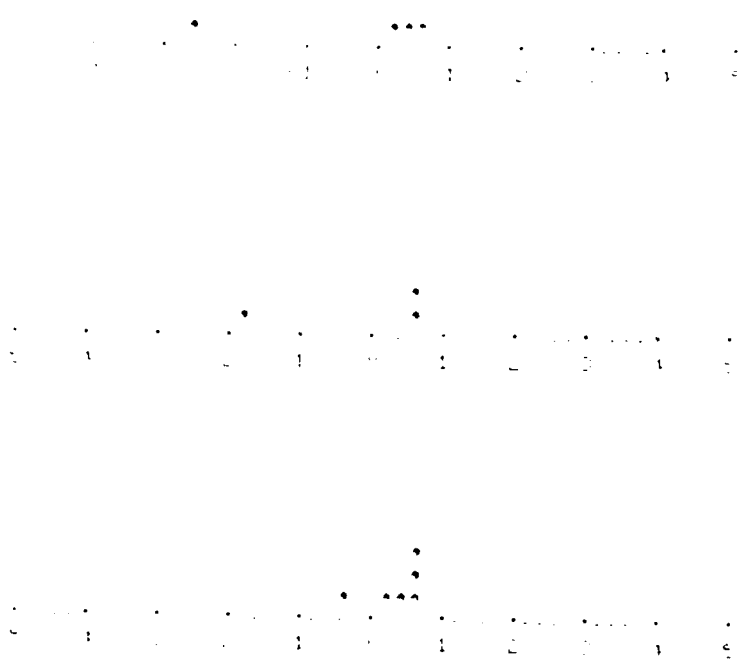
OTHER INDUSTRY

NO. OBS. = \$ 6
 MEAN = \$-6.9K
 STD. DEV. = \$ 9.8K
 MIN. OBS. = \$- 25K
 MAX. OBS. = \$ 0K

ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = \$-84.9K
 MAX. OBS. = \$ 0K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$ -16.0K STD. DEV. = \$ 27.3K

APPROXIMATE CHANGE IN ANNUAL SCRAP AND REWORK FOR CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$-15.2K
 STD. DEV. = \$ 21.7K
 MIN. OBS. = \$-47.4K
 MAX. OBS. = \$ 0K



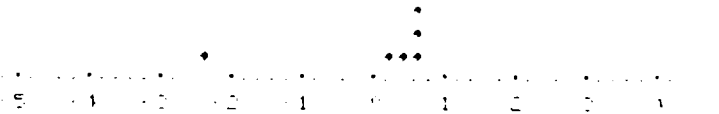
OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$- 5.9K
 STD. DEV. = \$ 10.0K
 MIN. OBS. = \$-17.5K
 MAX. OBS. = \$ 0K



OTHER INDUSTRY

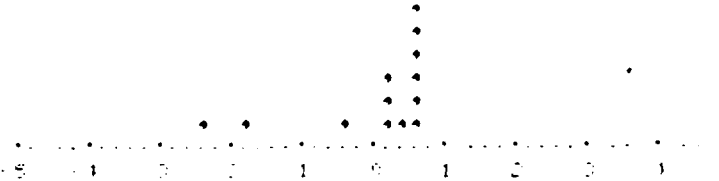
NO. OBS. = 6
 MEAN = \$-11.5K
 STD. DEV. = \$ 23.2K
 MIN. OBS. = \$-58.5K
 MAX. OBS. = \$ 0K



ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = \$-58.5K
 MAX. OBS. = \$ 0K

OBSERVATIONS

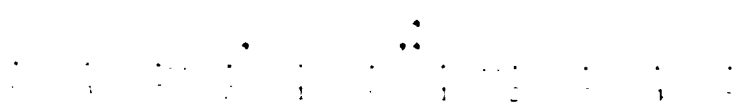


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$ - 11.3K STD. DEV. = \$19.3K

APPROXIMATE CHANGE IN ANNUAL TOOLING COSTS FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$ 13.0K
 STD. DEV. = \$ 252.5K
 MIN. OBS. = \$-508.8K
 MAX. OBS. =



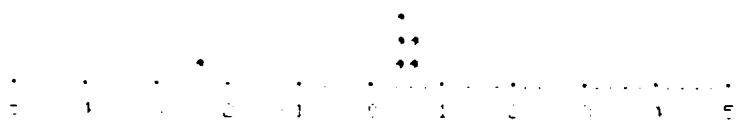
OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$-107.5K
 STD. DEV. = \$ 185.8K
 MIN. OBS. = \$-322.0K
 MAX. OBS. = \$ 0K



OTHER INDUSTRY

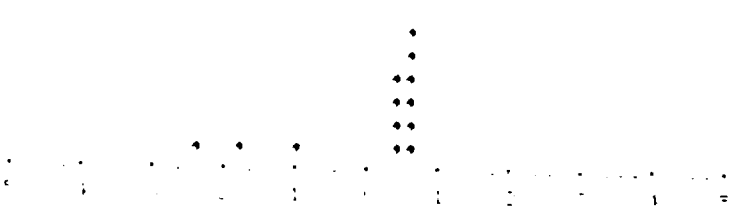
NO. OBS. = 6
 MEAN = \$-110.6K
 STD. DEV. = \$ 252.1K
 MIN. OBS. = \$-625.0K
 MAX. OBS. = \$ 0K



ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = \$-625.0K
 MAX. OBS. = \$ 0K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$-115.8K

STD. DEV. = \$219.7K

APPROXIMATE CHANGE IN ANNUAL TOOLING COSTS FOR CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$ -96.3K
 STD. DEV. = \$ 188.6K
 MIN. OBS. = \$ -379.2K
 MAX. OBS. = \$



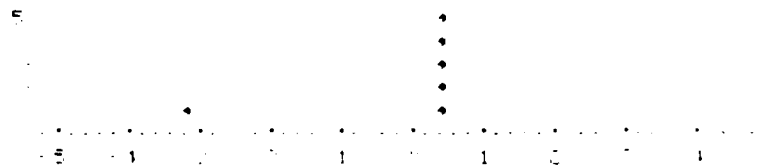
OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$ -29.2K
 STD. DEV. = \$ 50.4K
 MIN. OBS. = \$ -87.4K
 MAX. OBS. = \$



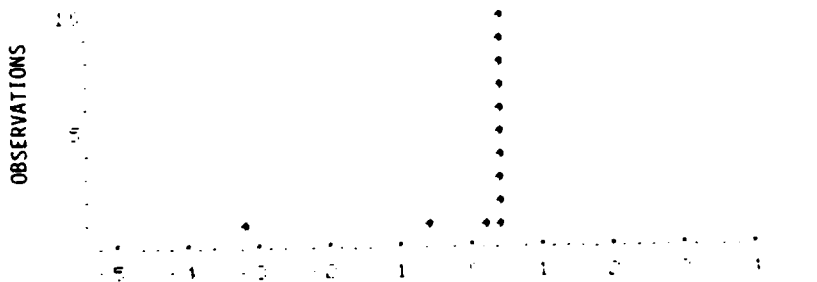
OTHER INDUSTRY

NO. OBS. = 6
 MEAN = \$ -246.6K
 STD. DEV. = \$ 595.4K
 MIN. OBS. = \$
 MAX. OBS. = \$



ALL RESPONSES

NO. OBS. =
 MIN. OBS. = \$ -1462K
 MAX. OBS. = \$



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$ -150.2K STD. DEV. = \$407.8K

APPROXIMATE CHANGE IN ANNUAL DIRECT LABOR COSTS FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

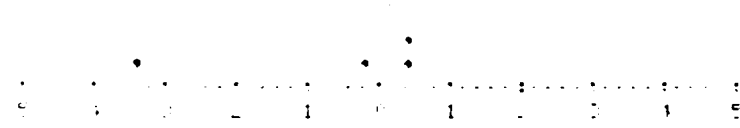
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$-177.0K
 STD. DEV. = \$ 307.5K
 MIN. OBS. = \$-636.0K
 MAX. OBS. = \$ 0



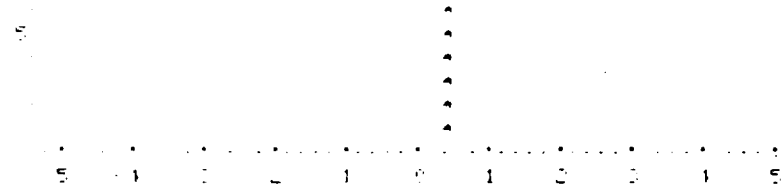
OTHER AEROSPACE

NO. OBS. = 4
 MEAN = \$-780.3K
 STD. DEV. = \$1296.7K
 MIN. OBS. = \$-2704.5K
 MAX. OBS. = \$ 0



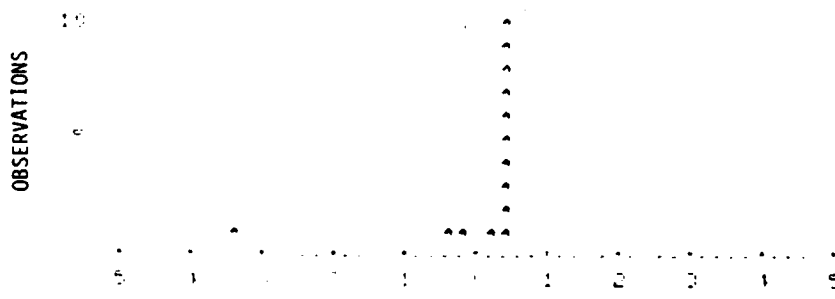
OTHER INDUSTRY

NO. OBS. = 6
 MEAN = \$- 16.4K
 STD. DEV. = \$ 24.2K
 MIN. OBS. = \$ - 48.0K
 MAX. OBS. = \$ 0



ALL RESPONSES

NO. OBS. = 14
 MIN. OBS. = \$-2704K
 MAX. OBS. = \$ 0



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

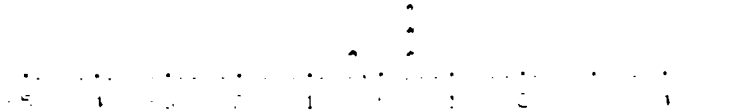
MEAN = \$-280.5K

STD. DEV. = \$722.5K

APPROXIMATE CHANGE IN ANNUAL DIRECT LABOR COSTS FOR CYLINDRICAL PARTS -- SYSTEM 1

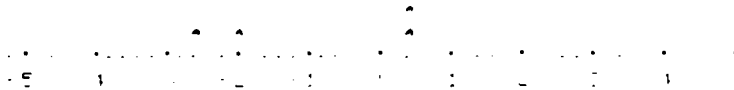
MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = \$ -81.2K
STD. DEV. = \$ 136.0K
MIN. OBS. = \$ -284.0K
MAX. OBS. = \$ 0



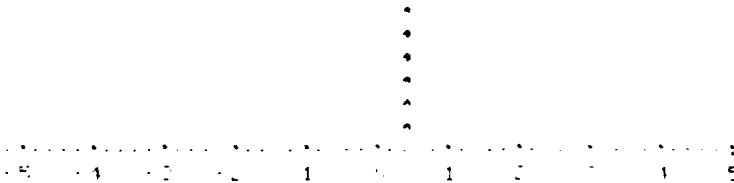
OTHER AEROSPACE

NO. OBS. = 4
MEAN = \$ -427.9K
STD. DEV. = \$ 490.6K
MIN. OBS. = \$ -957K
MAX. OBS. = \$ 0



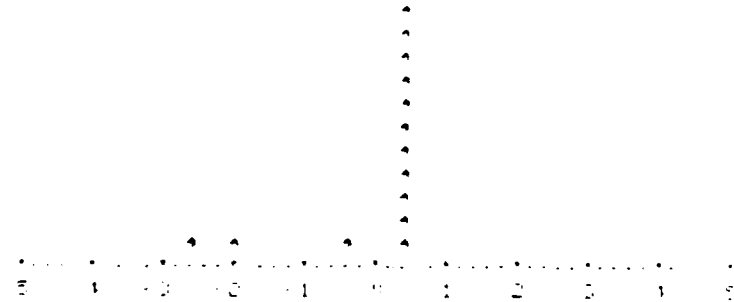
OTHER INDUSTRY

NO. OBS. = 6
MEAN = \$ -11.5K
STD. DEV. = \$ 19.2K
MIN. OBS. = \$ -48.0K
MAX. OBS. = \$ 0



ALL RESPONSES

NO. OBS. = 4
MIN. OBS. = \$ -975K
MAX. OBS. = \$ 0



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = \$150.3K STD. DEV. = \$306.6K

APPROXIMATE CHANGE IN ANNUAL MATERIAL FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$ -14.3K
 STD. DEV. = \$ 19.7K
 MIN. OBS. = \$ -42.4K
 MAX. OBS. = \$ 0



OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$ -42.9K
 STD. DEV. = \$ 74.4K
 MIN. OBS. = \$ -128.8K
 MAX. OBS. = \$ 0



OTHER INDUSTRY

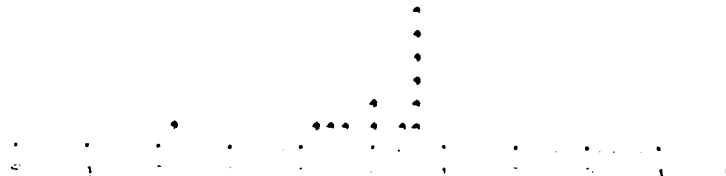
NO. OBS. = 6
 MEAN = \$ -24.4K
 STD. DEV. = \$ 22.7K
 MIN. OBS. = \$ -56.1K
 MAX. OBS. = \$ 0



ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = \$ -128.8K
 MAX. OBS. = \$ 0

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$ -25.6K STD. DEV. = \$36.8K

APPROXIMATE CHANGE IN ANNUAL MATERIAL FOR CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = \$ -7.9K
STD. DEV. = \$ 11.0K
MIN. OBS. = \$ -23.7K
MAX. OBS. = \$ 0

OTHER AEROSPACE

NO. OBS. = 3
MEAN = \$ -12.3K
STD. DEV. = \$ 19.7K
MIN. OBS. = \$ -35K
MAX. OBS. = \$ 0

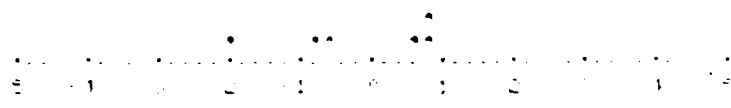
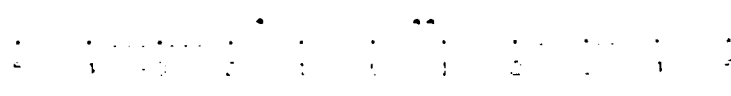
OTHER INDUSTRY

NO. OBS. = 6
MEAN = \$ -15K
STD. DEV. = \$ 17.1K
MIN. OBS. = \$ -42K
MAX. OBS. = \$ 0

ALL RESPONSES

NO. OBS. = 13
MIN. OBS. = \$ -42K
MAX. OBS. = \$ 0

OBSERVATIONS

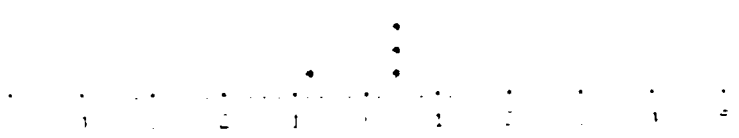


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = \$-12.2K STD. DEV. = \$15.1K

APPROXIMATE CHANGE IN ANNUAL PROCESS PLANNING COSTS FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$-516.8K
 STD. DEV. = \$1019K
 MIN. OBS. = \$-2035K
 MAX. OBS. = \$ 32.5K



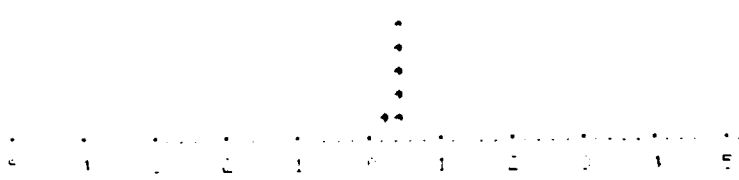
OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$ -2172K
 STD. DEV. = \$3586K
 MIN. OBS. = \$-6311K
 MAX. OBS. = \$ -5.7K



OTHER INDUSTRY

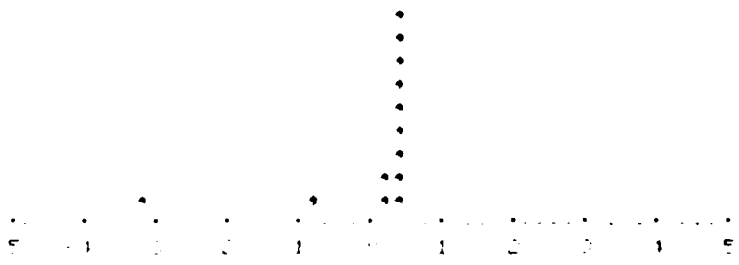
NO. OBS. = 6
 MEAN = \$-107.1K
 STD. DEV. = \$ 153.5K
 MIN. OBS. = \$-400K
 MAX. OBS. = \$ -1.3K



ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = \$-6311K
 MAX. OBS. = \$ 32.5K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$-706.5K STD. DEV. = \$1773K

APPROXIMATE CHANGE IN ANNUAL PROCESS PLANNING COSTS FOR CYLINDRICAL PARTS -- SYSTEM 1

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$-276.1K
 STD. DEV. = \$ 575.2K
 MIN. OBS. = \$-1138K
 MAX. OBS. = \$ 47.5K

OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$-738.4K
 STD. DEV. = \$ 881.3K
 MIN. OBS. = \$-1715K
 MAX. OBS. = \$ -2.3K

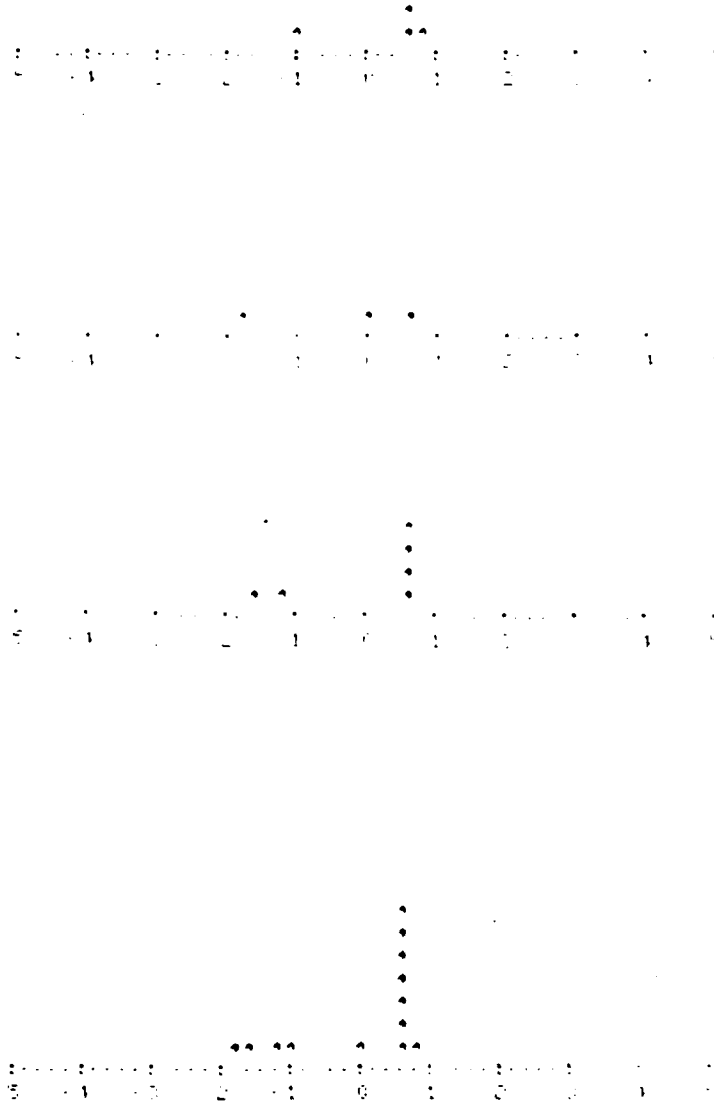
OTHER INDUSTRY

NO. OBS. = 6
 MEAN = \$-470.6K
 STD. DEV. = \$ 716.0K
 MIN. OBS. = \$-1495K
 MAX. OBS. = \$ -7.3K

ALL RESPONSES

NO. OBS. = 13
 MIN. OBS. = \$-1715K
 MAX. OBS. = \$ 47.5K

OBSERVATIONS

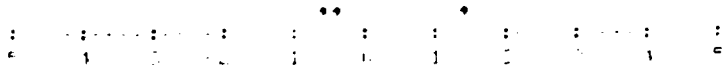


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$-472.6K STD. DEV. = \$675.5K

APPROXIMATE RATIO OF PROCESS PLANNING COSTS DERIVED FROM Q19 TO PROCESS PLANNING COSTS DERIVED FROM Q13 AND Q18 (FOR NON-CYLINDRICAL PARTS MANUFACTURED IN-HOUSE)

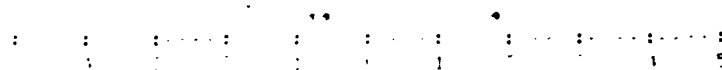
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 11.5
 STD. DEV. = 14.9
 MIN. OBS. = 2.0
 MAX. OBS. = 28.7



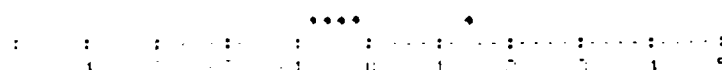
OTHER AEROSPACE

NO. OBS. = 3
 MEAN = 11.8
 STD. DEV. = 17.7
 MIN. OBS. = 0.03
 MAX. OBS. = 32.2



OTHER INDUSTRY

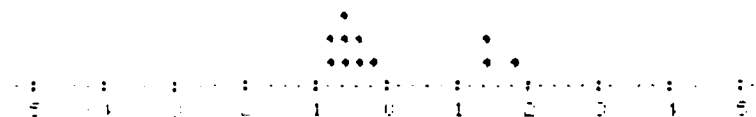
NO. OBS. = 5
 MEAN = 8.6
 STD. DEV. = 11.8
 MIN. OBS. = 0.7
 MAX. OBS. = 29.3



OBSERVATIONS

ALL RESPONSES

NO. OBS. = 11
 MIN. OBS. = 0.03
 MAX. OBS. = 32.2



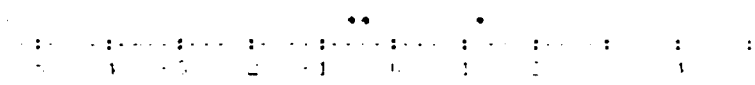
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 10.3 STD. DEV. = 12.8

APPROXIMATE RATIO OF PROCESS PLANNING COSTS DERIVED FROM Q19 TO PROCESS PLANNING COSTS DERIVED FROM Q13 AND Q18 (FOR CYLINDRICAL PARTS MANUFACTURED IN-HOUSE)

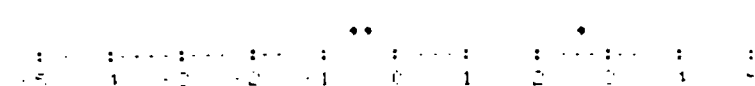
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = 25.4
 STD. DEV. = 35.2
 MIN. OBS. = 2.0
 MAX. OBS. = 65.8



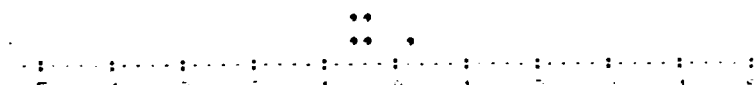
OTHER AEROSPACE

NO. OBS. = 3
 MEAN = 42.7
 STD. DEV. = 71.4
 MIN. OBS. = 0.02
 MAX. OBS. = 125.0



OTHER INDUSTRY

NO. OBS. = 5
 MEAN = 8.2
 STD. DEV. = 13.0
 MIN. OBS. = 0.7
 MAX. OBS. = 31.3



ALL RESPONSES

NO. OBS. = 11
 MIN. OBS. = 0.02
 MAX. OBS. = 125.0

OBSERVATIONS



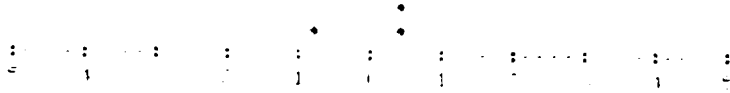
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = 22.3 STD. DEV. = 39.5

APPROXIMATE DIFFERENCE BETWEEN PROCESS PLANNING COSTS DERIVED FROM Q13 AND Q18 AND PROCESS PLANNING COSTS DERIVED FROM Q19 (FOR NON-CYLINDRICAL PARTS MANUFACTURED IN-HOUSE)

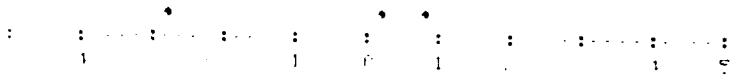
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$-1.8 mil.
 STD. DEV. = \$ 2.7 mil.
 MIN. OBS. = \$-4.9 mil.
 MAX. OBS. = \$-0.1 mil.



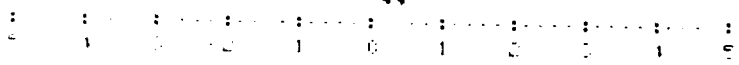
OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$-4.0 mil.
 STD. DEV. = \$ 7.4 mil.
 MIN. OBS. = \$-12.5 mil.
 MAX. OBS. = \$ 1.1 mil.



OTHER INDUSTRY

NO. OBS. = 5
 MEAN = \$-0.2 mil.
 STD. DEV. = \$ 0.2 mil.
 MIN. OBS. = \$-0.6 mil.
 MAX. OBS. = \$0.02 mil.



ALL RESPONSES

NO. OBS. = 11
 MIN. OBS. = \$-12.5 mil.
 MAX. OBS. = \$ 1.1 mil.

OBSERVATIONS

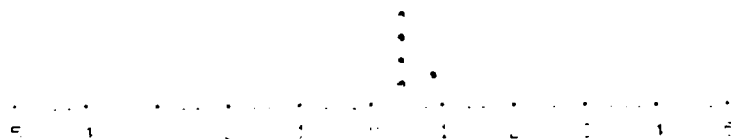


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$-1.7 mil. STD. DEV. = \$3.8 mil.

APPROXIMATE CHANGE IN WORK IN PROCESS INVENTORY FOR NON-CYLINDRICAL PARTS -- SYSTEM 1

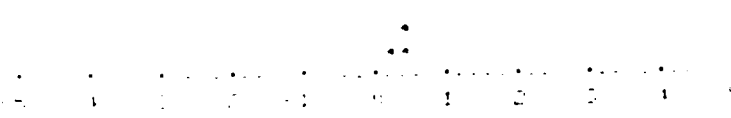
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$-4.5K
 STD. DEV. = \$ 9K
 MIN. OBS. = \$ -18K
 MAX. OBS. = \$ 0K



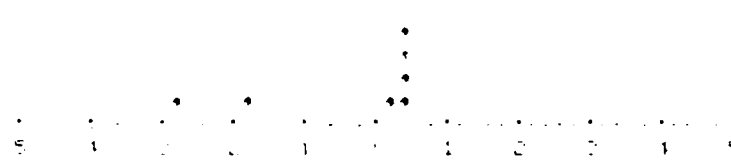
OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$ -20K
 STD. DEV. = \$34.6K
 MIN. OBS. = \$ -60K
 MAX. OBS. = \$ 0K



OTHER INDUSTRY

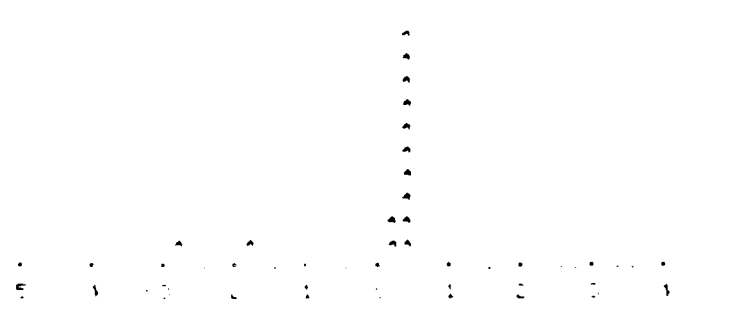
NO. OBS. = 7
 MEAN = \$-257.6K
 STD. DEV. = \$ 409K
 MIN. OBS. = \$-1000K
 MAX. OBS. = \$ 0K



ALL RESPONSES

NO. OBS. = 14
 MIN. OBS. = \$-1000K
 MAX. OBS. = \$ 0K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$-131.4K STD. DEV. = \$305K

APPROXIMATE CHANGE IN PROCESS PLANNING COSTS FOR CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS. = 1
MEAN = \$-2544K
STD. DEV. = \$0
MIN. OBS. = \$-2544K
MAX. OBS. = \$-2544K

OTHER AEROSPACE

NO. OBS. = 3
MEAN = \$-908.4K
STD. DEV. = \$1077.5K
MIN. OBS. = \$ -2.7K
MAX. OBS. = \$-2100.0K

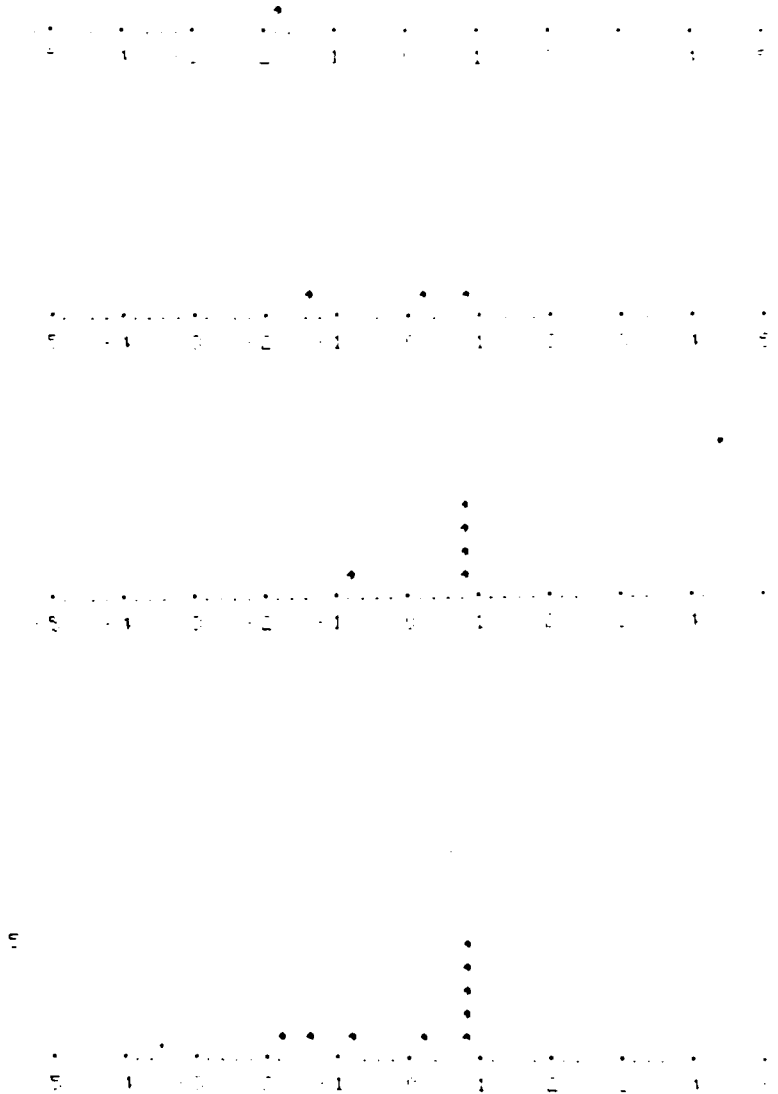
OTHER INDUSTRY

NO. OBS. = 5
MEAN = \$-319.1K
STD. DEV. = \$657.5K
MIN. OBS. = \$-6.0K
MAX. OBS. = \$-1495.0K

ALL RESPONSES

NO. OBS. = 9
MIN. OBS. = \$-2544K
MAX. OBS. = \$-2.7K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = \$-762.8K STD. DEV. = \$1016.9K

APPROXIMATE CHANGE IN PROCESS PLANNING COSTS FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS. = 1
MEAN = \$-23.7K
STD. DEV. = \$0
MIN. OBS. = \$-23.7K
MAX. OBS. = \$-23.7K

OTHER AEROSPACE

NO. OBS. = 3
MEAN = \$-2661.0K
STD. DEV. = \$4389.8K
MIN. OBS. = \$-7728.0K
MAX. OBS. = \$-1.6K

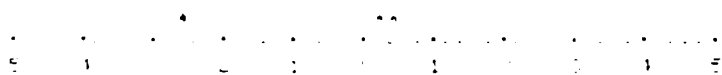
OTHER INDUSTRY

NO. OBS. = 5
MEAN = \$-147.8K
STD. DEV. = \$175.7K
MIN. OBS. = \$-450.0K
MAX. OBS. = \$-38.5K

ALL RESPONSES

NO. OBS. = 9
MIN. OBS. = \$-7728K
MAX. OBS. = \$-7.6K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

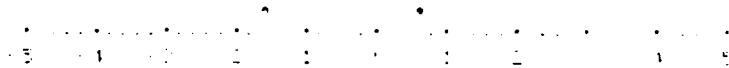
MEAN = \$-971.8K

STD. DEV. = \$2537.7K

APPROXIMATE CHANGE IN MATERIAL COSTS FOR CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS. = 2
 MEAN = \$-24.5K
 STD. DEV. = \$32.4K
 MIN. OBS. = \$-47.4K
 MAX. OBS. = \$-1.53K



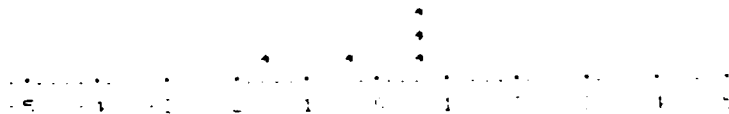
OTHER AEROSPACE

NO. OBS. = 5
 MEAN = \$-10.9K
 STD. DEV. = \$23.3K
 MIN. OBS. = \$-52.5K
 MAX. OBS. = \$0



OTHER INDUSTRY

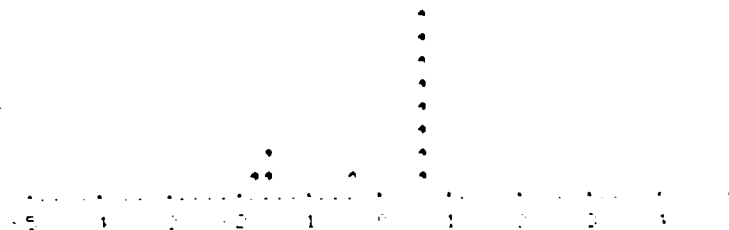
NO. OBS. = 5
 MEAN = \$-14.4K
 STD. DEV. = \$20.9K
 MIN. OBS. = \$-48.0K
 MAX. OBS. = \$0



ALL RESPONSES

NO. OBS. = 12
 MIN. OBS. = \$-52.5K
 MAX. OBS. = \$0

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$-14.6K STD. DEV. = \$21.8K

APPROXIMATE CHANGE IN MATERIAL COSTS FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS. = 2
 MEAN = \$-0.6K
 STD. DEV. = \$ 0.8K
 MIN. OBS. = \$-1.1K
 MAX. OBS. = \$0



OTHER AEROSPACE

NO. OBS. = 4
 MEAN = \$-50.6K
 STD. DEV. = \$95.2K
 MIN. OBS. = \$-193.2K
 MAX. OBS. = \$0



OTHER INDUSTRY

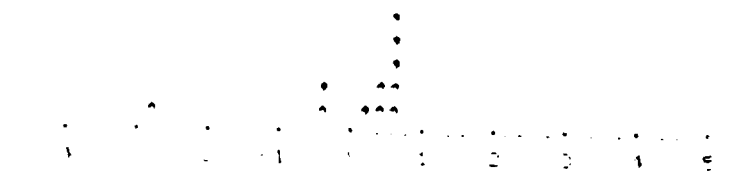
NO. OBS. = 5
 MEAN = \$-25.3K
 STD. DEV. = \$26.2K
 MIN. OBS. = \$-56.1K
 MAX. OBS. = \$0



OBSERVATIONS

ALL RESPONSES

NO. OBS. = 11
 MIN. OBS. = \$-193.2K
 MAX. OBS. = \$0



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

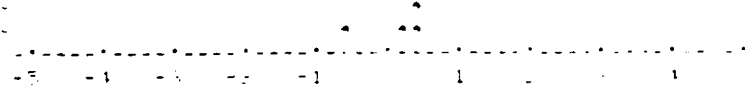
MEAN = \$-30.0K

STD. DEV. = \$57.9K

APPROXIMATE CHANGE IN DIRECT LABOR COSTS FOR CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = \$-96K
STD. DEV. = \$127K
MIN. OBS. = \$-284K
MAX. OBS. = \$-13.4K



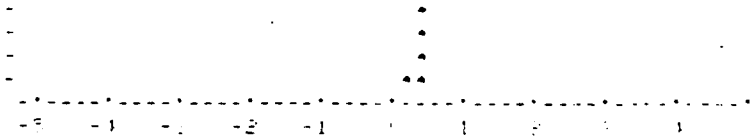
OTHER AEROSPACE

NO. OBS. = 3
MEAN = \$-316K
STD. DEV. = \$448K
MIN. OBS. = \$-831K
MAX. OBS. = \$-21.5K



OTHER INDUSTRY

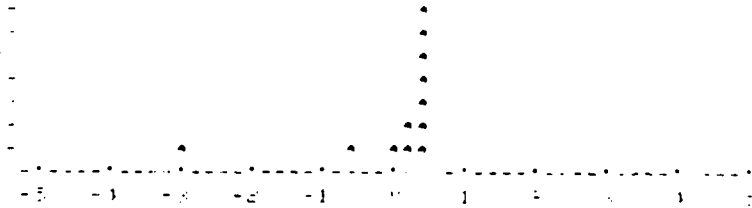
NO. OBS. = 5
MEAN = \$-17K
STD. DEV. = \$25K
MIN. OBS. = \$-60K
MAX. OBS. = \$0



ALL RESPONSES

NO. OBS. = 12
MIN. OBS. = \$-831K
MAX. OBS. = \$0

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
MEAN = \$-118K STD. DEV. = \$238K

APPROXIMATE CHANGE IN DIRECT LABOR COSTS FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$-195.3K
 STD. DEV. = \$297.3K
 MIN. OBS. = \$-636.0K
 MAX. OBS. = \$-9.5K



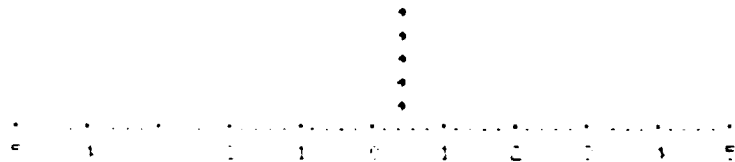
OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$-1079K
 STD. DEV. = \$ 1720K
 MIN. OBS. =
 MAX. OBS. = \$-66.5K



OTHER INDUSTRY

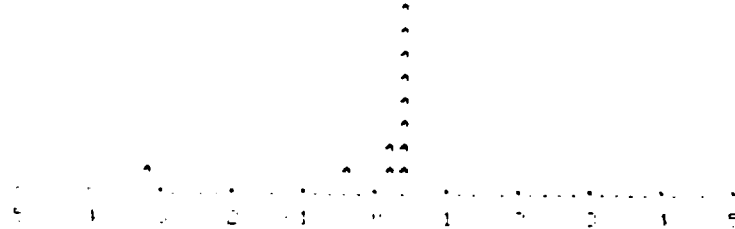
NO. OBS. = 5
 MEAN = \$-28.3K
 STD. DEV. = \$25.9K
 MIN. OBS. = \$ -48K
 MAX. OBS. = \$0



ALL RESPONSES

NO. OBS. = 12
 MIN. OBS. = \$-3065K
 MAX. OBS. = \$0

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$-346.7K STD. DEV. = \$873.5K

APPROXIMATE CHANGE IN TOOLING COSTS FOR CYLINDRICAL PARTS -- SYSTEM 2

MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$-103.8K
 STD. DEV. = \$183.8K
 MIN. OBS. = \$-379.2K
 MAX. OBS. = \$-0.6K



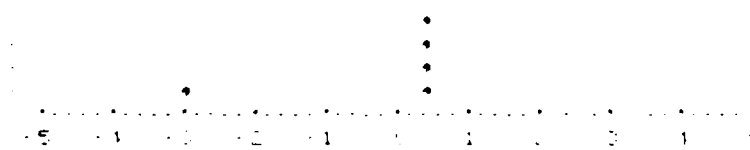
OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$-96.5K
 STD. DEV. = \$119.1K
 MIN. OBS. = \$-230.0K
 MAX. OBS. = \$-0.8K



OTHER INDUSTRY

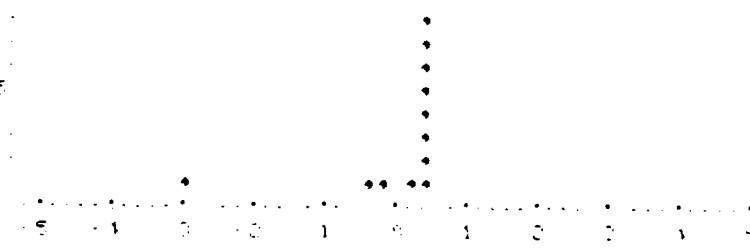
NO. OBS. = 5
 MEAN = \$-296.0K
 STD. DEV. = \$652.1K
 MIN. OBS. = \$-1462.5K
 MAX. OBS. = \$0



ALL RESPONSES

NO. OBS. = 12
 MIN. OBS. = \$-1462.5K
 MAX. OBS. = \$0

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$-187.4K STD. DEV. = \$418.9K

APPROXIMATE CHANGE IN TOOLING COSTS FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

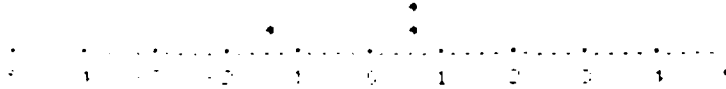
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$-137.9K
 STD. DEV. = \$247.7K
 MIN. OBS. = \$-508.8K
 MAX. OBS. = \$ 0.4K



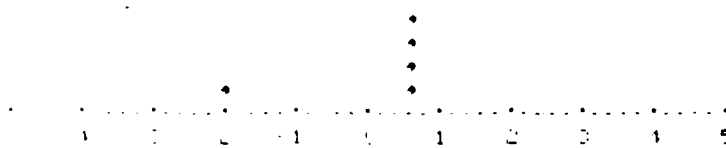
OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$-167.8K
 STD. DEV. = \$273.4K
 MIN. OBS. = \$-483.3K
 MAX. OBS. = \$ 0.4K



OTHER INDUSTRY

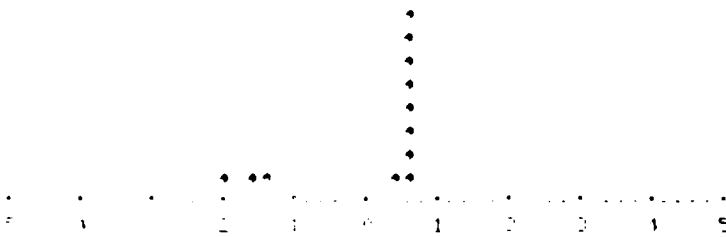
NO. OBS. = 5
 MEAN = \$-132.7K
 STD. DEV. = \$275.3K
 MIN. OBS. = \$-625.0K
 MAX. OBS. = \$ 0



ALL RESPONSES

NO. OBS. = 12
 MIN. OBS. = \$-625.0K
 MAX. OBS. = \$ 0

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$-143.2K STD. DEV. = \$241.0K

APPROXIMATE CHANGE IN SCRAP AND REWORK COSTS FOR CYLINDRICAL PARTS -- SYSTEM 2

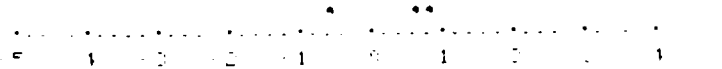
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$-18.3K
 STD. DEV. = \$20.0K
 MIN. OBS. = \$-47.4K
 MAX. OBS. = \$-2.0K



OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$-8.8K
 STD. DEV. = \$15.0K
 MIN. OBS. = \$-26.2K
 MAX. OBS. = \$0



OTHER INDUSTRY

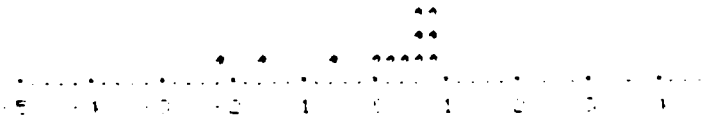
NO. OBS. = 5
 MEAN = \$-13.8K
 STD. DEV. = \$25.1K
 MIN. OBS. = \$-58.5K
 MAX. OBS. = \$0



ALL RESPONSES

NO. OBS. = 12
 MIN. OBS. = \$-58.5K
 MAX. OBS. = \$0

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

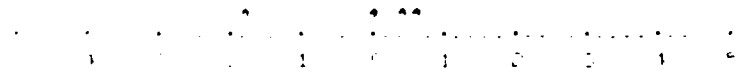
MEAN = \$14.1K

STD. DEV. = \$19.8K

APPROXIMATE CHANGE IN SCRAP AND REWORK COSTS FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

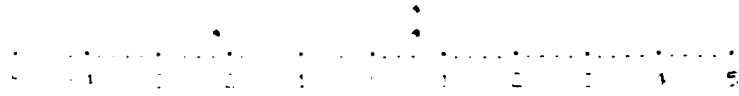
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$-29.5K
 STD. DEV. = \$37.9K
 MIN. OBS. = \$-84.8K
 MAX. OBS. = \$-1.3K



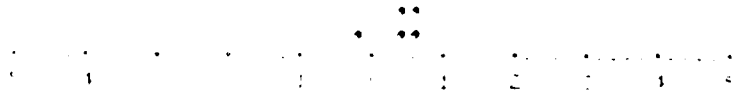
OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$-32.5K
 STD. DEV. = \$55.3K
 MIN. OBS. = \$-96.6K
 MAX. OBS. = \$-1.7K



OTHER INDUSTRY

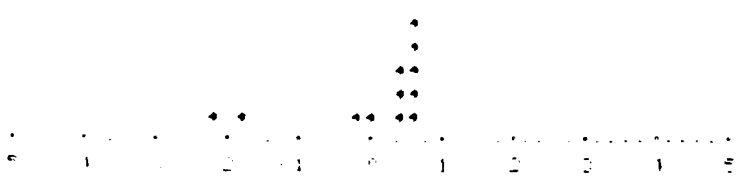
NO. OBS. = 5
 MEAN = \$-8.3K
 STD. DEV. = \$10.2K
 MIN. OBS. = \$-25.0K
 MAX. OBS. = \$0



ALL RESPONSES

NO. OBS. = 12
 MIN. OBS. = \$-96.6K
 MAX. OBS. = \$0

OBSERVATIONS



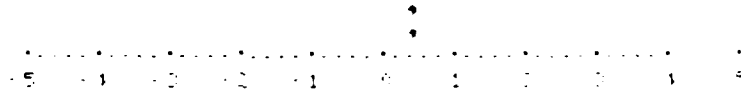
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$-21.5K STD. DEV = \$33.5K

APPROXIMATE CHANGE IN WORK IN PROCESS INVENTORY FOR CYLINDRICAL PARTS -- SYSTEM 2

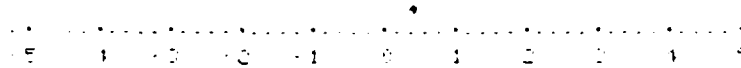
MISSILE PRIMES & SUBS

NO. OBS. = 2
 MEAN = \$-16.3K
 STD. DEV. = \$ 23.0K
 MIN. OBS. = \$ -32K
 MAX. OBS. = \$ 0



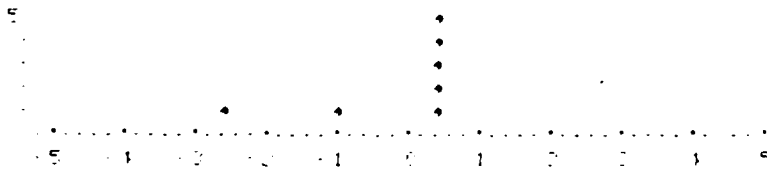
OTHER AEROSPACE

NO. OBS. = 1
 MEAN = \$ 0
 STD. DEV. = \$ 0
 MIN. OBS. = \$ 0
 MAX. OBS. = \$ 0



OTHER INDUSTRY

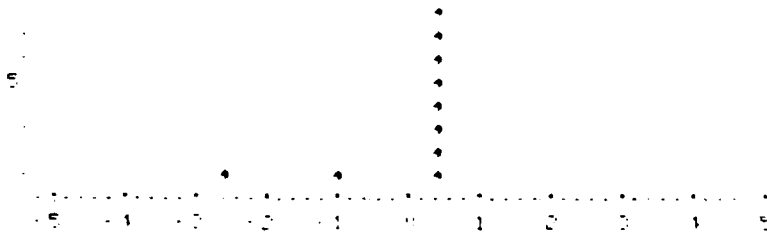
NO. OBS. = 7
 MEAN = \$530.7K
 STD. DEV. = \$962.5K
 MIN. OBS. = \$-2500
 MAX. OBS. = \$ 0



ALL RESPONSES

NO. OBS. = 10
 MIN. OBS. = \$-2500
 MAX. OBS. = \$ 0

OBSERVATIONS



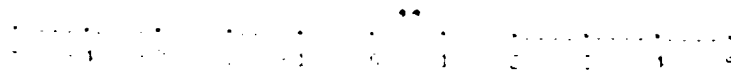
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$-374.8K STD. DEV. = \$925.0K

APPROXIMATE CHANGE IN WORK IN PROCESS INVENTORY FOR NON-CYLINDRICAL PARTS -- SYSTEM 2

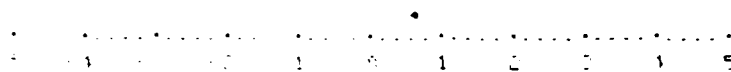
MISSILE PRIMES & SUBS

NO. OBS. = 2
 MEAN = \$ -15K
 STD. DEV. = \$-21.2K
 MIN. OBS. = \$-30.0K
 MAX. OBS. = \$ 0



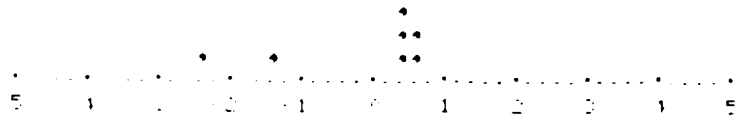
OTHER AEROSPACE

NO. OBS. = 1
 MEAN = \$0
 STD. DEV. = \$0
 MIN. OBS. = \$0
 MAX. OBS. = \$0



OTHER INDUSTRY

NO. OBS. = 7
 MEAN = \$-260.1K
 STD. DEV. = \$ 403.5K
 MIN. OBS. = \$ -1000K
 MAX. OBS. = \$ 0



OBSERVATIONS

ALL RESPONSES

NO. OBS. = 10
 MIN. OBS. = \$-1000K
 MAX. OBS. = \$ 0

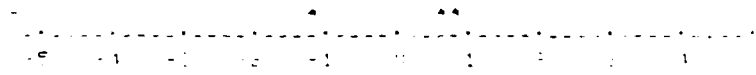


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$-185.1K STD. DEV. = \$351.0K

APPROXIMATE CHANGE IN PROCESS PLANNING COST FOR CYLINDRICAL PARTS -- SYSTEM 3

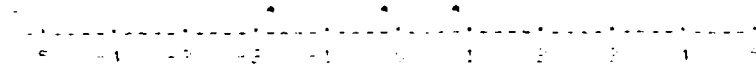
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = \$-718K
 STD. DEV. = \$1,103K
 MIN. OBS. = \$-1,991K
 MAX. OBS. = \$-45K



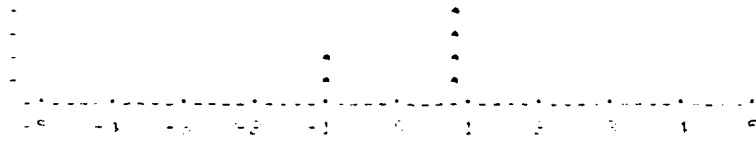
OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$1,109K
 STD. DEV. = \$1,240K
 MIN. OBS. = \$-2,450K
 MAX. OBS. = \$-5K



OTHER INDUSTRY

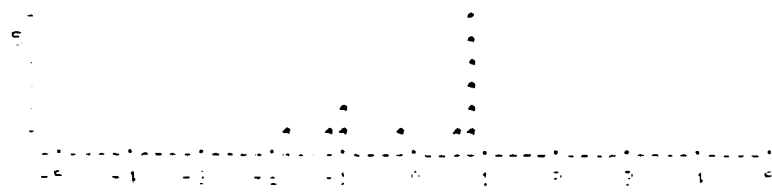
NO. OBS. = 6
 MEAN = \$-607K
 STD. DEV. = \$ 904K
 MIN. OBS. = \$-1,794K
 MAX. OBS. = \$-8K



ALL RESPONSES

NO. OBS. = 12
 MIN. OBS. = \$-2,450K
 MAX. OBS. = \$-5K

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$-638K

STD. DEV. = \$935K

APPROXIMATE CHANGE IN PROCESS PLANNING COST FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = \$-1,244K
 STD. DEV. = \$2,007K
 MIN. OBS. = \$-3,562K
 MAX. OBS. = \$-90K

OTHER AEROSPACE

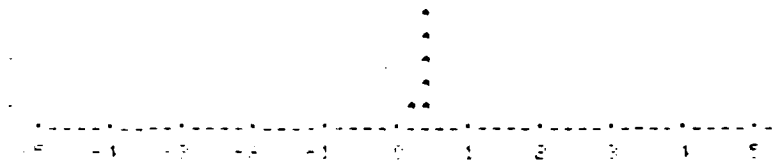
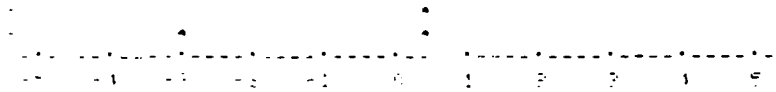
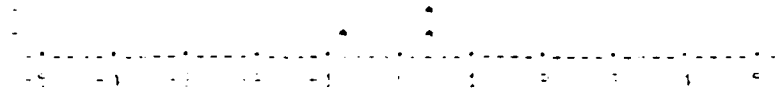
NO. OBS. = 3
 MEAN = \$-3,126K
 STD. DEV. = \$5,104K
 MIN. OBS. = \$-9,016K
 MAX. OBS. = \$-15K

OTHER INDUSTRY

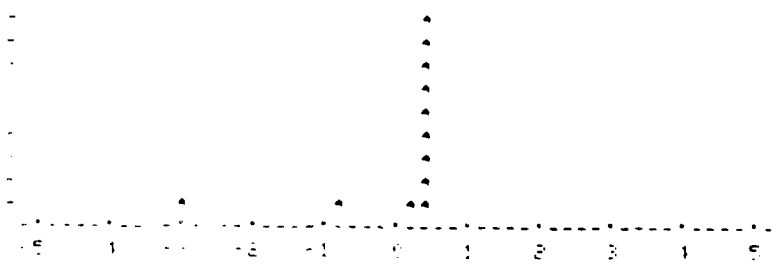
NO. OBS. = 6
 MEAN = \$-188K
 STD. DEV. = \$ 259K
 MIN. OBS. = \$-700K
 MAX. OBS. = \$-9K

ALL RESPONSES

NO. OBS. = 12
 MIN. OBS. = \$-9,016K
 MAX. OBS. = \$-9K



OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$-1,187K

STD. DEV. = \$2,659K

APPROXIMATE CHANGE IN MATERIAL COST FOR CYLINDRICAL PARTS -- SYSTEM 3

MISSILE PRIMES & SUBS

NO. OBS. = 4
MEAN = \$ -18K
STD. DEV. = \$ 14K
MIN. OBS. = \$ -34K
MAX. OBS. = \$ - 2K

OTHER AEROSPACE

NO. OBS. = 3
MEAN = \$ -25K
STD. DEV. = \$ 34K
MIN. OBS. = \$ -70K
MAX. OBS. = \$ 0

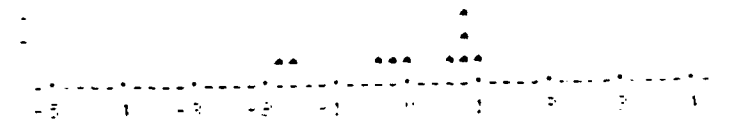
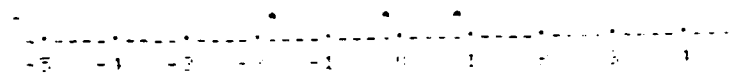
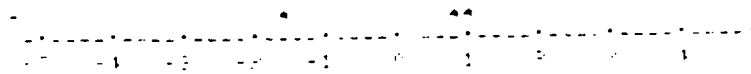
OTHER INDUSTRY

NO. OBS. = 3
MEAN = \$ -36K
STD. DEV. = \$ 34K
MIN. OBS. = \$ -72K
MAX. OBS. = \$ - 5K

ALL RESPONSES

NO. OBS. = 11
MIN. OBS. = \$ -72K
MAX. OBS. = \$ 0

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

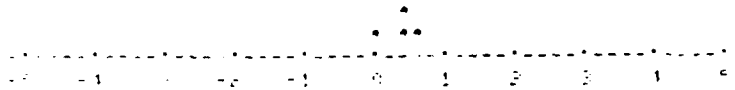
MEAN = \$ - 25K

STD. DEV. = \$ 27K

APPROXIMATE CHANGE IN MATERIAL COST FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

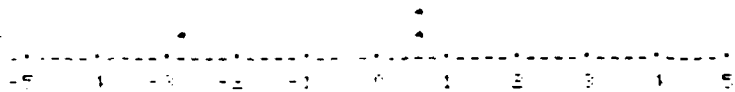
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$ -22K
 STD. DEV. = \$ 17K
 MIN. OBS. = \$ -42K
 MAX. OBS. = \$ -1K



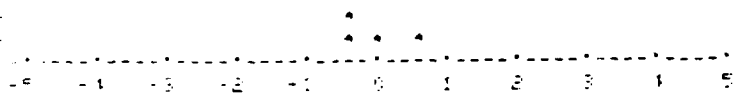
OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$ -84K
 STD. DEV. = \$ 145K
 MIN. OBS. = \$ -252K
 MAX. OBS. = \$ 0



OTHER INDUSTRY

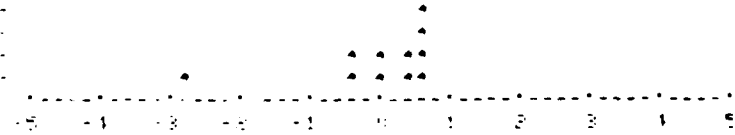
NO. OBS. = 4
 MEAN = \$ -50K
 STD. DEV. = \$ 37K
 MIN. OBS. = \$ -84K
 MAX. OBS. = \$ 0K



ALL RESPONSES

NO. OBS. = 11
 MIN. OBS. = \$ -252K
 MAX. OBS. = \$ 0

OBSERVATIONS

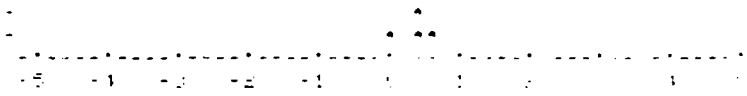


STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$-47K STD. DEV. = \$73K

APPROXIMATE CHANGE IN DIRECT LABOR COST FOR CYLINDRICAL PARTS -- SYSTEM 3

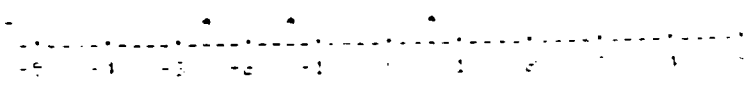
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$-122K
 STD. DEV. = \$ 115K
 MIN. OBS. = \$-284K
 MAX. OBS. = \$- 20K



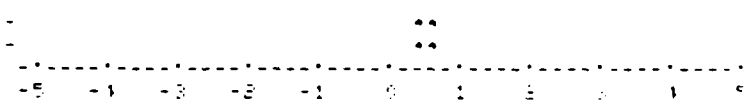
OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$-869K
 STD. DEV. = \$ 786K
 MIN. OBS. = \$-1595K
 MAX. OBS. = \$ -33K



OTHER INDUSTRY

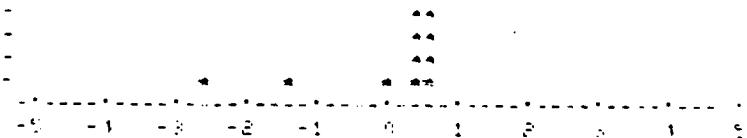
NO. OBS. = 4
 MEAN = \$ -30K
 STD. DEV. = \$ 32K
 MIN. OBS. = \$ -72K
 MAX. OBS. = \$ 0



ALL RESPONSES

NO. OBS. = 11
 MIN. OBS. = \$-1,595K
 MAX. OBS. = \$ 0

OBSERVATIONS



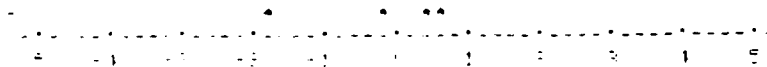
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$-292K STD. DEV. = \$516K

APPROXIMATE CHANGE IN DIRECT LABOR COST FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

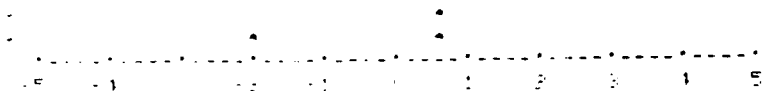
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$-233K
 STD. DEV. = \$ 283K
 MIN. OBS. = \$-636K
 MAX. OBS. = \$ -14K



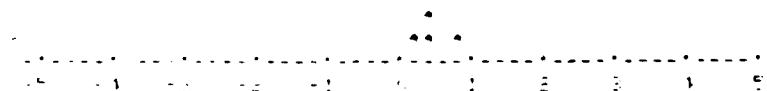
OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$-243K
 STD. DEV. = \$ 365K
 MIN. OBS. = \$-665K
 MAX. OBS. = \$ -28K



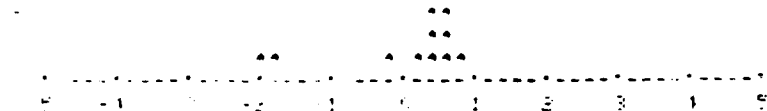
OTHER INDUSTRY

NO. OBS. = 4
 MEAN = \$ -71K
 STD. DEV. = \$ 50K
 MIN. OBS. = \$-117K
 MAX. OBS. = \$ 0



ALL RESPONSES

NO. OBS. = 11
 MIN. OBS. = \$-665K
 MAX. OBS. = \$ 0



OBSERVATIONS

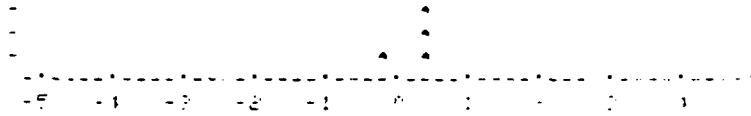
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$-156K STD. DEV. = \$258K

APPROXIMATE CHANGE IN TOOLING COST FOR CYLINDRICAL PARTS -- SYSTEM 3

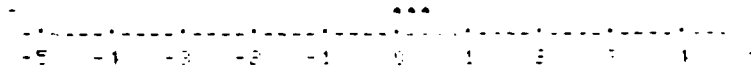
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$-112K
 STD. DEV. = \$ 179K
 MIN. OBS. = \$-379K
 MAX. OBS. = \$ -1K



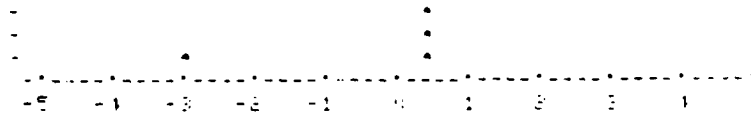
OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$-114K
 STD. DEV. = \$ 108K
 MIN. OBS. = \$-216K
 MAX. OBS. = \$ 0



OTHER INDUSTRY

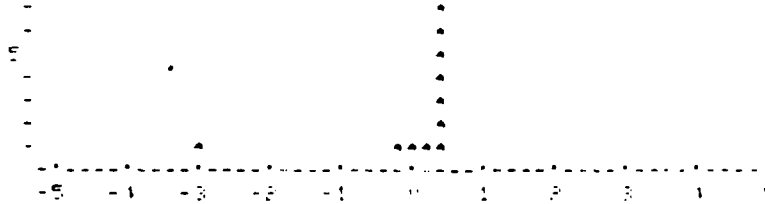
NO. OBS. = 4
 MEAN = \$ 520K
 STD. DEV. = \$1,018K
 MIN. OBS. = \$-2,047K
 MAX. OBS. = \$ -2K



ALL RESPONSES

NO. OBS. = 11
 MIN. OBS. = \$-2,047K
 MAX. OBS. = \$ 0

OBSERVATIONS



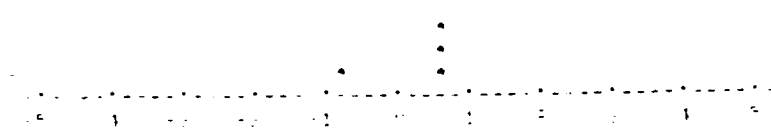
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$-261K STD. DEV. = \$604K

APPROXIMATE CHANGE IN TOOLING COST FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

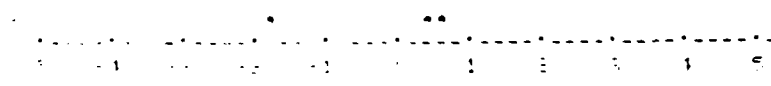
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$-144K
 STD. DEV. = \$ 244K
 MIN. OBS. = \$-509K
 MAX. OBS. = \$ -1K



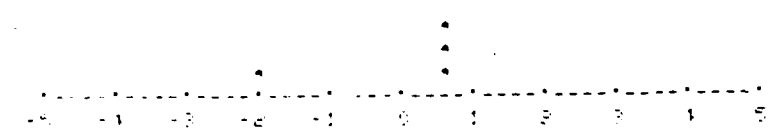
OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$-285K
 STD. DEV. = \$ 451K
 MIN. OBS. = \$-805K
 MAX. OBS. = \$ 0



OTHER INDUSTRY

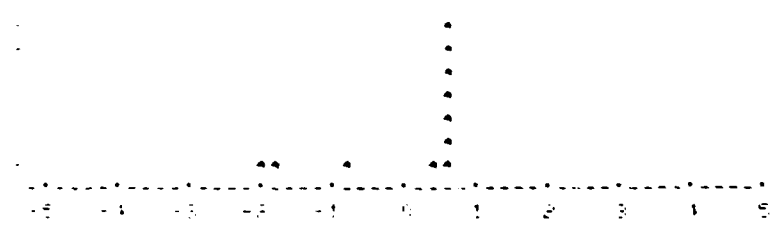
NO. OBS. = 4
 MEAN = \$-234K
 STD. DEV. = \$ 428K
 MIN. OBS. = \$-875K
 MAX. OBS. = \$ -17K



ALL RESPONSES

NO. OBS. = 11
 MIN. OBS. = \$-875K
 MAX. OBS. = \$ 0

OBSERVATIONS



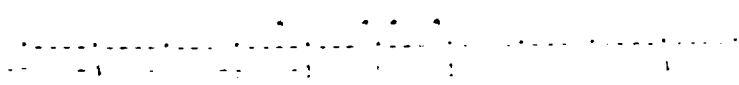
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$-215K STD. DEV. = \$342K

APPROXIMATE CHANGE IN SCRAP AND REWORK COSTS FOR CYLINDRICAL PARTS -- SYSTEM 3

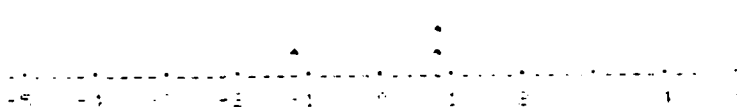
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$ -22K
 STD. DEV. = \$ 19K
 MIN. OBS. = \$ -47K
 MAX. OBS. = \$ -2K



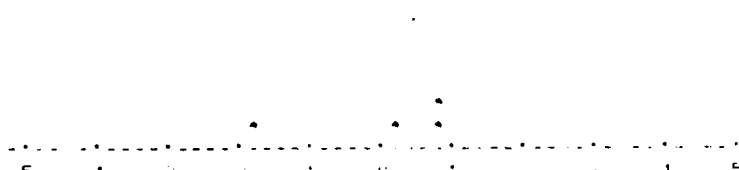
OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$ -15K
 STD. DEV. = \$ 25K
 MIN. OBS. = \$ -44K
 MAX. OBS. = \$ 0



OTHER INDUSTRY

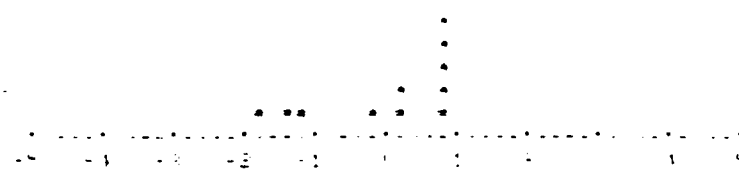
NO. OBS. = 4
 MEAN = \$ -19K
 STD. DEV. = \$ 27K
 MIN. OBS. = \$ -59K
 MAX. OBS. = \$ 0



ALL RESPONSES

NO. OBS. = 11
 MIN. OBS. = \$ -59K
 MAX. OBS. = \$ 0

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$-19K STD. DEV. = \$22K

APPROXIMATE CHANGE IN SCRAP AND REWORK COSTS FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

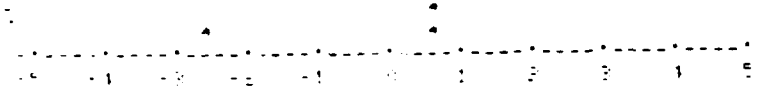
MISSILE PRIMES & SUBS

NO. OBS. = 4
 MEAN = \$ -36K
 STD. DEV. = \$ 38K
 MIN. OBS. = \$ -85K
 MAX. OBS. = \$ -1.3K



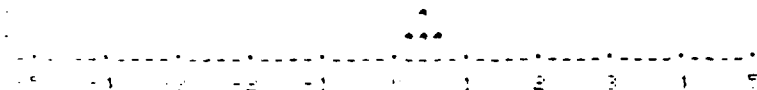
OTHER AEROSPACE

NO. OBS. = 3
 MEAN = \$ -54K
 STD. DEV. = \$ 93K
 MIN. OBS. = \$ -161K
 MAX. OBS. = \$ 0



OTHER INDUSTRY

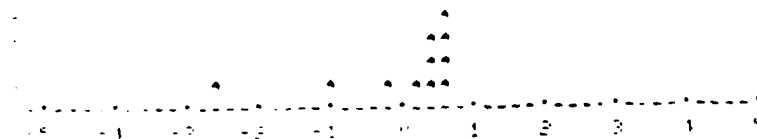
NO. OBS. = 4
 MEAN = \$ -13K
 STD. DEV. = \$ 10K
 MIN. OBS. = \$ -25K
 MAX. OBS. = \$ -2K



ALL RESPONSES

NO. OBS. = 11
 MIN. OBS. = \$ -161K
 MAX. OBS. = \$ 0

OBSERVATIONS



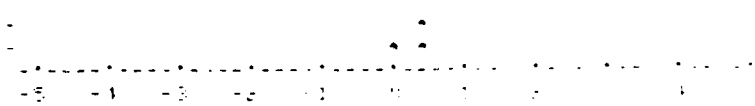
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$ -32K STD. DEV. = \$ 50K

APPROXIMATE CHANGE IN WORK IN PROCESS INVENTORY FOR CYLINDRICAL PARTS -- SYSTEM 3

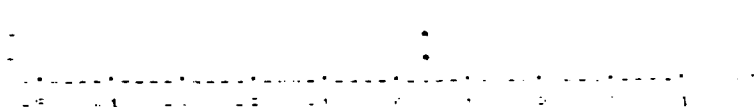
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = \$-149K
 STD. DEV. = \$ 219K
 MIN. OBS. = \$-400K
 MAX. OBS. = \$ 0



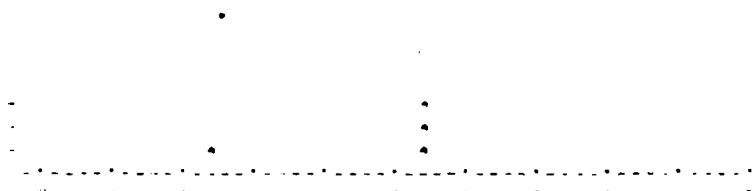
OTHER AEROSPACE

NO. OBS. = 2
 MEAN = \$-12.4K
 STD. DEV. = \$ 17.7K
 MIN. OBS. = \$ -25K
 MAX. OBS. = \$ 0



OTHER INDUSTRY

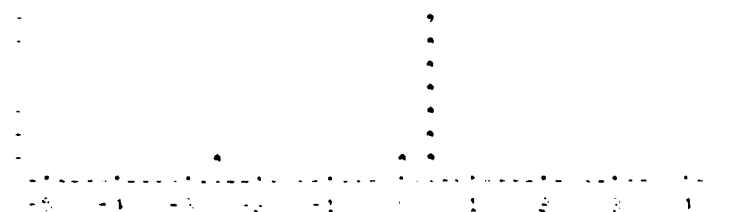
NO. OBS. = 4
 MEAN = \$-648K
 STD. DEV. = \$1,235K
 MIN. OBS. = \$-2,500K
 MAX. OBS. = \$ -20K



ALL RESPONSES

NO. OBS. = 9
 MIN. OBS. = \$-2,500K
 MAX. OBS. = \$ 0

OBSERVATIONS



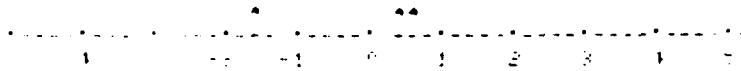
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$-340K STD. DEV. = \$820K

APPROXIMATE CHANGE IN WORK IN PROCESS INVENTORY FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

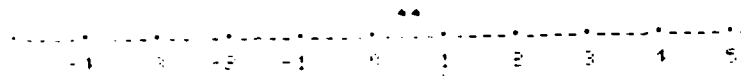
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = \$ -28K
 STD. DEV. = \$ 450K
 MIN. OBS. = \$ -800K
 MAX. OBS. = \$ 0



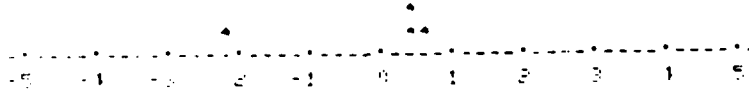
OTHER AEROSPACE

NO. OBS. = 2
 MEAN = \$ -30K
 STD. DEV. = \$ 42K
 MIN. OBS. = \$ -60K
 MAX. OBS. = \$ 0



OTHER INDUSTRY

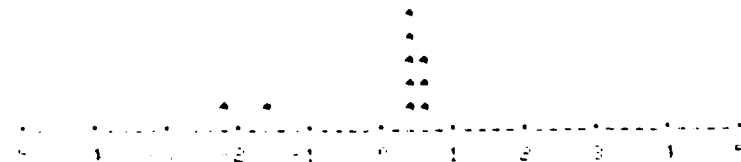
NO. OBS. = 5
 MEAN = \$ -235K
 STD. DEV. = \$ 429K
 MIN. OBS. = \$ -1,000K
 MAX. OBS. = \$ 0



ALL RESPONSES

NO. OBS. = 10
 MIN. OBS. = \$ -1,000K
 MAX. OBS. = \$ 0

OBSERVATIONS



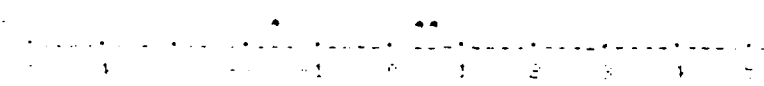
STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)

MEAN = \$ -207K STD. DEV. = \$ 369K

APPROXIMATE CHANGE IN WORK IN PROCESS INVENTORY FOR NON-CYLINDRICAL PARTS -- SYSTEM 3

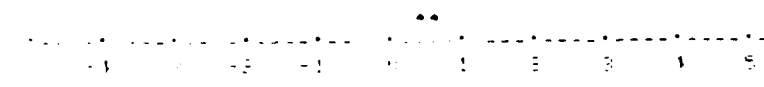
MISSILE PRIMES & SUBS

NO. OBS. = 3
 MEAN = \$ -28K
 STD. DEV. = \$ 450K
 MIN. OBS. = \$ -800K
 MAX. OBS. = \$ 0



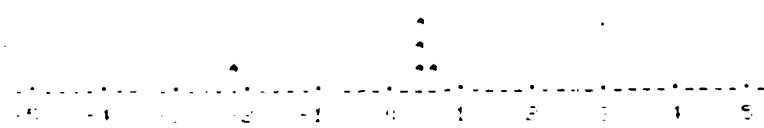
OTHER AEROSPACE

NO. OBS. = 2
 MEAN = \$ -30K
 STD. DEV. = \$ 42K
 MIN. OBS. = \$ -60K
 MAX. OBS. = \$ 0



OTHER INDUSTRY

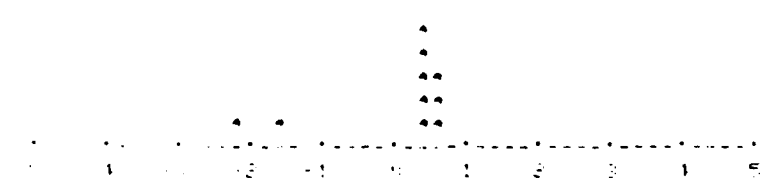
NO. OBS. = 5
 MEAN = \$ -235K
 STD. DEV. = \$ 429K
 MIN. OBS. = \$ -1,000K
 MAX. OBS. = \$ 0



ALL RESPONSES

NO. OBS. = 10
 MIN. OBS. = \$ -1,000K
 MAX. OBS. = \$ 0

OBSERVATIONS



STANDARD DEVIATIONS FROM MEAN (ALL RESPONSES)
 MEAN = \$ -207K STD. DEV. = \$ 369K

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