U.S. DEPARTMENT OF COMMERCE National Technical Information Service

AD-A026 824

AN INITIAL INVESTIGATION OF THE EFFECT OF REPEATED HIGH INTENSITY FLASHES ON MAN'S PERFORMANCE OF A TRACKING TASK

DARCOM INTERN TRAINING CENTER

March 1976

# **KEEP UP TO DATE**

Between the time you ordered this report which is only one of the hundreds of thousands in the NTIS information collection available to you—and the time you are reading this message, several *new* reports relevant to your interests probably have entered the collection.

Subscribe to the Weekly Government Abstracts series that will bring you summaries of new reports as soon as they are received by NTIS from the originators of the research. The WGA's are an NTIS weekly newsletter service covering the most recent research findings in 25 areas of industrial, technological, and sociological interest invaluable information for executives and professionals who must keep up to date.

The executive and professional information service provided by NTIS in the Weekly Government Abstracts newsletters will give you thorough and comprehensive coverage of government-conducted or sponsored research activities. And you'll get this important information within two weeks of the time it's released by originating agencies.

WGA newsletters are computer produced and electronically photocomposed to slash the time gap between the release of a report and its availability. You can learn about technical innovations immediately—and use them in the most meaningful and productive ways possible for your organization. Please request NTIS-PR-205/PCW for more information.

The weekly newsletter series will keep you current. But *learn what you have missed in the past* by ordering a computer **NTISearch** of all the research reports in your area of interest, dating as far back as 1964, if you wish. Please request NTIS-PR-186/PCN for more information.

> WRITE: Managing Editor 5285 Port Royal Road Springfield, VA 22161

# Keep Up To Date With SRIM

SRIM (Selected Research in Microfiche) provides you with regular, automatic distribution of the complete texts of NTIS research reports only in the subject areas you select. SRIM covers almost all Government research reports by subject area and/or the originating Federal or local government agency. You may subscribe by any category or subcategory of our WGA (Weekly Government Abstracts) or Government Reports Announcements and Index categories, or to the reports issued by a particular agency such as the Department of Defense, Federal Energy Administration, or Environmental Protection Agency. Other options that will give you greater selectivity are available on request.

The cost of SRIM service is only 45¢ domestic (60¢ foreign) for each complete

microfiched report. Your SRIM service begins as soon as your order is received and processed and you will receive biweekly shipments thereafter. If you wish, your service will be backdated to furnish you microfiche of reports issued earlier.

Because of contractual arrangements with several Special Technology Groups, not all NTIS reports are distributed in the SRIM program. You will receive a notice in your microfiche shipments identifying the exceptionally priced reports not available through SRIM.

A deposit account with NTIS is required before this service can be initiated. If you have specific questions concerning this service, please call (703) 451-1558, or write NTIS, attention SRIM Product Manager.

This information product distributed by



U.S. DEPARTMENT OF COMMERCE National Technical Information Service 5285 Port Royal Road Springfield, Virginia 22161

Report ITC-02-08-76-115

ADA 026824

FLASHES ON MAN'S PERFORMANCE OF A TRACKING TASK

AN INITIAL INVESTIGATION OF THE EFFECT OF REPEATED HIGH INTENSITY

Martin E. Winkler Maintenance Engineering Graduate Program Intern Training Center Red River Army Depot Texarkana, Texas 75501

March 1976

Final Report

APPROVED FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED

Prepared for

MAINTENANCE ENGINEERING GRADUATE PROGRAM AND TEXAS A&M UNIVERSITY GRADUATE CENTER DARCOM Intern Training Center Red River Army Depot Texarkana, Texas 75501



REPRODUCED BY NATIONAL TECHNICAL INFORMATION SERVICE U. S. DEPARTMENT OF COMMERCE SPRINGFIELD, VA. 22161

SECURITY CLASSIFICATION OF THIS PAGE (Then )	Data Entered)	
REPORT DOCUMENTATI	READ INSTRUCTIONS BEFORE COMPLETING FORM	
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
ITC-02-08-76-115		
. TITLE (and Subtitie)		5. TYPE OF REPORT & PERIOD COVERED
AN INITIAL INVESTIGATION OF T		[ideal
AN INITIAL INVESTIGATION OF IT	AN MAN'S DEDEAD.	Final
MANCE OF A TRACKING TASK	UN MAN 3 PERFOR-	5. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(#)		8. CONTRACT OR GRANT NUMBER(#)
Martin E. Winkler		
PERFORMING OPGANIZATION NAME AND ADDR	DESS	10. PROGRAM ELEMENT PROJECT TASK
Department of Maintenance Effect	tiveness	AREA & WORK UNIT NUMBERS
DARCOM Intern Training Center		
Red River Army Depot, Texarkana	, Texas 75501	
1. CONTROLLING OFFICE NAME AND ADDRESS		12. REPORT DATE
Department of Maintenance Effect	tiveness	March 1976
and Texas A&M University Gradua	ite Center	13. NUMBER OF PAGES
UAKLUM INTERN IRAINING CENTER	ferent from Controlling Office)	15. SECURITY CLASS. (of this report)
		15. DECLASSIFICATION/DOWNGRADING SCHEDULE
6. DISTRIBUTION STATEMENT (of this Report)		
7. DISTRIBUTION STATEMENT (of the abstract ent	ered in Block 20, if different from	n Report)
Research performed by Martin Morris, Assistant Professor,	E. Winkler under th Texas A&M Universit	e supervision of Dr. R.S. y
9. KEY WORDS (Continue on reverse elde if necessar	y and identify by block number)	
Performance, Tracking-Task,	Glare	
· · · · · · · · · · · · · · · · · · ·		
	PROCES S	URJECT TO CHANGE
D. ABSTRACT (Continue on reverse side if necessary	and identify by block number)	
Ints paper is a report of rese	earch designed to in	Nestigate the effect of
repeated glare on human performan The experiment used an EAI 680 is to record the experimental dat tes and then performed the track frun the subject experienced four with no dark-adaption or intermit	nce of a tracking ta ) computer to create ta. Subjects were d ing task for a half flashes from a glar ttent flashes, was c	isk. the tracking task as well lark-adapted for thirty minu- hour run period. During the source. A control run, performed by all five subject
Performance was measured by the 1	time required to rea	ich a predetermined level of
D 1 AN 73 1473 EDITION OF ! NOV 65 IS OF	SOLETE	
· · · · · · · · · · · · · · · · · · ·	SECURITY CLAS	SIELCATION OF THIS PAGE (When Data Enters

4. 3336

## SECURITY CLASSIFICATION OF THIS PAGE(Man Data Entered)

error, while a biological factor was measured by the lowest galvanic skin resistance value during the time period prior to reaching the error level. Statistical analysis showed both the flash-time factor and the condition flash-time interaction to be significant at the 95% level of confidence. Graphical analysis showed the subjects' performance to increase with time while operating the tracking task under the glare condition.

		DEAN NATELONAL
REPORT DOCUMENTATION	BEFORE COMPLETING FORM	
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitie)	<b> </b>	5. TYPE OF REPORT & PERIOD COVERED
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(=)		8. CONTRACT OR GRANT NUMBER(*)
9. PERFORMING ORGANIZATION NAME AND ADDRESS		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS		12. REPORT DATE
		13. NUMBER OF PAGES
14. MONITORING AGENCY NAME & ADDRESS(II different	from Controlling Office)	15. SECURITY CLASS. (of this report)
		15#. DECLASSIFICATION/DOWNGRADING SCHEDULE
6. DISTRIBUTION STATEMENT (of this Report)		
7. DISTRIBUTION STATEMENT (of the sbetract entered in	n Block 20, if different from	n Report)
8. SUPPLEMENTARY NOTES		
9. KEY WORDS (Continue on reverse side if necessary and	identify by block number)	
D. ABSTRACT (Continue on reverse side if necessary and	identify by block number)	
D FORM 1473 EDITION OF T NOV 48 IS DESOLE	TE	

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

and the second second

## FOREWORD

The research discussed in this report was accomplished as part of the Maintenance Eugineering Graduate Program conducted jointly by DARCOM Intern Training Center and Texas A&M University. As such, the ideas, concepts and results herein presented are those of the author and do not necessarily reflect approval or acceptance by the Army.

This report has been reviewed and is approved for release. For further information on this project contact Dr. Ronald C. Higgins, Chief of Maintenance Effectiveness, Red River Army Depot, Texarkana, Texas.

Approved:

mall C.

Dr. Ronald C. Higgins, Cher Maintenance Effectiveness Engineering

For the Commander

James L. Arnett, Director Intern Training Center

#### ABSTRACT

Research Performed by <u>Martin E. Winkler</u> Under the Supervision of Dr. R.S. Morris

This paper is a report of research designed to investigate the effect of repeated glare on human performance of a tracking task.

The experiment used an EAI 680 computer to create the tracking task as well as to record the experimental data. Subjects were dark-adapted for thirty minutes and then performed the tracking task for a half hour run period. During the run the subject experienced four flashes from a glare source. A control run, with no dark-adaption or intermittent flashes, was performed by all five subjects. Performance was measured by the time required to reach a predetermined level of error, while a biological factor was measured by the lowest galvanic skin resistance value during the time period prior to reaching the error level.

Statistical analysis showed both the flash-time factor and the condition flash-time interaction to be significant at the 95% level of confidence. Graphical analysis showed the subjects' performance to increase with time while operating the tracking task under the glare condition.

iii

#### ACKNOWL EDGMENTS

I wish to thank Dr. R.S. Morris for serving as my committee chairman and for his assistance throughout this project. I further wish to thank the other members of my committee, Dr. J.M. CoVan and Dr. S.B. Childs, for their constructive criticisms and other assistance.

Also, Robert Ferguson and Dennis Boyer contributed much by providing advice and alternatives in designing the computer algorithm used for the project.

During the course of this work, I was employed by the U.S. Army as a career intern in the DARCOM Maintenance Effectiveness Engineering Graduate Program. I am grateful to the U.S. Army for the opportunity to participate in this program.

The ideas, concepts, and results herein presented are those of the author and do not necessarily reflect approval or acceptance by the Department of the Army.

# TABLE OF CONTENTS

# Chapter

,

I	INTRODUCTION
II	REVIEW OF LITERATURE
III	EXPERIMENTAL PROCEDURE
IV	RESULTS AND DISCUSSION
۷	SUMMARY AND CONCLUSIONS
	REFERENCES
	GLOSSARY
	APPENDIX A
	APPENDIX B
	APPENDIX C

# LIST OF FIGURES

٩,

Figure		Page
1	Inverted 'U' Curve	4
2	Analog Circuit	9
3	I.En. 685 Data Sheet 1	12
4	Instructions	13
5	Run Time Line	11
6	Experimental Block Design	15
7	Rank Data: Subject Four	17
8	Model 2	18
9	Averaged Standardized Performance Data	23
10	Averaged Standardized GSR Data	26

## LIST OF TABLES

-

,

Table	Page
1	ANOVA MODEL 1
2	ANOVA MODEL 2
3	GSR VERSUS PERFORMANCE

#### CHAPTER I

#### INTRODUCTION

In many aspects of man-machine relations, vision is an important physical criterion. Be it repairing, operating, or installing, vision is often necessary for successful completion of the task. In realizing this, man has made great efforts to ensure proper lighting, However, as is often the case, solving one problem tends to either create or compound another.

The nighway lights on an automobile are of great service to its driver, but to the driver of an oncoming car, they can be just as great a problem. In a Minnesota roadside study it was found that highway traffic accidents were higher in areas having more glare sources (17)\*. Highway sections having higher frequencies of intersections and advertising signs, also showed higher accident rates. A common factor of all the higher accident areas was a greater number of glare sources; both reflected from the road signs and scattered from approaching cars.

The problem to be investigated in this paper is that of the effect of repeated glare of high intensity flashes on human performance. A tracking task was employed to stress the subjects, with the time to reach a predetermined level of error and galvaric skin resistance used as two separate measures of the effect.

The design of the experiment includes a control group, as well as, an experimental group. Both groups underwent the same procedure, with only the intermittent glare source removed for the control group.

\*Numbers in parentheses refer to citations in the List of References.

The test involved the use of a number of dark-adapted subjects to operate a two dimensional tracking simulator under a normally low level of illumination. In its final configuration the tracking-simulator was a Cathode Ray Tube (CRT). The target to be tracked was an illuminated dot which moved about the center cross-hairs of the CRT in a random manner. The subject, seated approximately two feet from the CRT, used a joy stick with two degrees of freedom to track the target deviations. The subject's displacement of the joy stick in the proper direction causes the target to move to the intersection of the cross-hairs at the center of the screen. Since the target was continuously driven along a random path, it was necessary for the subject to make similarly continuous movements with the joy stick to keep the target at the center of the CRT (zero positioning). At intervals throughout the test, a high intensity whitelight was flashed in the subject's line of sight. If at any time the subject allowed the target deviations to exceed a predetermined displacement, a buzzer sounded and continued to do so until the target was back within the allowable range. The budger served as additional feedback to the subject and provided an additional stress.

The subject's performance, total buzzer time, and galvanic skin resistance were monitored for future analysis. Finally, the subjects completed a questionnaire concerning the tracking task.

## CHAPTER II

#### REVIEW OF LITERATURE

Bartlett (1951) reported that a group of R.A.F. pilots were studied in simulated Spitfire cockpits. The most significant finding of this study was the general tendency for an increase in errors at the end of a flight. "A tired airman, it seems, has an almost irresistible tendency to relax when he nears the airport." (19) This condition could be explained by the inverted 'U' curve (Figure 1).

The Inverted U Hypothesis states that as stress increases, the resulting arousal increases, and performance consequently improves up to an optimal point, and thereafter declines. This relationship between stress and performance is entirely qualitative. Its use is therefore limited to detecting trends and patterns in data obtained under closely controlled conditions. Also, very little is known as to how the optimum point moves (or even if it does) as a subject's arousal is raised and lowered successively over a period of time. (25) For this experiment the inverted U curve may offer an explanation of time related changes in performance, pending the conditions of those changes.

Any experiment that places a demand on a subject over a period of time must consider fatigue as a possible factor. Fatigue can be of two types; muscular or general. General fatigue is defined by different authors according to either the caustive factors or the particular affected physiological parameters. Visual fatigue, nervous fatigue, and fatigue caused by monotonous work are all specific classifications of general fatigue. (10)

McFarland has shown that, although fatigue is different for the





Inverted 'U' Curve (25)

different physiological systems, it is possible to fatigue other seemingly unrelated systems through the application of stress at some other point in the bio-system. (20) This result can be seen in experiments involving very exhausting work. As an example, it was found that, in severe exercise on a bicycle the subject's adaptation and mental performance deteriorated as well as their physical ability to operate the bicycle exercise. This result indicates that any fatigue determined to exist during operation of the tracking task may be the consequence of some factor other than the said operation.

Krivohlavy (19) in a paper dealing with fatigue in industry, cited numerous studies which utilized vision as a measure of fatigue. Specifically, it was found that pupil diameter, as well as visual acuity, showed a marked decrease over time during fatiguing activities. Krivohlavy found that vision tests measuring perceptual performance in a selfpaced situation, taken at various times during a work shift, steadily diminished during the shift. The question left unanswered by Krivohlavy's study is, whether fatigue of the musculature is being measured by changes of the visual capabilities or if it is actually the visual system which is being fatigued. This experiment uses statistical methods to determine what factors effect the subject's performance.

Of studies concerned with the consequences of adverse lighting, few consign fatigue as a direct function of improper illumination. Numerous highway studies have examined the relationship between proper street lighting and accident rates but again, most are reluctant to consider driver fatigue as the result of too much or too little lighting.

Efforts to measure fatigue by performance have, in the past, been relatively unsuccessful. C. Cameron (5) stated in a report on fatigue

that a driver shows no significant deterioration in performance until after he has been working continuously for periods of 16 to 20 hours. Numerous other test results show similar time intervals. It seems then, that initially the effect of fatigue is somehow hidden from simple performance measurement. Some experimenters suggest that in Taboratory studies subjects tend to compensate for adverse conditions such as lighting by trying harder. In a report dealing with fatigue in modern life, (20) McFarland states, "What is needed to prevent masking of Tatigue is a combined measure of both speed and accuracy." To compensate for this result the subject's galvanic skin response (GSR) was monitored during the experiment investigated in this paper.

In a paper for the Texas Transportation Institute, a drivers GSR was monitored while the drivers operated their automobiles over roadway sections of various illumination levels. (?) The results showed that insufficient, as well as excessive roadway lighting, affected the drivers' galvanic skin resistance.

The GSR, when used properly, can be an indicator of central nervous system events. In 1888 Feré demonstrated that rapid fluctuations in skin resistance could occur in response to emotional stimulation. It is currently thought that these fluctuations are due to a change in the total permeability of a selective cutaneous membrane in response to the arrival of impulses carried by cholinergic sympathetic nerves. (4)

The GSR can, in addition to its emotional information, indicate levels of arousal. Higher levels of arousal are accompanied by lowered skin resistance. Changes in electrodermal reflex are rapid, usually requiring fractions of a second to reach peak values. This rapid response to a given stimulus is in itself another measure of a subject's

psychophysiological state. Ryan and Warner, investigating fatigue and its effects in car drivers, found that fatigue caused a delay in a subject's galvanic skin response. (10)

#### CHAPTER III

#### EXPERIMENTAL PROCEDURE

This chapter presents a description of the methodology and equipment used in this experiment. In addition, a presentation of the related statistical methods is included.

#### Equipment

The subject views the target from a Tektronix Type 556 Dual-Beam Oscilloscope. Seated approximately two feet from the face of the scope, the subject uses a two-dimensional joy-stick to hold the target at the center of the screen. The target is driven by two random signal generators through an EAI 680 analog computer. A circuit diagram is shown in Figure 2.

This circuit has three basic divisions; the display circuit, the error circuit, and the GSR circuit.

The display circuit originates with four track-store amplifiers sampling two random noise generators at a rate of 1.67 samples per second. This random signal is then added to the subject's input. From this point it is integrated and inverted before being displayed through the oscilloscope cross-plot.

The integration operates at a rate of one volt per second per voltinput with the oscilloscope set to scale one centimeter for every two volts-input. Consequently, the target moves at a rate of 0.83cm/sec per volt-input to the integrators.

The error circuit sums the subject's signal and the random signal and calculates the two dimensional mean-square error. When the



accumulated mean-square error exceeds 0.25 the comparator puts the time ramp in the hold mode while the digital part of the 680 computer reads this value from the time ramp. Once this operation is complete, the error circuit is zeroed and operation is started over. The time ramp and error circuit is also zeroed through the use of a push-button any time a flash from the Porta-Glare occurs. The error circuit also measures the target's distance from center. When target distance from center exceeds one centimeter in any direction, a parallel error circuit sounds a buzzer. The total amount of time the buzzer operates during a run is determined by the use of another time ramp.

The GSR signal is determined by the ten volt complement of the voltage drop across the subject's middle and index fingers. At the start of a run this signal is adjusted by use of a hand-set potentiometer to fall in the range of 1.0 - 1.5 volts. The remaining GSR circuitry determines the peak value obtained during each perturbance of the error circuit. This peak value is recorded along with the time to error data point.

The digital program used to control the analog circuitry is listed in Appendix A. In addition to recording the data this program sets keyboard potentiometers and provides preliminary data analysis. A sample output is included with the programs.

#### Experimental Conditions

The operation is first explained to each subject prior to a practice run. These runs are continued until the subject is able to control the target without sounding the buzzer for ten consecutive minutes. At this time the GSR electrodes are attached and from one to three runs are made

depending upon allowable time. Runs lasted thirty minutes and took place at all times of the day, depending upon the subjects' availability. Control runs were preceded by thirty minutes adaption time. A minimum of fifteen minutes rest was given between consecutive runs. Following the last run each subject filled out a questionnaire (Figure 3, page 12)

Prior to any run, the subject's part in the experiment is reviewed. This is done by reading a set of instructions (Figure 4, page 13) to the subject. The room was then darkened to effect dark-adaption of the subject's ocular system. After thirty minutes the buzzer is sounded to notify the subject of the end of the dark adaption period and the beginning of operation. The first three minutes of operation are used to refamiliarize the subject with the tracking task. After this time the subject is again notified and the actual run begins.

Runs lasted thirty minutes. During this time, four flashes of four second duration and 800 foot-candle intensity are given from a Porta-Glare unit placed 22 degrees above the subject's line of sight. These flashes occur at five minute intervals with the exception of the last, which comes after a ten minute delay. See time line shown below in Figure 5.



FIGURE 5

RUN TIME LINE (IN MINUTES) (↓ INDICATES FLASH)

#### Experimental Design

The experiment for this investigation is a three factor, Latin square design involving both fixed and random effects. (18) The condition

Subject Number	
Name	Sex
Date Tested	Age
Time of Test	
Amount of Practice Time	Does the Subject
Practice Sample Mean	Wear Glasses
Practice Standard Deviation	Wear Contact Lens
	Smoke
	Drink
	If yes, when was
Post Run Que Did you feel fatigued during a run	last time ************************************
**************************************	Tast time
Post Run Que Did you feel fatigued during a run If so, when What effect did the glare have	last time
Post Run Que Did you feel fatigued during a run If so, when What effect did the glare have What effect did the buzzer have	Tast time
Post Run Que Did you feel fatigued during a run If so, whenWhat effect did the glare have Did you lose sight of the grid	Tast time
Post Run Que Did you feel fatigued during a run If so, when What effect did the glare have What effect did the buzzer have Did you lose sight of the grid Did you lose sight of the dot	Tast time
Post Run Que Did you feel fatigued during a run If so, when What effect did the glare have What effect did the buzzer have Did you lose sight of the grid Did you lose sight of the dot If so, when	Tast time
Post Run Que Did you feel fatigued during a run If so, when What effect did the glare have What effect did the buzzer have Did you lose sight of the grid Did you lose sight of the dot If so, when Was any color better than the other	Tast time
Post Run Que Did you feel fatigued during a run If so, when What effect did the glare have Did you lose sight of the grid Did you lose sight of the dot If so, when Was any color better than the other Best	Tast time
Post Run Que Did you feel fatigued during a run If so, when What effect did the glare have What effect did the buzzer have Did you lose sight of the grid Did you lose sight of the dot If so, when Was any color better than the other Best Worst	Tast time
Post Run Que Did you feel fatigued during a run If so, when What effect did the glare have What effect did the buzzer have Did you lose sight of the grid Did you lose sight of the dot If so, when Was any color better than the other Best Worst COMMENTS:	Tast time

ł

At the beginning of the experiment you will be given thirty minutes in which to become accustomed to the control of the equipment.

The control stick at your right hand controls the movement of the dot on the screen. If you move the stick back the dot moves up, if you move the stick forward the dot will move down, moving the stick to the right and left will cause the dot to move in that direction. Your objective is to hold the dot on the cross hairs of the screen, or as close as you can.

At the end of your practice run you will be placed in a darkened room for about thirty minutes in order to allow your eyes to become dark adapted. After this time the buzzer will sound and you will be given two minutes of practice time, and then the operators will place the analog computer into the initial condition mode for fifteen seconds. This will move the dot to the center of the screen and hold it there. At this time the machine will be placed into the operate mode and will begin taking data.

During the run there will be from two to five flashes, with each run lasting approximately thirty minutes. At the end of the run an operator will change the filters on the screen. You will then be given a short rest period to readjust your eyes to the room and the next run will begin.

If you have any questions ask the operator at this time.

FIGURE 4 INSTRUCTIONS SHEET 2

sequence for each subject is determined by first assigning each condition a numerical range. Conditions are then assigned, using a random numbers table, subject to the stipulation that each subject must experience each experimental condition. The resulting Latin square is shown in Figure 6. All subjects used were selected from engineering graduate students.

With this experimental structure the subjects are not considered as repeated samples. Rather, each subject is treated as a different experimental level. The repeated factor within the block is the flash from the glare source. Data points shown in the block of Figure 6 represent the number of perturbances from the start of the experiment to the time of the flash.

For purposes of analysis, the subjects are later treated as repeated samples In this case the data is standardized for each subject-condition.

#### Statistical Methods

For this experiment the error term is represented by the value of T in the equation:

$$K = \int_{0}^{T} (X^{2}(t) + Y^{2}(t)) dt$$

where

K = predetermined level of error (0.25), T = time to error,  $X^2 = X$  component of mean-square error as a function of  $Y^2 = Y$  component of mean-square error as a function of time.

The first step taken in analyzing the data is to determine the corresponding statistical distribution for the variable T. A plot of ranked T values, on normal probability paper, obtained from subject number four,

	FLASH	001	002	003	004	005
I	lst	C	16 R	19 0	15 W	31 B
	2nd	O	33	37	31	63
	3rd	N	47	56	45	95
	4th	T	81	93	77	159
II	lst	35* 0	15 B	22 w	27 R	C
	2nd	61	32	43	40	O
	3rd	85	47	62	107	N
	4th	129	77	101	129	T
III	lst	29 B	C	18 R	19 0	30 W
	2nd	53	O	39	40	51
	3rd	74	N	58	59	76
	4th	117	T	95	104	124
IV	lst	23 R	16 W	17 B	C	28 0
	2nd	46	33	33	O	54
	3rd	73	49	48	N	84
	4th	120	65	81	T	138
V	lst	27 W	17 0	C	13 B	28 R
	2nd	50	34	O	29	57
	3rd	70	51	N	44	83
	4th	110	84	T	73	143

SUBJECT NUMBER

O = Orange Red R = Red B = Blue W = White

CONT = Control

\* Numbers indicate the value of the subscript i of  $T_i$  corresponding to 1st, 2nd, 3rd, and 4th flash respectively.

## FIGURE 6

EXPERIMENTAL BLOCK DESIGN

shows that this distribution is approximately normal (see Figure 7). Appendix B contains a program to rank the data and plot a frequency histogram for the control runs. By comparing the histogram plot for subject number four to the histograms (also contained in Appendix B) for the other subjects, it can be shown that the data taken is approximately normal for all subjects.

The next step in the statistical analysis is to combine a series of the T values to obtain new data. This new data represents the frequency of errors in consecutive 275 second intervals for each subject condition level and is given by Y in the equation:

$$Y = I/(\sum_{i=1}^{I} \tau_{i} \ge 275)$$

At this point an analysis of variance can be done to determine what factors have an influence on a subject's performance. The first model for analysis (model 1) is a three factor, mixed mode, with no replications. The statistical metrod for this analysis is described in Chapter V of <u>Statistical Principles in Experimental Design</u> by Winer (26).

As applied to this experiment, Winer proposes two experimental models:

(i)  $Y_{ijk} = \mu + S_i + C_j + F_k + SC_{ij} + SF_{ik} + CF_{jk} + SCF_{ijk} + \varepsilon_{ijk}$ (ii)  $Y_{ijk} = \mu + S_i + C_j + F_k + SC_{ij} + SF_{ik} + CF_{jk} + \varepsilon_{ijk}$ 

Equation (ii) is termed the additive model, whereas (i) is considered the non-additive model. The term "additive" implies that the components of the three-factor interaction are homogeneous and may, consequently, be considered as an estimate of experimental error.

To determine which model should be used, the variation due to



sources other than main effects is divided into two parts. One part, called nonadditivity, corresponds to the linear x linear component of the SCF interaction. The other part, called balance, is what is left. If the nonadditivity component is significantly larger than the balance, it is determined that the three-factor interaction estimated a source of variation different from experimental error. In this case model (i) would be chosen. If model (ii) is chosen, then the triple interaction term, SCF, is considered an estimate of experimental error.

For this experiment, model (ii) is found to be the most appropriate when tested at the 0.95 level of significance. The program to find the appropriate model and the Analysis of Variance table is shown in Appendix C.

The results of this test show the subject to be the most significant factor affecting the data. In an effort to remove this subject effect, the data is standardized for each subject-condition. The standardized subjects are then treated as repetitions. Figure 8 is a sketch of this new model (model 2).

CONDITION (j)	1 <u>&lt;</u> j <u>&lt;</u> 2
FLASH-TIME (k)	1 <u>&lt;</u> k <u>&lt;</u> 6
SUBJECT (1)	1 < i < 5

## FIGURE 8

## MODEL 2

The data is standardized by finding the mean and standard deviation for each subject-condition and using them in the equation

 $\sqrt{n} (Y_{jki} - E(Y_{j,i}))/S$ . Standardizing the data in this manner does not remove the underlying effect of the control condition, but rather, puts the subjects on the same level.

Once the data is in this form, the model shown in Figure 8 is analyzed as a two factor mixed model. The program for this analysis, along with the corresponding results, is in Appendix C. These results show the condition sum of squares equal to zero. This is due to the fact that the mean of standardized data equals zero.

#### CHAPTER IV

#### RESULTS AND DISCUSSION

The results of the analysis of variance, of experimental model one, are tabulated in Table 1. From these results the mathematical equation for model one is derived. Any factor (tabled under the heading SOURCE) whose calculated F value exceeds the value of the F statistic at the .05 level of significance is included in the model shown below:

$$Y_{ijk} = \mu + S_i + F_k + SC_{ij} + CF_{jk} + SCF_{ijk} + \varepsilon_{ijk}$$
(1)

The most significant factor of this model is the subject. For this reason the analysis of model two was deemed advisable.

The results of the analysis of model two, as described in chapter three are tabulated in Table 2. This table shows both the time factor, F, and the condition x time interaction term to be significant at the .05 level of significance.

The resulting mathematical equation for model two is:

$$Y_{jk(i)} = \mu + F_k + CF_{jk} + \varepsilon_{i(jk)}$$
(2)

If the terms involving the subject effect are omitted from model one, the result is model two. However, the two models differ in that model two shows the condition-time interaction to be more significant than the time factor alone, whereas model one expressed the opposite result. There is, however, no real inconsistency between the two models. Model one says that for a particular subject, performance is dictated primarily by the subject's individual ability and secondly, by how long the subject has been operating the tracking task. Model two says that if the effect of a subject's individual ability is mathematically

			NA MODEL I		
SOURCE	DF	SS	MS	F	F.05 DF,DF
5	4	.274545	.068636	1653.646729	2,93
;	1	.000159	.000159	3.830486	4.41
	5	.258067	.051613	1243.518799	2.77
SC .	4	.001382	.000345	8.321779	2.93
F	20	.017314	.000866	20.857750	2.19
F	5	.000576	.000115	2.773768	2.77
CF	18	.000747	.000042		

.000154

.000035

Table 1

ANOVA Model 1

S С F SC SF CF SCF

1 i

ł

-----

NONADD

BALANCE

1

17

.000154

.000593

# Table 2

# ANOVA Model 2

SOURCE	DF	SS	MS	F	F.05 DF,DF
С	1	.000000	.000000	.000000	zeros
F	5	56.200233	11.240046	3.032072	2.42
CF	5	65.860474	13.172094	3.553254	2.42
ERROR	48	177.938477	3.707051		

\_

standardized for all subjects, the primary factor influencing performance is the contition-time interaction. It is to be expected, that removing the very large subject effect, will provide a closer look at the effects of the other factors.

Figure 9 shows a graphic representation of the results of model two. For this graph the average standardized subject response for each level of the condition and time factors are plotted as performance versus time for each of the two condition levels. Since on this graph psrformance is measured by error frequency, higher data values indicate poorer performance.

This graph shows that under the glare condition performance increases with time. The control condition data, as plotted in Figure 9, shows no definitive trend. The comparatively good performance during the middle ten minutes of the control condition, followed by the conversely poor performance during the succeeding ten minute interval, can partly be explained by the subject's response to the questionnaire in Appendix B. Four out of the five subjects complained that the control run seemed far longer than any of the others. It is probable then, that the subjects' ability to keep track of time during a control run decreased, resulting in psychologically but not visually fatigued subjects.

Further insight to the meaning of the data graphed in Figure 9, can be gained by examination of the GSR data. Program three in Appendix C investigates one possible relationship between the subject's performance and his corresponding GSR reading. The proposed relationship says that any increase in performance will have associated with it, a decrease in galvanic skin resistance. Due to the method by which the GSR is measured in this experiment, a decrease in skin resistance is evidenced by an





# AVERAGED STANDARDIZED PERFORMANCE DATA

increase in the GSR reading. The results of program three are shown in Table 3.

## Table 3

## GSR Versus Performance

	SUBJECT	NN*	M**
Control	1	77	85
	2	43	51
	3	47	57
	4	46	39
	5	96	85
Flash	1	63	65
	2	39	60
	3	56	60
	4	41	50
	5	69	82

\* NN = number of points for which GSR follows performance.

\*\*M = number of points for which GSR does not follow performance.

The heading NN in Table 3 represents the number of data points in which the proposed relationship holds, while M is the number of times it does not. For the control runs, NN exceeds M for only two of the five subjects; and for the flash runs, NN never exceeds M.

Program-AVG in Appendix C is an attempt to directly relate the GSR levels to the data, graphed in Figure 9. This program finds the average GSR value for consecutive 275 second intervals, for each subject-
condition level. The GSR values are then standardized and averaged to obtain one data point for each condition-flash-time level. Figure 10 is the resulting plot of this data.

By comparing Figures 9 and 10, it can be seen that in general the trends of the plotted data dure the same. This relationship holds for all but one point on the glare data and for all but two points on the control run. For the glare run, the fifth points do not follow the general trend, while for the control run both the third and sixth points disturb the overall pattern.

The quastionnaire provides some comments from the subjects concerning the effect of the experiment. Three out of five subjects admitted to feeling fatigued as a consequence of the experiment. However, only two of the five subjects express the glare as bothersome: the other three subjects express the control run as the worst experimental condition. More specifically, these subjects find the glare to be a welcome change of pace.







## CHAPTER V

## SUMMARY AND CONCLUSIONS

Five subjects were tested to determine the effects of repeated flashes from a glare source on the performance of a tracking task. The task was given under five different experimental conditions. Analysis of Variance, as well as graphical methods, were applied to the control and white condition runs to determine the effect of the glare.

The Analysis of Variance indicates that both flash-time and the condition-flash-time interaction terms affect subject performance. The graph of the glare data (Figure 9, page 23) shows an overall increase in performance with respect to time. It is probable that the exceptionally poor performance during the first 275 seconds of the glare run is the result of subject anticipation of the first flash. The increasingly better performance during the glare runs suggests that the subjects hold the glare as the condition to be coped with. Consequently, the subjects consistently strive to overcome the obstacle of the flash, during the entire glare run. The result is a good approximation of a learning curve.

The graph of the control data shows a similar increase in performance up to and including the fourth 275 second interval. However, during the fifth time interval there is a drastic decrease in performance, followed by a significant improvement in succeeding time intervals. One explanation of this result is that the subjects view the control run as simply a necessary experimental reference; it represents no challenge and presents no new obstacle for them to surmount. This result is complimentary to the findings of McFarland as noted in Chapter II, page 3,

of this report.

A further explanation of the drastic shift in performance after 20 minutes of a control run, can be gained from the inverted U curve. The inverted U curve, as applied to the control run, indicates that after the first 20 minutes the subject's level of arousal has dropped far below the optimal. The subject has relaxed his performance standard. The sudden shift to a lower level of arousal is indicative of a psychologically fatigued subject.

The findings of this paper show the glare to be advantageous in that it tends to hold the subject's level of arousal at or near the optimal.

Future investigations should effectively reverse the titles of the two runs in an effort to indiscretely and falsely convince the subjects that what appears to be a control condition, is actually the condition under investigation. This could most readily be accomplished by employing separate groups for the control and glare runs, using care not to inform the one group of the existence of the other.

The GSR term, as graphed in Figure 10, page 26, suggests that a relationship between performance and galvanic skin resistance does exist. Further, the results of the analysis employed by this investigation show that this relationship is not simplistic in form. Rather, the manner by which galvanic skin resistance can be used to indicate a subject's transient ability to perform, involves more than a discrete GSR value. Further investigation should examine the continuous GSR wave form with respect to a similarly continuous measure of performance.

## LIST OF REFERENCES

- Bennett, E.; Degan, J.; Spiegel, J.; <u>Human Factors in Technology</u>, McGraw-Hill Book Co., Inc., 1963.
- Blackwell, H.R.; "The Problem of Specifying the Quantity and Quality of Illumination," presented at: Symposium on Light and Vision, February 1954.
- 3. Blackwell, H.R.; "Use of Performance Data to Specify Quantity and Quality of Interior Illumination", National Technical Conference of the Illuminating Engineering Society, September 1954.
- 4. Brown, Clinton C.; <u>Methods in Psychophysiology</u>, The Williams & Williams Co., Baltimore, 1967.
- 5. Cameron, C.; "A Theory of Fatigue", Ergonomics, Vol. 16, No. 5, 1973.
- Cameron, C.; "Fatigue Proglems in Modern Industry," <u>Ergonomics</u>, Vol. 14, No. 6, 1971.
- 7. Cleveland, D.E.; "Driver Tension and Rural Intersection Illumination," Texas Transportation Institute, October 1961.
- 8. Dowd, P.J.; Moore, E.W.; Cramer, R.L.; "Relationships of Fatigue and Motion Sickness to Vestibulocular Responses to Coriolis Stimulation," Human Factors, Vol. 17, No. 1, 1975.
- 9. Ellingstad, V.S.; Heimstra, N.W.; "Performance Changes During the Sustained Operation of a Complex Psychomotor Task," <u>Ergonomics</u>, Vol. 13, No. 6, 1970.
- 10. Grandjean, E.; Fitting the Task to the Man, Taylor & Francis Ltd., London, 1971.
- Grandjean, E.P.; Wotzka, G.; Schaad, R.; Gilgen, A.; "Fatigue and Stress in Air Traffic Controllers," <u>Ergonomics</u>, Vol. 14, No. 1, 1971.
- 12. Grant, L.S.; "Concepts of Fatigue and Vigilance in Relation to Railway Operation," Ergonomics, Vol. 14, No. 1, 1971.
- Hammerton, M.; Techner, A.H.; "The Effect of Temporary Obscuration of the Target on a Pursuit Trading Task," <u>Ergonomics</u>, Vol. 13, No. 6, 1970.
- 14. Hicks, Charles R.; Fundamental Concepts in the Design of Experiments, Holt, Rinehart and Winston, Inc., 1973.
- Hopkinson, R.G.; "Evaluation of Glare", presented at the Cornell Symposium, June 1957.

- 16. Kashinagi, S.; "Psychological Rating of Human Fatigue," <u>Ergonomics</u>, Vol. 14, No. 1, 1971.
- 17. Kipp, O.L.; "Final Report on the Minnesota Roadside Study," Highway Research Board Bulletin, No. 55, February 1970.
- 18. Kirk, Roger E.; Experimental Design: Procedures for the Behavioral Sciences, Brooks/Cole Publishing Co., 1968.
- 19. Krivohlavy, J.; Kodat, V.; Cizek, P.; "Visual Efficiency and Fatigue Juring the Afternoon Shift," Ergonomics, Vol. 12, No. 5, 1969.
- 20. McFarland, R.A.; "Understanding Fatigue in Modern Life," <u>Ergonomics</u>, Vol. 14, No. 1, 1971.
- 21. Postan, A.M.; "A Literature Review of Cockpit Lighting," U.S. Army Engineering Report, No. TM10-74, AD779407, April 1974.
- 22. Rowan, J.N.; Jensen, C.H.; Walton, N.E.; "An Interior Report on a Study of Disability Veiling Brightness," Texas Highway Department Illumination Studies, No. 2-8-64-75, June 1967.
- 23. Simpson, Ernest; <u>Physiology of Work Capacity and Fatigue</u>, Thomas Books, 1971.
- 24. Tsaneva, N.; Markov, S.; "A Model of Fatigue," <u>Ergonomics</u>, Vol. 14, No. 1, 1971.
- 25. Welford, A.T.; "Stress and Performance," <u>Ergonomics</u>, Vol. 16, No. 5, 1973.
- 26. Winer, B.J.; <u>Statistical Principles in Experimental Design</u>, McGraw-Hill Book Co., 1962.
- 27. Yoshitake, H.; "Relations Between the Symptoms and the Feeling of Fatigue," Ergonomics, Vol. 14, No. 1, 1971.

## GLOSSARY

C: The symbol used for Condition factor. Subscripted by (j) with j = 1 representing a control condition; a j = 2 representing a glare run.

DF: The symbol used in computer programs for degrees of freedom.

- E(Y):The expected value of Y. Estimates  $\mu$  by the equation  $\sum$  Y/n.
- ε: The symbol used for the error term in the statistical analysis of variance.
- F: The symbol used for the flash-time factor. Subscripted by (k) with k = 1 through 6 corresponding to consecutive 275 second intervals of a run.
- MS: The statistical notation for mean square, found by dividing the SS term by its corresponding degrees of freedom.
- $\mu$ : Symbol used to represent the population mean.
- RUN: A generalized term used when referencing the entire thirty minutes of operating the tracking task.
- S: The symbol used for Subject. When subscripted by  $(1 \le i \le 5)$ , S refers to a particular subject.

ズ: Sample standard deviation.

- SOURCE:Heading used in analysis of variance to indicate the source of the variation.
- SS: Symbol used by analysis of variance programs to represent the sum of squares.

STANDARDIZED:Used in reference to data which has been manipulated by  $\sqrt{n} (Y - E(Y))/S$ .

A P P E N D I X A

\$J08 \$EX.		GLAREUDO
460.	DIMENCION ALDON DI	GLARE001
	- DIMENSION ANTINGA WAANNA MARKAANA KAANAANA DIMEMBIUM AIKUUAKI	GLAREOD2
	THIERED AND ALTIOISMILLO)SAFAFAFAFAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	GLAREU03
	LOCICAL LOCUAL CCT DCCLT	-GLAREQU4
	LUGICAL LUGVAL;SEI;KESEI NATA ICANG IDDIVIT ITV TUGDIC DE DA	GLARE005
	DATA DIAN DIAN DIAN DIAN DIAN DIAN DIAN DIA	GLARE006
	UATA PILLJ, PILZJ, PILJ, PILG, PILSJ, PILGJ, PILGJ/4HP042,	GLARE007
•	04TA 07471 0740144000 44P100 44P102/	GLARE008
	UATA PI(7), PI(8)/4HP004, 4HP009/	GLARE009
· · · · · · ·		GLARE010
	DATA VAL(1),VAL(2),VAL(3),VAL(4),VAL(5),VAL(6)/.9999,.5,	GLARE011
		GLARE012
	UATA VAL(7),VAL(8)/.75,.75/	GLARE013
	DATA VAL(9) /.0300/	GLARE014
		GLARE015
• • • • •	DALA VALILJIZ.JULUZ	GLARED16
	UAIA SEI, RESET/ • TRUE • • • FALSE • /	GLARE017
		GLARE018
	CALL OSHYIN(IERR, 68)	GLARE019
r	CALL USULYR(2., IERR)	GLARE020
L 114	INSTRUCTION CARDS	GLARE021
		GLAREJ22
115		GLARE023
113	FURMATISSH INSTRUCTIONS )	GLARE024
- 1 c	TYPE 215	GLARE025
210	FURMAT(41H SET PUSH BUTTUN 1 DV. PUSH BUTTUN 4 OFF )	GLARE026
	TYPE 315	GLARE027
512	FURMATIJOH PLACE 14 10##6. ALU RUN MUUE )	GLAREU28
	TYPE 415	GLARE029
415	FURMAT(35HTURN UN SCOPE AND SELECT CROSSPLUT )	GLARE030
		GLARE J31
212	FURMAT(48HPLACE COUTTERS AND MONOSTABLES AT DESTRED VALUE )	GLARE032
	TYPE 525	GLARE033
525	FURMATIBLE PLACE INTU NORMAL AND SECUNDS )	GLARE034
• 7	TYPL 615	GLARE J35
615	FORMAT(50H WHEN YOU WISH TO STOP RUN PEALE PUSH BUTTON 4 ON )	GLARE036
<del>-</del>	TYPE /15	GLARE037
715	FORMAT(32H IF YOU HAVE DUNE THIS TYPE A 1 )	GLARE038
	REAU(IKHD, 40)JAA	GLAREU39
- <b></b>	IF[JAA-1)110.210.116	GLARE040
216	CONTINUE	GLAREU41
	$DU = 10 I = 1 \cdot 10$	GLARE042
	CALL UWPR(PT(I),VAL(I),IERR)	GLARE043
• •	CALL QSULYR (BUU., ILRR)	GLARE044
10	CUNTIAUE	GLAREU45
	CALL QSIC(ILKR)	GLARE046
	CALL GSDLYR(13., IHRR)	GLARE047
	CALL QWOLL(1,SET,ICRR)	GLAREU48
	CALL GSULYK(2., L.PR)	GLAREU49
C	TO IMPUT THE NUMBER OF SUBJECTS PREVIOUSLY TESTLU	GLAREUSO
	LALL CSOP(LUNR)	GLARE051
	CALL USULYRII3ILRR)	GLARIU52
	WRITE(IIV,11)	GLARE 353
11	FORMAT LAGHENTER THE JUMBER OF SUBJECTS PREVIOUSLY TESTED)	11 AKF054
	READ(IKBD, 12)1SPT	GLARFUSS
12	FURHAT(13)	GLARE056

. . ..

......

وريواني الدروير والمعر المرمونيونية والمربة فترم مراسية

		35
	ENDMAT ( DAUGET BUCH BUTTONG TH JEDD THEN THRE I A	GLARE057
13	PEADLINED ANTA	GLAREODO
40	FORMAT([])	GLAREUSS -
	IF 11A=1112.50.50	GLAREOGO
50	CALL QWCLL(1, RESET, IERR)	GLARE062
	CALL OSDLYR14., JERK)	GLAREO63
	CALL QWCLL(1,SET,IERR)	GLARE064
	CALL OSDLYR (2., IERR)	GLARE065
		GLARE066
• • • •	- J茶U	GLARE067
15	CALL ORCPLEQQUELONAL TERRI	GLAREUGO
	CALL OSULYR(2IFRR)	GI AREO70
	IF(.NOT.LUGVAL)JU TU 15	GLARE071
	CALL QRBADR(VALUC, 6, 1, IERR)	GLAREU72
	CALL GREADRIGSRE.7.1.IERR)	GLARE073
_	TYPE 1, J, VALOC, GSRE	GLARE074
· · · · <b>· ·</b> · · ·	FORMAT113,618,64,618,61	GLARE075
	CALL WSULYK(Z., ICKK)	GLARE076
	CALL WHULLIINKESLINIERKJ	GLAKEUTT
	CALL QULL(1.SET.TERR)	GLAREO78
	CALL USULYK(2 ILRK)	GLAREO80
	C=C+1.	GLARE081
	[+L=L	GLAREU82
	VALUE(J)=VALOC/VAL(4)	GLARE083
	GSR(J)=GSRE	GLARE034
	IF(J-20.)911,911,912	GLARE085
912	RTME 913 Rodnatianu szerendő i salík linetentet – v	GLAKEU86
113	TO STOP AFTER ROMINITES	GLAREUDI GLARE088
<b>911</b>	CALL DRSLL(J.LUJVAL.IERR)	GLARE089
	CALL QSULYR(2., ILRR)	GLARE090
	CALL URSLL(J,LUGVAL,IERR)	GLARE091
	CALL QSULYR(2., IFRK)	GLARE092
•	IFINOTALIGO IJ 15	GLARE 493
26	CALL QSH(IERR)	GLARE094
	CALL WRDADR IDI; 3,1,1ERR) CALL OSDIVE/13 II.DDI	GLAKEU95
	URITE(ITV.9)	GLARE098
9	FURMAT (99HIF YUU WISH A PRINTOUL OF THE VALUES OF THE	GLARE098
1	ARRAY THEN TYPE 1 11	GLAREU99
7	READ(IKED,40) IL	GLARF100
-	IF(1C-1)123.0.123	GLAPE101
C	BEGIN CUMPILATION OF DATA	GLARE102
0	$\begin{array}{c} WK11U(1 Y_{1} C) \\ E(DMAT - IA DM(I SM)) \\ I(DMA T - IA DM(I SM)) \\ I(I SM SM) \\ I(SM SM) \\ I(SM) \\ I(SM) \\ I(SM SM) \\ I(SM) \\ I(SM) \\ I(SM) \\ I(SM) \\ I(SM) \\ I(SM) ) \\ I(SM) ) \\ I(SM) \\ I(SM) \\ I(SM) ) \\ I(SM) \\ I(SM) ) \\ I$	GLAREIO3
16	ARTECTERTNICATION OF DATA AND EXTENSOL BEGINNINGF	GLANEIU4 GLAREIO5
26	FORMAT (1H1,20X,43HPRI)TOUT OF ARRAY VALUES FOR SUBJECT NUMBER.	GLARE 106
1	15)	GLARE107
	WRITE(HPT, S1) J	GLAREION
51	FORMAT(13)	GLARE109
	U() 17 I=1+J	GLARE110
		GLARE111
63	WKエキモモリアドリウビリーエリ V ALUE モエリック224 モヨー F //D M A F / キューデキ・ション チョン	GLARE112
76	* WRMMAXAZ#FAVAZ#FAVAZ# WRTFFTPR3 4T_1541,VAF12773, S2713,TR	CLARCIIS CLADENNA
1 H	$EORMAT(z) X \cdot 2HJ = \cdot 13 \cdot 2UX \cdot F1 \cup x \cdot F2 \cup x \cdot F1 \cup x \cup $	GLARFIIK
17	CONTINUE	GLAREIIG
· · ·		

JQ=1 GLARE117 MMM = -9GLARE118 I=0 GLARE119 DO 1000 JJJ=1,20 GLARE120 MMM=MMM+10 GLARE121 1 = I + 10GLARE122 IF (I-J)1222,1222,1111 GLARE123 1222 CONTINUE GLARE124 CALL SUPGII+USR+JQ+10.+MMM) GLARE125 1000 CALL SOPM(I, VALUE, JO, 10., MMM) GLARE126 1111 1=1 GLARE127 CALL SUPG(I.GSR.JU.C.1) GLARE128 CALL SUPM(I, VALUE, J0, C, 1) GLARE129 CONTINUE 123 GLARE130 C TO PLUT ON CRT GLARE131 WRITE(ITV,19) GLARE132 19 FORMAT(5)HOU YOU WISH THE VALUES OR THE ARRAY TO BE PLOTTED . GLARE133 1/.20HIF YES THEN TYPE 2 1 GLARE134 21 READ(IKBD,4))18 GLARE135 IF(16-2)122,24,122 GLARE136 24 CONTINUE GLARE137 C PLOT PROGRAM GLARE138 UU 69 I=1.J GLARE139 A(1,1) = 1GLARE140 A(I,2) = VALUL(I)GLARE141 69 CONTINUE GLARE142 CALL APLOT(A,200,1,J) GLARE143 122 CONTINUE GLARE144 L TU STOP OR HULD AT THE END OF A RUN GLARE145 WRITE(JIV.104) GLARE146 1J1 FORMATE 45HTYPE 1 IF YOU WISH TO STOP THE EXPERIMENT. GLARE147 1 / ,37H2 IF YOU WISH TO START A NEW SUBJECT, GLAKE148 - / ,45H - 3 IF YUU WISH TO HELU WAITING A NEW SUBJECT) GLARE149 1 105 READ([KBD,102]]A GLARE150 102 FORMAT(11) GLARE151 36 TO(100,10,10),JA GLARE152 L SHUT DOWN SEQUENCE GLARE153 100 CONTINUE GLARE154 END GLARE155 SUBROUTINE APLOT(A,N, NPLOT, NPCT) GLARE156 DIMENSILA A(1) GLARE157 CALL BEGIN(9690+1) GLARE158 LALL ERASE GLARE159 CALL VECTOR GLARE160 XMAX = A(1)GLARE161 XMI = A(1)GLAKE162 TH RU TET WAY GLARE163 IF(^(1).LT.XMIN)XMIN=A(1) **JLARE164** IF(A(I).GI.XMAX)XMAX=A(I) GLARE165 30 CONTINUL GLARE166 MDX = N + 1GLARE167 YMIN=A(NOX) GLARE168 YMAX=YMIN GLARE169 160 JO 11=1. VPLOT GLASE170 00 80 12=1. NPNT GLARE171 10X=11+N+12 GLARE172 IF(A(NOX) LI YMIN) YMI 4=A(NUX) GLARE173

.. ....

.

	IF(A(NDX).GT_YMAX)YMAX=A(NDX)	GLARE174
80	CONTINUE	GLARF175
90	CONTINUE	GLARE176
	XFACT=800./(XMAX-XMIN)	GLARE177
	YEACI=500_/LYMAX-YMIIL	GLARE178
	XORG=(1023800.)/2.	GLARE179
	IF(XMIN.LT.O.)XURG=223800.*XMIN/(XMAX-XMIN)	GLARE180
	YURG=140.	GLARE181
	IF(YMIN_LI_U_)YURG=140500.*YMIN/(YMAX-YMIN)	GLARE182
	CALL SCALE(XFALT,YFACT,XURG,YURG)	GLARE183
	XLUW=XMIN.	GLARE184
	IF(XMIN.GE.())XLUW=().	GLARE185
	YLUW=YMIN	GLARE186
	IF (YMIN.GE.).)YL()W=0.	GLARE187
	XLNG=(XMAX-XMIN)	GLARE188
	YLNG=(YMAX-YMIN)	GLARE 189
		GLARE 190
		GLAKE191
		GLAKE192
	MAKKTZI CALL AVICIVEND VERH JENC VERC VITE VITE AKNUG MARKUMA	GLAKELYS CLADELOS
	LALE AAIDIALUWATEUWAKENGATENGAKIILATILAMAKKKAMAKKY) Do loes 12-l Kolot	CLARE194
	DU LUUU LZ-LANNULUL CALL VSCTOP	0LAKE190
		064886190 (1886107
	$\frac{1}{1} \frac{1}{1} \frac{1}$	GI AREIGH
20	χη τη τη τηματική τηματή. ΤΟΡ μα()	GI ARF 100
£ \'	▲ F 12 (M= C) あるまでは、 (M= C)	GLARE200
		GLARF201
1 (	196 J=1	GLARF202
	•••••••	GLARF203
4 N.	(1)X = [2 + 4 + 1]	GLARF204
	X = A(II)	GLARE205
	IF(XM1) = GE(1) = X(11) = X(11)	GLAKE206
	Y = A (NDX)	GLARE207
	1F(YMIN.GE.O.)Y=A1A X)-YMIA	GLAREZUS
	CALL TPLOT(X,Y, 1PLA, PAKK)	GLARE209
2000	CONTINUE	GLARE210
	CALL TPAUSE	GLARE 211
<b>1 0</b> 00	CONTINUE	GLARE212
	RETURA	GLARE213
	ENL	GLARE214
	SUBRUUTINE SOPM(I,VALUE,JU,C,MMM)	GLARE215
	DIMENSION VALUE(1), JU(1), S(100), AMEAN(100), P(100)	GLARE216
	DIMENSION (FF(100)	GLARE217
	ASUMED.J	GLARE218
	SOM=0.0	GLARE219
	100 9122 K=MMHg1	GLARE220
	H(K)=VALUF(K)*+2	GLARF221
	SUM=SUM+H(N)	GLAPE222
	ASUM=ASUM+VALUE(K)	GLARE223
9172	CONTINUL	GLARE224
	S(JU) = S(AT(SUM + (ASUM + *)) * (1./()) * (1./((-1.)))	GLARE225
	AMEAN(JG)=ASUMZC	GLARE220
	$FFF(J_{W}) = (S(J_{W}) * * ? / \Delta^{W} \land v(J_{W})) * ? \supset a$	GLARE227
	$WRITE(10, 815)C, S(JC), AM, AM(J_), FFF(J/)$	GLARE228
815	FURMAT(F20.), 2005AMPLE STAND AND DEVIATION IS .G18.C.	GLARE229
	II4HSAMPLE MEAN IS ,018.0,11HNINFAUT IS ,FH.4}	GLARE230

.

	RETURN	GLARE231
	END	GLARE232
	SUBROUTINE SUPGII, VALUE, JO, C, MMM)	GLARE233
	DIMENSION VALUE(1),JQ(1),S(100),AMEAN(100),B(100)	GLARE234
	DIMENSION FFF(100)	GLARE235
	ASUM=0.0	GLARE236
	SUM=0-0	GLARE237
	00 9122 K=MMM,1	GLARE238
	B(K)=VALUE(K)**2	GLARE239
	SUM=SUM+B(K)	GLARE240
	ASUM=ASUM+VALUE(K).	GLARE241
9122	CONTINUE	GLARE242
· · · ·	S(JQ)=SQRT(SUM-(ASUM**2)*(1./C))*(1./(C-1.))	GLARE243
	AMEAN(JQ) = ASUM/C	GLARE244
	FFF(JQ)=(S(JQ)**2/AMEAN(JQ))*100.	GLARE245
	WRITE(16,815)C,S(JQ),AMEAN(JG),FFF(JQ)	GLARE246
815	FORMAT(F15.0.5HGSR .29HSAMPLE STANDARD DEVIATION 15 .G18.6.	GLARE247
	114HSAMPLE MEAN IS .G18.6.11HWINEACT IS .E8.4)	GLARE248
	RETURN	GLARE249
	E ND	GLARE250
		GLARE251
SEX.R	ICIG	GLARE252
IN.*		GLARE253
IN.RT	PLOT. DK3	GLARE255
111.RT		CLARC254
IN.RT		CLARE254
FOR		CLARE250
LIN		CLADE250
E SUD		0LAKE200 CI 406260
	) - <b>6</b> .1	GLAREZDY CLAREZDY
- #H3111		GLAREZOU CLADE261
2H7011		GLAKEZOI

PRINTOUT	0F	ARRAY	VALUES	/0R	SUBJECT	NUMBER	3	39	
	J∎	1				7.784		.175	3.418
	J#	2				17,316		.170	3.418
	J∎	3				12,823		.171	3.418
	J∎	4				17,023		.165	3.418
	J≡	5				17,236		.169	5.418
	] <b>=</b>	6				30,029		.160	3,418
	J₽	7				21,826		.154	3,418
	J≢	8				15,967		.195	3,418
	J=	9				17.705		,156	3,418
	J=	10				14,502		.162	3,418
	J≢	11				13,409		,167	3,418
	1=	12				11,963		•177	3.418
	J∎	13				21,729		•173	3,418
	. f 🖤	14				15.0AB		.188	3.41A
	JB	15				10.870		,165	3,418
		10				17.920		.152	3,418
	1.	17				24.268		,167	3,418
	JE	18				27.686		.165	3.418
	JE	19				11,000		,153	3,418
	J #	SN				14,191		,165	3.418
	J = 1 =	21				10,000		.152	3,418
	1-	22				1/,12/		.187	3,418
	J. T.	23				19,080		+151	3,418
	.1=	25				10 <sup>4</sup> 40A		.1/2	3,418
	1=	26				47 044		•172	3,418
	1=	27				17,217		.1/0	3,418
	1=	28				10,4119		.152	3,418
	.1=	20				1/ 120		.15/	3.418
	.1=	30				10.007		• 100 • # (A	3.418
	Ja	31				20 441		+ 100	0.415
	J∎	32				13 312		• 1 3 2	3,415
	j.	33				6 240		• 1 • 0	J 410
	.] #	34				19 173		125	3,410
	Ja	35				23.177		- 175	3 4 4 8
	J #	36				14.074		.195	3.418
	j =	37				16.748		.177	3.418
	J =	38				24 068		.179	3.410
	j 🛚	39				20.148		. 168	3.418
	Ja 🛛	414				17.511		.160	3.418
	.j∎	41				20,105		.172	3.418
	J =	42				19,482		.151	3.418
	J∎	43				21,710		.154	3.418
,	J 🔳	44				19,775		.155	3.418
	J 🕷 👘	45				17,223		.157	3.418
•	j 🖷	46				22.412		.171	3.418
•	] =	47				8.624		.172	3.418
	] 🖷 👘	4 H				19,4na		.215	3,418
	J 🗰 🛛	49				20,431		.161	3.41A
		514				24,254		.150	3.418
	]≡ :	51				14.843		.151	3.418
	18 (	57				25,128		·174	3.41A
	រុម !	n 3 • 4				10.050		.293	3.418
		74 Ka				18.408		.190	3.418
	,∎ : 					20.538		.150	3.418
	, ≡ ; 1					19,171		.152	3.41 B
	) # ( *	27 Na				11,184		.153	3.418
	/ # . 					14,014		•169	3,418
	/# 3  # 4	5 Y 5 (8				17,334		.151	3,418
	, = C 1 = 4	2 V' 6 4				22,217		.147	3.414
1	/= C /= 4	21 50				21,124		.175	3.414
	- C	) <b>E</b>				11 445		.181	3.418

الى بېلىقەرىم مەممىيە ۋە ئەتمىمىد بىلە تارىخى بىر

jj.

....

1999 / L

the second s

. . .

J= 63			
J= 64	16,730	.174	3.418
J# 65	20,450	.159	3 410
J= 66	17,725	. 57	3 418
J= 67	12,451	.152	3 419
.TE 68	16,827	.152	61 F 6
J# 69	17,413	-188	3 444
Ja 70	24 H 35	.163	3 419
3 = 71	2V.53H	.163	1 410
J= 72	13, 137	.183	1 4 6 D
J= 73	5,163	.186	0,418 3,449
	19.073	. 221	
	14.674	.175	0,410 3.440
1= 76	19.442	-171	3 418
JE 77	12,451	.186	3.41
Ja 7A	27.074	165	3.41M 1.441
J= 70	17,627	-181	3 443 9 443
	16,827	-161	5.418
	21,045	.163	3 419
J= 82	19.247	-21@	3 4 9
о — од Ляна	16,680	.188	1 44a
	12,234	. 185	3 4 1 5
	9.614	-176	3 4 1 M
С= 00 Ля нб	15,753	. 162	ः, मात ३. सम्ब
1 = A7	13,232	190	3 414
1 = KH	20,041	.177	1 413
	14. Out	- 189	1.410
	19.445	.243	18 A 6 9 19 1 19 19 19 19 19 19 19 19 19 19 19 19
	13. 137	.167	
1= 02	22.440	.163	3 410
J = 0.1	12,234	.155	0 4 1 4 4 4 4 6
1= 90	12.77	.174	3 416
	10.1.14	.203	4 4 1 4
	2× • * # A	165	1 At a
1 . 07	12.14	160	1. 4. j. 4.
JE QA	₩ <b>.</b> 521	.157	
τ	10.400	.161	3.414
1 = · · ·	1 - , 242	1 B /	J . 4 1 /5
7 — 1 + 1 7 = 1 - 1	1 10 g . 5 M m	167	A ATA
1=107 1=102	11. 140	- 167	
и — 1 · е Твти 1	12,424	.176	1 4 4 0
	13,232	194	· • 41=
/ - 1 0 4 ] = 1 0 4	1	- 1 <b>7  4</b>	3.4]M 6.4.4.4
e = 1 e G	24, 121	.210	J_414 J_440
			<b></b>

0000	21.7440	56 V.A.	22.9369	5127	3-1647	0140	14.6446	. 4234	11.5949	- 203-	14.7686	1010	5.5988	AFIE -	22.4579	0000	A 00A0	0213	12.1174		1.1575
4	0 V.		S	S	5	5	IS	SI	S	Ø)	5	0	S	SI	S	15	5		5	2	<b>.</b>
		NTNFACT		F LAFAL F	4 INFACT	ENFACT	TURINIS	2 INFACT	<b>WINFACT</b>	E INFACT	WINFACT	VINFACT	WINFACT	<b>WINFACT</b>	* I NFACT	HINFACT	WINFACT	KINFACT	WINFACT		WINFACT
167014	17.0100	167151	15.8188	.158799	17.1979	.169775	17.1356	.167914	19.5691	.162585	17.8442	.167234	18.6005	.179364	15.8384	.186841	15.4242	158425	16.8184	2171306	17.2687
۲ ۲	S I	51	S.	15	67. #~4	15	s.	15	S.	5. F	15	1.5	51	15	1 S	15	15	15	15	5	SI
* F & P	.541	HE AN	5.E & 14	· • • ] • •	P.F.A.N	ME AN	ME A N	NEAN	N 17 - 1 - 1	• F A h	ME AN	WE AN	r F. A.	·EAn	LEAN	. 5 2 1	<b>VE 3</b> 1	YER.	~~~34	45 4 11	WE AN
.402221F-425Arb1F	1.03512 5AMPLE	.356322E-0254401E	1.46411 SAHDE	. A63234F=2254HDLF	- 737275 SAURE	51 22755 min 254 mp L F	1.5944. 5AMLE	62010 FF-0254MD	3 10475 88435°1	- 10×2×0×-××5×5×3	1.38621 SAMPLF	. JON LANF-ROSAMPLE	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	43474330 <b>=</b> 4566776 <b>°</b>	1.44n2 SAMPLE	, d234dhEmi25arplF	Blanks SCHTT	. 444124 mc25425	1.42740 SAMPLE	-1 58274F-02588P	. 447. X7 SAMPLE
<b>5</b> I	5 [	51	•	v.	51	51		51	s. I	<b>V</b> .	2 S	<i>U</i> .	5	5	S.T	v.	I C	v.	s: J	ر ر	SI
	FEVIATION	- 5 F V F A F A F 2	C CENTETINE		5447273100		IF VTATION	· rfylatter	IFVIATIC'	· : = V T A T T 11.	· +++IATION	ALLEVING .	· · · · · · · · · · · · · · · · · · ·	· · FVIATE	· · FVIATIO	FVTATTON	CEVILTING	FVJATTCP	FUTATTON.	· + EVILETIO	·ULITIATI .
STA' CAD.	STA. PAN	STA- DAG	STAL DAD	STANNAU	STANDAD	STA- SLUS	5 4 4 1 6 4	5-41044	STA - CAD	STAINAUN	STAT DAR!	574. 1.45	STAL DAD!	CF-1-715	STATIS	STA: DAD	STAUDAUC	STANDAU	279 V 872	578-126-	STAL FADI
3 Janas	. 91-PLF	1 d- 85	2 ] d - 4 2 .	۰. م	1 1 1 1 1 1	d Fo	4 ]d • • • •	A Idues	4 Hd - V -		SA-D-F	J Id IS	4ोत्राज्य <b>*</b>	A D A	u _ a	d d v	+ ]d .vs•	54-45	. 4 . P( F	54. PLF	3 Id. 73.
155.	-	•	-				-	•	<b>u</b>		-			•	• •		•-		•	י אר שי	4

.

4<u>1</u>

APPENDIX

-----

B

PAGE 1

DIMENSIUM FRERCOM DIMENSION VALUE (200), J(2001, GSR(200), HED(3) DIMENSION POT(2M) LORIFAL SEVSW TOTEGEN HPT CHMMNN MX, 4Y DATA IRM/3+0./ NIM MYEIK \*Y#6 HPTEAN TPN=10 2 READ (HPT, 9) N WRITE (TPN, 990) DO 11 11=1, " READ (HOT, H) JITT), VALUE (TI), OSR(TT) CHATTNEE 11 C = 11 g H로 1. NO 14 YEL, -C=C+1. DG IM KET, W TE LYALDE (T)-VALHE(K))1,10,10 1 H=VAL - F (+) VAL HE (K) = VAL HE (T) · 사회 : 1년 (1) #뷰 10 DONTTONE 56 26 tist, c \*= # 4 1 .  $A = (C + 1_{0} - 3) / (C + 1_{0})$ 20 SATTE (100,12) JT, VALUE (JT), AJ V FANER FACEVAL HE. XSTERVALEVAL HE.N. 1, XHEANS XRT EXPETIVETON - PTTE (TEN, 131 YHEAN, XSTI ショ ハイクチェナラ CALL FARTERAL OF, VALUE, 1, USO, FRES, POT, STATS, N, 11 • 1. ± 1.11 + 1 WATTER TERS, 499) 11 #114 -(2) CALL HISTON, FRED, TA DO TET. NAT. SESS (11) ANTO 99 TECSE \$ (311 GOTO 2 CALL FXTT ODE FORMATINES 13 FOR 4112 Y, F1 , 4, 10X, F1 , 41 12 F --- AT12 - + , T3, 1: ×, F10 . 4, 1 × Y, F10 . 31 THE FOR AT LETST A FOR ATTT3, 2(F13, 31) F + 12

1	26.8860	004
2	21 5150	• 2 2 4 0 4 4
с. 1	C1 0 1 0 M	• 988
0	20.0010	.982
4	20.1480	.976
5	19,1890	<b>. 97</b> in
5	18,9940	963
7	18,7990	.957
8	17.920	.951
9	17.627	945
1 (4	17.2362	010
	17 1300	• <b>3</b> 0.9
12	17 18 4 5 14	• <sup>2</sup> (2 (2 )
4.7		• 927
1.5	17,0410	.921
] 4	10.0000	•915
15	16,6580	• 9 N Q
15	16,3570	- Q N D
17	16.2410	.896
1.8	16,046B	<b>8 Q</b> or
19	15,9672	.884
20	15,7530	. H7 H
21	15,5762	872
22	15.5580	. 866
23	15.4794	. 8p -
24	14.795	ес <i>о</i> НБЛ
25	14.7770	8 A K
26	14 6703	₽ (* 14) i ( 12 A 4
27		• <sup>(1</sup> 4 )
21	1 4 0 4 0 4 0 1 4 4 9 4 0 4 0	• <b>• • •</b> •
20		• 450
2 A		• #23
34	14.2000	7
31	14.1410	.*11
- 32	13,995	• <sup>(*)</sup> 1 (5)
33	13.8980	•704
34	13.86 214	• 7 9 B
35	13,6232	<b>,</b> 7₽7
36	13,6230	<b>•</b> 78⊡
37	13,6230	.774
38	13,428%	
39	13.4894	76?
4 (1	13.330 1	755
41	13.3340	7.5
42	13,2142	140
43	13.7372	738
44	13.037.4	732
45	13.1372	796
46	12.8490	704
47	10 7440	7 1 2
A	10 7443	+/30 7.47
40	10 304	• / 0 /
4.4	12.7200	• 7 5 1
,1 1/1 AT A	12.7282	• n 4 h
21	12.6462	• 68.5
72	12.6280	• 5 K K
5.5	12,4510	• b 7 7
54	12,451 *	.671
55	12.2560	• ** ** **
56	12.256	.057
<b>5</b> 7	12.238	hh2
58	12.154	- nan
59	12.154	_ • A *
6.1	12.14.	- NA
<b>n</b> 1	12.14	2 +
62	12-14	. 622

64       12,0610 $014$ 65       12,0610 $014$ 66       10,0630 $085$ 67       11,0630 $085$ 69       11,0450 $079$ 70       11,8472 $057$ 71       11,8472 $057$ 72       11,8470 $051$ 74       17,7683 $057$ 75       11,7683 $057$ 76       11,7490 $0337$ 77       11,6520 $534$ 78       11,5540 $512$ 83       11,6520 $534$ 84       11,35540 $512$ 85       11,2700 $482$ 86       11,2700 $482$ 87       11,0660 $474$ 87       11,0660 $474$ 87       11,0660 $474$ 87       11,0660 $474$ 87       11,0660 $474$ 87       11,0660 $474$ 87       11,0660 $474$ 89       10,87730 $445$ <	63	12.0610	.615
65 $12, 0.61 M$ $6.44$ $66$ $12, 0.62 M$ $59 H$ $67$ $11, 963 M$ $545$ $69$ $11, 963 M$ $545$ $69$ $11, 963 M$ $547$ $70$ $11, 8472$ $567$ $71$ $11, 8472$ $567$ $72$ $14, 8470$ $555$ $74$ $11, 768 M$ $555$ $74$ $11, 7490$ $543$ $76$ $11, 7490$ $543$ $76$ $11, 7490$ $543$ $78$ $11, 6520$ $524$ $79$ $11, 5720$ $514$ $81$ $11, 4560$ $512$ $81$ $11, 4560$ $404$ $84$ $11, 3530$ $484$ $84$ $11, 3590$ $487$ $87$ $11, 4660$ $477$ $84$ $11, 3773$ $445$ $97$ $10, 6930$ $433$ $94$ $19, 7730$ $445$ $97$ $10, 6930$ $437$ $97$ $10, 6$	64	12.1610	.014
$66$ $12, \mu 426$ $504$ $67$ $11, 9639$ $504$ $69$ $11, 9459$ $574$ $70$ $11, 8479$ $567$ $72$ $11, 8479$ $567$ $72$ $11, 8479$ $567$ $73$ $11, 7680$ $555$ $74$ $11, 7490$ $543$ $75$ $11, 7490$ $537$ $77$ $11, 6520$ $524$ $79$ $11, 572m$ $514$ $79$ $11, 572m$ $514$ $79$ $11, 554\mu$ $512$ $81$ $11, 652\mu$ $524$ $79$ $11, 572m$ $514$ $82$ $11, 456\mu$ $544$ $84$ $11, 554\mu$ $512$ $81$ $11, 456\mu$ $544$ $82$ $11, 456\mu$ $544$ $84$ $11, 3590\mu$ $489$ $84$ $11, 3590\mu$ $487$ $84$ $11, 3590\mu$ $475$ $87$ $11, 663\mu$ $427$ $87$ $10, 693\mu$ </td <td>65</td> <td>12.0610</td> <td>.644</td>	65	12.0610	.644
67       11.963#       541         68       11.963#       574         70       11.865#       574         71       11.867#       567         72       11.847#       561         73       11.768#       544         75       11.749#       545         76       11.749#       537         77       11.652#       534         78       11.652#       534         78       11.554#       512         81       11.652#       544         79       11.572#       514         82       11.455#       544         83       11.455#       494         84       11.359#       48#         85       11.279#       48#         86       11.261#       47#         87       11.466#       47#         87       11.966##       48#         87       11.279#       48#         97       19.673#       47#         97       19.673#       47#         97       19.673#       47#         97       19.673#       47#         97       19.673# <t< td=""><td>66</td><td>12.0420</td><td><b>,</b>598</td></t<>	66	12.0420	<b>,</b> 598
68       11,9638 $585$ 69       11,9659 $573$ 71       11,8659 $573$ 72       14,8479 $567$ 73       11,7689 $555$ 74       11,7689 $537$ 75       11,7499 $5337$ 76       11,7499 $534$ 78       11,6520 $534$ 79       11,5729 $514$ 80       11,6520 $524$ 79       11,5729 $514$ 82       11,4569 $594$ 82       11,4569 $594$ 82       11,4569 $594$ 83       11,2790 $489$ 84       11,3590 $487$ 85       11,2790 $489$ 86       11,2790 $489$ 87       11,96840 $477$ 87       11,96840 $477$ 87       11,96840 $477$ 87       10,6934 $433$ 92       10,6934 $433$ 93       10,6934 $416$	67	11,9634	.591
60       11.945%       57%         70       11.865%       574         71       11.847%       567         72       11.847%       567         73       11.768%       55%         74       11.749%       547         75       11.749%       537         77       11.652%       524         78       11.572%       514         80       11.554%       512         81       1.652%       524         79       11.572%       514         82       11.456%       512         83       11.456%       494         84       11.359%       486         85       11.279%       489         86       11.261%       475         87       11.966%       470         87       11.966%       470         88       11.261%       475         97       10.66%       470         87       11.96%%       484         97       10.66%       470         89       10.67%       421         97       10.693%       421         97       10.693%       42	68	11.9530	.585
7n $11$ $8479$ $567$ $72$ $11$ $8479$ $561$ $73$ $11$ $768a$ $543$ $76$ $11$ $7490$ $543$ $76$ $11$ $7490$ $543$ $76$ $11$ $7490$ $543$ $77$ $11$ $652n$ $534$ $78$ $11$ $572a$ $514$ $8p$ $11$ $5540$ $512$ $8p$ $11$ $5540$ $512$ $8p$ $11$ $5540$ $514$ $8p$ $11$ $5540$ $514$ $8p$ $11$ $5540$ $514$ $8p$ $11$ $5540$ $514$ $83$ $11$ $4560$ $402$ $84$ $11$ $3590$ $4na$ $84$ $11$ $2790$ $489$ $4na$ $87$ $11$ $2060$ $477$ $4n3$ $467$ $97$ $10$ $6770$ $427$ $6330$ $433$	69	11.9451	.579
$71$ $11, 847^{\mu}$ $567$ $72$ $11, 847^{\mu}$ $567$ $73$ $11, 768^{\mu}$ $555$ $74$ $11, 768^{\mu}$ $543$ $76$ $11, 749^{\mu}$ $537$ $77$ $11, 652^{\mu}$ $534$ $78$ $11, 652^{\mu}$ $514$ $79$ $11, 572^{\mu}$ $514$ $84$ $11, 554^{\mu}$ $512$ $81$ $11, 456^{\mu}$ $514$ $84$ $11, 554^{\mu}$ $514$ $81$ $11, 456^{\mu}$ $494$ $84$ $11, 359^{\mu}$ $489$ $84$ $11, 279^{\mu}$ $489$ $84$ $11, 279^{\mu}$ $489$ $86$ $11, 279^{\mu}$ $489$ $87$ $11, 466^{\mu}$ $47^{\mu}$ $87$ $11, 968^{\mu}$ $47^{\mu}$ $87$ $11, 968^{\mu}$ $47^{\mu}$ $97$ $10, 693^{\mu}$ $433$ $97$ $10, 693^{\mu}$ $433$ $97$ $10, 693^{\mu}$ $415$ $97$ $10, 693^{\mu}$ <t< td=""><td>7 (4</td><td>11.805(*</td><td>.573</td></t<>	7 (4	11.805(*	.573
72       11,768/3       574         74       11,768/3       540         75       11,749/0       537         76       11,749/0       537         77       11,652/0       534         78       11,572/0       514         8/2       11,456/0       594         8/2       11,456/0       594         8/2       11,456/0       494         8/4       11,359/0       489         8/3       11,456/0       494         8/4       11,359/0       489         8/3       11,456/0       494         8/4       11,359/0       489         8/3       11,456/0       494         8/4       11,359/0       489         8/4       11,968/0       470         8/5       11,279/0       489         9/6       11,870/0       457         9/3       10,870/0       433         9/4       10,971/0       451         9/7       10,693/0       434         9/8       10,773/0       445         9/7       10,693/0       434         9/7       10,693/0       437	71	11,8479	. Dh7
7.3       11.7682       534         75       11.7490       543         76       11.7490       537         77       11.6520       524         79       11.5720       514         80       11.5540       514         81       1.6520       524         79       11.5720       514         84       11.4560       500         83       11.4560       500         84       11.3590       484         85       11.2790       482         86       11.2610       476         87       11.0660       477         88       1.0660       470         89       10.8700       483         91       8700       463         92       10.6930       433         93       10.8700       445         94       10.6930       433         95       10.6930       433         94       10.6930       433         97       10.6930       434         97       10.6930       434         97       10.6930       434         97       10.6930       42	72	11,04/1	001 555
74       11,7490       543         76       11,7490       537         77       11,6520       534         78       11,6520       524         79       11,5720       514         80       11,6520       524         79       11,5720       514         81       11,5540       514         82       11,4560       506         83       11,4560       494         84       11,3590       480         85       11,2790       489         86       11,2790       489         86       11,2790       489         86       11,2790       489         86       11,2790       489         86       11,2710       470         87       11,0660       470         94       10,7730       445         97       10,6930       433         96       14,5964       421         97       10,6930       434         97       10,6930       434         97       10,6930       434         97       10,6930       434         97       10,6930 <t< td=""><td>70</td><td>11 768a</td><td>€007 540</td></t<>	70	11 768a	€007 540
76       11,7490       537         77       11,6520       534         78       11,6520       514         79       11,5540       512         81       11,4560       506         82       11,4560       404         84       11,3590       486         83       11,4560       404         84       11,3590       486         85       11,2790       487         86       11,2790       489         86       11,2790       487         87       11,0660       470         89       12,8700       457         94       14,7010       451         97       10,6930       433         93       14,8700       457         94       14,6930       427         95       14,6930       427         96       14,5964       415         97       14,6930       433         94       14,6930       427         95       14,6930       427         97       14,4940       394         142       9,9123       374         15       9,7174 <td< td=""><td>74</td><td>11 07 A Dra</td><td>•04% 543</td></td<>	74	11 07 A Dra	•04% 543
77       11.6520       534         78       11.6520       524         79       11.572       514         84       11.554       512         81       11.4560       506         83       11.4560       494         84       11.3590       484         85       11.2790       482         86       11.2790       482         86       11.2790       482         86       11.2790       482         87       11.0660       477         88       13.9680       483         89       10.8700       453         90       10.8700       453         91       17.730       445         92       10.6930       433         94       17.6930       434         95       10.6930       437         96       14.5964       415         97       10.6930       434         97       10.6930       437         96       14.4843       394         97       10.6930       437         98       17.4843       394         99       10.49483	76	11.7490	.537
78       11.652 $\mu$ 524         79       11.572 $\mu$ 514         8 $\mu$ 11.554 $\mu$ 512         81       11.456 $\mu$ 5 $\mu$ 82       11.456 $\mu$ 494         84       11.359 $\mu$ 484         85       11.456 $\mu$ 494         84       11.359 $\mu$ 489         86       11.279 $\mu$ 489         86       11.261 $\mu$ 47 $\mu$ 87       11.466 $\mu$ 47 $\mu$ 88       13.988 $\mu$ 463         89       14.870 $\mu$ 451         91       14.773 $\mu$ 461         92       10.693 $\mu$ 433         93       14.693 $\mu$ 434         94       14.693 $\mu$ 434         97       10.693 $\mu$ 441         97       10.693 $\mu$ 441         97       10.693 $\mu$ 441	77	11-6520	.534
79       11.572 $h$ 514         8 $h$ 11.554 $h$ 512         81       11.456 $h$ 50 $h$ 82       11.456 $h$ 50 $h$ 83       11.456 $h$ 494         84       11.359 $h$ 48 $h$ 85       11.279 $h$ 48 $h$ 86       11.279 $h$ 48 $h$ 86       11.279 $h$ 48 $h$ 86       11.279 $h$ 48 $h$ 87       11.06 $h$ 47 $h$ 88       9.0 $h$ 87 $h$ 48 $h$ 91       9.68 $h$ 47 $h$ 48 $h$ 92       10.693 $h$ 47 $h$ 451         91       10.77 $h$ 45 $h$ 42 $h$ 92       10.693 $h$ 43 $h$ 4 $h$ 93       10.693 $h$ 427         94       10.693 $h$ 42 $h$ 4 $h$ 97       10.693 $h$ 4 $h$ 4 $h$ 97<	78	11.6520	524
$8_{P}$ 11,554/P       512 $81$ 11,475/P       5/4 $82$ 11,456/P       5/4 $83$ 11,456/P       5/4 $83$ 11,456/P       4/4 $84$ 11,359/P       4/4 $85$ 11,279/P       4/8 $86$ 21,261/P       4/7 $87$ 11,06/P       4/7 $89$ 12,87/P       4/8 $89$ 12,87/P       4/7 $89$ 12,87/P       4/8 $97$ 10,693/P       4/3 $97$ 10,693/P       4/2 $97$ 10,675/P       4/2 $97$ 10,675/P       4/2 $97$ 10,498/P       4/8 $97$ 10,498/P       4/8 $97$ 10,498/P       4/9 $97$ 10,498/P       4/9 $104$ 9.12       3/4	79	11.5720	.518
R1       11.4756       504         R2       11.4566       506         R3       11.4566       494         R4       11.3590       484         R5       11.2796       482         86       11.2796       482         86       11.2796       482         86       11.2796       482         87       11.0660       472         88       13.9688       463         89       10.8700       445         97       10.6930       433         93       10.7730       445         97       10.6930       433         94       10.6930       433         94       10.6930       433         94       10.6930       427         96       14.5964       415         97       10.6930       433         94       10.49400       4047         97       10.6930       433         94       10.49400       4047         97       10.6756       414         97       10.49400       304         102       9.1716       364         103       9.7176	8.4	11.5540	.512
$R_2$ 11.456 $\mu$ Swith $R_3$ 11.456 $\mu$ 404 $R_4$ 11.359 $\mu$ 4 $\mu$ $R_5$ 11.279 $\mu$ 4 $R_9$ $R_6$ 11.261 $\mu$ 47 $\mu$ $R_7$ 11.066 $\mu$ 47 $\mu$ $R_9$ 10.87 $\mu$ 457 $Q_4$ 10.73 $\mu$ 445 $Q_7$ 10.603 $\mu$ 433 $Q_4$ 12.6964       415 $Q_7$ 10.637 $\mu$ 433 $Q_4$ 12.6964       415 $Q_7$ 10.657 $\mu$ 434 $Q_9$ 14.48 $\mu$ 396 $Q_9$ 12.44 $\mu$ 314	81	11.4750	546
83       11,4560       404 $84$ 11,3590       480 $85$ 11,2790       480 $86$ 11,2610       470 $87$ 11,0660       470 $87$ 11,0660       470 $87$ 11,0660       470 $87$ 11,0660       470 $89$ 10,8700       451 $91$ 10,7730       445 $97$ 10,6930       430 $93$ 10,6930       430 $94$ 10,6930       427 $95$ 10,6930       427 $95$ 10,6930       427 $96$ 14,6930       427 $97$ 10,6930       430 $97$ 10,6930       427 $96$ 14,6930       427 $97$ 10,6930       430 $97$ 10,6930       430 $97$ 10,6930       441 $97$ 10,6930       415 $97$ 10,6930       415 $97$ 10,6930       304	82	11,4560	501
R4       11.3590       480         85       11.2790       480         86       11.2610       470         R7       11.0660       470         R4       13.9680       463         89       10.8700       457         94       10.7730       465         97       10.6930       433         93       10.6930       433         94       12.6930       427         95       10.6930       433         94       12.6930       427         95       10.6750       421         96       14.5770       400         97       10.6750       421         96       14.5770       400         97       10.6750       415         97       10.4870       304         90       1.44803       304         107       14.5770       400         90       1.44803       304         108       9.7170       344         109       9.122       374         114       10.9717       365         125       9.7170       344         144       9.7170       <	83	11,4560	. 494
85       11.279# $48p$ $86$ 11.261p $47h$ $87$ 11.466# $47h$ $87$ 11.466# $47h$ $80$ 14.396## $463$ $80$ 14.870# $453$ $91$ 19.730 $445$ $97$ 10.693# $433$ $94$ 14.693# $427$ $95$ 10.6576# $421$ $96$ 14.5964 $415$ $97$ 10.657# $4.92$ $94$ 14.693# $427$ $96$ 14.5964 $415$ $97$ 10.657# $4.91$ $94$ 17.498## $4.92$ $94$ 17.498## $4.92$ $94$ 10.498## $4.92$ $94$ 10.498## $4.92$ $94$ 10.498## $4.92$ $94$ 10.498## $3.94$ $144$ $9.717*$ $3.54$ $144$ $9.717*$ $3.65$ $135$ $9.717*$ $3.54$ <t< td=""><td>84</td><td>11.3590</td><td>.480</td></t<>	84	11.3590	.480
86 $11,2619$ $475$ $87$ $11,06660$ $475$ $84$ $13,9680$ $453$ $89$ $19,8700$ $457$ $94$ $10,7730$ $445$ $91$ $13,7730$ $445$ $97$ $10,6930$ $433$ $94$ $10,6930$ $427$ $95$ $10,6750$ $421$ $96$ $14,6930$ $427$ $95$ $10,6750$ $421$ $96$ $14,6930$ $427$ $95$ $10,6750$ $421$ $96$ $14,6750$ $421$ $96$ $14,6750$ $415$ $97$ $10,6750$ $412$ $90$ $1A,4803$ $395$ $100$ $10,4900$ $394$ $101$ $10,97170$ $372$ $144$ $9,7170$ $372$ $144$ $9,7170$ $354$ $147$ $9,7170$ $354$ $144$ $9,7170$ $354$ $147$ $9,7170$ $354$	85	11,2790	
R711, $M66 M$ $47 M$ $R8$ 13, $96 H M$ $463$ $R9$ 10, $870 M$ $453$ $91$ 10, $773 M$ $445$ $91$ 10, $773 M$ $445$ $97$ 10, $693 M$ $433$ $94$ 10, $675 M$ $440 M$ $97$ 10, $404 M$ $394$ $104$ $9, 717 M$ $374$ $104$ $9, 717 M$ $364$ $144$ $9, 717 M$ $364$ $144$ $9, 694 M$ $317$ $114$ $9, 694 M$ $317$ $115$ $9, 326 M$ $317$ $114$ $9, 246 M$ $317$ $115$ $9, 326 M$ $311$ $114$ $9, 131 M$ $28 M$ $115$ $9, 334$ $28 M$ $116$ $9, 131 M$ $28 M$ $117$ $9, 334$ $28 M$ $116$ <td>86</td> <td>11,2610</td> <td>.47 m</td>	86	11,2610	.47 m
AR       13.968 $\mu$ 463         R9       12.870 $\mu$ 457         94       16.770 $\mu$ 451         97       10.693 $\mu$ 433         93       14.693 $\mu$ 433         94       12.693 $\mu$ 427         95       14.693 $\mu$ 433         94       12.696 $\mu$ 427         95       14.675 $\mu$ 427         96       14.596 $\mu$ 415         97       14.677 $\mu$ 409         94       12.696 $\mu$ 415         97       14.677 $\mu$ 409         94       12.408 $\mu$ 412         97       14.697       409         90       1.4.48 $\mu$ 394         141       14.225 $\mu$ 374         143       9.717 $\mu$ 355         144       9.717 $\mu$ 365         145       9.717 $\mu$ 354         147       9.717 $\mu$ 354         144       9.717 $\mu$ 354         147       9.717 $\mu$ 354         147       9.717 $\mu$ 354         144       9.598 $\mu$ 325	87	11,4664	<b>. 47</b> ⊡
R9 $14, 870 M$ $457$ 94 $10, 770 V$ $451$ 91 $13, 7730$ $451$ 92 $10, 693 M$ $434$ 93 $10, 693 M$ $433$ 94 $14, 693 M$ $427$ 95 $10, 675 M$ $421$ 96 $14, 5964$ $415$ 97 $10, 677 M$ $4.44$ 98 $10, 677 M$ $4.44$ 99 $10, 408 M$ $402$ 99 $1.4, 480 M$ $39.4$ $10.0$ $17, 400 M$ $39.4$ $10.1$ $10, 275 M$ $372$ $10.4$ $9, 712 M$ $372$ $144$ $9, 712 M$ $355$ $135$ $9, 717 M$ $354$ $147$ $9, 608 M$ $341$ $109$ $9, 608 M$ $341$ $109$ $9, 608 M$ $355$ $111$ $9, 608 M$ $317$ $114$ $9, 326 M$ $317$ $113$ $9, 276 M$ $317$ $114$ $9, 326 M$ $317$ $115$ $9, 326 M$ $315$ $117$ $9, 131^{2}$ $247$ $116$ $9, 213 M$ $263$ $117$ $9, 335$ $274$ $120$ $6, 033 M$ $274$ $121$ $9, 333 M$ $274$ $124$ $8, 624 M$ $257$ $126$ $8, 447 M$ $232$	<u>8</u> .8	13,9680	<b>,</b> 463
94 $10, 201^{\circ}$ .451         91 $13, 7730$ .445         92 $10, 6930$ .433         93 $10, 6930$ .433         94 $12, 6930$ .427         95 $10, 6750$ .421         96 $14, 5964$ .415         97 $10, 6770$ .400         94 $10, 4040$ .306         97 $10, 5770$ .400         90 $1.4, 4803$ .306         100 $10, 40400$ .304         111 $10, 2050$ .344         102 $9, 9123$ .374         103 $9, 7174$ .365         104 $9, 7170$ .354         143 $9, 7170$ .354         144 $9, 7170$ .354         145 $9, 7170$ .354         144 $9, 7170$ .354         144 $9, 7170$ .354         144 $9, 7170$ .354         144 $9, 7170$ .354         144 $9, 7170$ .354         144	RQ	10.8700	. 457
91 $13, 7730$ $445$ 92 $10, 6930$ $433$ 93 $14, 6930$ $427$ 95 $10, 6930$ $427$ 95 $10, 6750$ $421$ 96 $14, 5964$ $415$ 97 $10, 5770$ $400$ 94 $10, 4983$ $402$ 95 $10, 4983$ $402$ 99 $1.4, 4833$ $304$ 101 $10, 24504$ $344$ 102 $9, 9123$ $374$ 103 $9, 7174$ $355$ 135 $9, 7174$ $355$ 135 $9, 7174$ $354$ 144 $9, 7170$ $354$ 145 $9, 7170$ $354$ 146 $9, 7170$ $354$ 147 $9, 6984$ $335$ 118 $9, 4064$ $317$ 119 $9, 4064$ $317$ 113 $9, 4760$ $374$ 114 $9, 3260$ $305$ 115 $9, 3260$ $230$ 116 $9, 2134$ $2457$ 117 $9, 4337$ $274$ 116 $9, 2134$ $287$ 117 $9, 334$ $274$ 121 $0, 7331$ $287$ 122 $8, 617-1$ $247$ 124 $8, 624.7$ $244$ 125 $8, 545.7$ $244$ 126 $8, 4474$ $232$	Q 4	1 14 0 7 9 1 1	.451
97 $10, 6936$ $433$ $93$ $10, 6936$ $433$ $94$ $10, 6936$ $427$ $95$ $10, 6756$ $421$ $96$ $14, 5963$ $415$ $97$ $10, 5776$ $439$ $94$ $10, 4086$ $462$ $99$ $1, 4863$ $375$ $103$ $10, 4086$ $375$ $104, 10, 2056$ $374$ $103$ $9, 9123$ $374$ $103$ $9, 9123$ $374$ $103$ $9, 9123$ $374$ $103$ $9, 7177$ $355$ $135$ $9, 7176$ $354$ $144$ $9, 7177$ $354$ $144$ $9, 7177$ $354$ $144$ $9, 7177$ $354$ $144$ $9, 7177$ $354$ $144$ $9, 7177$ $354$ $144$ $9, 7177$ $354$ $144$ $9, 7177$ $354$ $147$ $9, 6986$ $327$ $114$ $9, 6986$ $327$ $117$ $9, 4069$ $317$ $118$ $9, 4069$ $317$ $119$ $9, 4069$ $317$ $114$ $9, 2130$ $267$ $117$ $9, 1317$ $247$ $116$ $9, 2337$ $274$ $127$ $9, 337$ $274$ $129$ $8, 6247$ $244$ $129$ $8, 6247$ $244$ $125$ $8, 5457$ $244$ $126$ $8, 4470$ $232$	91	13.7730	.445
9.310, 69.304.339410, 69.304279510, 67.504219614, 596.44159710, 577.54.509810, 404.030.4991.4, 480.530.410.510.430.410.410, 404.030.410.410, 404.030.410.410, 404.030.410.410, 404.030.410.410, 20.5637.410.49, 91.2437.410.39, 71.7435.513.59, 71.7735.414.49, 71.7035.414.79, 71.7035.414.79, 71.7035.414.49, 69.8434.110.99, 69.8433.511.19, 69.1237.211.19, 69.1237.211.29, 40.6931.111.39, 40.6931.111.49, 13.1024.511.59, 32.602.3411.69, 21.3424.511.69, 21.3424.511.69, 33.727.412.19, 33.727.413.224.525.512.48, 62.424.412.55, 54.523.412.68, 447.023.2	92	10.6930	430
941069304279510675042196145964415971657754599410498046294104980462941049804629410498046294104980462941049804629410498039410110265038410299124374103991243741049717635410597176354104971773441449598632414496612324144966123241449661232414494260311144932602301159326023011692144245117913102471169214424511793342741210535255122 $k$ 917257124 $8$ 6242244125 $5$ $5457$ 244126 $8$ 4474232	9.3		• 4.3.3
0.5 $10.0750$ $421$ $0.6$ $14.5964$ $415$ $97$ $16.5775$ $4.59$ $94$ $16.4066$ $4.59$ $90$ $1.4.4030$ $375$ $10.5$ $17.4000$ $39.4$ $101$ $16.2756$ $34.4$ $102$ $9.9124$ $374$ $103$ $9.9124$ $374$ $103$ $9.9124$ $374$ $103$ $9.9127$ $355$ $103$ $9.7176$ $355$ $135$ $9.7176$ $354$ $144$ $9.7177$ $354$ $144$ $9.7177$ $354$ $147$ $9.7177$ $354$ $144$ $9.7177$ $354$ $144$ $9.7177$ $354$ $144$ $9.7177$ $354$ $144$ $9.7177$ $354$ $147$ $9.7177$ $354$ $144$ $9.7177$ $354$ $147$ $9.7177$ $354$ $147$ $9.7177$ $354$ $144$ $9.7177$ $354$ $147$ $9.7177$ $354$ $113$ $9.4767$ $377$ $114$ $9.4267$ $311$ $114$ $9.3267$ $230$ $115$ $9.3267$ $230$ $116$ $9.2136$ $24.7$ $117$ $9.332$ $27.4$ $121$ $9.7337$ $257$ $122$ $6.947$ $257$ $124$ $8.6247$ $244$ $125$ $8.6437$ $257$ $126$ $8.4470$ $232$	94	10,0930	. 477
37 $14$ $305$ $415$ $97$ $16$ $577$ $4.50$ $94$ $16$ $4067$ $4.62$ $94$ $1.4$ $4067$ $376$ $161$ $16.256$ $364$ $162$ $9.9125$ $364$ $163$ $9.9125$ $374$ $163$ $9.9125$ $374$ $163$ $9.9127$ $377$ $144$ $9.7174$ $355$ $135$ $9.7176$ $354$ $146$ $9.7176$ $354$ $146$ $9.7176$ $354$ $146$ $9.7176$ $354$ $148$ $9.6986$ $341$ $148$ $9.6986$ $324$ $144$ $9.7176$ $354$ $144$ $9.7176$ $354$ $144$ $9.7176$ $354$ $144$ $9.7176$ $354$ $147$ $9.6986$ $324$ $116$ $9.2566$ $324$ $111$ $9.4266$ $317$ $113$ $9.4766$ $317$ $114$ $9.3266$ $204$ $115$ $9.3266$ $204$ $116$ $9.2194$ $295$ $117$ $9.1316$ $247$ $118$ $9.113$ $247$ $121$ $9.332$ $274$ $122$ $6.917$ $257$ $124$ $8.6437$ $257$ $125$ $8.5457$ $234$ $126$ $8.4476$ $232$	90		421
$0$ $10^{\circ}$ $40^{\circ}$ $40^{\circ}$ $40^{\circ}$ $9^{\circ}$ $1.^{\circ}$ $49^{\circ}$ $30^{\circ}$ $10^{\circ}$ $1.^{\circ}$ $49^{\circ}$ $30^{\circ}$ $10^{\circ}$ $1.^{\circ}$ $49^{\circ}$ $30^{\circ}$ $10^{\circ}$ $1.^{\circ}$ $49^{\circ}$ $30^{\circ}$ $10^{\circ}$ $1.^{\circ}$ $49^{\circ}$ $37^{\circ}$ $10^{\circ}$ $9^{\circ}$ $9^{\circ}$ $12^{\circ}$ $10^{\circ}$ $9^{\circ}$ $9^{\circ}$ $9^{\circ}$ $14^{\circ}$ $9^{\circ}$ $9^{\circ}$ $12^{\circ}$ $14^{\circ}$ $9^{\circ}$ $717^{\circ}$ $354$ $14^{\circ}$ $9^{\circ}$ $717^{\circ}$ $364$ $14^{\circ}$ $9^{\circ}$ $717^{\circ}$ $354$ $14^{\circ}$ $9^{\circ}$ $717^{\circ}$ $324^{\circ}$ $111^{\circ}$ $9^{\circ}$ $9^{\circ}$ $317$ $112^{\circ}$ $9^{\circ}$ $466^{\circ}$ $317$ $113^{\circ}$ $9^{\circ}$ $466^{\circ}$ $317$ $113^{\circ}$ $9^{\circ}$ $326^{\circ}$ $29^{\circ}$ $115^{\circ}$ $9^{\circ}$ $326^{\circ}$ $29^{\circ}$ $116^{\circ}$ $9^{\circ}$ $33^{\circ}$ $274^{\circ}$ $116^{\circ}$ $9^{\circ}$ $33^{\circ}$ $274^{\circ}$ $12^{\circ}$ $9^{\circ}$ $33^{\circ}$ $27^{\circ}$ $12^{\circ}$ $9^{\circ}$ $33^{\circ}$ $27^{\circ}$ $12^{\circ}$ $9^{\circ}$ $33^{\circ}$ <td< td=""><td>07</td><td>10 5770</td><td></td></td<>	07	10 5770	
00 $1A$ $4BA$ $376$ $1MA$ $1C$ $4BA$ $376$ $1MA$ $1C$ $4BA$ $39A$ $1MA$ $1C$ $4BA$ $39A$ $1MA$ $1C$ $4BA$ $39A$ $1MA$ $00$ $12A$ $37H$ $1MA$ $00$ $12A$ $37H$ $1MA$ $00$ $12A$ $37H$ $1MA$ $00$ $912A$ $37H$ $1MA$ $00$ $717H$ $365$ $1AF$ $00$ $717H$ $364$ $1MA$ $00$ $608A$ $335$ $111$ $00$ $608A$ $325H$ $112$ $00$ $466H$ $317$ $113$ $00$ $218H$ $20A$ $116$ $00$ $218H$ $20A$ $117$ $00$ $1310$ $28H$ $116$ $00$ $1131$ $28H$ $121$ $00$ $336$ $28H$ $121$ $00$ $336$ $28H$ $122$ $6017H$ $25H$ $124$ $8.624H$ $244$	он 47	10 4080	s 4 (* 2)
10.010.010.010.110.0 $30.4$ 10.110.0 $20.50$ 10.110.0 $20.50$ 10.39.0 $9.125$ 10.39.0 $9.7175$ 10.49.7175 $35.5$ 10.59.7176 $35.4$ 10.69.7176 $35.4$ 10.79.7176 $36.4$ 10.89.7176 $35.4$ 10.99.7176 $35.4$ 10.99.7176 $35.4$ 10.99.7176 $35.4$ 10.99.7176 $35.4$ 10.99.7176 $35.4$ 10.99.7176 $35.4$ 11.19.6084 $34.1$ 10.99.6084 $35.7$ 11.19.6084 $35.7$ 11.19.6012 $32.5$ 11.29.4069 $31.7$ 11.39.4766 $30.5$ 11.59.3266 $23.9$ 11.69.2194 $20.5$ 11.79.1316 $24.7$ 11.89.335 $27.4$ 12.19.335 $25.2$ 12.2 $6.917.4$ $25.7$ 12.4 $8.624.7$ $24.4$ 12.5 $8.545.7$ $23.4$ 12.6 $8.447.6$ $23.2$	33	1 A _ A B (A A	1997 1995
101       10 $2050$ $314$ 102       9 $9123$ $374$ 103       9 $9123$ $372$ 144       9 $7174$ $355$ 125       9 $7174$ $355$ 125       9 $7176$ $354$ 145       9 $7176$ $354$ 147       9 $7176$ $354$ 148       9 $6986$ $341$ 149       9 $6986$ $341$ 149       9 $6986$ $341$ 149       9 $6986$ $341$ 149       9 $6986$ $325$ 111       9 $6912$ $325$ 112       9 $4469$ $317$ 113       9 $6767$ $311$ 114       9 $3266$ $325$ 115       9 $3266$ $240$ 116       9 $2137$ $247$ 117       9 $1317$ $247$ 118       9 $9337$	100	10 4 11 11	- 39 4
142 $0.9123$ $374$ $143$ $0.9125$ $372$ $144$ $0.7173$ $365$ $135$ $9.7176$ $364$ $146$ $9.7176$ $354$ $147$ $0.7176$ $354$ $148$ $0.6986$ $341$ $148$ $0.6986$ $341$ $148$ $0.6986$ $341$ $148$ $0.6986$ $324$ $111$ $0.6986$ $324$ $111$ $0.6986$ $325$ $112$ $9.4469$ $317$ $113$ $9.6766$ $375$ $115$ $9.32666$ $230$ $115$ $9.32666$ $230$ $116$ $9.21966$ $203$ $117$ $9.1316$ $2474$ $118$ $9.0337$ $274$ $121$ $9.0337$ $274$ $122$ $6.9177$ $257$ $124$ $8.6437$ $257$ $124$ $8.6437$ $257$ $124$ $8.6437$ $257$ $125$ $8.5457$ $234$ $126$ $8.4478$ $232$	1 (1 )	10.2050	344
103 $Q_1 Q_1 P_1$ 372         144 $Q_2 T_1 T_1 P_1$ 365         155 $Q_2 T_1 T_1 P_1$ 364         147 $Q_2 T_1 T_1 P_1$ 344         148 $Q_2 G_1 T_1 P_1$ 344         148 $Q_2 G_1 T_1 P_1$ 344         148 $Q_2 G_1 T_1 P_1$ 344         149 $Q_2 T_1 T_1 P_1$ 344         144 $Q_2 G_1 T_1 P_1$ 344         144 $Q_2 G_1 T_1 P_1$ 344         144 $Q_2 G_1 P_1 P_1$ 344         144 $Q_2 G_1 P_1 P_1$ 344         144 $Q_2 G_1 P_1 P_1$ 344         149 $Q_2 P_1 P_1 P_2$ 370         111 $Q_2 P_1 P_1 P_2$ 317         112 $Q_2 P_1 P_1 P_2$ 317         113 $Q_2 P_1 P_2 P_2$ 317         114 $Q_2 P_2 P_2 P_2$ 203         115 $Q_2 P_2 P_2 P_2 P_2$ 213         116 $Q_2 P_2 P_2 P_2 P_2$ 214         117 $Q_2 P_2 P_2 P_2 P_2 P_2$ 214         120 $P_1 P_2 P_2 P_2 P_2 P_2 P_2 P_2 P_2 P_2 P_2$	192	9.9120	374
144       9.7174       365         135       9.7170       354         146       9.7170       354         147       9.7170       354         148       9.7170       344         148       9.7170       344         149       9.7170       344         144       9.7170       344         147       9.7170       344         148       9.7170       344         149       9.7170       344         144       9.6986       341         149       9.6986       329         111       9.6986       370         112       9.4966       317         113       9.4966       317         113       9.4966       317         114       9.3266       290         115       9.3266       290         116       9.2199       293         117       9.1312       247         118       9.0337       274         121       9.0337       274         121       9.03337       274         121       9.0335       257         124       8.6247       <	103	9.9120	372
195 $9.7170$ $36.7$ 146 $9.7170$ $344$ 147 $9.7170$ $344$ 148 $9.6980$ $341$ 149 $9.6980$ $335$ 111 $9.6980$ $329$ 111 $9.4260$ $372$ 112 $9.4460$ $317$ 113 $9.4260$ $317$ 114 $9.3260$ $305$ 115 $9.3260$ $290$ 116 $9.2190$ $243$ 117 $9.1310$ $247$ 118 $9.0332$ $274$ 121 $9.0332$ $274$ 122 $6.9176$ $257$ 124 $8.6247$ $244$ 125 $8.5457$ $237$	1 4 6	9.717 1	355
1.36 $9,7170$ $354$ 1.47 $9,7170$ $344$ 1.48 $9,6984$ $341$ 1.49 $9,6984$ $335$ 1.13 $9,6912$ $329$ 1.11 $9,4260$ $372$ 1.12 $9,4464$ $317$ 1.13 $9,4260$ $317$ 1.13 $9,4260$ $311$ 1.14 $9,3260$ $305$ 1.15 $9,3260$ $294$ 1.16 $9,2194$ $293$ 1.17 $9,1312$ $247$ 1.18 $9,1133$ $247$ 1.19 $9,332$ $274$ 1.21 $9,332$ $274$ 1.22 $8,9174$ $257$ 1.24 $8,6247$ $244$ 1.25 $6,5457$ $234$	195	9.7170	36 -
1 47 $9,717%$ $344$ $148$ $9,698%$ $341$ $149$ $9,698%$ $335$ $113$ $9,698%$ $377$ $111$ $9,426%$ $377$ $112$ $9,446%$ $317$ $113$ $9,426%$ $311$ $114$ $9,326%$ $305$ $115$ $9,326%$ $244$ $116$ $9,214%$ $263$ $117$ $9,131%$ $287$ $118$ $9,113%$ $287$ $119$ $9,033%$ $274$ $121$ $9,033%$ $257$ $121$ $9,033%$ $257$ $124$ $8,624%$ $237$ $125$ $8,545%$ $238%$	1 10	9,7170	5 A 5 A
144 $9,6984$ $341$ $149$ $9,6984$ $335$ $111$ $9,6984$ $335$ $111$ $9,6984$ $3294$ $111$ $9,4260$ $374$ $112$ $9,4464$ $317$ $113$ $9,4760$ $311$ $114$ $9,3260$ $365$ $115$ $9,3260$ $244$ $116$ $9,2144$ $293$ $117$ $9,1310$ $247$ $118$ $9,1133$ $247$ $119$ $9,0334$ $274$ $121$ $9,0335$ $259$ $122$ $8,6437$ $257$ $124$ $8,6247$ $244$ $125$ $6,5457$ $232$	1 17	9.717"	. 3 4 H
100 $9.6984$ $335$ $111$ $9.5512$ $324$ $111$ $9.4260$ $374$ $112$ $9.4260$ $317$ $113$ $9.4260$ $311$ $114$ $9.3260$ $305$ $115$ $9.3260$ $240$ $116$ $9.21340$ $293$ $117$ $9.1310$ $287$ $118$ $9.1133$ $287$ $119$ $9.0337$ $274$ $121$ $9.0337$ $274$ $122$ $8.6437$ $257$ $124$ $8.6247$ $244$ $125$ $6.5457$ $238$ $126$ $8.4474$ $232$	1 (A H	<b>4</b> ,598*	.341
113 $9.5\%1\%$ $324$ 111 $9.426\%$ $35\%$ 112 $9.446\%$ $317$ 113 $9.476\%$ $311$ 114 $9.326\%$ $3\%5$ 115 $9.326\%$ $24\%$ 116 $9.21\%\%$ $293$ 117 $9.131\%$ $24\%$ 118 $9.433\%$ $274$ 129 $9.533\%$ $274$ 121 $9.533\%$ $27\%$ 122 $6.917\%$ $25\%$ 124 $8.643\%$ $25\%$ 125 $6.545\%$ $23\%$ 126 $8.447\%$ $232$	1 (A Q	9.698.4	.335
111 $9.4260$ $370$ 112 $9.4069$ $317$ 113 $9.4260$ $317$ 113 $9.4260$ $311$ 114 $9.3260$ $305$ 115 $9.3260$ $230$ 116 $9.2190$ $203$ 117 $9.1310$ $287$ 118 $9.1131$ $287$ 119 $9.0337$ $274$ 121 $9.0337$ $274$ 122 $8.6430$ $257$ 124 $8.6247$ $244$ 125 $8.5457$ $232$	113	9.5012	• 35 4
1129.4464 $317$ $113$ 9.4764 $311$ $114$ 9.3264 $365$ $115$ 9.3266 $244$ $116$ 9.2144 $243$ $117$ 9.1312 $247$ $118$ 9.1133 $247$ $119$ 9.0334 $274$ $121$ 9.0335 $257$ $121$ 9.7335 $257$ $124$ 8.6437 $257$ $124$ 8.6247 $244$ $125$ 5.5457 $234$	111	9.4250	• 250
113       9.476"       311         114       9.3260       305         115       9.3260       230         116       9.21%0       265         117       9.1310       287         118       9.1133       287         119       9.0337       274         121       9.0335       252         122       8.6437       257         124       8.6247       244         125       5.5457       234         126       8.4478       232	112	9.4464	. 317
114       9.3260       .305         115       9.3260       .200         116       9.21%       .205         117       9.1310       .247         118       9.1133       .247         119       9.0337       .274         121       9.0337       .257         121       9.0335       .252         122       8.6430       .257         124       8.6247       .244         125       5.5457       .234         126       8.4478       .232	113	9.4767	. 311
115       9.326°       243         116       9.2136°       243         117       9.131°       247         118       9.1133°       247         119       9.0332       274         121       9.0332       274         121       9.0335       252         122       6.917°       257         123       8.643°       257         124       8.6245       244         125       5.5455       234         126       8.4474       232	114	9.3260	• 367
110       9.2100       293         117       9.1310       287         118       9.1133       287         119       9.0332       274         121       9.0335       282         122       8.0437       257         123       8.6437       257         124       8.6247       244         125       8.5457       232	117	9.320°	• 2 3 9
117       9.131       24         118       9.133       24         119       9.0332       274         121       9.0333       255         121       9.0333       255         122       8.643       255         124       8.6245       244         125       5.5455       234         126       8.4474       232	110	9.2124	• C 11 3 0 4 7
116     9.0332     274       119     9.0332     274       121     9.0332     252       121     9.0335     252       122     8.6437     257       124     8.6247     244       125     5.5457     234       126     8.4478     232	117	<b>∀</b> ∎10] <sup>™</sup>	• C D /
121     9.0000     274       121     9.0000     255       121     9.0000     255       121     9.0000     255       122     5.917     255       123     8.6430     255       124     8.6245     244       125     5.5455     234       126     8.4474     232	110	♥•110° 0 0110	• K * ·
121     0.0330     252       122     5.9174     257       123     8.6430     257       124     8.6247     244       125     5.5457     238       126     8.4478     232	101	an a	• < / H
122     5.000     257       122     5.017     257       123     8.6430     257       124     8.6240     244       125     5.457     238       126     8.4478     232	121	S = 2, 3, 3, 1 S = 2, 3, 3, 1	• C C D 12 K /2
123     8.643/2     25/       124     8.624/2     244       125     8.545/2     23/       126     8.447/4     232	122	► • • • • • • • • • • • • • • • • • • •	251
124 8.6247 244 125 8.5457 234 126 8.4478 232	123	8 - K 4 3 (1	• • · · · · · · · · · · · · · · · · · ·
125 8,5452 .23M 126 8,4474 .232	124	A_624	240
126 8 447 A .232	125	545×	2.44
	126	8 447 1	.232

· · · · · · ·

45

. 'بوندية وكله الد أقو

127	8.4470	296
128	8.4290	9 2 <b>2</b> 9
129	8.4290	862V 213
130	8.2340	*~10 207
131	8.2340	231
132	8-1360	• <b>6</b> % 1 10 <b>5</b>
133	8-4570	140
134	8-0570	103 193
135	8,0380	4100
136	8_0380	4 1 / /
137	8-0380	+17 ( 156
139	8.0380	● 100 150
139	7.9410	150
140	7.9412	1 4 6
141	7.861W	• 1 44 1 • 1 4 4
142	7.8430	134
143	7.7450	104 104
144	7.6660	. 122
145	7.3730	.116
146	7.3730	- 1 1 11
147	7.3550	114.4
148	7,3550	6.9.8
149	7,2574	. 1. 21
150	7.1590	- 4: H 5
151	7. BBC .	074
152	6.9640	.073
153	6.6H9M	167
154	6,573A	261
155	6.2002	.055
156	6,2810	144
157	6.1049	643
158	6.0060	. \$ 37
159	5,9880	. 03 a
160	3.2530	.024
161	2.6670	.014
165	2.179 *	. 12
195	1.904.8	● <sup>15 tA</sup> m
11,3938	3 7151	

HISTOGRAM 1

47

and a second s

FREDHENCY	•*	4	61	18	33	30	43	14	14	5	2	1	24	0	1
43							*****	u an in it go i	••••				***		
42							*								
41							*								
40							*								
39							*								
38							*								
3/							-								
15							-								
34							-								
33					*		•								
32					•		*								
31					+		*								
30					+	٠	•								
29					٠	*	*								
28					*	*	*								
27					*	*	*								
26							*								
25					*	*	*								
24															
20					*	-									
21					•	÷	-								
21A					*	•	*								
19					*	*	*								
18					*	•	+								
17					*	•	*								
16				*	٠	*	*								
15				*	*	*	*								
14				*	•	•	•	*	•						
13				•	*	*	*	•	*						
12				•	*	*	*	٠	•						
11				*		*	•	•	•						
10					*	•	*	•	•						
6				• •		-	•		-						
7				-		•	•								
6					*	*	•	•	•						
5				*	+	٠	*	•	*	•					
4		*		•	٠	•	٠	٠	•	•					
3		٠		*	٠	٠			٠	•					
2		٠		*	*	•	٠	٠	•	٠	٠				
• • • • • • • • • • • •		•		* 	*	•	*	•	*	•	* 	*			*
THTEHVAL	1	2	3	4	5	ħ	7	ĥ	9	1 10	1 1	12	13	14	15

1	32,6660	.9 <b>9</b> 0
Ş	31.3780	979
3 4	30,1090	.969
5	26,9840	е 908 Сан
6	26.4160	.937
7	26,9979	927
6	25.7140	,917
9	25,5190	.906
11	25.2443	4 2 4 6 8 6 6
12	24.1700	.875
13	23.9750	865
14	23,6822	.654
15	23,2910	.844
17	42.042V 22 8430	,833 ,933
18	22.5892	.812
19	22.3149	
50	22.2172	,792
21	21.8269	•7R1
23	21.B260	•//) 76.1
24	21.8262	.753
25	21.7290	.749
26	21.5330	.729
27	21,3344	.714
29	21.1430	• 7 11 M
314	21.0450	• 14F
31	24,9290	677
32	24.6540	. 507
33	20,6362	• 65h
35	29-4419	• 0 4 h 6 3 h
36	24.4410	.625
37	20.2540	
38	27.245"	6 0 4
39 Att	20.1562	. 544
41	20-UNA7	• 0 M.S ► 7 3
42	19,9719	-5n2
43	19.5624	552
44	19.4642	.542
CP AA	19.0737	.531
47	18,7990	• 0×1 51-∕
48	18.7R10	<b>1</b> 500
49	18,7010	<b>"</b> 494
52	18,7414	<b>47</b> 3
71 42	18,4980 18,300	489
53	18_2139	6 4 7 M . A A H
54	18.0974	437
55	18.097"	.427
55	17,9230	. 417
57 58	17,99727 17,29823	• 4-1 m
59	17_6890	496 e
<b>R</b> H	17,529.1	.375
61	17.529*	365
62	17.2183	1.5.4

.

63	16.9430	.344
64	16.9250	.333
65	16.5340	. 323
66	16.5340	.312
87	16.3570	302
69	16.3390	292
60	16.2694	241
70	15,1620	.271
71	16.9640	269
71	15.9480	250
72	15,8693	240
7.5	15 5762	.229
74 7K	15.5764	219
7 J 76	15.3630	208
77	15,1670	198
78	14-6000	-187
70	14.0140	177
र ज 	13.5254	107
81	13.2320	155
82	13.2324	146
43	13,1350	1.55
84	13.0370	.125
85	12.7440	.115
85	12.6282	.104
87	12.1474	• (* Q 4
88	12.0610	.VA3
A Q	12.0422	·273
94	11.9630	.462
91	11.8470	<b>.</b> ⊻52
92	11.7680	•1×42
9.5	11.3770	_+.51
24	10.773	.*21
95	6,866B	• * 1 * 1
18,3689	4.7976	

.....

49

. . .

4.

2 HISTOGRAM

FREDIENCY V 1 1 7 17 9 13 16 14 6 ń 1 2 1 1 ----\_ \_ -- -17 ٠ 16 15 \* \* \* \* 14 . 13 \* 4 ٠ 12 \* ÷ \* \* \* \* 11 \* \* 10 \* \* • + + 9 87654321 \* ٠ \$ + ٠ \* \* \* \* \* \* \* \* \* \* \* • • \* \* • ٠ \*
\*
\* . \* \* \* • \* . ----. • TI TERVAL 7 1 2 5 6 N 9 1 (4 11 12 13 14 15 3 4

50

•

•	30 000	004
2	27 070A	• 9 9 1
3	57 6960 97 6960	• 421
4	67 DOOM 36 LAKA	.972
5	26 1930	. 402
5		,953
7	5 J 1 2 CON 2 A 193 Km	. 44.5
, 8	640654	. 934
0	23 0774	. 925
10		• ¥15
14	20 41 00	• 9 M P
12	20.0174	• 6 9 6
12	54 8064	.08/
1.0	21,0200	.877
15		- HAH
15	21.0/100 24.5334	• <b>* * * *</b>
17	24 4944	• A 4 4
1.4	C 1 + 1 C 417 2 t - (A 4 R (A	• K G K
10	20 9343	• <sup>6</sup> 3 17
24	20 519	• • • • • •
21	24 8304	
22	20 ADOC	• 0 · · 2
23	20 4440	./42
24		•/H.S
25	200 - 3.4 3.4	•//4
26	20 2643	•/n/ ***
27		• / 22
28	20 0690	∎/4 <u>⊃</u> 715
20	10 77KA	•/3h
3.9		•/20
31	10 4820	•/ <u>1</u> /
32	19 4644	€ / 12 B 6 3 3
33	10 3950	• <sup>17</sup> 4 0
34	10 3852	- 0 M M
35	10 3850	• • 7 •
36	10 2870	• <sup>17</sup> 7 1
37	19 1710	• * * * *
38	19.0730	6 A D
30	10 .73.4	+U4/ +10
A (A	18.9940	+ 00Z
41	18-6040	613
42	18 4/8*	• · · · · · ·
43	18-4080	544
44	18.3114	
45	17.9240	575
46	17.92.40	.56t
47	17.9220	557
48	17.725	547
49	17.7060	.534
<b>h</b> .13	17.6270	. 524
51	17.5110	-514
52	17.4130	5.44
53	17.3340	50.5
54	17.316	_ 4 + 1
55	17.2362	_ 4 + 1
56	17.218 1	412
57	17.124	442
ጎዝ	17.1200	47.1
<b>5</b> ()	17.4231	444
6:1	17.0230	430
51	16.8270	125
62	16.427	415

63	16.7480	. 406
64	16.7300	396
65	16.6500	367
66	16.3570	377
67	15,9670	368
68	15,8690	358
69	15,7530	.349
7 い	15,6560	3414
71	15.6562	.330
72	15.5760	321
73	15,0880	.311
74	14,8930	302
75	14,6792	,292
76	14.6790	<b>2</b> 83
77	14.5000	,274
78	14,5020	.264
79	14.1910	,255
80	14,0140	.245
81	13,4090	.236
82	13,4090	,225
93	13,3120	.217
84	13,2320	.248
85	13.2320	.108
86	13,0370	.184
87	13,0370	.179
88	12.8230	.170
9.9	12,4510	• 164
9(4	12.4510	.151
91	12,2389	.142
92	12,2380	,132
93	12,1400	.123
94	11,9030	.113
90	11,0847	• 1 +1 4 (AL) A
90 A7	11.0840	e 194
97 97	11.0960	• M 9 3
<b>3</b> 0	10 970V	• 417 3
<u>9</u> 9	0 6100	
1011	96019M 0 5910	• (C) (C) / (A - 7
1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	9 89 AD	● <sup>V1</sup> 4 / (A 11 ⊶
196 183	7 7840	9 HI 17 C
1 () A	6 200A	ាងស្រុក ស្រុកស្រុក
105	046770 6.1833	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
17 2687	A SECT	•••••
a r g si 1117 r		

HISTOGRAM 3

FREQUENCY	и	3	3	5	14	8	15	17	21	6	3	4	2	v	1
21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1		*	*	*	*	*		* * * * * * * * * * * * * * * * * * * *		* * * * * * * *	*	*	•		
IN TEHVAL CLASS BJOG BAS, H1, 50 BEX, +	1	2	3	4	5	5	7	8	9	110	11	12	13	14	15

1	35-2840	0.0
2	32.9410	• <b>3</b> 89
3	30.7920	.9//
4	30.4200	• 40 P
5	30 4200	.954
6	27.7650	.943
7	26.807a	•931
8	25 7890	• 92.9
9	26 6013	• 911H
19	26 5140	.897
11	26.3980	• 685
12	26 1950	.874
13	25.6350	•405
14	25-4390	.051
15	25.4218	.034
16	25.3230	●82H
17	25.2442	.616
18	25,2260	• <b>6</b> 4 3
19	25.1280	• 7 V N
20	24.756%	./82
21	24.6580	е//и Тти
22	24.6400	•/59
23	24.2494	•/4/
24	24.1700	./00
25	23.9750	,/24
26	23.1750	• / 1 · ) 7 · 1 ·
27	23, 477 1	•/···1
28	22.9800	67H
29	22.9ana	● <sup>Q</sup> / <sup>C</sup>
3,171	22.9000	.555
31	22.8430	644
12	22.7454	632
33	22.7454	621
34	22.745*	649
35	22.491 /	.594
36	22.296M	- 5H h
37	21.9MAN	575
38	21.H26A	563
	21.826M	552
<b>4</b> (A	21.7290	544
41	21.71au	522
42	21.0314	517
4,3	21.6310	544
44	21,6130	494
4 ) A 2	21.4170	443
41	21.3384	. 471
47	21.2400	. 46-1
40	21.4274	. 444
4 y 8 n	20,9474	. 437
5P 6.	24.4312	,425
51	20.8310	.414
52 K 1	20.7522	.4.4.2
.)) 	20.459%	. 341
4.5 M	<n. 4397<="" td=""><td>.370</td></n.>	.370
30 46	20.2450	.364
R 7	19.0737	• 3hn
57 5 R	19,0590	.345
40	19,4824	. 3.3.3
60		.322
A 1	10 04 70	• 31 ·
62		.200
63	ለ¥∎ድ⊓¥″ የይለውቀል	.247
		.27~

.

.

64	18.7010	- 264
65	18.6830	-253
66	18,1950	241
67	18-1150	9 K //
68	17.6270	218
69	17,1390	247
70	17,1300	10K
71	17 1200	184
72	18 0250	170
73	15 9600	.1/2
7.0		.101
7 4 7 K		+140
73		-138 -
70	14.0978	,126
//	14.6949	,115
78	14,3860	.193
79	13,6050	.002
<b>В</b> И	12,2560	VAR
81	10.8890	. 169
82	10,4800	N97
83	9.0150	.146
84	5.1540	.034
85	6.5920	. 923
86	8120	
20.9478	5,6377	•

5.9

- 1944 - 1947 - 1947 - 1947 - 1947 - 1947 - 1947 - 1947 - 1947 - 1947 - 1947 - 1947 - 1947 - 1947 - 1947 - 1947

HISTOGRAM 4

5**6** 

FREDHENCY	ها	1	0	2	3	2	6	12	24	16	14	1	3	1	1
24									*			****			
23									*						
22									*						
21									•						
24									*						
19									*						
19									*						
17									•						
10									•	*					
1.5									*	*					
14									*	+	*				
13									*	*	*				
12								•	*	*	*				
11								+	*	*	*				
10								*	*	*	*				
9								*	*	*	*				
Ŕ								+	*	*	*				
7								+	*	*	*				
6							*	*	*	*	*				
•							*	*	*	Ŵ	*				
4							*	*	*	*	*				
3					*		*	*	*	*	*		*		
2				*	*	*	*	*	*	*	*		*		
1 ********		*		*	*	*	*	*	*	•	*	•	*	*	*
τοτεργαι	1	2	3	4	5	6	7	ĸ	Q	t a	<b>{ 1</b>	12	13	14	15

...

4	04	
,	C1 ■ MIN 510	<b>.</b> 995
2	17,139*	. 980
3	17-1231	م ہر د
4	16 7104	• 27 F1 44
4		• 979
5	10,4550	.973
6	16.3390	967
7	15 5680	0.5.0
, 0		• 40%
<b>~</b>	15,400%	• 9 h h
9	15.2850	. 951
10	15 3700	( An
• •		• • • • •
11	14,9788	<b>- 51 4</b> 11
18	14.8740	<b>4</b> 34
13	14.8740	<b>.</b>
1 -	11 7454	6 A 3 2
1.6		• * < 3
1.5	14.6478	_91×
16	14.5810	. 21.5
17	14.4440	U (A 7
1.8	14 3460	• • • • •
• 6		• • • • • •
) 4	14.3472	• M 9 M
<b>S</b> -9	14.111*	+41
21	13.898%	and and the
22	<ul> <li>4 2 − 42 (2) (2) (2)</li> </ul>	€ C C
<i>r c</i>		• M. M. 1
23	13.7210	.474
24	13.5070	5. 6. 4
25	13 3101	6 A M
0.5		* C D (3
20	13.2140	• <sup>12</sup> 5 14
27	13,2140	. 850
215	12-9210	- 
20	10 8404	•
	12.8420	• N 0 2
30	25.9530	<b>,</b> में के म
31	12,8230	. 8.41
32	12,8230	
1.4		
	17.004%	• 82 3
14	12,3356	.Fta
35	12.2560	. H A 4
30	12 4610	•
17		• * • • •
17	11.953	• 7 O IS
.5.14	11,9450	. 7 . 2
39	11.768	7 8 7
1.1	11 740	
		• 7 3 1
41		.775
42	11,67.00	.77
4.3	11.572	7.5
<b>A</b> A	11 5644	
	1 1 y - 1 (1 4) T	• / ***
4 'i	11.456 1	.754
46	11,3774	7 1 4
47	11.3590	242
4 4	11 360	• / 4 3
4 1	1 L . O D W	. / . • •
A 4	11,2794	.732
<b>h</b> ·	11,2510	.727
51	11 1421	101
6.0		
17 6 3	1 1 63 ** 41 T	. / 1 · ·
<b>n</b> .1	11, 1001	.71
5.4	12.9+6 *	7.5%
<b>5</b> 5	1 M CARE A	• • • •
<b>5</b> L		• 75 44 - 4
	5 1 GMM 1	_* 4 A
57	1 4 Q A M	102.3
<b>K</b> 34	14.8+0 -	er At sal s
50	- وج ۲ دانگذیس ۲	• 77
· •		• * 7 *
<b>n</b> '	1 (* <b>,</b> 8 <b>7</b> (* *	. 572
61	11.773	NF 7
62	19.773	•
<i>4</i> 1	e presente a construction de la	• • • •
,	T DALA 1	<b>1. 1</b>

64	10.59AP	_65M
		645
55	10,000	<b>*</b> (2.4.3
66	10.5960	<u>,639</u>
0.0		674
67	10,4980	• 0 <b>3</b> 4
68	10-4980	-624
0.,		-0.4
16 Q	10.4000	• ° € 3
7 14	10 3820	- 617
/ 21		
71	10.3820	• • • • •
70	1 IA 3 IA 3 IA	_607
10	111.0000	6.14
73	10.2840	ר א מ יי
7 4	1 1 2841	596
14		5/1.1
75	10.2000	• 0 4 M
76	10.2050	.585
, , ,		т. 16. чт. з
77	10,2000	* 31 4
74	10-1870	.574
70		
79	10,1870	• 205
H A	13.1370	_563
61	The Colored and	• • • • • • • •
82	10,0890	<b>,</b> 552
0 <b>-</b>	n 610A	han
83	A B A I S I.	
84	9.9120	.041
04	O RIAN	-536
50		• • • •
86	<b>4.746</b> 0	• D (1)
	0 7060	- 525
<b>c</b> 7	······································	64.0
8 A	9.7170	• 21.9
90	G. BORM	-514
		5.12
9.1	<b>A * D</b> A Q N	• 5 / / *
91	9.619	■ 5 ** 3
00	0 610.1	447
42	9.01.4	
93	9.6194	• 442
0.4	0.5010	_ 4 h m
95	<b>4 0</b> 4 1 5	• • • •
96	9.6810	. 475
	0.5013	A 1 .A
97	N • D & F 2	
<b>JR</b>	Q_5330	_ 4m /1
	GAREN	- 459
44		4 5 4
1 ·A (A	9.40h7	• 4 7 4
4 . 3 4	0 A363	414
1 32 1		
1 1 2	9.326%	• 44.5
1.3.6	9-3263	4.57
1		410
1 14	4.3 M	• 4 3 2
1.45	9,30H N	_ 42N
	0 3(19.)	421
1 1 1	4 · 0 / 0	• *** 1
107	9.2293	.415
•	0 2104	41
1.761		• * •
1144	9.2140	. 4.1.4
1.1.1	0.11.4.1	. 344
1.1.1	− <b>π</b> φ k 1 kℓ ′ κ − κ k −	• ···
111	R . 9350	• 3.4 9
112	8,936	3 H H
LIE .		-
11.5	H. 4178	• 30.3
114	8_43B	. 317
	- 0 O.J.A	170
רוי	D D D C VING	• • • • •
116	R.7400	• <sup>3 ** **</sup>
117	H_6431	. 351
117		
114	H . 0241	• 377
110	H_624"	_ 3 N 1
· · · ·	то то 12 КАК/И	410
121	r 🙀 . ? 4 "? "	• • • •
121	8.545 1	• 5.5 /
1 3 3	H 527 -	. 533
	······································	
123	N. 4291	• 5
124	A_4202	.322
4	<u>ц</u> лку к	
18.2		• • • •
127	H.2341	• * * 1
-		

c

1

.

	0 1760	346
127	л. 100м П. 100м	3(11
128	8,0380	9 (P) (* 1) 13 (2 %)
129	ваизни	• <b>⊆</b> 7 ⊲ <b>3</b> ∪ 7
130	7.9410	• * * *
131	7,9410	.284
132	7,8610	.2/1
133	7.8430	.273
134	7,7450	• 26B
135	7.7450	.252
136	7.7450	.257
1.37	7.6663	<b>,</b> 251
138	7.5500	.24h
130	7.5500	.241
1.4.)	7 4520	.235
140	7.4520	234
141	7.3732	224
142	7.3650	214
143	7.2750	213
144	7.2750	5 V.H
140	7 1780	242
140	7 1503	.197
14/	7	101
144		1.45
149		1516
152	6 9954 °	175
151	0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	.169
152		104
153		164
154	<u>ତ୍</u> ଟରର <sup>ାମ</sup> (ଜନ୍ମର)	153
155	D. DDY/	• 1 70
156	0.0920	140
157	<b>6</b> ,470 <sup>1</sup> / <sub>1</sub>	• 1 4 7
156	6.281	• • • • •
159	6.2210	• 101 • 104
15 1	h. 1 . A .	• 1 2 0
161	6. VV 51	• 1 / 1
152	<b>D</b> , MAAU	.11-
16.5	5,988M	• 1 • • •
164	5.9080	• 1 • 7 4
165	5,8110	• (* Q H
160	5.7920	.003
167	5.7130	* <sup>10</sup> H 7
164	5.6254	•VH2
169	5.422	
17 1	4.932	• 17 T
171	4.913.*	• 17 <del>(*</del> 14
172	4.8162	• 1* Pr ( )
173	4,4167	د <sup>(ر</sup> الم
174	4.639.4	• * 4 >
175	4.4254	.241
170	4.425%	<u>ه</u> ۱۸ (۹ به
17.2	4,4534	
174	4-4530	- 1º 27
170	3.076	.~22
	2.667	• · 1 6
1.1	2 4 GAK	. 11
1 1 1	5 4411	 _ 1 = b
177 177	4.173h	•
1 . X D . 3 4		

i an

 N. ....

. . . . . . . . .

HISTOGRAM

5

60

FREDHENCY	γ.	4	9	15	30	40	36	24	1 18	12	5	Ø	م 1	9 	1
44	******					*									_
39						\$									
38						*									
37						*									
35						*	*								
35						*	*								
34						*	*								
33						*	*								
32		<b>`</b>				*	*								
31						*	•								
314					*	*	*								
29					*	*	*								
24					*	*	*								
27					*										
25					*	*	*								
25					*	*									
24							-								
23					-	-	¥								
22					-	-	- -								
21						-	-	*							
20					-	-	-	•							
14					-	-	-								
17					-	-	-								
17					*	•	•	*							
10				*	*	*	*	*							
1.4				*	*	+	+	*							
13				*	•	*	•	*							
12				*	*	*	*	*							
11				*	*	*	*	*		•					
				*	*	*	•	•	*	•					
9			+	*	*	*	•	+	•	*					
R			*	*	*	*	*	٠	*	+					
7			*	*	*	*	+	+	*	*					
<b>h</b>			*	*	*	*	*	*	ť	*					
5			+	*	*	*	*	*	•	٠	٠				
4		*	٠	*	*	*	*	+	*	*	•				
3		*	*	*	•	*	*	*	*	*	*				
2		٠	٠	*	*	*	ŧ	*	*	•	*				
1		*	*	*	*	*	*	• • •	•	* 	*				• = = = =
TH THRVAL FL 455	۱	2	3	۸	•	4	7	r <b>4</b>	)	۰ ،	11	12	13	14	15

.
APPENDIX

С

.....

PAGE 1

PROGRAM ONE

OTHENSTON JJJJ(200), VALUE (200), GSR(200), Y(5,2,6) DIMENSIO: TK (5,2), TJK (5), TIK (2), TIJ (6), TI (2,6), TJ (5,6) THTEGER HPT LOGICAL SENSA HPTE4A F#4.45 10-115 READCHPTT Y 09 Do 12 TX#1,5 · VITE (IPN, 856) (A12 Jx=1,2 H86., DO 12 KY=1.5 T= (TX+ 1x)=H+Y(TX+JX+KX) H=TH ([X, 1X] 12 CONTENE SQTTE (IPS, 555) no 22 (X#1,5 H= - - -11123 JX=1,2 て 1+(TX)= -+ T+(T+,JX) 427.14 (T27 20 -001 11 - 15 KTTE(TP 4, AAB) an 30 Jest 2 4 **2** P ... No. Nº 1881,5 TTE (IK) # F~ (IX) + H 35 0 2 11 12 - TTP (TP , APA) and 4 and 1 **4 # 1 , 2** 11.5 A.F. KS #1, 3 11 41 11=1,5 TILIY, Y3#H+Y([X,JX,KX] +==TT(14, (X) AT THE TT OF - TIF (TH+ , 56h) というかい トピエキょう H# 1. 1 15 1 IVE 1,2 (X>, YC) [ ( ++ # ( + ) ( JX, KX ) 358TT1((x)) 50 00 TT HE 600 --- 4T (1 14, 4HHERE) 5 1 18 TY#1,5 · , + \_\_\_\_**±1,**3 - 8 . . 1. ) · · · · – T¥∎1 ; 2 TTETE, - - 1 = + + ( T + , J × , < X ) \*\*\*\*\* ٠. ·s # \* . 1 7 1 1 41.2

YIJK#TIK(JX)+H HETTK(JX) 70 CONTINUE WRITE (IPN, 666) HED. DO 50 IX=1,5 TJK2=TJK(1X)++2/12.+H HETJK2 BO CONTINUE wette(TPN,666) H=R. 5.1\*\*1.8 00 TTK2=TTK(JX)++2/30.+H 4=7142 81 CONTINUE HRITE (IPN, 556) най, no 82 KX#1,6 TIJ2=TTJ(KX)++2/12.+H HETIJ2 A2 CONTINUE HATTE (1P (, 555) 비밀가는 YTJ#2#TTJK##2/60. 00 33 TX#1,5 00 33 1x=1,2 Tx2=Tx(Tx,Jx)++2/5.+1 HETR? 93 CHATTHE - ATTE (TPN, 556) ·• \* • 00 44 IV#1,5 HOBA \*1=1,6 T 12#T J ( T X , K X ) ++2/2 +H HETJ2 A4 CONTINE **∺**≋⊻ ... 14 45 JX=1,2 100 H5 H3#1,5 T12#T1(JX, KX)##2/5,+H -a112 AS POST IF - # / " NC 85 11=1,5 rn 35 JY#1,2 35 38 KX#1,5 Y2#Y(IX,JX,XX)++2+4 HBY2 AS CITT IF H#!!. TET115/. 00 37 1×=1,5 DO 87 1x#1,2 エンタア いきましょう T AVE(TIK(I\*)/12.-T)\*(TIK(JX)/31.-T)\*(T11(KY)/1/.-T)\*(TY,JX,FY)+H

1973

H B T F A

AT CHATCHE

SSS=TJK2+TIJK2	
SSC=TIK2+TIJK2	
88F#TIJ2#TIJK2	
SSSC=TK2+TJK2+TIJK2	
sssf#tj2=tik2=tij2+tijk2	
38CF#TI2+TIK2+TIJ2+TIJK2	
\$\$\$FC=Y2=TK2=TJ2=TI2+TJ×2+TIK2+TIJ2=TTJK2	
\$5140#60,**2*(TNAD**2)/(\$\$\$*\$\$C*\$\$F)	•
S9HAL#S9SFC#SSNAD	
X93#538/4.	
XSC#38C/1.	
XSF#\$SF/5.	
XSSC=SSSC/4.	
X58F=588F/20.	
XSCF=SSCF/5.	
x55FC=358FC/18.	
X \$ NAD = 55 NAD / 1 .	
X894L#SS94L/17.	
FTEXSVAU/XSRAL	
IF(FT=F)39,49,88	
89 FS=X53/X55FC	
FraxsL/XSSFC	
F 5 ( # \$ 3 5 L / \$ 5 5 F L	
とした時代のしたとのうたし、このでは、「「「「「」」の「」」の「」」の「」」の「」」の「「」」の「「」」の「」」の「	
FAILS (174)0001 Fre Example to Any studyontoerte of Additivity ACCE	PTEDI
- 353 - 14-AI(14),42X,33847F4(F63)3 0F A00111111 ACC.	P(F)
- 355 - 19-41 (14),422,3385764(FE3)3 0F 400311111 4000 - 4176(194,554) - 584 600 447(777.234,6000066,134,2006,134,2068,164,2	448.17X.14F)
- 555 - 14*AT(11),42X,33847F6(FE313 OF A003)11(11* ACC - 1TE(1P),554) - 554 F0* *AT(///,23X,6HSOURCE,13X,2HDF,13X,2HSS,16X,2 - 917+(1P*,553) SSS.XSS.FS	448,17¥,14F)
- 555 - 14*AT(14),42X,33847F4(FE3)3 OF A00711V11* ACC - 4TTE(TP),554) - 554 F1* ATT///,23X,6480URCE,13X,240F,13X,2458,16X,2 - 4TTE(TP),553) SSS,XSS,FS - 4TTE(TP),553) SSS,XSS,FS - 4TTE(TP),553) SSS,XSS,FS	448,17¥,14F)
- 555 - 14*41(14),42x,53447F4(FES)5 OF & WOTTIVITY ACC +1TE(1P),554) -554 FOW MAT(///,23x,64500RCE,13x,240F,13x,2455,16x,2 -91TE(1P),553) SS5,XS5,F5 -91TE(1P),552) SSC,XSC,FC -91TE(1P),551) SSF,XSF,FF	448,17¥,14F)
- 555 - 14*AT(141,42X,53844FM(FE313 OF A003)11411* ACC - 1TE(1P),554) - 554 FORMAT(///,23X,6HSOURCE,13X,2HDF,13X,2HSS,16X,2 - 91TE(1P),553) SSS,XSS,FS - 91TE(1P),552) SSC,XSC,FC - 91TE(1P),551) SSF,XSF,FF - 94TTE(1P),553) SSSC,XSSC,FSC	448,17¥,14F)
- 555 - 14 - 21 (141, 422, 33447 - 17 - 2313 - 02 - 2007 - 17 - 200 - 17E(12), 554) - 554 - FORMAT(///,232, 6HSOURCE, 132, 2HDF, 132, 2HSS, 162, 2 - 917E(12), 553) - SSS, XSS, FS - 917E(12), 552) - SSSE, XSS, FS - 917E(12), 553) - SSSE, XSSE, FS - 917E(12), 553) - SSSE, XSSE, FSE - 917E(12), 549) - SSSE, XSSE, FSE	448,17¥,14F)
- 555 - 14 - 21 (141, 422, 33447 - 41 - 2313 - 02 - 2007 - 1217 - 202 - 417E(12), 554) - 554 - FOR AAT(///, 232, 64500RCE, 132, 240F, 132, 2458, 162, 2 - 917E(12), 553) - SS5, XSS, FS - 917E(12), 551) - SS5, XSS, FS - 917E(12), 551) - SS5, XSS6, FSC - 917F(12), 553] - SSS6, XSS6, FSC - 917F(12), 549) - SSSF, XSSF, FSF - 417E(12), 549) - SSCF, XSCF, FCF	448,17¥,14F)
- 555 - 14 - 21 (14), 422, 33447-4(FES)3 OF 200711(11) 400 - 17E(1P), 554) - 554 FOM AAT(///,232,64500RCE,132,240F,132,2458,162,2 - 917E(1P),553) SS5,255,FS - 917E(1P),553) SS5,255,FS - 917E(1P),553) SS5C,255C, - 917E(1P),553) SS5F,255F,FSF - 17E(1P),549) SS5F,255F,FSF - 17E(1P),549) SS5F,255F,FC - 917E(1P),549) SS5F,255FC	448,17¥,14F)
	448,17¥,14F)
	448,17¥,14F)
	448,17¥,14F)
	448,17¥,14F)
<pre>355 F 14 F 1 (14), 42x, 334 4 F 1 (14), 42x, 334 4 F 1 (14), 42x, 334 4 F 1 (14), 14 (14), 553) 554 F 14 AT(///, 23x, 6450)RCE, 13x, 240F, 13x, 2458, 16x, 2</pre>	MM8,17¥,14F)
<pre>&gt;</pre>	MM8,17¥,14F)
<pre>&gt;</pre>	
<pre>355 F 14 F 1 (14), 42x, 334 4 F 1 (FE3) 3 (F = 400 (F) (14), 42x, 334 4 F 1 (FE3) 3 (F = 400 (F) (14), 553) 554 F 14 F 4 T (77, 23x, 6 + 50) RCE, 13x, 2 + 0 F, 13x, 2 + 55, 16x, 2</pre>	
<pre>&gt;</pre>	
<pre>&gt;</pre>	MM8,17¥,14F)
<pre>&gt;</pre>	MM8,17¥,14F)
<pre>555 Fide a f(1A1, 42x, 53A4FPA(PES)3 AP a month (1A1, 42x, 55A)</pre>	
<pre>555 Fide a f(1A1, 42x, 53A4FFF(1PES)3 for a ministration action + fTF(fP), 554) 554 Fide a a f(7/7, 23x, 6HSD)PCE, 13x, 2HDF, 13x, 2HSS, 16x, 2 </pre>	CTED)
<pre>555 F 10 * A T (1/1, 42x, 33 A * P + 1 = 2313 OP A + 1 = 1 = 1 = 1 + 1 + 1 + 1 + 1 + 1 + 2 + 2 + 3 + 3 + 2 + 3 + 3 + 2 + 3 + 3</pre>	CTEN1
<pre>355 * 14*41(11,42%,33*4**********************************</pre>	CTEN1
<pre>355 * 10 * 11(11, 42x, 33 * F(1) = 2313 * 0 * 100 + 11(11) * 200</pre>	CTEN)
<pre>555 File AT(1), 42x, 33, 44P(1) FESTS OF ADDITIVITY ACC.</pre>	CTEN1
<pre>355 File AT(1), 42x, 33, 44P(1) FESTS OF ADDITIVITY ACC.</pre>	CTEN)
<pre>55 File All(101,424,5344File(1)=2315 for All(1)[1] File All(1) + TTE(TP1,554) 554 File All(1)/234,6450:98(E,134,240)F,134,2455,164,2 - STTE(TP1,553) SSS,XSS,FS - STTE(TP1,551) SSC,XSC,FC - STTE(TP1,551) SSC,XSC,FSC - STTE(TP1,549) SSSF,XSF,FSF - STTE(TP1,549) SSSF,XSSF,FSC - STTE(TP1,547) SSSC,XSCF,FC - STTE(TP1,545) SSGL,XSAL 545 File All(2,254,7444L4,265,94,2417,2(74,F11,6)) 546 File All(2,254,640,0400,114,144,2(74,F11,6)) 547 File All(2,254,640,0400,114,144,2(74,F11,6)) 548 File All(2,254,640,0400,114,144,2(74,F11,6)) 549 File All(2,244,245F,154,244,245,154,241,45,174,F11,6)) 549 File All(2,244,245F,154,242,33(74,F11,6)) 549 File All(2,244,245F,164,242,33(74,F11,6)) 551 File All(2,244,145,184,144,3(74,F11,6)) 552 File All(2,244,145,184,144,3(74,F11,6)) 553 File All(2,244,145,184,144,3(74,F11,6)) 553 File All(2,244,145,184,144,3(74,F11,6)) 554 File All(2,244,145,184,144,3(74,F11,6)) 553 File All(2,244,145,184,144,3(74,F11,6)) 554 File All(2,244,145,184,144,3(74,F11,6)) 554 File All(2,244,145,184,144,3(74,F11,6)) 553 File All(2,244,145,184,144,3(74,F11,6)) 554 File All(2,244,145,184,144,3(74,F11,6)) 555 File All(2,244,145,184,144,3(74,F11,6)) 557 File All(2,244,145,184,144,3(74,F11,6)) 558 File All(2,244,145,184,144,3(74,F11,6)) 559 File All(2,244,145,184,144,3(74,F11,6)) 550 File All(2,244,145,184,144,3(74,F11,6)) 551 File All(2,244,145,184,144,3(74,F11,6)) 552 File All(2,244,145,184,144,3(74,F11,6)) 553 File All(2,244,145,184,144,3(74,F11,6)) 355 File All(2,244,145,184,144,3(74,F11,6)) 355 File All(2,244,145,184,144,3(74,F11,6)) 357 File All(2,244,145,184,144,3(74,F11,6)) 358 Jil(2,244,145,144,144,144,144,144,144,144,144,1</pre>	CTEN1



411 04

I

HYPOTHESIS OF ADDITIVITY ACCEPTED

BALANCE	NONADO	<b>SC "</b>	CF	35	8 C	٦	C	<b>;</b> ,	SOURCE
17		18	3	29	•	(J)	14	•	٥F
. 26593	. PBP154	.094747	. 486570	• • 1 7 3 1 4	286100	.258367	. aga 159	.274545	ی ئ
552 C 83 5	. 799154	• P 9 5 5 4 2	_200115		. 299345	.~51613	64100¢°	.¢6A636	.( : <b>#</b>
			2.773768	22.857758	8.321779	1243,518799	3,837486	1553_646729	T
			2.77	2.19	2.93	2.77	4.41	2.93	F.05 DF,DF

Table 1

PROGRAM TWO TITHENSTON XMEN(2,8) DIFENSION YEFAN(5,2), X8TD(5,2), Y(5,2,6), TOTI(2,6), TOTI(6) DTHENSTON TOTIK (2) . X(6) THTEGER HPT HPTEAY 701015 VENDTHOTT Y nn 13 T#1,5 nn 13 Jat,2 nn 12 K#1,6 15 X(x)=+(1,3,4) YMFAN(T, J)#PHEAN(X, 6) WSTOFE, JIERVAR(X, 6, 1, XMEAN(I, J)) 13 487011, J1#4007(X470(7, J)) nn 14 fel,5 nn 14 Tal,2 Dr 14 Ka1,5 14 V(T, 1,K)#(V(T, J,K)+XMEAN(I,J))/X8TP(I,J)+6.++.5 ниян. na 2ª 101,2 00 27 X81,6 () #너희 DO 15 T#1,5 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* 35 HETOTICJ,43 TRT#TOTI(1, <) ++2/5.+HH 20 HHETPT H-++1\_ nr 21 4#1,5 H 8 <sup>(3</sup> + De 16 1#1,7 TOTIICS)=TOTICI,K)+0 16 PETOTTIERS 7273#707777763##2717.+44 21 HH#T211 41.27 nn22 1=1,2 ы**к**., 0-117 401.0 TOT14(1)=TOT1(1,4)+4 17 HETHTISCTY TPTK#TOTTK(J3++2/30.+HH 22 111=1214 • H#\*\*\* CO 18 181,2 アハアルトヨアドアアメ (パ)チャ 18 - +- # T 17 AL TOTAL #10741 ++2/60. нв., no19 1=1,5 1114 J#1,2 no 10 x#1,4 \*2=\*(1,3,\*)\*\*2++ 10 HEV2 ~~~\*\*\*\*\*\*\*\*\*\*\*\*\* 45F#7271=707\$L

## PARE 2

SSCF#T2I-T2IK-T2JJ+T0TAL FRADREY2-T21 XSC=SSC/1. YSF=SSF/5. ¥30F=590F/5. YSFREEPRORIAR. FC#X3C/XSER FF#YSE/XSER FOF=XSCF/XSEP WRITTE (TPN, 554) 554 FORMAT(///,23X,6HSOURCE,13X,2HDF,13X,2HSS,16X,2HMS,17X,1HF) WHITE (TPN, 5521 SSC. XSC. FC WRITE (TPN, 351) SSF, XSF, FF HATTE (TPH, SAR) SSCE, XSCE, FCE FRITE (TRN, 547) ERROR, XSER 547 FORMAT(1,248,5HERROR,138,2H48,2(78,F11,6)) 548 FORMAT(/,24X,2HCF,17X,1H5,3(7X,F11.6)) 551 FORMAT(1.24x, 1HF, 14x, 1H5, 3(7x, F11, 6)) 552 FORMAT(/, 24x, 14C, 18x, 141, 3(7x, F11, 6)) 444 WRITE (TPY, 111) 111 - FORSATCS 411 00 333 141,5 Pn 333 J#1,2 DO 333 8#1.6 330 FORMAT(10x,2111,14,),11,5x,F5.3) 333 COLTTONE nr 28 1#1,2 PO 29 Vat, A no to Tat, 5 28 YHEF (J, F) BO FRAM(Y. S) 10 30 141.2 P. 3 . Hal, 6 30 BRTTELTPH, 321 1, K, KOFF (J, K) 30 FOR ALLINY, T1, 14, , T1, 54, F5, 31

F & to

1,119 1.1.1 - 901 1,1,2 1,1,3 =3.54 -,250 1,1,4 3,903 1,1,5 -, 331 1,1,6 1.2.1 4,490 1,2,2 - 879 \*1.55 1.2.4 1,2,5 =1,91 =1,18 1,2,6 2,1,1 =1.76 2,1,2 2,1,3 =1,13 =1.25 4,980 2,1,5 2,1,6 2,2,1 - 892 - 892 2.2.2 =2.80 1.402 2,2,3 2,2,4 2,2,5 2,2,5 #2.34 2.532 \*1.58 860 3,1,1 3,1,2 3,1,3 #3.43 #1.88 3,1,4 3,1,5 3,1,5 - 333 3,400 3,2,1 2.112 3,070 1,2,2 3,2,3 . 624 41.76 -.552 3,2,5 =3,5% 3,2,6 1, 091 -, 097 4,1,2 A,1,3 A,1,0 3.619 **\*3**,12 ,539 4.1.5 =1.72 4,1,1 4,2,1 3.595 #2.16 #1.75 4,2,3 \*,2,6 2.463 4,2,5 6,2,5 5,1,1 =1.74 =.377 =1.09 =1.23 =2.78 5,1,2 5,1,4 -\_\_\_\_\_ ∿,1,5 ∿,1,5 3,744 2,234 5,2,1 3,199 **``**>,> =2.75 . . . . ,<u>j</u>78 5. . . . 464 5,2,5 ±3,22 5.2.1 1.438

ł

ł

69

ź

1.1	321
1.2	- 489
1,3	=1.45
1,4	=1.47
1.5	2, 266
1,5	.550
2,1	3,100
2,2	- 701
2,3	- <u>089</u>
2,4	- 476
2,5	- 942
2.6	=1 0.6

R1/ 90

la in a pri							Contra - A State of American States
							• •
						71	
						/1	
		1TI	<b>ר</b> :	<b>4</b> 7	C	SD	
		ואמ	Π.			с П С	
		ฉี่				1	
ja l							
		4 1 2	<b>.</b> ,	(J)		י ח	
Q. *							
		177	5	3			
	Таб	ີ່	• ``D	•. •.	• `		
	e li	3	26	Si S	इ.	.0. 10	
	N	177	17 4	ري سي	20 20 20		
			-				
		يىر -	امر: •	•	• •		
		1~1	170	2	Ì.	:	
		с Сл		\$			
		*	6	Л	4		
				ير. •	•		
			رد. الا	د. اهر	2		
			د در د	1		T	
84. J.S.			2	5	Ĵ		
•							
			N	2	С	רו" י ר	
			.42	.42	ר יייייייייייייייייייייייייייייייייייי	n 05	
					-7	'n	
Nu IP Store							

PAGE 1

s de la

PROGRAM THREE ETTERSTON VALUE (245), ESU(200), & (240) LOGICAL SESSA THTERER HPT TP-1815 HPTHAN 1 55AD (HPT.21 **2** ( = 2 F 14 AT(13) SEASCHEL, 31 K (1), VAL DE (1), BSP (1) 101 21 1=2, 3 574 AT(13,2(P1-,31) 1=1=1 TREASE FEATHWAL FEATILE, 18,6 12 76 (15-17)-550(1))11,11,7 11 5 = 1+1  $|f(x,T)| \geq 2$ 6 TECHN ( DAM 2173)7,7,11 7 := +1 20 10 11 1 

∎ 57 ≖ -

-8 Ка я К

= -5 = -2

SEX, ATCTA IP LI IP JN LI IP IP IP					
148,41,5					
16X.+					
• • • •		11			
	Ξ	- 4			
		14			
	x	د 🗴			
		,			
	-				
	-				
	. 67	<b>**</b> 1%			
•	=	e 1			
	2	ч <b>п</b>			
	2				
217 22					

73

-----

PAGE 1

PROGRAM - AVG na sun seneral de la completador de la TITHE STOK JJJJ (200), VALUE (200), GSR (200), V(5,2,6) DIMENSION G(5,2,6), Gx(2,6), XMEAN(5,2), XSTO(5,2), X(6) INTEGER HPT LOGICAL SEVEN HPTE4/ TPHEID 1#1 . F T#1+1 187 9 J#J+1 FEAD (HAT, 5) 5 - RTTE (TPV, 5) ... 5 FID AT (13) ¥ # 2 1.811 5 N 😸 🖓 `≻**`**=∎``\_ TOTALE . 107#0. Y . #¥ ..+1. ° = ++1 18 (1-1) 16, 16, 14 16 REAR (MRT, 4) JIJJ(NN), VALNE(MN), RSP(MN) 4 FUW AT(13,2(F17.3)) TOTAL AVAL OF CONTAL TOT#0547 - 1+TOT TE (T"TAL -275.)11,13,13 13 YTT, J,K)#¥ 770TAL RET, J, K) BT 172XH 1212-5112,14,18 14 TF (. . T. SP S. (1)) 50TH 14 7887-273,15,15 15 JF(1-0)-,44,04 00 "TTTF ( TP", 081 3H F + AT(1-1) F 77 1#1,5 27 77 1#1,2 TT 77 - #1.F -775(10 ,25) 1,1,4,4(1,1,4),0(1,1,4) 78 PT& STITEY, 11,14,,11,14,,11,174,F8,4,174,F8,43 77 0 . 11 .... 3 Is1,5 3 1=1,2 27 2 A #1,4 ノーシビィリホックリッシュ・フ Y'S'''(T, T)#F''FA''(Y, 5) X = T = ( ], () #000 S = ( X, S, 1, X 0 F A 5 ( ], J ) ) እ. የሚከጠና 1, 1) #እስለተያእኛው የሺ<sub>ት</sub> /11 ነ The train a sea 1 31 Tal, R - 34 (#1,2 nn 38 (#1,5 AA -- 2110510 ,6511,1,4,251,3,41

PAGE	2	75
65	FOWMAT(1AX, 11, 14,, 11, 14,, 11, 10X, F6, 4)	ومراجع والمراجع
	WRITE (IPN,98)	
	Do 6 J#1,2	
	9月 6 米里1,6	
	下のずまが。	,
	00 5 I=1,5	
	GX(J,X) = TOT + O(I, J, X) / 5	
8	(TOTARX(J,K))	
	00 7 J=1,2	
	DD 7 K#1,6	
	+ PITE(1PH, 55) J, K, GK(J, K)	
55	, FOW MAT(1 AV, T1, 14, , T1, 14X, F0, 4)	
7	「企PATTN/研究」。 La service and a service and	

.

ς.

.

		· · · · ·				
	1.1.1	.0913	-1414			76
	1.1.2	20837	.1409	· · · · · ·	<b>₽</b> 11 81 11 1 8 8 800 10	· · · · · · · · · · · ·
	1.1.3	. 0737	.1483			
	1,1,4	9862	.1478	na dina mpanya na ang pang pang pang pang pang pang p	n - 1955 - Conflict All All and an	- An and an an an and an
	1,1,5	1219	1563			
	1,1,6	<b>.</b> 0858	,1538			
	1,2,1	0909	.1901			
	1,2,2	.0786	.0066			
	1.2.3	.0713	7076		tat availationalation at the second state	
	1,2,4	<b>,</b> 8684	·PV27			
·· ·	1,2,5	. 2675	· PPU3			
	1,2,6	.0742	<b>≈</b> .0207			
	2,1,1	<u>_ 9594</u>	1614			
	5,1,2	.0512	.1579			
territoria de la composición de la comp	<u> </u>	45002	<u>1494</u>			Annya and you any analysis and you and you are a set
	2.1.5	2628	1506			
	2.1.6		1559			
	2.2.1	2562	1722			
	8.2.2	4535	1798			
	2,2.3	2555	1389			
and and the second s	2,2,4	a538	.1975			
	2,2,5	. \$562	1852			
ł	2.2.	<b>.</b> 054.⁺	.1 <sup>A</sup> ₽7			
£	3,1,1	0591	.1585			
	3,1,2	.4595	.1555			
	3,1,3	.2521	.1722			
		• P 5 4 7	-1639 -			
	3 <b>,</b> 1 <b>,</b> 7	• · · D / /	.1/hý			
	2010 <sup></sup> 3-2-1	- 25日13日 25日15日	.1/04			
	3 2 9	07 C 4	1484			
	3.2.3		-1545			
	3.2.4	0 6 2 3	1443			
	3.2.5	3643	1551			
	3,2,8	593	1655			
	s,1,1	• ? 5 ° 9	.2 . 4 .)			
	1,1,2	. 1467	,2158			
	4.1.1	. 1542	.2219			
	4.1.4	· A 42 8	. 2282			
	5 <b>. 1 . 5</b>		.2285			
	4,1,1	. 4 1 7 2	.2378			
	ジョイット シークーク	• ' <b>``</b> \Z	1.0070			
	1997 9 19 19 - Din K	• • • 7 ·	• 1 4 9 9			
	1.2.1	0 K 7 7	1528			
	1.2.	. 1543	1572			
	2,2,4	527	1494			
	*,1,1		2335			
	F,1,2	_** <b>\$</b> 86	1054			
	<b>N</b> , 1, 8	. 1935	.1 .77			
	* , 1 , 4	• n 3 9 7	•1#3°			
	5 . 1 . h	.1144	• 1 12 1 14			
		•1 5 *	.177.			
	5 y ( y 1 6 3 3	1.10	.1451			
		₩ 1 1 4 ×	• 1 6 M 3			
	ĸ	• 7771 2872	.1720			
	***** * . 2 . *	· · · · · · · · · · · · · · · · · · ·	***** 1 ^ A 7			
	иси Б. Э. А	• † † † † . 27 G 3 1				
	+ +	• · · · · ·	♦ 1 17 ₩			

• •

			,				
••••••••••••••••••••••••••••••••••••••	a ya ya waka mana kang ka sa ka	· •. • · · ·	·		 		
	1,1,1	=2,610				77	
· · · ·	1,1,2	=2.909			 		······
<ul> <li>No Markates, According to a surger car annumber of the</li> </ul>	1,1,3	1853	ng mang meng meng meng meng meng meng meng me		 1929 - La Parlamenta (m.		Noticia antorip gayatterining of most
	1.1.5	- 12// 3.2060					
	1,1,6	2,2358				· · · ·	·
	1.2.1	4,9889			 		
	1,2,2	-,71157					
an a cha da dhilann basar balanta a sana balanta a	1,2,0	= 9423	With Manager and a state of the second state of the	tions to the second	 ан тара алгана адабаан таражаан тара	o trioscal de la sete cas	- B. Mahage cards was a strand contact of standard gram.
	1,2,5	*1.123					
	1,2,6	=1.149					// ·· ·· · · · · · · ·
. • · · · •	2,1,1	3,5545					
	2,1,2	1,6769					
Na contra come contra de la contra de	2.1.4	• 6323				• • • • • • • • • •	• • • • • • • • • • • • • • • • • • •
	2,1,5	#2.275					
	2,1,8	.5943					
	2,2,1						
	2.2.3	2,4661					
	2,2,4	1,9337					
	2.2.5	1.4346					
	2.2.5	7292					
	3.1.2	=2.253					
	3,1,3	7115			•		
	3,1,3	=2,994					
	3,1,5	2.8151					
	- 5 # 1 # 5 - 5 - 2 - 4	2,090H #3 112					
	3.2.2	=1.24					
	7,2,7	.5972					
	3,5,4	=1.275					
		1,0790					
	· • • •	<b>23</b> 546					
	4,1,7	#1,243					
	4,1,5	. 745					
	1,1,6	3,5551					
	- + 2 + 1	4,9090					
	· . · .	• <b>1</b> • <b>***</b>					
	* * * * * * * * *	#1, 10 - 2035					
	· · · · ·	- 9742					
	6. 5. 1	<b>#1,</b> 7, 8					
	5,1,1	4 5 . 34					
	N.1.2						
	a ka s Taka ka	#1_537					
	h, 1, h	0037					
	* • <sup>*</sup> • <sup>6</sup>	\$2.374					
		ー。4257 ・ 15月					
٠		1.177 1.3144					
	5,2,4	.8235					
	1.2.5	- <b>-</b> 210					
à	5,0,A	#J_171					

1.1	20 <b>64</b>	78
1 2		n an
A & C	- <del> </del>	·
1,3		
1.4	<b>#1,133</b>	
1,5	.9277	
1.5	1 3206	· · · · · · · · · ·
2.1	4814	
a 9	_ K7R(	
213	<u>, 5003</u>	an a
2,4	-,1295	
2,5	- 7417	
2.0	- 6013	
	¥ • • •	

. ...