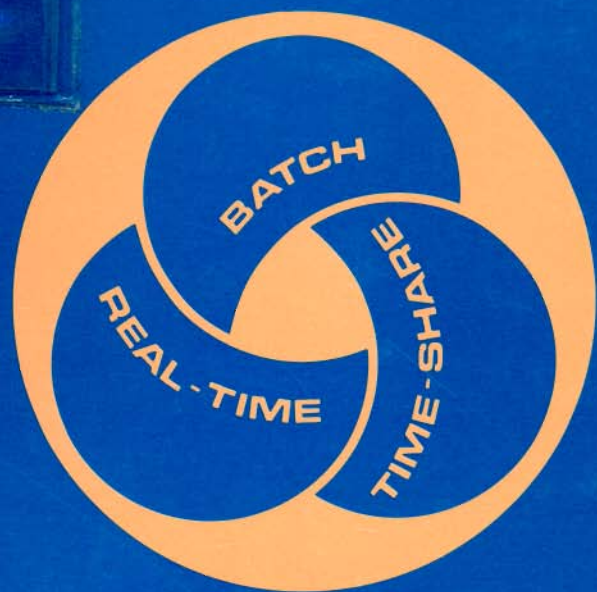


HP 3000

**STATISTICAL
ANALYSIS
ROUTINES**



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HP 3000

STATISTICAL

ANALYSIS

ROUTINES



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PREFACE

This manual is the user's reference to the HP 3000 Statistical Analysis Routines (acronym STAR/3000). STAR/3000 is a subsystem of MPE/3000, the HP 3000 Multiprogramming Executive Operating System for the HP 3000 Computer System.

User prerequisites are minimal: knowledge of a programming language is *not* required. A statistician can use an easily-learned syntax to command STAR/3000 directly.

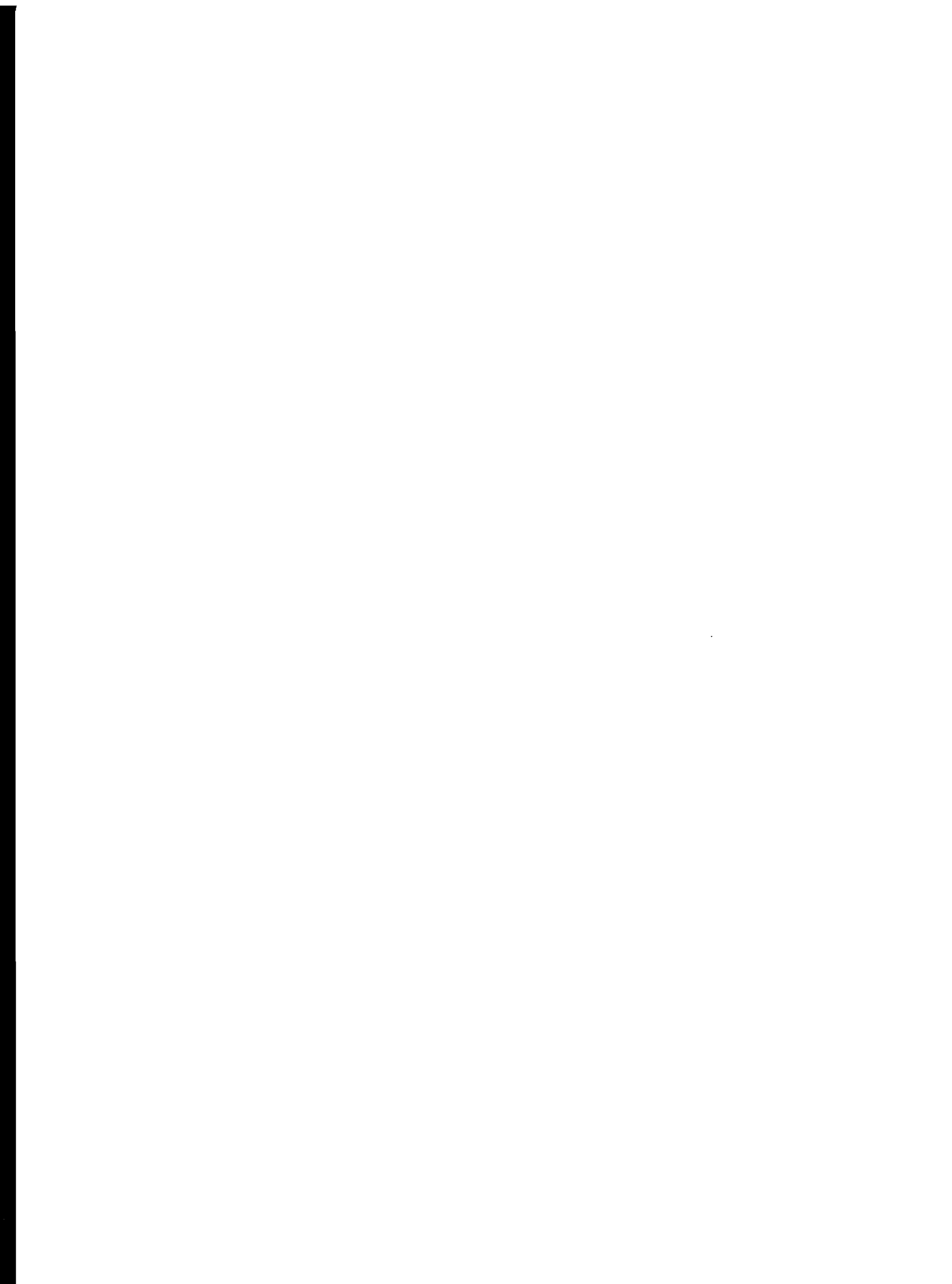
The Introduction defines the purpose of STAR/3000, its relationship to other HP 3000 software and its minimum hardware requirements. Section II describes the structure, capabilities and operating characteristics of STAR/3000. Operating instructions appear in Section II, output format examples are displayed in Section III and STAR/3000 error conditions are examined in Section IV. An index is provided at the back of the manual.

The following manuals may be needed for further references:

HP 3000 Scientific Library (03000-90010)

HP 3000 Compiler Library (03000-90009)

HP 3000 Multiprogramming Executive Operating System (03000-90005)



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INTRODUCTION

Statistical analysis can be performed through an HP 3000 computer by conventional methods using a standard programming language, or through the facilities provided by the HP 3000 Statistical Analysis Routines (STAR/3000). STAR/3000 eliminates the need to use a programming language. Instead, a statistician can use simple commands to use STAR/3000 directly.

STAR/3000 provides for input, filing, and manipulation of data to produce analyses reports in easy-to-read form. Up to 32,767 cases (observations sets), of up to 63 variables per case, can be processed, using single-precision, floating-point (type REAL) internal representation and arithmetic.

RELATIONSHIP TO OTHER HP 3000 SOFTWARE

The HP 3000 Multiprogramming Executive Operating System (MPE/3000) presides over the HP 3000 Computer System; MPE/3000 is used to place STAR/3000 into operation. STAR/3000 is used to access procedures in the HP 3000 Scientific Library and/or the HP 3000 Compiler Library. To write STAR/3000 commands, the user need not be aware of either library; STAR/3000 interprets user commands and calls appropriate library procedures when needed. When the user signals the end of STAR/3000 use, operation returns to MPE/3000.

HARDWARE REQUIREMENTS

The minimum hardware requirements of STAR/3000 are the same as those of MPE/3000, as described in the HP 3000 Multiprogramming Executive Operating System manual, 03000-90005.



SECTION I

STAR/3000 Organization

STAR/3000 consists of a control module, STAR EXECutive, and a set of function modules, listed below. Operation begins in STAR EXEC, in response to an MPE/3000 command from the user. Then a user command directs STAR EXEC to pass operation to a function module. When use of the function module is complete, operation returns to STAR EXEC (except from the FINISH module, where operation returns to MPE/3000).

STAR EXECUTIVE

STAR EXEC, as the “supervisor” of STAR/3000 operations, performs several functions, including:

- Accepting user commands and passing operation to the appropriate function module.
- Communicating messages between the session user and function modules.
- Printing the results from function modules.

FUNCTION MODULES

The following list summarizes the STAR/3000 function modules; their detailed descriptions are in Section II.

FUNCTION MODULE	IS USED TO
FILE	Specify that data to be analyzed is stored in an MPE/3000 file.
DATA	Specify that data is to be typed on an interactive keyboard or read from a batch input device.
SAVE	Save the current data file as an MPE/3000 file.
PRINT	Print the current data.
EDIT	Make changes to the current data.
TRANSFORM	Transform all observations of one or more variables to a specific modification.
ELEMSTAT	Report the elementary statistics of the current data.
FREQUENCY	Report the one-way frequency distribution of the observations of a specified variable within specified ranges of values.
HISTOGRAM	Print a distribution bar graph (a histogram) of the observations of a variable.
PLOT	Plot a scatter diagram (an X-Y graph) of the relationship between two variables.
CORRELATE	Report the product-moment correlation coefficients, mean deviation and standard deviation of all variables.
REGRESSION	Report the multiple linear regression coefficients and related statistics for a specified set of independent variables versus a specified series of dependent variables.
FINISH	Terminate STAR/3000 operation and return to MPE/3000.

DATA HANDLING

The user presents data to STAR/3000 in a two-dimensional array by cases (rows) and variables (columns). Each case contains observation values, in floating-point (type REAL) form, one observation for each variable in the data. STAR/3000 allows the data matrix to contain 2 to 32,767 cases of 1 to 63 variables.

A set of data can be analyzed by STAR/3000 only if it exists in an MPE/3000 file that is pointed to as the current data file. That current data file can be either of two types:

1. A STAR/3000 temporary file, created whenever the DATA module is used. Such a file is discarded whenever the FILE or FINISH module is used or when the DATA module is used again. Or, such a file can be saved as an MPE/3000 file by the SAVE module.
2. An MPE/3000 file in the temporary file domain or the permanent file domain.

Detailed descriptions of MPE/3000 file management are given in the MPE/3000 manual (03000-90005); all descriptions pertinent to STAR/3000 are given in this manual.

To create and point to a STAR/3000 temporary file, the DATA module is used; to point to an MPE/3000 file, the FILE module is used.

MPE/3000 FILES

Files Created by DATA

STAR/3000 users experienced in programming may want to consider how the DATA module opens a STAR/3000 temporary file. The MPE/3000 file intrinsic FOPEN is used, with the parameters¹ set as follows:

formal designator:	STRDATA
foptions:	<u>Bit(s)</u>
	15 — 14: 00, the file is a new file.
	13: 0, write the file in binary code.
	12 — 10: 010, the actual file designator is \$NEWPASS.
	9 — 8: 00, fixed length records.
	7: 0, no carriage control.
	6: (Reserved for MPE/3000 system use.)
	5: 1, Disallow file equation.
	4 — 0: (Reserved for MPE/3000 system use.)

¹See *HP 3000 Multiprogramming Executive Operating System (03000-90005)*.

aoptions:	<u>Bit(s)</u>	
	15 – 12:	0101, update access.
	11:	0, no multirecord access.
	10:	0, no dynamic locking.
	9 – 8:	01, exclusive access.
	7:	0, normal buffering.
	6 – 0:	(Reserved for MPE/3000 system use.)
recsize:		128
device:		DISC
formmsg:		(none)
userlabels:		0
blockfactor:		1
numbuffers:		1
filesize:		$4 \cdot (\text{entier} (\frac{2 \cdot \text{NUMOBS} \cdot \text{NUMVAR} + 127}{128})) + 1$
	where:	NUMOBS = parameter <i>o</i> specified to DATA. NUMVAR = parameter <i>v</i> specified to DATA. The integer 4 allows for an expansion factor of 4 times the original file size by the EDIT module, if needed. The word <i>entier</i> means the largest integer not algebraically exceeding the expression in parenthesis.
numextents:		16
initalloc:		4 extents
filecode:		1030

Files Created By A User's Program

A data file can be created by a user's program before STAR/3000 is placed into operation to analyze that data. The MPE/3000 file intrinsic FOPEN must be used, with the following parameter settings¹:

formaldesignator:		Any legal to MPE/3000
foptions:	<u>Bit(s)</u>	
	15 – 14:	User's choice.
	13:	0, write the file in binary code.
	12 – 10:	User's choice.
	9 – 8:	00, fixed length records.
	7:	User's choice.

¹See *HP 3000 Multiprogramming Executive Operating System, 03000-90005*.

	6:	(Reserved for MPE/3000 system use.)
	5:	User's choice.
	4 – 0:	(Reserved for MPE/3000 system use.)
aoptions:	<u>Bit(s)</u>	
	15 – 12:	Recommended, 0101 for update access by EDIT or TRANSFORM; otherwise, user's choice.
	(All other aoptions: user's choice.)	
resize:	an even integer greater than or equal to 4.	
device:	User's choice.	
formmsg:	User's choice.	
userlabels:	User's choice.	
blockfactor:	User's choice.	
numbuffers:	User's choice.	
filesize:	User's choice.	
numextents:	User's choice.	
initialloc:	User's choice.	
filecode:	1030	

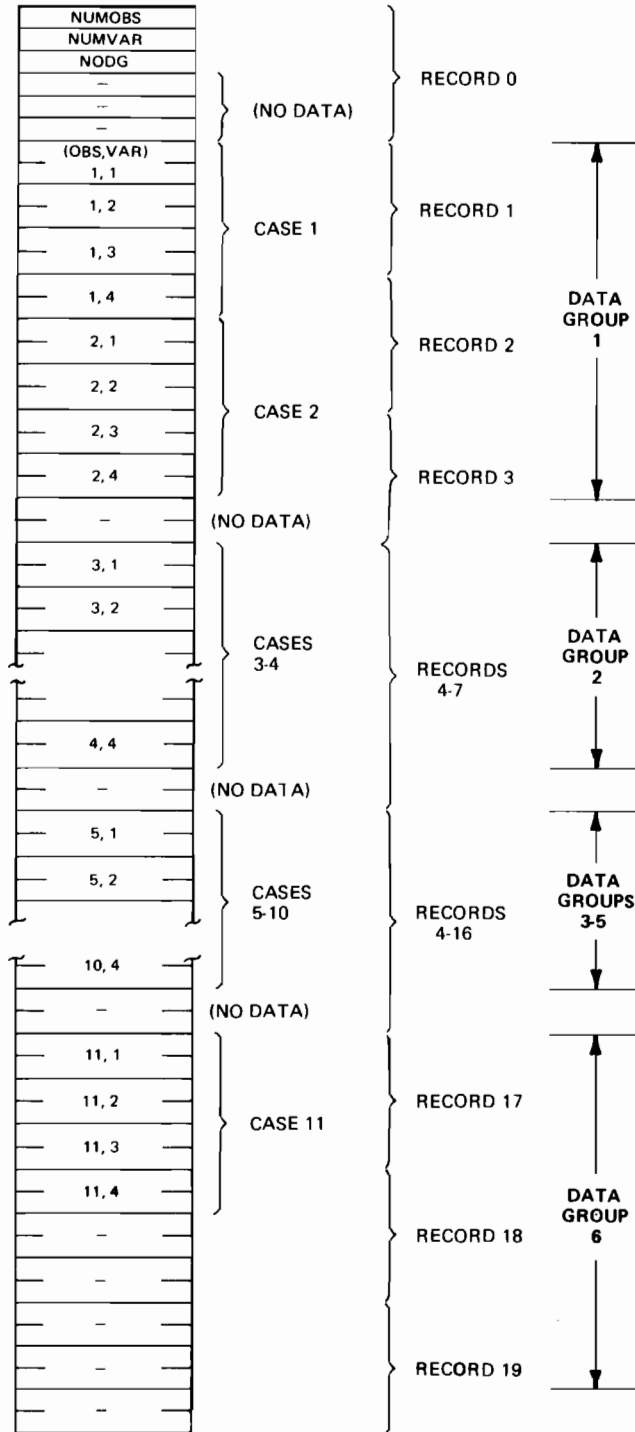
Further, the data file structure must also use these characteristics:

1. The first record (record 0) must contain three integers, in the first three words (the labels are examples only):
 - NUMOBS, the number of cases (a case is a set of observation values, one value for each variable in the data).
 - NUMVAR, the number of variables in the data.
 - NODG, the number of cases per data group (a data group is an integer number of cases written into the data file by a single output statement of the user's program).
2. Each data group (see NODG, above) must be written to start at the next unwritten logical record boundary; see the example below.
3. Each case (see NUMOBS, above) can be considered an n -dimensional vector, where n is the number of variables (see NUMVAR, above) and the i th dimension is the observation value for variable $\#i$. Each case is written in ascending order of variable numbers, the total file is written in ascending order of case (observation) numbers.

EXAMPLE:

In this example, NUMOBS = 11, NUMVAR = 4 and NODG = 2. The logical record size (see FOPEN parameter recsize) is 6; thus, the last data group contains only one case.

NOTE: The last data group is the only one that can contain fewer than NODG cases.



SECTION II

Operating STAR/3000

Operation of STAR/3000 includes three general activities:

1. Log on to MPE/3000.
2. Initiate STAR/3000 operation.
3. Issue STAR/3000 commands.

LOG ON TO MPE/3000

To log on to MPE/3000, specify a parameter list in the format required to initiate a session or a job¹, as needed for the STAR/3000 operations to follow.

NOTE: If data to be analyzed is already stored in one or more MPE/3000 files, the parameter list must correspond to that used to create the data file(s).

INITIATE STAR/3000 OPERATION

In An MPE/3000 Session

To initiate STAR/3000 operation, type² an MPE/3000 command:

¹See *HP 3000 Multiprogramming Executive Operating System (03000-90005)*.

²In a session, MPE/3000 or STAR/3000 prints a prompt character (for example, a colon) whenever a user response is expected. Type an appropriate response on the same line and immediately following the prompt character. Signal the end of any response by striking the RETURN (or equivalent) key. Correct any typing errors by using CONTROL-H or CONTROL-X, as described in *HP 3000 Multiprogramming Executive Operating System (03000-90005)*.

STAR
or
STAR *listfile*
or
STAR **listfile*

Include *listfile*¹ to direct STAR/3000 reports to a non-standard list device, or include **listfile* to “back-reference” (see MPE/3000 command :FILE) a user pre-defined file. If neither *listfile* or **listfile* is included, STAR/3000 reports appear on \$STDLIST, the standard list device of the MPE/3000 system in use.

Interactive messages between MPE/3000 or STAR/3000 and the user are printed on the interactive keyboard terminal regardless of the list device used for STAR/3000 reports.

STAR/3000 operation begins with a standard HP 3000 program identity message, a request for the user’s STAR/3000 experience and a prompt character². The experience request is:

ARE YOU AN EXPERIENCED STAR USER?
>

Type YES or NO or TERM.

TERM causes STAR EXEC to print the message:

STAR OPERATION TERMINATED

and return operation to MPE/3000 without any further action.

YES signals STAR EXEC to shorten messages to the user, to print only a reminder of needed input(s).

NO signals STAR EXEC to include extra phrases in messages to the user, to print a full request for needed input(s).

After a YES or NO response, STAR EXEC prints a request for the name of an MPE/3000 file:

To a STAR/3000 inexperienced user,
WHAT IS YOUR DATA FILE?
>

¹See HP 3000 Multiprogramming Executive Operating System (03000-90005).

²STAR/3000 uses one of three prompt characters, at various times:
> (greater than symbol), for a function module command or STAR/3000 parameters.
(number symbol), for a STAR/3000 command.
? (question mark), for data entries to the DATA module.

Detailed descriptions of STAR/3000 commands and parameters and function module commands appear later in this section.

To a STAR/3000 experienced user,

DATA FILE?

>

To point to an MPE/3000 file as the current data file, type *filename*². STAR EXEC then passes operation and the *filename* specification to the FILE module.

To create and point to a STAR/3000 temporary file, type the character * (asterisk); this directs STAR EXEC to pass operation to the DATA module instead of the FILE module (see DATA, later in this section).

After the FILE or the DATA module has returned operation to STAR EXEC, proceed to the instructions under "Issue STAR/3000 Commands."

In An MPE/3000 Job

To initiate STAR/3000 operation, submit ¹ an MPE/3000 command:

```
:STAR
  or
:STAR listfile
  or
:STAR *listfile
  or
:STAR, NOLIST
  or
:STAR listfile, NOLIST
  or
:STAR *listfile, NOLIST
```



Include *listfile*² to direct STAR/3000 reports to a non-standard list device, or include **listfile* to "back-reference" (see MPE/3000 command :FILE) a user pre-defined file. If neither *listfile* or **listfile* is included, STAR/3000 reports appear on \$STDLIST, the standard list device of the MPE/3000 system in use.

¹In a job, all inputs are submitted through the batch input device (card reader, tape unit, etc.).

²See HP 3000 Multiprogramming Executive Operating System (03000-90005).

Include NOLIST to specify that STAR/3000 commands are not to be printed. If NOLIST is not included, STAR/3000 commands are printed as they are read, on the list device to be used for STAR/3000 reports.

No messages or requests to the user are printed in a job. Instead, STAR EXEC requires the first record submitted (after the MPE/3000 command to initiate STAR/3000 operation) to be a STAR/3000 command record #DATA or #FILE (as described later in this section); then any other STAR/3000 commands can be used.

ISSUE STAR/3000 COMMANDS

In A Session

STAR EXEC prints a request whenever it expects a STAR/3000 command:

To a STAR/3000 inexperienced user,

```
WHICH PROCEDURE DO YOU WISH TO USE?  
#
```

To a STAR/3000 experienced user,

```
WHICH PROCEDURE  
#
```

Type an appropriate STAR/3000 command, using the instructions for function modules later in this section; signal the end of any command by striking the RETURN (or equivalent) key.

STAR EXEC or a function module may find a functional error (for example, the DATA module did not find enough file space available, or an erroneous input was detected). An error message is printed and, if recovery is possible, a request for correction is printed. See Section IV, "STAR/3000 Errors."

If wanted, type HELP as the response to a # or > prompt character. An explanatory message appropriate to the STAR/3000 function in use is printed.

If wanted, a STAR/3000 report sequence can be interrupted by use of the BREAK (or equivalent) key; but be sure to consider the following: The current data file pointer may be to a STAR/3000 temporary file (by use of the DATA module). Do *not* issue an MPE/3000 User Command :ABORT after the interruption; that data will be lost.

If wanted, type TERM as the response to a function module command prompt character > to terminate operation in the STAR/3000 module in use. Operation returns to STAR EXEC which then requests another STAR/3000 command.

To terminate all STAR/3000 operations, use the FINISH module instructions.

In A Job

All commands in a job are submitted in records to be read by the batch input device of the MPE/3000 system in use. If that device is a card reader, each card is a record; if the device is a tape unit, each record is read from tape; etc. Each STAR/3000 command record must begin with a prompt character, as described in the following pages. If parameters are required for a given STAR/3000 command, they must be included in the command record or submitted in the next record. If a separate parameters record is used, it must *not* begin with a prompt character.

STAR EXEC or a function module may find a functional error (for example, the DATA module did not find enough file space available, or an erroneous input was detected). An error message is printed on the list device in use for STAR/3000 reports and STAR/3000 operation is aborted; operation returns to MPE/3000. See Section IV, "STAR/3000 Errors."

To terminate all STAR/3000 operations, use the FINISH module instructions.

FILE

Purpose: Specify that the data to be analyzed is stored in an MPE/3000 file. See NOTE below.

Command Formats:

Session: FILE
FILE *filename*

Job: #FILE
#FILE *filename*

Operation: In a session:

If a *filename* is not included in the FILE command, a request is printed:

To a STAR/3000 inexperienced user,

WHAT IS YOUR FILE NAME?

>

To a STAR/3000 experienced user,

FILE NAME?

>

Type a *filename*.

Operation: In a job:

If a *filename* is not included in the #FILE command record, submit one in the next record. Do not include a prompt character in the first position of a *filename* record.

NOTE: Before a FILE command is issued, the current data file pointer may be to a STAR/3000 temporary file (by use of the DATA module). If so, the FILE module destroys that pointer and releases the MPE/3000 file space occupied by that file to other use; the data is lost. In a job, the user must prevent such a loss by using the SAVE module before using the FILE module. In a session, STAR/3000 protects against such a loss by printing the question:

FILE (cont.)

To a STAR/3000 inexperienced user,

DO YOU WANT TO SAVE YOUR CURRENT DATA FILE?

>

To a STAR/3000 experienced user,

SAVE

>

Type YES or NO. YES passes operation to the SAVE module (use the SAVE instructions, later in this section) then returns operation to the FILE module. NO continues operation in the FILE module.

DATA

Purpose: Specify that the data to be analyzed is to be typed on the keyboard terminal, or is to be read by the job batch input device. See NOTE on the last page of these DATA descriptions.

Command Formats:

Session: DATA
DATA *v*, *o*

Job: #DATA
#DATA *v*, *o*
where *v* specifies the number of variables to be entered and *o* specifies the number of cases (sets of observations, each set containing one observation for each variable).

Operation: In a session:

If *v* and *o* are not included in the DATA command, a request is printed:

To a STAR/3000 inexperienced user,

```
ENTER NUMBER OF VARIABLES AND OBSERVATIONS  
>
```

To a STAR/3000 experienced user,

```
VARIABLES AND OBSERVATIONS  
>
```

Type two integer numbers, one for the number of variables and one for the number of cases (sets of observations, each set containing one observation for each variable).

When DATA is ready to receive data entries, a request is printed:

To any STAR/3000 user,

```
ENTER DATA  
?
```

DATA (cont.)

Data Entry Instructions:

Type data entries for o rows of v observation values. Separate the second and later data entries for each row from the previous entry by a comma and follow the last entry for each row with a semi-colon. Use more than one line if needed, but keep all digits of an observation value in one line. Here are format examples for $v = 6$ and $o = 2$:

In one line: 3.14,4.25,5.67,9,6.57,3.5;1.35E4,2.3E3,3.E4,7,6,5;

In two lines: 3.14,4.25,5.67,9,6.57,3.5;
1.35E4,2.3E3,3.E4,7,6,5;

In four lines: 3.14,4.25,5.67,
9,6.57,3.5;
1.35E4,2.3E3,3.E4,
7,6,5;

Or, use any combination of the above format examples.

If needed, fewer cases (sets of observations) than specified for the number of observations (o) can be entered for data. At any point in a series of data entries, terminate the series by these steps:

1. Strike the RETURN (or equivalent) key; the ? prompt character is printed at the beginning of the next line.
2. Type TERM.

If the above steps are used within the first row of data entries, error messages are printed:

NO DATA ON FILE

FATAL ERROR: STAR OPERATION TERMINATED

and STAR/3000 operation is aborted.

The above data entry termination steps can be used within any row after the first complete row. If so, all data already entered for that interrupted row is discarded; the data for all rows already completed is retained intact.

DATA (cont.)

Operation: In a job:

If *v, o* is not included in the #DATA command record, submit that pair of parameters in the next record. Do *not* include a prompt character in the first position of a parameters record.

Submit data entries in one or more records after the #DATA *v, o* command record (or after the *v, o* parameters record). Use the Data Entry Instructions given above for a session; each data entry record corresponds to a typed line (72 characters maximum). Do *not* include a prompt character in any data entry record.

NOTE: Before a DATA command is issued, the current data file pointer may be to a STAR/3000 temporary file (by a prior use of the DATA module). If so, the DATA module destroys that pointer and releases the MPE/3000 file space occupied by that file to other use; the data is lost. In a job, the user must prevent such a loss by using the SAVE module before using the DATA module again. In a session, STAR/3000 protects against such a loss by printing the question:

To a STAR/3000 inexperienced user,

DO YOU WANT TO SAVE YOUR CURRENT DATA FILE?

>

To a STAR/3000 experienced user,

SAVE

>

Type YES or NO. YES passes operation to the SAVE module (use the SAVE instructions, later in this section) then returns operation to the DATA module. NO continues operation in the DATA module.

SAVE

Purpose: Save the current data file as an MPE/3000 file under any *filename* acceptable to MPE/3000.

Command Formats:

Session: SAVE
SAVE *filename*
SAVE *filename*, T
SAVE *filename*, P

Job: #SAVE
#SAVE *filename*
#SAVE *filename*, T
#SAVE *filename*, P

where T specifies the MPE/3000 temporary file domain and P specifies the permanent file domain; if neither is specified, SAVE assumes T as the default specification. If a *filename* is not specified, see "Operation," below.

Operation: In a session:

If a *filename* is not included in the SAVE command, a request is printed:

To a STAR/3000 inexperienced user,

WHAT NAME AND DOMAIN DO YOU WISH TO USE?
>

To a STAR/3000 experienced user,

NAME AND DOMAIN
>

Type a *filename* in one of the three formats defined above.

Operation: In a job:

If a *filename* is not included in the SAVE command record, submit one in the next record in one of the three formats defined above. Do *not* include a prompt character in the first position of a *filename* record.

PRINT

Purpose: Print the entire data matrix contained in the current data file, each row horizontally and each column vertically.

Command Formats:

Session: PRINT

Job: #PRINT

EDIT

Purpose: Make changes to the current data, using the EDIT commands described below.

Command Formats:

Session: EDIT

Job: #EDIT

Operation: In a session:

EDIT operation begins when a request is printed:

To a STAR/3000 inexperienced user,

ENTER EDIT COMMAND

>

To a STAR/3000 experienced user,

COMMAND

>

Type an EDIT command from the following list:

AROW *n*

to add *n* cases (observation sets) to the end of the current data file; *n* is any integer number that does not increase the total number of cases to more than 32,767. Then begin on the next line to type the new observation values; use the Data Entry Instructions given for the DATA module.

COPY

to copy the current data file into a new MPE/3000 file then point to that file as the current data file. Before this module is placed into operation, the current data file pointer may be to a STAR/3000 temporary file (by recent use of the DATA module). If so, this COPY function destroys that pointer and releases the MPE/3000 file space occupied by that file to other use; the original data is lost. To protect against such a loss, a request is printed:

To a STAR/3000 inexperienced user,

DO YOU WANT TO SAVE YOUR CURRENT DATA FILE?

>

EDIT (cont.)

To a STAR/3000 experienced user,

SAVE

>

Type YES or NO. YES passes operation to the SAVE module (use the SAVE instructions, earlier in this section) then returns operation to this point. NO continues operation at this point. The copy is made and the pointer is changed.

DROW r or DROW r_1, r_2

to delete case (observation set) r or cases r_1 through r_2 from the current data file; r, r_1 and r_2 are any row numbers existing in the data matrix.¹

NOTE: If DROW is used more than once, delete the higher numbered cases first, to avoid renumbering errors.

For example:

DROW 12, 15 (row 16 becomes row 12, etc.)

DROW 8, 10 (row 11 becomes row 8, etc.)

LROW r or LROW r_1, r_2

to list (print) all of case (observation set) r , or of cases r_1 through r_2 ; r, r_1 and r_2 are any row numbers existing in the data matrix.¹

ROBS r, c

to replace the observation value r for variable c ; r is any row number and c is any column number existing in the data matrix. Type the new observation value on the next line.

RROW r or RROW r_1, r_2

to replace all of case (observation set) r , or all of cases r_1 through r_2 ; r, r_1 and r_2 are any row numbers existing in the data matrix.¹ Then begin on the next line to type the new observation values; use the Data Entry Instructions given for the DATA module.

TERM

to terminate the EDIT process and return operation to STAR EXEC.

NOTE: If any of the above EDIT commands are typed without the required parameter(s) (n, r, r_1 or r_2), an appropriate request is printed.

¹The parameter r_2 can be an asterisk, to specify "through the end of the data matrix".

EDIT (cont.)

Operation: In a job:

Submit EDIT commands in records that conform to the rules for typed EDIT commands, given above. Each record corresponds to a typed line (72 characters maximum); do *not* include a prompt character as the first character of any EDIT command record or any new data record.

NOTE: To avoid the loss of data described above for the COPY function, use the SAVE module before using the EDIT module in a job.

TRANSFORM

Purpose: Transform all observation values of one or more variables to a specific modification, using the TRANSFORM commands described below.

Command Formats:

Session: TRANSFORM
TRANSFORM t, v
TRANSFORM $7, v, n$

Job: #TRANSFORM
where t, v and n are described below.

Operation: In a session:

If t, v or $7, v, n$ are not included in the TRANSFORM command, a request is printed:

To a STAR/3000 inexperienced user,

```
ENTER TRANSFORMATION, VARIABLE PAIR  
>
```

To a STAR/3000 experienced user,

```
TRANSFORMATION, VARIABLE  
>
```

Type one or more TRANSFORM command, variable pairs (each pair on a separate line) in the format t, v or $7, v, n$; where:

t is a TRANSFORM command number in the range [1,6], as defined below.

v is either the number of a variable, or ALL for all variables, in the data matrix.

n is the integer scale factor (power of ten) wanted for TRANSFORM command 7, defined below.

1, v

to obtain the reciprocal ($1/x$) for each observation value x of variable v or of all variables.

2, v

to obtain e^x (raise the Naperian base e to the x power) for each observation value x of variable v or of all variables.

TRANSFORM (cont.)

3, v

to obtain $\ln(x)$ (the natural logarithm of x) for each observation value x of variable v or of all variables.

4, v

to obtain $\log_{10}(x)$ (the base 10 logarithm of x) for each observation value x of variable v or of all variables.

5, v

to obtain the square root of x for each observation value x of variable v or of all variables.

6, v

to obtain the nearest integer to x for each observation value x of variable v or of all variables.

7, v , n

to obtain $10^n \bullet x$ for each observation value x of variable v or of all variables; if n is not included in the TRANSFORM command 7, v , a request is printed:

ENTER SCALE FACTOR

>

Type any integer scale factor value needed.

TERM

to terminate the TRANSFORM process and return operation to STAR/3000.

Operation: In a job:

Submit TRANSFORM command record(s), one command per record, using one of the following formats:

TRANS = t , VAR = v , or TRANS = t , VAR = ALL or

(for command 7):

TRANS = 7, VAR = v , SCALE = n or TRANS = 7, VAR = ALL, SCALE = n

where t , v and n are as defined above for a session. Do *not* include a prompt character in any TRANSFORM command record.

ELEMSTAT

Purpose: Report the elementary statistics (MEAN, STANDARD DEVIATION, STANDARD ERROR OF THE MEAN, VARIANCE, KURTOSIS, SKEWNESS, MINIMUM, MAXIMUM, and RANGE) of one or more variables. Mathematical definitions are given in *HP Scientific Library (03000-90010)*.

Command Formats:

Session: ELEMSTAT
ELEMSTAT v_1, v_2, \dots, v_n
ELEMSTAT ALL

Job: #ELEMSTAT
where v_1 through v_n are the numbers of any variables in the data matrix.

Operation: In a session:

If v_1 through v_n or ALL are not included in the ELEMSTAT command, a request is printed:

To a STAR/3000 inexperienced user,

WHICH VARIABLE(S) DO YOU WISH TO PROCESS?
>

To a STAR/3000 experienced user,

WHICH VARIABLE(S)
>

Type ALL or the number(s) of one or more variables existing in the data matrix; separate the second and later numbers from each previous number by a comma.

Operation: In a job:

Submit ALL or the number(s) of one or more variables, in a record immediately following the #ELEMSTAT command record. Use the rules for typed entries given above for a session; the variable number(s) record corresponds to a typed line (72 characters maximum). Do *not* include a prompt character in the variable numbers record.

FREQUENCY

Purpose: Report the one-way frequency distribution of the observations of a variable, within specified ranges. The report lists the value ranges specified and the absolute, relative and cumulative frequencies of observations within each of those ranges.

Command Formats:

Session: FREQUENCY
FREQUENCY *v*

Job: #FREQUENCY
where *v* is the number of any variable in the data matrix.

Operation: In a session:

If *v* is not included in the FREQUENCY command, a request is printed:

To a STAR/3000 inexperienced user,

WHICH VARIABLE DO YOU WISH TO PROCESS?
>

To a STAR/3000 experienced user,

WHICH VARIABLE
>

Type the number of any variable in the data matrix. Then another request is printed:

To a STAR/3000 inexperienced user,

HOW MANY INTERVALS DO YOU WISH?
>

To a STAR/3000 experienced user,

HOW MANY INTERVALS
>

Type an appropriate integer in the allowable range [1,100]. Then another request is printed:

To any STAR/3000 user,

ENTER INTERVAL BOUNDARY POINTS
>

FREQUENCY (cont.)

Type $i + 1$ floating-point (type REAL) values, where i is the integer just specified for the number of intervals. The values can be typed in any order and the increment between values does not have to be constant. Separate the second and later values from each previous value by a comma.

NOTE: If any value is typed twice, the second entry is not used, but the number of intervals i is reduced by 1 (to maintain the relationship $i + 1$).

Use more than one line to type the interval boundary point values if needed, but keep all digits of a value in one line. Here are format examples for $i = 11$:

In one line: -3,-2,-1,0,1,2,3,4,5,6,7

In two lines: -3,-2,-1,0,
1,2,3,4,5,6,7

In four lines: -3,-2,-1,
0,1,2,
3,4,5,
6,7

Or, use any combination of the above format examples.

After FREQUENCY has finished printing its report, another request is printed:

To a STAR/3000 inexperienced user,

DO YOU WANT A HISTOGRAM?

>

To a STAR/3000 experienced user,

HISTOGRAM?

>

Type YES or NO. YES passes operation and all the parameters just used by FREQUENCY to the HISTOGRAM module; after that module has finished its report, operation returns to STAR EXEC. NO returns operation directly to STAR EXEC.

FREQUENCY (cont.)

Operation: In a job:

Submit a variable number and a number of intervals specification in the record immediately following the #FREQUENCY command record, using the format:

VAR = *v*, INT = *i*

where *v* is the number of any variable in the data matrix and *i* is any appropriate integer in the range [1,100]. Then, in the next record(s), submit the interval boundary point values wanted, using the rules given above for typed entries in a session; each record corresponds to a typed line (72 characters maximum). Do *not* include a prompt character in any parameters record.

If a histogram is wanted, submit a record containing the parameter HISTOGRAM immediately after the last parameters record. Do *not* include a prompt character as the first character of such a HISTOGRAM record. After FREQUENCY has finished its report, operation and the parameters just used by FREQUENCY are passed to the HISTOGRAM module; after that report is finished operation returns to STAR EXEC. If a parameter HISTOGRAM record is not presented, after FREQUENCY has finished its report, operation returns directly to STAR EXEC.

EXAMPLE:

```
#FREQUENCY
VAR=8, INT=6
10,30.65,50,71.30,90,111.95,130
HISTOGRAM
```

HISTOGRAM

Purpose: Print a distribution bar graph (a histogram) of the observations of a variable, within specified ranges. The report is a graphical representation of the frequency of observations within the specified ranges.

Command Formats:

Session: HISTOGRAM
HISTOGRAM *v*

Job: #HISTOGRAM
where *v* is the number of any variable in the data matrix.

Operation: In a session:

Operation can be passed to this module "automatically" from the FREQUENCY module (see "FREQUENCY," earlier in this section). If so, no further commands are given; the parameters just used by FREQUENCY are used by HISTOGRAM.

Or, a HISTOGRAM command can be issued as defined above. In such a case, if *v* is not included with the HISTOGRAM command, request is printed:

To a STAR/3000 inexperienced user,

WHICH VARIABLE DO YOU WISH TO PROCESS?
>

To a STAR/3000 experienced user,

WHICH VARIABLE
>

Type the number of any variable in the data matrix. Then another request is printed:

To a STAR/3000 inexperienced user,

HOW MANY INTERVALS DO YOU WISH?
>

To a STAR/3000 experienced user,

HOW MANY INTERVALS
>

Type an appropriate integer in the allowable range [1,100]. Then another request is printed:

HISTOGRAM (cont.)

To any STAR/3000 user,

ENTER INTERVAL BOUNDARY POINTS

>

Type $i + 1$ floating-point (type REAL) values, where i is the integer just specified for the number of intervals. The values can be typed in any order and the increment between values does not have to be constant. Separate the second and later values from each previous value by a comma.

NOTE: If any value is typed twice, the second entry is not used, but the number of intervals i is reduced by 1 (to maintain the relationship $i + 1$).

Use more than one line to type the interval boundary point values if needed, but keep all digits of a value in one line. Here are format examples for $i = 11$:

In one line: -3,-2,-1,0,1,2,3,4,5,6,7

In two lines: -3,-2,-1,0,
1,2,3,4,5,6,7

In four lines: -3,-2,-1,
0,1,2,
3,4,5,
6,7



Or, use any combination of the above format examples.

Operation: In a job:

Operation can be passed to this module "automatically" from the FREQUENCY module (see "FREQUENCY," earlier in this section). If so, no further commands are given; the parameters just used by FREQUENCY are used by HISTOGRAM.

Or, a #HISTOGRAM command can be submitted as defined above. In such a case, submit a variable number and a number of intervals in the record immediately following the #HISTOGRAM command record, using the format:

VAR = v , INT = i

HISTOGRAM (cont.)

where v is the number of any variable in the data matrix and i is any appropriate integer in the range $[1,100]$. Then, in the next record(s), submit the interval boundary point values wanted, using the rules given above for typed entries in a session; each record corresponds to a typed line (72 characters maximum). Do *not* include a prompt character in any parameters record.

PLOT

Purpose: Plot a scatter diagram (an X—Y graph) of the relationship between two variables.

Command Formats:

Session: PLOT
PLOT *h, v, p*

Job: #PLOT
where *h* is the number of the variable to be plotted in the horizontal axis, *v* is the number of the variable to be plotted on the vertical axis and *p* is the character to be used as the plot symbol.

Operation: In a session:

If *h, v, p* are not included in the PLOT command, a request is printed:

To a STAR/3000 inexperienced user,

ENTER X (HORIZONTAL) AND Y (VERTICAL) VARIABLES
>

To a STAR/3000 experienced user,

VARIABLES
>

Type the numbers of two variables existing in the data matrix; separate the numbers by a comma. Then another request is printed:

To a STAR/3000 inexperienced user,

SPECIFY A PLOT SYMBOL
>

To a STAR/3000 experienced user,

PLOT SYMBOL
>

Type any character wanted.

PLOT (cont.)

Operation: In a job:

Submit two variable numbers and a plot symbol in the record following the #PLOT command record using the format:

$$X = h, Y = v, \text{CHAR} = p$$

where h , v and p are as defined above. Do *not* include a prompt character in the first position of this record.

CORRELATE

Purpose: Report the product-moment correlation coefficients, mean deviation and standard deviation of all variables in the data matrix.

Command Formats:

Session: CORRELATE

Job: #CORRELATE

Operation: In a session:

After the report is finished, a request is printed:

To a STAR/3000 inexperienced user,

DO YOU WISH TO PERFORM REGRESSION NOW?

>

To a STAR/3000 experienced user,

REGRESSION

>

Type YES or NO. YES passes operation to the REGRESSION module with an advantage: REGRESSION does not have to re-compute the factors just produced by CORRELATE. NO returns operation to STAR EXEC.

Operation: In a job:

No further commands are required for the CORRELATE module. Note, however, an advantage is available: if the next record after the #CORRELATE command is a parameter REGRESSION, the REGRESSION module does not have to re-compute the factors just produced by CORRELATE. Do *not* include a prompt character in the first position of a parameter REGRESSION record; then use the instructions for REGRESSION, later in this section.

EXAMPLE:

```
#CORRELATE  
REGRESSION  
DEP=7,8,9, IND=12,13,14,17, PRINT
```

REGRESSION

Purpose: Report the multiple linear regression coefficients and related statistics for a specified set of independent variables versus a specified set of dependent variables.

Command Formats:

Session: REGRESSION

Job: #REGRESSION

Operation: In a session:

REGRESSION operation begins when a request is printed:

To a STAR/3000 inexperienced user,

SPECIFY THE DEPENDENT VARIABLE(S)

>

To a STAR/3000 experienced user,

DEPENDENT

>

Type the number(s) of one or more variables; separate the second and later numbers from each previous number by a comma. Then another request is printed:

To a STAR/3000 inexperienced user,

SPECIFY THE INDEPENDENT VARIABLE(S)

>

To a STAR/3000 experienced user,

INDEPENDENT

>

Type the number(s) or one or more variables, using the same rules given above for the dependent variable number(s).

REGRESSION (cont.)

After the REGRESSION report is finished, another request is printed:

To a STAR/3000 inexperienced user,

DO YOU WISH TO PRINT RESIDUALS?

>

To a STAR/3000 experienced user,

RESIDUALS?

>

Type YES or NO. YES passes operation to the residuals report; after that report, operation either returns to the REGRESSION report (if more than one dependent variable was specified) or passes to the request described in the next paragraph (if only one dependent variable was specified). NO bypasses the RESIDUALS report; operation either returns to the next REGRESSION report (if more than one dependent variable was specified) or passes to the request described in the next paragraph (if only one dependent variable was specified).

After the REGRESSION report (or residuals report) for the final dependent variable is finished, another request is printed:

To a STAR/3000 inexperienced user,

DO YOU WISH TO PERFORM MORE REGRESSION NOW?

>

To a STAR/3000 experienced user,

MORE

>

Type YES or NO. YES returns operation to the beginning of REGRESSION operations (and avoids the need to re-compute correlation coefficients); NO returns operation to STAR EXEC.

REGRESSION (cont.)

Operation: In a job:

Submit numbers of dependent and independent variables (and, if wanted, a request PRINT to print residuals) in record(s) immediately following the #REGRESSION command record (or the parameter REGRESSION record), using one of these formats:

$$\text{DEP} = d_1, d_2, \dots, d_n; \quad \text{IND} = i_1, i_2, \dots, i_m$$

or

$$\text{DEP} = d_1, d_2, \dots, d_n; \quad \text{IND} = i_1, i_2, \dots, i_m; \quad \text{PRINT}$$

where d_1 through d_n are dependent variable number(s), i_1 through i_m are independent variable numbers; m and n can be any number of entries wanted.

NOTE: The three elements (DEP =, IND = and PRINT) can be specified in any order; use the rules given above for typed entries in a session. Each record corresponds to a typed entry (72 characters maximum). Do not include a prompt character in any parameters record.

Operation in the REGRESSION module continues until all parameters records have been processed, then operation returns to STAR EXEC.

FINISH

Purpose: Terminate STAR/3000 operations and return operation to MPE/3000. See NOTE below.

Command Formats:

Session: FINISH

Job: #FINISH

NOTE: The current data file pointer may be to a STAR/3000 temporary file (by use of the DATA module). If so, the FINISH module destroys that pointer and releases the MPE/3000 file space occupied by that file to other uses; the data is lost. In a job, the user must prevent such a loss by using the SAVE module before using the FINISH module. In a session, STAR/3000 protects against such a loss by printing the question:

To a STAR/3000 inexperienced user,

DO YOU WANT TO SAVE YOUR CURRENT DATA FILE?

>

To a STAR/3000 experienced user,

SAVE

>

Type YES or NO. YES passes operation to the SAVE module (use the SAVE instructions, earlier in this section) then returns operation to the FINISH module. NO continues operation in the FINISH module. Operation then returns to MPE/3000.

CAUTION: Do not log off MPE/3000 without considering the following: At log off time all files created in the MPE/3000 temporary file domain are discarded; the data is lost. To retain the contents of those files, use the MPE/3000 file management command :SAVE.



SECTION III

STAR/3000 Examples

This section presents samples of various STAR/3000 reports.

Each report has a unique format; those formats are the same regardless of the list device used. However, one difference occurs between STAR/3000 operation within a session and a job: In a session, STAR/3000 commands and parameters always appear with the reports; in a job, STAR/3000 commands and parameters appear with the reports if NOLIST has *not* been specified with the MPE/3000 command to initiate STAR/3000 operation.

The following samples were generated in an MPE/3000 job, with NOLIST *not* specified. Each STAR/3000 function module was used at least once:

DATA accepted five cases for four variables; PRINT listed the values in orderly format; SAVE saved that data in an MPE/3000 file DEMO1.

FILE pointed to DEMO2, an MPE/3000 file of 113 cases for 42 variables, taken from a medical study. This data was used for all other reports in this demonstration.

ELEMSTAT obtained a cursory examination of variable 1; EDIT listed cases 62 through 64, changed observation 63 for variable 1, listed case 63 again; then ELEMSTAT examined variables 1 and 7.

TRANSFORM obtained $\ln(x)$ for each observation value x of variable 7; then ELEMSTAT examined variables 1, 7 and 8 which were deemed ready for further analyses.

PLOT produced a scatter diagram of variable 7 versus variable 1.

FREQUENCY reported the distribution of observations for variable 8 in six intervals, then in 25 intervals; HISTOGRAM then used the same parameters for 25 intervals to print its report.

CORRELATE made calculations and printed a report for all variables; then REGRESSION produced two series of reports, one series for dependent variables 7, 8 and 9 and independent variables 12, 13, 14 and 17 and the other series for dependent variables 1, 2 and 3 and independent variables 19, 20, 21 and 24. Residuals were reported.

FINISH terminated STAR/3000 operations.

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#DATA

4,5

3,6,10,8;2.3,3.1,6.2,4.5;.5,.7,.6,.6;23,20,22,27;4,5,6,9;

#PRINT

ROW	1	2	3	4
1	3.00000	6.00000	10.0000	8.00000
2	2.30000	3.10000	6.20000	4.50000
3	.500000	.700000	.600000	.600000
4	23.0000	20.0000	22.0000	27.0000
5	4.00000	5.00000	6.00000	9.00000

#SAVE DEMO1
#FILE DEMO2
#ELEMSTAT 1

		VARIABLE #	1		
MEAN	632.65	STD DEV.	88.243	STD ERROR	8.3012
VARIANCE	7786.9	KURTOSIS	1.0434	SKEWNESS	-.99814
MINIMUM	315.00	MAXIMUM	758.00	RANGE	443.00

#EDIT
LROW 62,64

ROW	1	2	3	4	5
62	598.000	63.0000	177.000	1.00000	1.00000
63	315.000	47.0000	155.000	2.00000	3.00000
64	638.000	38.0000	163.000	2.00000	1.00000
ROW	6	7	8	9	10
62	4.00000	115.000	97.0000	78.0000	85.0000
63	4.00000	103.000	81.0000	78.0000	66.0000
64	4.00000	144.000	82.0000	105.000	63.0000
ROW	11	12	13	14	15
62	181.000	180.000	115.000	148.000	361.000
63	180.000	164.000	141.000	110.000	374.000
64	175.000	183.000	169.000	120.000	258.000
ROW	16	17	18	19	20
62	.000000E+00	395.000	254.000	152.000	470.000
63	.000000E+00	262.000	178.000	122.000	430.000
64	.000000E+00	440.000	229.000	137.000	420.000
ROW	21	22	23	24	25
62	1.00000	598.000	63.0000	177.000	1.00000
63	1.00000	660.000	47.0000	155.000	2.00000
64	1.00000	638.000	38.0000	163.000	2.00000
ROW	26	27	28	29	30
62	1.00000	4.00000	103.000	72.0000	62.0000
63	3.00000	4.00000	62.0000	43.0000	88.0000
64	1.00000	4.00000	119.000	75.0000	118.000
ROW	31	32	33	34	35
62	56.0000	118.000	180.000	254.000	93.0000
63	33.0000	121.000	165.000	290.000	36.0000
64	56.0000	80.0000	158.000	326.000	67.0000
ROW	36	37	38	39	40
62	191.000	235.000	699.000	219.000	148.000
63	146.000	.000000E+00	401.000	162.000	106.000
64	168.000	17.0000	450.000	229.000	119.000
ROW	41	42			
62	290.000	2.00000			
63	310.000	2.00000			
64	360.000	2.00000			

ROBS 63.1
243
LROW 63

ROW	1	2	3	4	5
63	243.000	47.0000	155.000	2.00000	3.00000
ROW	6	7	8	9	10
63	4.00000	103.000	81.0000	78.0000	66.0000
ROW	11	12	13	14	15
63	180.000	164.000	141.000	110.000	374.000
ROW	16	17	18	19	20
63	.000000E+00	262.000	178.000	122.000	430.000
ROW	21	22	23	24	25
63	1.00000	660.000	47.0000	155.000	2.00000
ROW	26	27	28	29	30
63	3.00000	4.00000	62.0000	43.0000	88.0000
ROW	31	32	33	34	35
63	33.0000	121.000	165.000	290.000	36.0000
ROW	36	37	38	39	40
63	146.000	.000000E+00	401.000	162.000	106.000
ROW	41	42			
63	310.000	2.00000			

#ELEMSTAT 1,7

VARIABLE # 1					
MEAN	632.01	STD DEV.	90.781	STD ERROR	8.5399
VARIANCE	8241.1	KURTOSIS	2.2524	SKEWNESS	-1.2165
MINIMUM	243.00	MAXIMUM	758.00	RANGE	515.00

VARIABLE # 7					
MEAN	106.25	STD DEV.	30.683	STD ERROR	2.8864
VARIANCE	941.46	KURTOSIS	-.65865	SKEWNESS	-.87315E-02
MINIMUM	26.000	MAXIMUM	171.00	RANGE	145.00

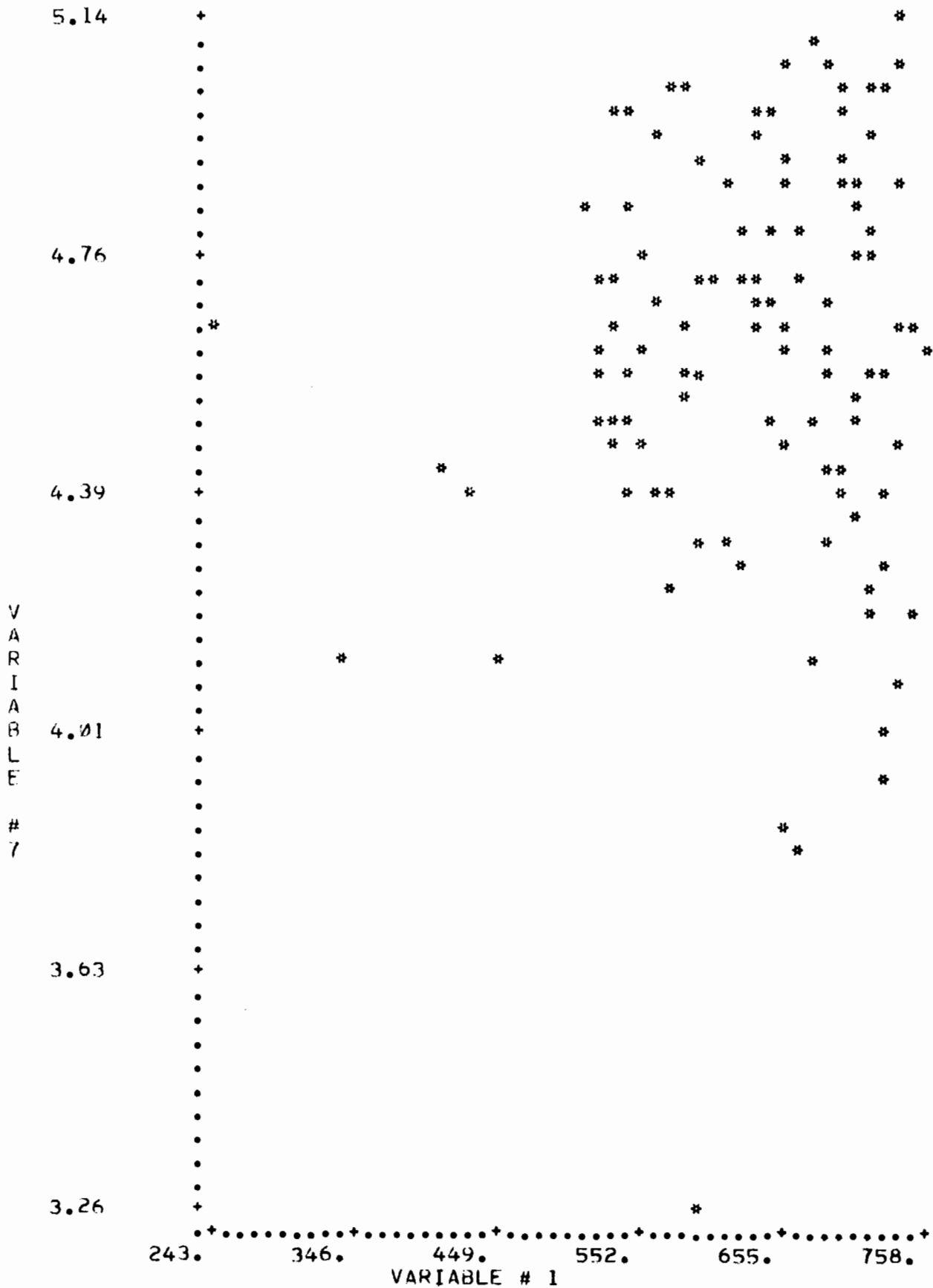
#TRANSFORM
VAR=7, TRANS=3
#ELEMSTAT 1,7,8

VARIABLE # 1					
MEAN	632.01	STD DEV.	90.781	STD ERROR	8.5399
VARIANCE	8241.1	KURTOSIS	2.2524	SKEWNESS	-1.2165
MINIMUM	243.00	MAXIMUM	758.00	RANGE	515.00

VARIABLE # 7					
MEAN	4.6186	STD DEV.	.32332	STD ERROR	.30415E-01
VARIANCE	.10453	KURTOSIS	1.6490	SKEWNESS	-.94582
MINIMUM	3.2581	MAXIMUM	5.1417	RANGE	1.8836

VARIABLE # 8					
MEAN	73.434	STD DEV.	21.993	STD ERROR	2.0689
VARIANCE	483.68	KURTOSIS	-.45828	SKEWNESS	.75271E-01
MINIMUM	15.000	MAXIMUM	124.00	RANGE	109.00

#PLOT X=1,Y=7,CHAR=#



#FREQUENCY
 VAR=8, INT=6
 10,30.65,50,71.30,90,111.95,130

VARIABLE # 8

	RANGE -----	ABSOLUTE FREQUENCY -----	RELATIVE FREQUENCY -----	CUMULATIVE FREQUENCY -----
.....	10.0	0	.000000E+00	.000000E+00
10.0	- 30.7	2	1.76991	1.76991
30.7	- 50.0	14	12.3894	14.1593
50.0	- 71.3	38	33.6283	47.7876
71.3	- 90.0	34	30.0885	77.8761
90.0	- 112.	20	17.6991	95.5752
112.	- 130.	5	4.42478	100.000
130.	0	.000000E+00	100.000

#FREQUENCY
 VAR=8,INT=25
 5,10,15,20,25,30,35,
 40,45,50,55,60,70,65,
 75,80,85,90,95,100,105,
 110,115,120,125,130

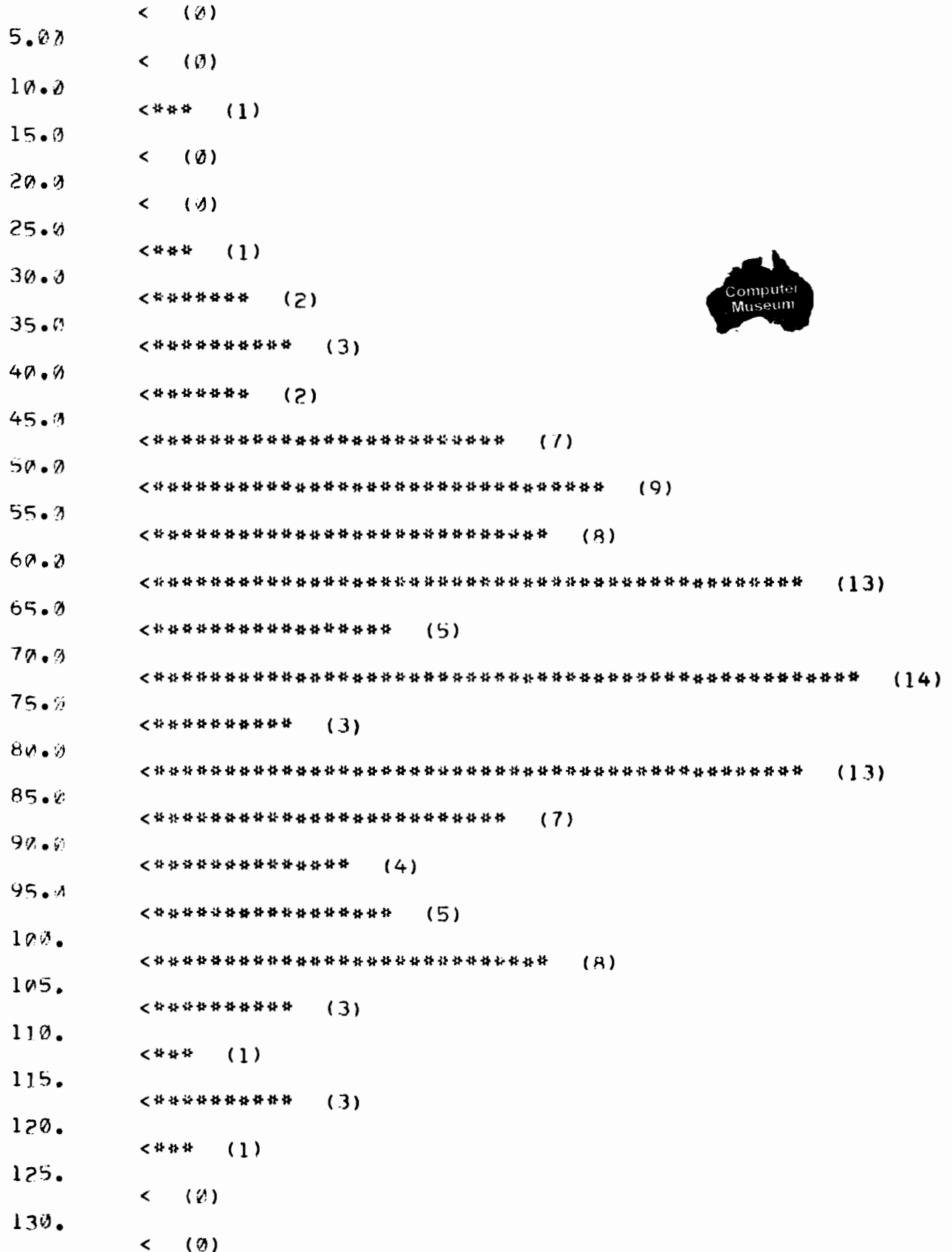
VARIABLE # 8

	RANGE	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY	CUMULATIVE FREQUENCY
	-----	-----	-----	-----
.....	5.00	0	.000000E+00	.000000E+00
5.00	- 10.0	0	.000000E+00	.000000E+00
10.0	- 15.0	1	.884956	.884956
15.0	- 20.0	0	.000000E+00	.884956
20.0	- 25.0	0	.000000E+00	.884956
25.0	- 30.0	1	.884956	1.76991
30.0	- 35.0	2	1.76991	3.53982
35.0	- 40.0	3	2.65487	6.19469
40.0	- 45.0	2	1.76991	7.96460
45.0	- 50.0	7	6.19469	14.1593
50.0	- 55.0	9	7.96460	22.1239
55.0	- 60.0	8	7.07965	29.2035
60.0	- 65.0	13	11.5044	40.7080
65.0	- 70.0	5	4.42478	45.1328
70.0	- 75.0	14	12.3894	57.5221
75.0	- 80.0	3	2.65487	60.1770
80.0	- 85.0	13	11.5044	71.6814
85.0	- 90.0	7	6.19469	77.8761
90.0	- 95.0	4	3.53982	81.4159
95.0	- 100.	5	4.42478	85.8407
100.	- 105.	8	7.07965	92.9204
105.	- 110.	3	2.65487	95.5752
110.	- 115.	1	.884956	96.4602
115.	- 120.	3	2.65487	99.1150
120.	- 125.	1	.884956	100.000
125.	- 130.	0	.000000E+00	100.000
130.	0	.000000E+00	100.000

HISTOGRAM

0 2.8 5.6 8.4 11.2 14.0

+.....+.....+.....+.....+.....+



113 OBSERVATIONS

#CORRELATE
CORRELATION COEFFICIENTS

VARIABLE NUMBER	1	2	3	4	5
1	1.0000	-.13065	.12662	-.76740E-01	-.25891E-
2	-.13065	1.0000	-.19883	-.10179	.12574
3	.12662	-.19883	1.0000	-.62741	-.31151
4	-.76740E-01	-.10179	-.62741	1.0000	.19892
5	-.25891E-	.12574	-.31151	.19892	1.0000
↓	↓	↓	↓	↓	↓
40	-.85127E-01	.90445	-.19883	-.15411	-.29844
41	-.70791E-01	.43564E-01	.18445	-.16410	-.29687
42	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+
MEAN	632.01	54.628	164.83	1.4779	1.7611
STD DEV	90.781	16.597	9.2726	.50174	.97536

VARIABLE NUMBER	6	7	8	9	10
1	-.36740E-01	.46325E-01	.36938E-01	.11283	-.80555E-
2	-.78173E-01	-.18217	-.26912	-.30550E-01	-.30382
3	.00000	.23789	.00000	.15950	.28404
⋮	⋮	⋮	⋮	⋮	⋮
41	.37738E-01	.41275E-01	-.24248	.14928	⋮
42	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+
MEAN	200.96	77.522	540.89	206.42	105.35
STD DEV	97.279	135.99	133.01	85.442	20.166

VARIABLE NUMBER	41	42
1	-.70791E-01	.00000E+00
2	.43564E-01	.00000E+00
3	.18445	.00000E+00
4	-.16410	.00000E+00
5	-.29687	.00000E+00
6	↓	↓
↓	.23663	.00000E+00
34	-.16611E-01	.00000E+
35	.47355E-01	.00000E+00
36	.37738E-01	.00000E+00
37	.41275E-01	.00000E+00
38	-.24248	.00000E+00
39	.14928	.00000E+00
40	.65750	.00000E+00
41	1.0000	.00000E+00
42	.00000E+00	1.0000
MEAN	304.74	2.0000
STD DEV	57.599	.00000E+00

REGRESSION
 DEP=7,8,9, IND=12,13,14,17, PRINT

REGRESSION OUTPUT. Y = VARIABLE # 9

IND. VARIABLE	B	BETA	STD. ERROR	T-DIST.
12	-.11429	-.73900E-01	.15449	-.73981
13	.12685E-02	.63113E-02	.29265E-01	.43344E-01
14	-.92163E-01	-.15221	.68186E-01	-1.3517
17	-.33275E-01	-.17117	.25381E-01	-1.3110

Y INTERCEPT: 149.02
 MULTIPLE R: .21683
 SSR: 4616.3
 SSE: 93576.
 S: 29.435
 F: 1.3320

RESIDUAL TABLE. Y = VARIABLE # 9

OBS. NUMBER	Y-OBSERVED	Y-ESTIMATED	RESIDUAL	STANDARD RESIDUAL
1	95.000	103.69	-8.6908	-.29525
2	76.000	104.24	-28.243	-.95949
3	76.000	103.63	-27.630	-.93866
4	188.00	113.57	74.426	2.5285
5	100.00	101.98	-1.9763	-.67140E-01
6	102.00	103.10	-1.0959	-.37231E-01
7	73.000	101.62	-28.618	-.97224
8	97.000	100.34	-3.3400	-.11347
9	78.000	106.50	-28.505	-.96838
10	110.00	106.45	3.5481	.12054
11	114.00	105.45	8.5470	.29037
12	130.00	07.03	22.975	.78051
13		.792	-2.7910	-.94846E-01
		.29		
		.20		
		.3		
102	97.000	103.69	-8.6908	-.29525
103	126.00	113.57	74.426	2.5285
104	87.000	101.98	-1.9763	-.67140E-01
105	111.00	103.10	-1.0959	-.37231E-01
106	118.00	101.62	-28.618	-.97224
107	140.00	100.34	-3.3400	-.11347
108	112.00	106.50	-28.505	-.96838
109	102.00	106.45	3.5481	.12054
110	112.00	105.45	8.5470	.29037
111	127.00	07.03	22.975	.78051
112	136.00	.792	-2.7910	-.94846E-01
113	58.000	.29		

REGRESSION OUTPUT, Y = VARIABLE # 8

IND. VARIABLE	B	BETA	STD. ERROR	T-DIST.
12	.18081	.15740	.11214	1.6123
13	.23069E-01	.15453	.21244E-01	1.0859
14	-.30839E-01	-.68571E-01	.49496E-01	-.62306
17	-.35435E-01	-.24541	.18424E-01	-1.9233

Y INTERCEPT: 57.416
 MULTIPLE R: .29963
 SSR: 4863.6
 SSE: 49308.
 S: 21.367
 F: 2.6632

RESIDUAL TABLE, Y = VARIABLE # 8

ORBS. NUMBER	Y-OBSERVED	Y-ESTIMATED	RESIDUAL	STANDARD RESIDUAL
1	88.000	60.972	27.028	1.2649
2	115.00	78.018	36.982	1.7308
3	101.00	72.769	28.231	1.3213
4	83.000	78.677	4.3231	.20232
5	65.000	72.865	-7.8652	-.36810
6	59.000	79.301	-20.301	-.95011
7	67.000	81.212	-14.212	-.66513
8	65.000	71.282	-6.2823	-.29402
9	97.000	77.587	19.413	.90854
10	101.00	68.363	32.637	1.5274
11	129.00	71.082	37.918	1.7746
12	80.000	78.716	1.2839	.60089E-01
13	74.000	72.105	.8953	.88703E-01
↓	82.000	84.000	.779	-.97246E-01
↓	↓	↓	↓	1.0724
99	↓	↓	↓	↓
100	104.00	73.773	30.227	↓
101	59.000	68.859	-9.8595	-.46143
102	53.000	75.279	-22.279	-1.0427
103	73.000	78.993	-5.9929	-.28047
104	50.000	71.369	-21.369	-1.0001
105	94.000	86.623	7.3766	.34523
106	85.000	71.612	13.388	.62656
107	89.000	75.093	13.907	.65087
108	68.000	68.831	-.83104	-.38893E-01
109	44.000	66.547	-22.547	-1.0552
110	46.000	71.617	-25.617	-1.1989
111	124.00	85.981	18.019	.84330
112	61.000	62.499	-1.4987	-.70140E-01
113	37.000	72.141	-35.141	-1.6446

REGRESSION OUTPUT. Y = VARIABLE # 7

IND. VARIABLE	R	BETA	STD. ERROR	T-DIST.
12	.28356E-02	.16791	.16489E-02	1.7197
13	.41600E-03	.18955	.31235E-03	1.3318
14	-.60247E-03	-.91121E-01	.72775E-03	-.82785
17	-.38656E-03	-.18210	.27090E-03	-1.4270

Y INTERCEPT: 4.2830
 MULTIPLE R: .29920
 SSR: 1.0481
 SSE: 10.660
 S: .31417
 F: 2.6547

RESIDUAL TABLE. Y = VARIABLE # 7

OBS. NUMBER	Y-OBSERVED	Y-ESTIMATED	RESIDUAL	STANDARD RESIDUAL
1	4.7362	4.4238	.31242	.99443
2	5.0039	4.7014	.30254	.96299
3	4.9836	4.6481	.33556	1.0681
4	4.6728	4.6637	.90847E-02	.28917E-01
5	4.9488	4.6003	.34843	1.1091
6	4.7362	4.7182	.18035E-01	.57406E-01
7	4.7185	4.7550	-.37393E-01	-.11902
8	4.5539	4.56	-.13982E-01	-.44505E-01
9	5.0370	4	.35741	1.1376
10	4.9273	↓	.379	1.1261
11	4.9836	↓	-	1.3294
12	↓	↓	↓	↓
13	↓	↓	↓	↓
14	↓	↓	↓	↓
15	↓	↓	↓	↓
16	↓	↓	↓	↓
17	↓	↓	↓	↓
18	↓	↓	↓	↓
19	↓	↓	↓	↓
20	↓	↓	↓	↓
21	↓	↓	↓	↓
22	↓	↓	↓	↓
23	↓	↓	↓	↓
24	↓	↓	↓	↓
25	↓	↓	↓	↓
26	↓	↓	↓	↓
27	↓	↓	↓	↓
28	↓	↓	↓	↓
29	↓	↓	↓	↓
30	↓	↓	↓	↓
31	↓	↓	↓	↓
32	↓	↓	↓	↓
33	↓	↓	↓	↓
34	↓	↓	↓	↓
35	↓	↓	↓	↓
36	↓	↓	↓	↓
37	↓	↓	↓	↓
38	↓	↓	↓	↓
39	↓	↓	↓	↓
40	↓	↓	↓	↓
41	↓	↓	↓	↓
42	↓	↓	↓	↓
43	↓	↓	↓	↓
44	↓	↓	↓	↓
45	↓	↓	↓	↓
46	↓	↓	↓	↓
47	↓	↓	↓	↓
48	↓	↓	↓	↓
49	↓	↓	↓	↓
50	↓	↓	↓	↓
51	↓	↓	↓	↓
52	↓	↓	↓	↓
53	↓	↓	↓	↓
54	↓	↓	↓	↓
55	↓	↓	↓	↓
56	↓	↓	↓	↓
57	↓	↓	↓	↓
58	↓	↓	↓	↓
59	↓	↓	↓	↓
60	↓	↓	↓	↓
61	↓	↓	↓	↓
62	↓	↓	↓	↓
63	↓	↓	↓	↓
64	↓	↓	↓	↓
65	↓	↓	↓	↓
66	↓	↓	↓	↓
67	↓	↓	↓	↓
68	↓	↓	↓	↓
69	↓	↓	↓	↓
70	↓	↓	↓	↓
71	↓	↓	↓	↓
72	↓	↓	↓	↓
73	↓	↓	↓	↓
74	↓	↓	↓	↓
75	↓	↓	↓	↓
76	↓	↓	↓	↓
77	↓	↓	↓	↓
78	↓	↓	↓	↓
79	↓	↓	↓	↓
80	↓	↓	↓	↓
81	↓	↓	↓	↓
82	↓	↓	↓	↓
83	↓	↓	↓	↓
84	↓	↓	↓	↓
85	↓	↓	↓	↓
86	↓	↓	↓	↓
87	↓	↓	↓	↓
88	↓	↓	↓	↓
89	↓	↓	↓	↓
90	↓	↓	↓	↓
91	↓	↓	↓	↓
92	↓	↓	↓	↓
93	↓	↓	↓	↓
94	↓	↓	↓	↓
95	↓	↓	↓	↓
96	↓	↓	↓	↓
97	5.0000	4.6495	.232	↓
98	4.7005	4.6580	.40459	↓
99	3.8712	4.6783	.22192E-01	↓
100	4.8283	4.5281	-.65692	↓
101	4.4188	4.5885	-2.0910	↓
102	4.3567	4.5885	.76328	↓
103	4.6444	4.5600	.44916	↓
104	4.4773	4.6154	-.82327	↓
105	5.0039	4.6154	-.24082	↓
106	4.7449	4.7200	-.24082	↓
107	4.8828	4.5704	-.93111E-01	↓
108	4.4998	4.5704	-.29637	↓
109	4.2195	4.8034	.20050	↓
110	4.0775	4.5805	.16439	↓
111	5.0304	4.6251	.25774	↓
112	4.7185	4.5131	-.13266E-01	↓
113	4.0073	4.5146	-.29514	↓
114		4.5465	-.46891	↓
115		4.8024	-.42225E-01	↓
116		4.4765	-.93944	↓
117		4.6182	-.42225E-01	↓
118			-.42225E-01	↓
119			-.42225E-01	↓
120			-.42225E-01	↓
121			-.42225E-01	↓
122			-.42225E-01	↓
123			-.42225E-01	↓
124			-.42225E-01	↓
125			-.42225E-01	↓
126			-.42225E-01	↓
127			-.42225E-01	↓
128			-.42225E-01	↓
129			-.42225E-01	↓
130			-.42225E-01	↓
131			-.42225E-01	↓
132			-.42225E-01	↓
133			-.42225E-01	↓
134			-.42225E-01	↓
135			-.42225E-01	↓
136			-.42225E-01	↓
137			-.42225E-01	↓
138			-.42225E-01	↓
139			-.42225E-01	↓
140			-.42225E-01	↓
141			-.42225E-01	↓
142			-.42225E-01	↓
143			-.42225E-01	↓
144			-.42225E-01	↓
145			-.42225E-01	↓
146			-.42225E-01	↓
147			-.42225E-01	↓
148			-.42225E-01	↓
149			-.42225E-01	↓
150			-.42225E-01	↓
151			-.42225E-01	↓
152			-.42225E-01	↓
153			-.42225E-01	↓
154			-.42225E-01	↓
155			-.42225E-01	↓
156			-.42225E-01	↓
157			-.42225E-01	↓
158			-.42225E-01	↓
159			-.42225E-01	↓
160			-.42225E-01	↓
161			-.42225E-01	↓
162			-.42225E-01	↓
163			-.42225E-01	↓
164			-.42225E-01	↓
165			-.42225E-01	↓
166			-.42225E-01	↓
167			-.42225E-01	↓
168			-.42225E-01	↓
169			-.42225E-01	↓
170			-.42225E-01	↓
171			-.42225E-01	↓
172			-.42225E-01	↓
173			-.42225E-01	↓
174			-.42225E-01	↓
175			-.42225E-01	↓
176			-.42225E-01	↓
177			-.42225E-01	↓
178			-.42225E-01	↓
179			-.42225E-01	↓
180			-.42225E-01	↓
181			-.42225E-01	↓
182			-.42225E-01	↓
183			-.42225E-01	↓
184			-.42225E-01	↓
185			-.42225E-01	↓
186			-.42225E-01	↓
187			-.42225E-01	↓
188			-.42225E-01	↓
189			-.42225E-01	↓
190			-.42225E-01	↓
191			-.42225E-01	↓
192			-.42225E-01	↓
193			-.42225E-01	↓
194			-.42225E-01	↓
195			-.42225E-01	↓
196			-.42225E-01	↓
197			-.42225E-01	↓
198			-.42225E-01	↓
199			-.42225E-01	↓
200			-.42225E-01	↓

DEP=1,2,3, IND=19,20,21,24, PRINT

REGRESSION OUTPUT. Y = VARIABLE # 3

IND. VARIABLE	B	BETA	STD. ERROR	T-DIST.
19	-.17671E-02	-.48383E-02	.28832E-02	-.61288
20	.94246E-03	.79336E-02	.93862E-03	1.0041
21	.00000E+00	.00000E+00	.00000E+00	.00000E+00
24	.99996	.99950	.19246E-02	519.57

Y INTERCEPT: -.10184
 MULTIPLE R: .99980
 SSR: 9626.0
 SSE: 3.8203
 S: .18808
 F: 68031.

RESIDUAL TABLE. Y = VARIABLE # 3

OBS. NUMBER	Y-OBSERVED	Y-ESTIMATED	RESIDUAL	STANDARD RESIDUAL
1	165.00	165.01	-.11810E-01	-.62795E-01
2	171.00	171.03	-.33936E-01	-.18043
3	175.00	175.04	-.40253E-01	-.21402
4	157.00	157.05	-.51056E-01	-.27146
5	177.00	177.04	-.44281E-01	-.23544
6	178.00	177.99	.99487E-02	.52897E-01
7	185.00	184.99	.84839E-02	.45108E-01
8	169.00	169.05	-.48767E-01	-.25929
9	155.00	155.03	-.29327E-01	-.15593
10	168.00	167.99	.80000E-01	.44297E-01
11	↓	152.01	↓	-.973E-01
		178.01		↑
		164.99	↓	↓
	168.00	164.99	.569E-01	↓
99	161.00	164.99	.10498E-01	↓
100	170.00	164.99	-.42633E-01	-.22660
101	154.00	164.99	-.64026E-01	-.34042
102	161.00	164.99	.34241E-01	.18206
103	170.00	161.01	-.55237E-02	-.29369E-01
104	170.00	170.00	.76294E-03	.40565E-02
105	150.00	149.97	.33508E-01	.17816
106	170.00	170.04	-.43396E-01	-.23073
107	142.00	142.02	-.21057E-01	-.11196
108	161.00	161.01	-.78735E-02	-.41863E-01
109	165.00	165.02	-.18280E-01	-.97194E-01
110	165.00	165.02	-.24780E-01	-.13176
111	160.00	160.07	-.65033E-01	-.34578
112	168.00	167.99	.13641E-01	.72530E-01
113	163.00	163.04	-.41351E-01	-.21986
	163.00	163.00	.45776E-03	.24339E-02

REGRESSION OUTPUT. Y = VARIABLE # 2

IND. VARIABLE	B	BETA	STD. ERROR	T-DIST.
19	.14194	.21713	.25296	.56111
20	-.57957E-01	-.27258	.82349E-01	-.70380
21	.00000E+00	.00000E+00	.00000E+00	.00000E+00
24	-.34682	-.19368	.16885	-2.0540

Y INTERCEPT: 115.77
 MULTIPLE R: .21636
 SSR: 1444.2
 SSE: 29406.
 S: 16.501
 F: 1.3260

RESIDUAL TABLE. Y = VARIABLE # 2

OBS. NUMBER	Y-OBSERVED	Y-ESTIMATED	RESIDUAL	STANDARD RESIDUAL
1	68.000	54.880	13.120	.79512
2	37.000	51.888	-14.888	-.90226
3	50.000	50.335	-.33525	-.20317E-01
4	53.000	56.661	-3.6608	-.22185
5	75.000	49.488	25.512	1.5461
6	66.000	51.010	14.990	.90845
7	52.000	48.440	3.5598	.21574
8	68.000	51.576	16.424	.99532
9	73.000	57.863	15.137	.91734
10	53.000	54.738	-1.7382	-.10534
	64.000	59.542	4.458	.27016
	65.000	50.265		
	74.000	55		
97			10.925	.6622
98			-19.845	-1.2027
99	28.000	55.049	-27.049	-1.6392
100	21.000	51.419	-30.419	-1.8435
101	59.000	60.658	-1.6582	-.10049
102	63.000	56.433	6.5674	.39800
103	16.000	53.607	-37.607	-2.2791
104	62.000	61.377	.62283	.37745E-01
105	66.000	52.188	13.812	.83707
106	74.000	62.549	11.451	.69396
107	50.000	56.421	-6.4208	-.38912
108	68.000	55.246	12.754	.77290
109	75.000	54.016	20.984	1.2717
110	71.000	54.751	16.249	.98474
111	42.000	54.632	-12.632	-.76552
112	43.000	54.627	-14.627	-.88645
113	52.000	56.035	-4.0347	-.24451

REGRESSION OUTPUT. Y = VARIABLE # 1

IND. VARIABLE	B	BETA	STD. ERROR	T-DIST.
19	3.9800	1.1131	1.2956	3.0720
20	-1.5760	-1.3551	.42177	-3.7365
21	.00000E+00	.00000E+00	.00000E+00	.00000E+00
24	1.5672	.16000	.86482	1.8121

Y INTERCEPT: 468.23
 MULTIPLE R: .40529
 SSR: .15161E+06
 SSE: .77140E+06
 S: 84.514
 F: 5.3066

RESIDUAL TABLE. Y = VARIABLE # 1

OBS. NUMBER	Y-OBSERVED	Y-ESTIMATED	RESIDUAL	STANDARD RESIDUAL
1	517.00	640.73	-123.73	-1.4640
2	537.00	627.05	-90.049	-1.0655
3	546.00	629.66	-83.658	-.98988
4	563.00	606.23	-43.230	-.51152
5	562.00	628.97	-66.973	-.79245
6	629.00	676.06	-47.057	-.55680
7	634.00	683.05	-49.047	-.58035
8	583.00	596.22	-13.215	-.15637
9	585.00	613.91	-28.914	-.34213
10	594.00	668.67	-74.666	-.88347
11	630.00	624.17	5.8282	.68962E-01
12		624.64	-14.638	-.17320
↓		624.64	-4.21	-.5E-01
↓	691.00	644.00	27.00	.3115
98	646.00	645.00	.00	.00000
99	653.00	603.74	49.262	.58289
100	710.00	607.02	102.98	1.2185
101	697.00	673.62	23.376	.27659
102	706.00	638.12	67.884	.80323
103	744.00	660.02	83.980	.99368
104	535.00	646.89	-111.89	-1.3240
105	539.00	626.12	-87.123	-1.0309
106	602.00	597.04	4.9594	.58681E-01
107	617.00	638.28	-21.276	-.25175
108	704.00	653.47	50.534	.59794
109	712.00	617.01	94.995	1.1240
110	740.00	587.29	152.71	1.8069
111	718.00	664.21	53.795	.63652
112	527.00	614.99	-87.992	-1.0412
113	724.00	649.05	74.950	.88684

#FINISH

END OF STAR OPERATION

SECTION IV

STAR/3000 Errors

Errors detected during STAR/3000 operations are of two general types: those found by STAR/3000 itself (by STAR EXEC or a function module) and those found by either another HP 3000 software element or a hardware element.

STAR/3000 ERRORS IN A SESSION

In a session STAR/3000 reports errors found by printing message(s) on the interactive keyboard terminal. Then, if recovery from the error is possible, a request for user action is printed. Or, if recovery is not possible, STAR/3000 operation is aborted.

STAR/3000 ERRORS IN A JOB

In a job STAR/3000 reports errors found by printing message(s) on the list device in use for STAR/3000 reports (as defined when STAR/3000 operation was initiated). No recovery mechanism is provided; STAR/3000 operation is then aborted.

CAUTION: If STAR/3000 operation is aborted, in either a session or a job, do not log off MPE/3000 without considering the following: To do so would discard the contents of all files created in the MPE/3000 temporary file domain. To retain those contents, use the MPE/3000 file management command :SAVE.

All STAR/3000 error messages are described in the following table.

Table 4-1. STAR/3000 Errors

Message(s)	Source(s)/Description
DATA FILE I/O ERROR	
DATA	File system returned CCL ¹ on read.
EDIT	File system returned CCL ¹ on read or write.
FILE	File system returned CCL ¹ on read.
TRANSFORM	File system returned CCL ¹ on read or write.
DATA FILE EOF	
DATA	File system returned CCG ¹ on read.
EDIT	File system returned CCG ¹ on read or write.
FILE	File system returned CCG ¹ on read.
TRANSFORM	File system returned CCG ¹ on read or write.
DUPLICATE FILE NAME	
SAVE	This <i>filename</i> already exists.
ILLEGAL COMMAND	
STAR EXEC	Command not recognized.
ILLEGAL COMMAND FORMAT	
STAR EXEC	Command record does not begin with # (number sign).
ILLEGAL DATA ELEMENT	
FREQUENCY	One or more boundary point values entered has an illegal character.
HISTOGRAM	(Same as above.)
ILLEGAL FILE NAME	
FILE	The <i>filename</i> specified is not acceptable to MPE/3000.
SAVE	(Same as above.)
STAR EXEC ²	(Same as above.)
ILLEGAL KEYWORD	
FREQUENCY	Parameter record does not include VAR= or INT=.
HISTOGRAM	(Same as above.)
PLOT	Parameter record does not include X= or Y= or CHAR=.
REGRESSION	Parameter record does not include DEP= or IND=.
TRANSFORM	Parameter record does not include TRANS= or VAR= or (for command 7) SCALE=.

¹See HP 3000 Multiprogramming Operating System manual, (03000-90005).

²See "Initiate STAR/3000 Operation."

Table 4-1. STAR/3000 Errors (cont.)

Message(s)
Source(s)/Description

ILLEGAL PARAMETER

DATA	}	(Self-explanatory)
EDIT		
FREQUENCY		
HISTOGRAM		

ILLEGAL RESPONSE

CORRELATE	Type YES or NO, no other response is allowed.
FREQUENCY	(Same as above.)
REGRESSION	(Same as above.)
STAR EXEC	Type YES or NO or TERM, no other response is allowed.

ILLEGAL SUB-COMMAND

EDIT	The EDIT command is not recognized.
FREQUENCY	The record following the last parameter record for interval boundary point values is misspelled.

ILLEGAL TRANSFORMATION

TRANSFORM	The TRANSFORM command does not begin with an integer in the range [1,7].
-----------	--

ILLEGAL VARIABLE NUMBER

ELEMSTAT	The variable number specified does not exist in the data matrix.
FREQUENCY	(Same as above.)
HISTOGRAM	(Same as above.)
PLOT	(Same as above.)
REGRESSION	(Same as above.)
TRANSFORM	(Same as above.)

INSUFFICIENT DATA

FREQUENCY	Too few boundary point values have been entered.
HISTOGRAM	(Same as above.)

INSUFFICIENT FILE SPACE

DATA	Parameter for <i>v</i> and/or <i>o</i> would create a file too large for the file space available.
------	--

LESS THAN 2 OBSERVATIONS IN THE DATA FILE

CORRELATE	}	(Self-explanatory)
REGRESSION		

Table 4-1. STAR/3000 Errors (cont.)

Message(s)	Source(s)/Description
MISSING FILE OR DATA COMMAND	
STAR EXEC	The first STAR/3000 command must be #FILE or #DATA.
NEEDED STACK SPACE UNAVAILABLE	
CORRELATE ELEMSTAT REGRESSION STAR EXEC	} (Self-explanatory)
NO DATA ON FILE	
DATA	The command TERM was submitted within the first row of data entries; see the CAUTION on page 4-1.
NOT ENOUGH DATA FOR STATISTICS	
REGRESSION	The current data file does not contain $N > P + 1$, where N is the number of cases (sets of observations) and P is the number of independent variables specified.
ROW <i>nn</i> HAS AN ILLEGAL DATA ELEMENT	
DATA	One or more data values submitted has an illegal character; the entire row must be re-submitted.
ROW <i>nn</i> HAS INSUFFICIENT DATA	
DATA	Less than <i>v</i> observation values were submitted for this row number; the entire row must be re-submitted.
ROW <i>nn</i> HAS TOO MUCH DATA	
DATA	More than <i>v</i> observation values were submitted for this row; the entire row must be re-submitted.
SINGULAR MATRIX	
REGRESSION	The independent and dependent variables specified extracted a singular matrix from the correlation matrix; multiple linear regression is not available.

Table 4-1. STAR/3000 Errors (cont.)

Message(s)
Source(s)/Description

TOO MANY PARAMETERS

DATA	}	(Self-explanatory)
EDIT		
FILE		
FREQUENCY		
HISTOGRAM		
PLOT		
REGRESSION		
TRANSFORM		

TOO MUCH DATA

FREQUENCY	}	(Self-explanatory)
HISTOGRAM		

UNABLE TO ACCESS DATA FILE

FILE	Was unable to open the <i>filename</i> specified.
------	---

UNABLE TO ACCESS LIST FILE

STAR EXEC	Was unable to open the <i>listfile</i> specified (see "Initiate STAR/3000 Operation").
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