DISCLAIMER

Although each program has been tested by its contributor, no warranty, express or implied, is made by the contributor or 1620 USERS Group, as to the accuracy and functioning of the program and related program material, nor shall the fact of distribution constitute any such warranty, and no responsibility is assumed by the contributor or 1620 USERS Group, in connection therewith.

80-Series Multiple Linear Regression System

James N. Boles
Associate Professor
Department of Agricultural Economics
University of California
Berkeley 4, California

1620 Users Group Membership Code: 5076

Modifications or revisions to this program, as they occur, will be announced in the appropriate Catalog of Programs for IBM Data Processing Systems. When such an announcement occurs, users should order a complete new program from the Program Information Department.

80-SERIES MULTIPLE LINEAR REGRESSION SYSTEM

Table of Contents

Deck Key

	Deck number		Description	Sequence numbers
BASIC	1	80-1	Condensed object deck	
	2	80-2	Condensed object deck	
	3	80-3	Condensed object deck	
	4	80-4A	Condensed object deck	
	5	80-4B	Condensed object deck	
	6	80-4C	Condensed object deck	N.A.
	7	80-A	Condensed object deck	
	8	80-B	Condensed object deck	
	9	80-C	Condensed object deck	
	10	80-D	Condensed object deck	
	11	80-E	Condensed object deck	
	12	Sample problem deck		
OPTIONAL	13	80-1	SPSII Source deck	00010-05150
	14	80-2	SPSII Source deck	05160-11600
	15	80-3	SPSII Source deck	11610-14100
	16	80-4A	SPSII Source deck	14000-23790
	17	80-4B	SPSII Source deck	00010-09150
	18	80-4C	SPSII Source deck	00010-08560
	19	80-A	SPSII Source deck	00010-03090
	20	80-B	SPSII Source deck	00010-04300
	21	80-C	SPSII Source deck	00010-04570
	22	80-D	SPSII Source deck	00010-09890
	23	80-E	SPSII Source deck	00010-08350

The first card of each of the 23 decks is a "hash total" card (punched by the IBM 1620 library program, 1.6.031). The hash totals are given on the next page. The hash total cards for object decks 1 through 11 do not interfere with loading and need not be removed. They should be removed from decks 12 through 23 prior to use.

Optional material will be forwarded only upon special request.

	Hash Total	Deck Number
EQUAL	4619062606406934826J	1
EQUAL	7346149242656783481H	2
EQUAL	8941247296212462747G	3
EQUAL	0440825345102592544E	4
EQUAL	9801815785232229213H	5
EQUAL	8518120390079187668B	6
EQUAL	271760517900188042300	7
EQUAL	5643157880863689959B	8
EQUAL	837469426998481829AT	9
EQUAL	828352842850534391H4	10
EQUAL	3623988362804704764T	11
EQUAL	5332560741668060950H	12
EQUAL	293813232263131921255	13
EQUAL	264954022446399115367	14
EQUAL	190093657673914215OT	15
EQUAL	814898744549798827688	16
EQUAL	77837403318404022108	17
EQUAL	685564085971926522H4	18
EQUAL	546177923969409729395	19
EQUAL	6383955665921642286H	20
EQUAL	264520805494843151255	21
EQUAL	607500379543862571G7	22
EQUAL	855157628475356373B2	23

1620 USERS GROUP LIBRARY
PROGRAM ABSTRACT

1. TITLE (If subroutine, state in Title): 80-Series Multiple Linear Regression System

2. Author; Organization: James N. Boles, Associate Professor, Department of Agricultural Economics, University of California, Berkeley.
Date: January 2, 1964 Users Group Membership Code: 5076

3. Direct Inquiries to Name: James N. Boles, Department of Agricultural Economics, University of California, Berkeley Phone: THornwall 5-6000 3349

4. Description/Purpose: (5. Method; 6. Restriction/Range; When Applicable)
This system solves the general multiple linear regression problem. By means of a variety of transformations, it may also be used to fit curved surfaces to data points providing only that the function representing the surface be linear in its parameters. Three alternative forms of regression are: (a) stepwise, (b) multiple dependent variable, and (c) alternate dependent variable. The system is quite flexible as to input and output. Options are selected mainly by control card. Complete residual or error analysis is provided.

7. Specifications (Check or fill in appropriate spaces):
a. Storage used by program: 13,400
b. Equipment required by program:
Card System X ; Magnetic Tape System ____; No. of Tapes ____;

Paper Tape System ____; Disk File System ____; No. of Packs ____;

TNS, TNF, MF ___; Auto divide X ; Indirect addressing ___; Floating point hardware ____;

Other (specify) ____

Can program be used on lesser Machine? Yes . Specify which requirements can be easily removed Recompile with subroutine deck without automatic divide feature.
c. Programming type (Check appropriate spaces):

Fortran without Format ____; Fortran with Format ____;

Fortran II ___; Mainline, Complete ___; Subroutine or function subprogram(S or F) ____;

Is the program a library (ie, SPS) function to the Fortran system checked? ____;

SPS ____; SPS - 1620/1710 X ;

Mainline, Complete X ; Macro ____; Subroutine ____;

Other programming language: ____; Give details ____

d. Language used in the writeup: English

8. Additional Remarks: Allocation of memory is made by the program for each problem. The programs are independent of memory size. For 20, 40, and 60 K memories, approximately 30, 65, and 85 variables may be used.

Notes to Users

1. The input subroutine used by 80-1 and 80-2 is located from 00892 to 01974. It is initialized when 80-1 is in core. Several cards of the object 80-2 have been deleted so that the initialization is not disturbed as 80-2 loads. The gap appears between cards loading into 00840 and 01716 (see page 410).

2. The object decks have been condensed by a routine similar to squeez. The first six and the last four cards serve as program loader and contain the add and multiply tables. The remaining cards have a standard format. The first five columns contain a flagged address to which the digits starting in column 8 will be transmitted. Columns 6 and 7 contain a flagged number indicating how many digits are to be transmitted. Programs 80-1, B, C, D, and E are preceded by a two card memory clear routine. All object decks are preceded by a hash total card that does not interfere with loading.

3. Programs 1 through 4 are designed to operate sequentially with no halt. Each of these programs end with a simulated "load," read numeric card into zero, and branch to zero.

4. Program 80-D proceeds by setting up an alphameric card image and then either types or punches the card image. In order to transmit the record mark as well as other data, the flag has been removed from the flagged zero at 08424 following OUTPUT.

I. DESCRIPTION OF PROGRAMS AND FUNCTIONS

The 80-Series Multiple Linear Regression System is the current result of a long series of revisions starting basically with Stepwise Multiple Linear Regression Analysis for the IBM 1620 (card), 6.0.007 (now withdrawn), written by Don Wyman. The basic mathematical method is given in:

> M. A. Efroymsen, "Multiple Regression Analysis," Mathematical Methods for Digital Computers, ed. A. Ralston and H. Wilf (New York: John Wiley and Sons, 1960), Chap. 17, pp. 191-203.

Perhaps a general description of certain features of the system is in order.

1. Input. A flexible input routine is provided. Under format control, cards are read with field widths ranging from 1 to 14 digits. The cards are read alphamerically so that explicit decimals may or may not be used. Contrary to Fortran, the format description overrides the explicit decimal. Negative numbers are indicated by an explicit minus sign appearing somewhere in the field. Format control also allows card columns to be skipped. The maximum number of card columns to be read per card can also be specified.
2. Transformations. A rather complete set of transformations is provided, including all the floating point arithmetic subroutines provided in the SPS II library.
3. Memory Allocation. A single reference address is defined, and memory allocation is then computed for each problem. This allows great flexibility in optimizing the use of memory. In other words, if the problem is of rather simple structure, involving few formats, transformations, etc., a greater portion of the memory is made available for data storage. This feature also makes the system usuable without modification for memory sizes from 20 to 60 K.

4. Extensive use is made of programmed subroutines, thus making it possible and easy to rearrange and recompile for different purposes.
5. Contrary to most input routines for regression analysis, either one-pass input or two-pass input is available on option. In one-pass input, the data are read only once, forming the sums and sums of products. From these, the "large" variance-covariance matrix, "large" standard deviations, means, standard deviations, and simple correlation coefficients are computed: M = number of observations.

   a. "Large" covariance.

   $$L_{ij} = \sum_m X_{im} X_{jm} - \frac{1}{M} \left(\sum_m X_{im}\right)\left(\sum_m X_{jm}\right)$$

   b. "Large" standard deviation.

   $$L_i = \sqrt{L_{ii}}$$

   c. Arithmetic mean.

   $$\overline{X}_i = \frac{1}{M} \sum_m X_{im}$$

   d. Standard deviation.

   $$S_i = \frac{1}{\sqrt{M}} L_i$$

   e. $$r_{ij} = \frac{L_{ij}}{L_i L_j}$$

Using one-pass input, however, with 8-significant-digit floating point arithmetic, may cause the loss of significant digits.

Two-pass input, on the other hand, reads the data once to form sums and means and then reads the data the second time to form the "large" variance-covariance matrix, automatically subtracting means before forming the sums of products.

$$L_{ij} = \sum_m (X_{im} - \overline{X}_i)(X_{jm} - \overline{X}_j).$$

Two-pass input takes more time but does result in a more accurate correlation matrix and does make available for punching and later use the "large" variance-covariance matrix. An experiment was run using zero-fill and nine-fill to determine the relative accuracy of the one- versus two-pass procedure. On the average, correlation coefficients using the two-pass method had about 1.5 more significant digits.

6. Matrix Inversion. A matrix inversion routine has been adapted from Strap, 6.0.004 (now withdrawn), that requires only an upper triangular matrix. The correlation matrix is used in order to start with numbers ranging in magnitude between -1 and +1 and thus to improve the accuracy of inversion.

7. Regression Form. Three alternative forms of linear multiple regression are provided:

   a. Stepwise. In this form there is a single dependent variable. A stepwise method of matrix inversion is used so that at each iteration the program selects the particular independent variable to add that will cause the greatest reduction in the unexplained variance of the dependent variable. Values of FIN and FOUT may be entered so that the program will select variables for inclusion providing the associated F level is greater than FIN and select variables to delete providing the associated F level is less than FOUT.

      The purpose of the stepwise procedure is to automatically select a subset of the independent variables such that their associated coefficients will be statistically significant at some preselected level of significance. In this particular

application, and considering one variable at a time, the T random variable is equivalent to $\sqrt{F}$. Thus, the selection of FOUT = 4.0 is equivalent to the selection of a critical value of T = 2.0. The actual level of significance associated with a critical value of F or T depends also on the degrees of freedom (DF) which, in turn, is equal to the number of observations minus the number of parameters estimated (including the constant term).

A test is made at each iteration so that no independent variable is selected for inclusion if its diagonal element in the correlation matrix is smaller than 0.001. This value implies a very high degree of multiple correlation between the variable in question and the already included independent variables, that is, an R^2 greater than 0.999.

   b. Multiple Dependent Variable Regression. Here the problem is to compute the regression statistics for a subset of the variables regressed against the remaining subset of variables. Thus, for example, when regressing the second, fifth, and eighth variables against the first, third, fourth, sixth, and seventh, three separate regression equations and their associated statistics are computed.

      The technique used here to select the independent variable to add is to aggregate the variance reduction for each of the dependent variables and select the independent variable that causes the greatest reduction in the aggregate.

   c. Alternate Dependent Variable Regression. Here all variables are treated symmetrically. The entire matrix of correlation coefficients is inverted and regression statistics computed for each

specified dependent variable regressed against the remaining set of N-1 variables. In order for this method to work, all variables used must be linearly independent.

8. Most of the options are indicated on a parameter card. Sense switches are used only to select printing of input and/or transformed data and to halt computation. Printing of input data is done only for one or two observations to see if the data are entering properly after which the switches are turned off.

9. Contrary to most regression programs, the location of dependent variables is arbitrary. A record of one-digit fields is used in which a zero indicates an excluded independent variable, a one indicates an included independent variable, and a record mark, ‡ , indicates a dependent variable.

10. In stepwise and multiple dependent variable regression, if one or more independent variables is excluded, an option is provided whereby this excluded variable may be regressed against the included set of independent variables.

11. If, by chance or error, one of the variables is constant and thus has a zero "large" variance, the zero value is replaced by one so that no attempt will be made to divide by zero while computing the correlation matrix. Computation continues, but this variable will not enter into the regression.

12. If perfect multiple correlation is obtained, the standard error of the dependent variable is zero. When this happens, the standard error of the coefficient is zero and the T ratio is not computed.

13. If the number of parameters estimated (including the constant term) is equal to the number of observations, the degrees of freedom (DF) are equal to zero, and the standard error of estimate is zero. A test is

made to see if DF = 0.0. If it is, the normal computation of $S_{Y.X}$ is not performed since it involves division by DF. This situation can arise only if the number of observations equals or is less than the number of variables (including the dependent variable).

14. Convenient output is provided, complete with alphabetical headings and explicit decimals. This output is either provided for on the typewriter or is punched for 80 x 80 listing. On option, almost all typewriter output can be suppressed.

15. Complete residual analysis is available.

16. Provision is made for reloading (a) sums and sums of products or (b) means, standard deviations, and the correlation matrix. At load time, variables can be deleted and/or sets of data from subgroups can be aggregated. There are two alternative methods for aggregating subgroups: one which corresponds to fitting a regression function to a set of subgroups such that all regression coefficients are forced to be the same for each subgroup and the second such that the constant terms are allowed to vary from one subgroup to another.

For simplicity, assume that there are two subgroups: one consisting of 40 observations and the second of 60 observations. For the first method, both subgroups are analyzed separately, <u>using one-pass input</u>. Then the "sums" decks are aggregated by Program 80-A, and the regression results obtained are precisely those that would have been obtained by analyzing the whole set of 100 observations as one problem. This is so because the aggregation forms sums such as:

$$\sum_{t=1}^{40} X_t + \sum_{t=41}^{100} X_t = \sum_{t=1}^{100} X_t$$

and

$$\sum_{t=1}^{40} X_t Y_t + \sum_{t=41}^{100} X_t Y_t = \sum_{t=1}^{100} X_t Y_t .$$

The second method analyses the two subgroups using two-pass input. Here the sums of squares and products are in terms of deviations from the group means, $\bar{X}_1$, $\bar{Y}_1$, $\bar{X}_2$, and $\bar{Y}_2$.

In this case

$$\sum_{t=1}^{40} (X_t - \bar{X}_1)(Y_t - \bar{Y}_1) + \sum_{t=41}^{100} (X_t - \bar{X}_2)(Y_t - \bar{Y}_2) + \sum_{t=1}^{100} (X_t - \bar{X})(Y_t - \bar{Y}),$$

where $\bar{X}$ and $\bar{Y}$ are means of the entire set of 100 observations. In this case, all results, except the constant term, are appropriate for the regression model that allows for separate values of the constant terms in each subset but forces all other coefficients to be the same. The separate constant terms must be calculated by hand. In the simple case described above, $A_{01} = \bar{Y}_1 - B\bar{X}_1$, and $A_{02} = \bar{Y}_2 - B\bar{X}_2$.

17. On option, any of the regression forms can be forced through the origin.

A specific description of the programs and their functions follows.

80-1. Program 80-1 reads the header cards and initializes for either 80-2 or 80-A. It reads and flags the parameter cards and computes data addresses for the specific problem at hand.

80-2. Program 80-2 reads, floats, and stores the basic data; transforms the data; performs either one-pass or two-pass input; and forms sums and sums of products. On option, sums and sums of products are punched.

80-3. Program 80-3 forms means, standard deviations, and the upper triangular correlation matrix. On option, these statistics are punched.

80-4A. Program 80-4A performs stepwise multiple linear regression. On option, it punches the regression statistics for each iteration, punches the transformed correlation matrix, and reinverts and punches the reinverted matrix.

80-4B. Program 80-4B performs multiple dependent variable regression. It has similar options to 80-4A.

80-4C. Program 80-4C performs alternate dependent variable regression. It has similar options to 80-4A.

80-A. Program 80-A is used to load, delete and/or cumulate sums and sums of products or means, standard deviations, and correlation coefficients. It is followed by 80-3 and 4 if sums are loaded or by 80-4 if means are loaded.

80-B. Program 80-B is used to read, translate, and print on the typewriter in explicit decimal form any or all of the punched output from 80-2, 3, or 4.

oO-C. Program 80-C is used to read, translate, and punch in explicit decimal form any or all of the punched output from 80-2, 3, or 4.

80-D. Program 80-D is used to compute and print and/or punch residuals. If the dependent variable is in logarithmic form, this program, in option, computes the antilogs of the actual value, predicted value, and residual.

80-E. Program 80-E is used to check punching accuracy. It reads, floats, and stores the basic data; and it cumulates and prints the sums of the basic data and the sums of the transformed data.

II. DATA PREPARATION, 80-1 THROUGH 4

(Note: Sequence of header cards is given by flow chart on page 18.)

A. Alphameric Cards

One or more alphameric cards must be used. Alphameric cards are read and immediately listed on the typewriter and are normally used to describe the particular problem being solved. If no such typing is desired, a blank card may be used.

The program recognizes that another alphameric card follows by the presence of a record mark (0-2-8 multiple punch) in column 80. Consequently, the last alphameric card in a sequence must not have a record mark in column 80. All alphameric cards, except the last, must have a record mark in column 80.

For a particular card, listing on the typewriter continues until a record mark is encountered. Consequently, it is desirable to place a record mark immediately following the last alphameric character to be typed. Some cards may then have two record marks, one following the alphameric information and one in column 80.

There is no limit on the number of alphameric cards used.

B. One Parameter Card--No Flags Necessary

Columns	Description	Example
1- 6	Date.	013163
7- 8	Problem number.	02
9-13	NOBS, number of observations.	00031
14-16	NFORM, number of data formats.	035
17-19	INVAR, number of variables read.	046
20-22	NOVAR, number of locations needed to accommodate all variables during transformation. NOVAR $\geq$ N. NOVAR $\geq$ INVAR.	065

Columns	Description	Example
23-25	N, number of variables used in regression. If the load and delete option is selected, N must be the number of variables before deletion.	060
26-28	NDEP, number of dependent variables. Used only with ADV option.	014
29-31	NOTRAN, number of transformations.	015
32-34	NOCON, number of transformation constants.	012
35-36	NCOL, number of card columns read. If left blank, up to 76 columns will be read.	65
37-39	NELIM, number of variables eliminated. Used only with CON 16.	

Columns 40 through 57 are used to enter one-digit constants that designate options. All but column 55 are either 0 (blank) or 1.

Column	
40	CON 1. A one indicates a choice of stepwise regression.
41	CON 2. A one indicates a choice of multiple dependent variable regression.
42	CON 3. A one indicates a choice of alternate dependent variable regression.
	Note: Only one of the first three options should be used.
43	CON 4. A one indicates that FIN and FOUT are to be entered. These values are used only in stepwise regression. If they are not entered, FIN and FOUT are automatically set equal to zero. A zero or blank indicates no F values are read.
44	CON 5. A one indicates that two-pass input is selected. With two-pass input, the data are read first and, after transformation, the variables are summed and means computed. During the second pass of the data deck, the means are subtracted from the transformed variables, and sums of squares and cross products are formed of the residuals. If sums are punched, the sums-of-products matrix consists of large variances and covariances, $L_{ij} = \sum_m (X_{im} - \bar{X}_i)(X_{jm} - \bar{X}_j)$.

A zero or blank indicates one-pass input. The sums-of-products matrix is then

$$M_{ij} = \sum_m X_{im} X_{jm} .$$

Column

45 CON 6. A one indicates that weighted regression is used; a zero or blank that no weighting is required. If weights are used, the weight must be entered as an additional variable and, after transformation, it must occupy the (N+1)st position.

46 CON 7. A one indicates that the regression surface is forced to pass through the origin; a zero or blank indicates that forcing is not desired. This option is used only with one-pass input.

47 CON 8. A one indicates that typing of regression statistics is not wanted. A zero or blank will cause the regression statistics to be typed. In any case, at least the final regression statistics are punched and may be listed with Program 80-B or C.

48 CON 9. A one indicates that sums and sums of products are punched in internal floating point format. A zero or blank indicates that "sums" are not punched.

49 CON 10. A one indicates that means, standard deviations, and correlation matrix are punched in internal floating point format. A zero or blank indicates that "means" are not punched.

50 CON 11. A one indicates that "steps" are punched; a zero or blank that "steps" are not punched. This option is used only with the stepwise regression option.

51 CON 12. A one indicates that the transformed correlation matrix is punched in internal floating point format; a zero or blank indicates no punching.

52 CON 13. A one indicates that the transformed correlation matrix is reinverted and punched in internal floating point format; a zero or blank indicates no reinversion and punching.

Note: CON 14 and CON 15 are not used in the 80 Series.

Column

55 CON 16. A digit, M, indicates that the "load" option is selected and M sets of previously punched "sums" or "means" are to be cumulated. Normally, M is greater than one only when CON 17 is blank or zero; that is, the cumulation option is used only to aggregate sums and sums of products for subsets of data. With this option, it is possible to eliminate designated variables. A zero or blank indicates the load option is not used. CON 16 indicates the selection of the load option. Only if CON 16 is a digit will CON 17 be tested.

56 CON 17. A one indicates that previously punched means, standard deviations, and correlation matrix are to be loaded; a zero or blank indicates that previously punched sums and sums of products are to be loaded.

Note: This constant is tested only if CON 16 is a digit.

57 CON 18. A one indicates that if any independent variable is not used due to multicollinearity[1], it is regressed against the included set of independent variables; a zero or blank indicates that this option is not selected.

C. IND Card

This card is used only for stepwise or multiple dependent variable regression to denote the dependent variable (for stepwise regression) or dependent variable(s) for multiple dependent variable regression. Punch a record mark (0-2-8 multiple punch) in the column or columns corresponding to the dependent variable or variables. If the load and delete option is used, the variables are renumbered sequentially after deletion and the record mark or marks should be located relative to the new indexes.

D. IDD Card(s)

This card is used only with alternate dependent variable regression. Starting with columns 1 and 2, punch in two-digit indices of all dependent variables to be used. Use columns 1 through 80. If more than 40 dependent variables are used, punch a second card with the same format. The variables do not have to be in ascending or descending sequence.

[1] or for other reasons.

E. Transformation Index Card(s)

As many transformation cards as needed, each card containing 10 eight-digit transformation indices.

Perhaps a brief explanation of the transformation scheme is in order before a detailed description of each transformation is given. The data are read, floated, and stored in the first INVAR locations of DATA1. There are NOVAR locations provided in DATA1. X(1) through X(NOVAR), then, refer to these NOVAR locations. The original INVAR variables are transmitted to DATA2 which consists of exactly INVAR locations. All of the transformations except the second refer to the numbers stored in the NOVAR locations of DATA1. These numbers may be the numbers originally read in or numbers found as a result of previous transformations. Sequential transformations may be applied to the same variable.

8-Digit Transformation Index

Columns

1-2 Transformation code, TT.

3-4 Index II, where the result of transformation is stored.

5-6 Index JJ, of first variable used in the transformation.

7-8 Index KK, of additional variable or transformation constant used in the transformation.

Transformation Index = (TTIIJJKK). Code = TT.

01 $X_J \longrightarrow X_I$

The number in the Ith location is replaced by the number in the Jth location. The number in the Jth location is unchanged. Example: (01060300). The sixth number is replaced by the third number.

02 X_J (original) $\longrightarrow X_I$

The number in the Ith location of DATA1 is replaced by the Jth input variable stored in DATA2.

03 $-X_J \longrightarrow X_I$

The number in the Ith location is replaced by the negative of the number in the Jth location.

04 $X_J + C_K \longrightarrow X_I$

The number in the Ith location is replaced by the sum of the number in the Jth location and the Kth constant.

05 $X_J \cdot C_K \longrightarrow X_I$

The number in the Ith location is replaced by the product of the number in the Jth location and the Kth constant.

06 $X_J + X_K \longrightarrow X_I$

The number in the Ith location is replaced by the sum of the numbers in the Jth and Kth locations.

07 $X_J - X_K \longrightarrow X_I$

The number in the Ith location is replaced by the difference of the numbers in the Jth and Kth locations.

08 $X_J \cdot X_K \longrightarrow X_I$

The number in the Ith location is replaced by the product of the numbers in the Jth and Kth locations.

09 $X_J \div X_K \longrightarrow X_I$

The number in the Ith location is replaced by the ratio of the numbers in the Jth and Kth locations.

10 $1.0 \div X_J \rightarrow X_I$

The number in the Ith location is replaced by the reciprocal of the number in the Jth location.

11 $X_J^{(C_K)} \rightarrow X_I$

The number in the Ith location is replaced by the number in the Jth location raised to the C(K) power.

12 Ln X_J (natural log) $\rightarrow X_I$

13 Log X_J (base 10) $\rightarrow X_I$

14 $(e)^{X_J} \rightarrow X_I$

15 $(10)^{X_J} \rightarrow X_I$

16 SIN $X_J \rightarrow X_I$

17 Cos $X_J \rightarrow X_I$

18 ARCTAN $X_J \rightarrow X_I$

19 $\sqrt{X_J} \rightarrow X_I$

20 This is a dummy transformation inserted so that the user can write any specific transformation, and use this code to get to it.

F. Format Card for Transformation Constants

Transformation constants are read under the same type of format control as are the data cards. If transformation constants are used, a single format card must be prepared that specifies the number of fields, the field width, and the location of decimal points. See "J" for more detail.

G. Transformation Constant Card(s)

As many cards as needed to punch all transformation constants according to format specifications. Negative constants require an explicit minus sign somewhere in the specified field. No flags are used.

H. Format Card for FIN and FOUT

FIN and FOUT are read under format control in the same way as data cards. If this option is chosen, a single format card must be used. See "J" for more detail.

I. Card for FIN and FOUT

A single card is punched according to the format specification. FIN should be greater than FOUT in order to prevent cycling. At the conclusion of the stepwise process, all included independent variables will have an F value greater than FOUT and all excluded independent variables will have an F value less than FIN.

J. Format Card(s) for Data

As many cards as needed, each card containing up to 13 six-digit formats.

Column	
1-2	Number of sequential variables of the same format.
3-4	Number of card columns in field, that is, field width of variable.
5-6	Number of decimal places from right of the field. If an explicit decimal is present in the field, it is ignored.

Thus, if the first three variables are entered in five-column fields with the implicit decimal two places from the right, the six-digit format specification would be (030502). An example of the first three data fields for the numbers 2.35, 8.9, and 128 would be 00235/00890/12800. (Slashes are not punched.)

A six-digit format code is used to skip columns. In the third and fourth columns of the six-digit code, enter the number of card columns to skip. Enter zeros in the first, second, fifth, and sixth columns. For example, 004200 will cause the next 42 columns of the input card to be skipped.

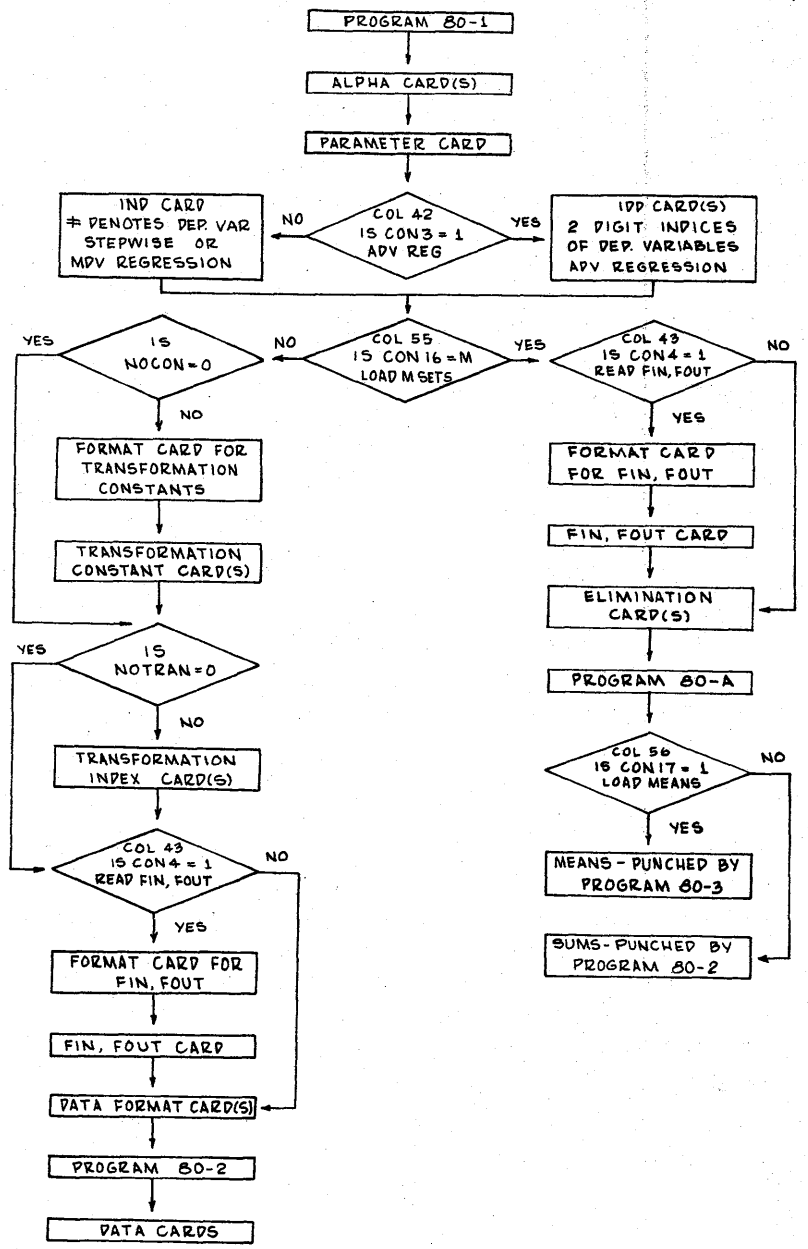
K. Elimination Card(s)

As many cards as needed are used with the load option. Columns 1 and 2 of the first card are used to denote the number of variables after deletion. Columns 1-80 of the second card are used to punch in ascending order the indices of up to 40 variables to be deleted. If more than 40 variables are to be deleted, punch the two-digit sequential indices in columns 1 through 80 of the third card. If no variables are to be deleted, a single card with the number of variables loaded, punched in columns 1 and 2, is all that is required.

All of these header cards are not used for all problems. The sequence needed may be determined by consulting the flow chart on the next page.

L. Data Cards

Data fields are required to be from 1 to 14 columns wide. If NCOL in the parameter card is left blank, data fields are punched consecutively from column 1 through 76. If NCOL is punched, data fields are punched consecutively from column 1 through NCOL. A new input card must be used if the next data field would otherwise overlap NCOL+1. Columns from NCOL+1 to 80 may be used for any other purpose. NCOL may be set as high as 80, in which case the entire card is used for data fields. As many data cards per observation are used as are necessary for the INVAR variables.



In order to clarify the input format, a number of examples are given below. Input cards are read alphamerically. Each two-digit alphameric code in the data field is then analyzed. If the two-digit code represents a number, the numeric digit is transmitted to a work area. If the two-digit code represents a decimal point, no transmission takes place. If the two-digit code represents a minus sign, a flag is placed over the low-order digit, and a zero is transmitted. Any other two-digit code including alphabetic information results in a zero being transmitted. After all two-digit codes have been analyzed, the resulting numeric field is translated into internal floating point format and stored in "DATA 1."

1. Decimal points

   a. Punched decimal points

      The decimal point indicated by the format statement for the step-wise regression overrides decimal points in the input. The number of digits in the field in the format is the number of columns considered. A punched decimal point counts as one column in the field. Example 1 illustrates these points.

Example 1

Input Card Columns 1-10 12345.6789

Format			Meaning	Result
Number of words with format	Length of field	Decimal digits		
01	04	03	1.234	$\bar{1}234000\bar{0}1$
01	06	01	5678.9	$\bar{5}6789000\bar{0}4$

In the second field of six digits, the input shows the number to be 5.6789, but the format says there is only one decimal digit and 5678.9 results because the format overrides.

   b. Format decimal

      The number of decimal digits (digits to right of decimal point) indicated by the format is not limited by the field length because the number of decimal digits is only used in calculating the exponent of the floating point number. A negative number of decimal digits is equivalent to adding that number of zeros to the right of the number. Example 2 illustrates these points.

Example 2

Input Card Columns 1-20 12345678901234567890

Format			Meaning	Result
Number of words with format	Length of field	Decimal digits	First number in field	
01	04	05	.01234	$\bar{1}2340000\bar{0}\bar{1}$
01	04	$0\bar{5}$	567800000	$\bar{5}6780000\bar{0}9$
01	05	06	.090123	$\bar{9}0123000\bar{0}\bar{1}$
01	05	$0\bar{6}$	45678000000	$\bar{4}5678000\bar{0}\bar{1}$
01	02	05	.00090	$\bar{9}0000000\bar{0}3$

In the first field of four digits, there are five decimal digits indicated so that these result in .01234. In the second field of four digits, there are negative five decimal digits indicated which results in adding five zeros to the field of four digits.

2. Minus signs

Negative numbers must be indicated by an explicit minus sign because a number overpunched by a negative sign will be interpreted as a letter. A minus sign will result in a zero digit and a negative sign.

The format field indicates the number of columns in the field. The above is illustrated in Example 3.

Example 3

Input Columns 1-20 -1234-4567-1234-45-7

Format			Meaning	Result
Number of words with format	Length of field	Decimal digits		
01	05	03	-1.234	1234000001
01	05	00	-4567.	4567000004
01	03	01	-1.2	1200000001
01	03	02	-3.40	3400000001
01	04	00	-4507.	4507000004

In the fourth field, the input card contained 34-. The minus sign resulted in a zero digit and a negative field. In the fifth field, the input card contained 45-7. The minus sign again resulted in a zero digit and a negative field.

3. Other alphabetic information

Any alphabetic information besides a decimal or a minus will be replaced by a zero digit. This is illustrated in Example 4.

Example 4

Input Card Columns 1-20 A = 1bB = 2bC = 3-D = 1.2345
Note: b = blank

Format			Meaning	Result
Number of words with format	Length of field	Decimal digits		
03	04	01	001.0 002.0	1000000001 2000000001
01	08	04	-003.0 001.2345	3000000001 1234500001

III. OPERATING DETAILS

General

Set left margin at 15. Set tab stops at 21, 34, 47, 60, and 73. All programs that are first of a sequence have a 2-card memory clearing routine.

Each program in the sequence 1 through 4 is designed to simulate the load key upon completion. That is, it reads a card into location zero and branches to zero, thus loading the next program. Programs 80-4A, 4B, and 4C may be terminated after a matrix transformation cycle by turning on sense switch 4. The current IND card and "means" deck are punched for restart.

Programs 80-1 Through 80-4

A. Set sense switches.

	On	Off
Sense switch 1	Prints basic data	No print
Sense switch 2	Prints transformed data	No print

B. Push reset button on console. Computer must be in manual mode. If it is not, push instant stop and then reset.

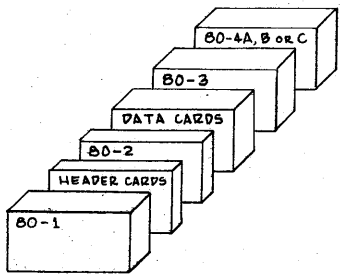
C. Load program 80-1 into read hopper. Follow with header cards, 80-2, data cards, 80-3, and 80-4A, 4B, or 4C.

D. Push load key on 1622 Card Read.

E. Push punch start.

F. Push reader start to complete reading final cards of 80-4.

Card Sequence for 80-1 Through 80-4



Program 80-A

A. Reset.

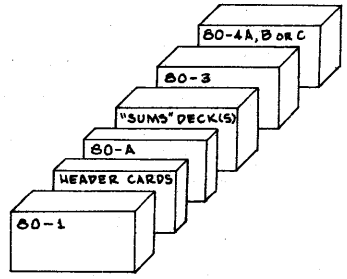
B. Load 80-1 in read hopper. Follow with header cards, 80-A, "sums" deck or "means" deck, and 80-3 and/or 80-4.

C. Load.

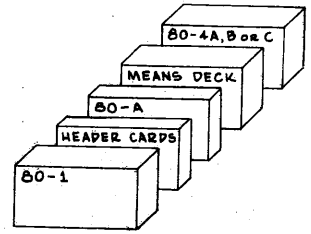
D. Punch start.

E. Reader start to complete reading.

Loading "sums," M in column 55, blank or zero in column 56 of parameter card to cumulate M "sums" decks.



Loading "means," 1 in column 55, 1 in column 56 of parameter card.



Program 80-B

A. Reset.

B. Load 80-B into read hopper followed by Alpha card(s), control card, "sums" deck, "means" deck, transformed correlation matrix deck, reinverted correlation matrix deck, and "steps" deck.

Control Card for 80-B

	One	Blank
Column 2	Print "sums"	No print
Column 4	Print "means"	No print
Column 6	Print transformed correlation matrix	No print
Column 8	Print reinverted correlation matrix	No print
Column 10	Print "steps"	No print

The decks that are loaded must correspond to options punched in the control card. In other words, if column 6 is blank, the transformed correlation matrix should not be loaded.

C. Push load key.

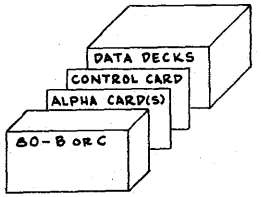
D. The program continues reading "step" cards until the last card is sensed. When the card reader stops, push reader start.

E. To print another problem, load Alpha card(s), control card, and data decks in read hopper, push reader start and start.

Program 80-C

This program is identically the same as 80-B, except the data are read, translated, and punched in explicit decimal format. In addition to steps A through E, push punch start after C.

Card Sequence for 80-B or C



Program 80-D

A. Reset.

B. Load 80-D in read hopper followed by control card, Alpha card(s), header cards (except Alpha) used in solving the original problem, step cards for a single step, and data cards.

C. Push load key.

D. Push punch start.

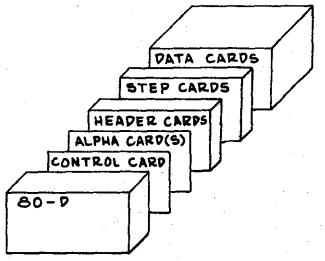
E. Data cards are read until the last card is sensed. When card reader stops, push reader start.

F. If another problem is to be run, load cards (excluding 80-D) and push reader start and start.

Control Card for 80-D

	One	Blank or zero
Column 2	Suppresses printing	Prints
Column 4	Suppresses punching	Punches
Column 6	Computes antilogs	No antilog
Column 8	Base 10	Base e

Card Sequence for 80-D



If the current problem has been solved using the load and delete option, the header cards used to read the original data, make transformations, and form the sums and sums-of-products matrix must be modified so that the N variables

formed agree in form and sequence with those after deletion. This can be done using additional transformations,using the skip option on format, or by modifying the step output.

Suppose that 18 two-digit variables were used to form the original sums and sums of products with no transformations and that the 2nd, 3rd, and 10th variables were deleted from the current problem. Then the parameter card should be modified to show INVAR = 15 and the format card changed from 180200 to:

010200/000400/060200/000200/080200

Variables: 1 Skip 4-9 Skip 11-18 .

Note: Slashes are not punched.

An alternative approach would be to use the move transformation, 01, to move 4 to 2, 5 to 3, 6 to 4, 7 to 5, 8 to 6, 9 to 7, 11 to 8, etc. In this case INVAR = 18, N = 15, and the parameter card would be changed to indicate the number of transformations used.

Still another technique would be to modify the IND card (second card) of the step deck. Recall that the IND card signifies an included independent variable as a 1 punch, an excluded independent variable as an 0 punch, and a dependent variable as a ‡ (0-2-8 multiple punch). This card could be repunched for the original 18 variables, punching a zero or blank for deleted variables. If this technique is used, the first card of the step deck may have to be modified by punching in columns 5 and 6, the original index of the variable used as the dependent variable. Column 5 should be flagged.

Program 80-E

A. Set sense switches.

	On	Off
Sense switch 1	Print input data	No print
Sense switch 2	Print transformed data	No print

B. Reset.

C. Load 80-E in read hopper followed by header cards just as prepared for 80-1. Follow header cards with the data cards.

D. Push load key.

E. Push reader start when card reader stops. If another problem is to be run, load cards (excluding 80-E) and push reader start and start.

Error Halts

SPS II Library Subroutines are used throughout. The presence of special conditions causes an error message of the form:

XXXXX 00 XX
R S

to be typed, where R is a return address to the main program, and S is a code that identifies the special condition. See the Reference Manual, IBM 1620/1710 Symbolic Programming System.

The detection of an overflow or underflow conditions causes the subroutine being executed to examine core storage position 00401 to determine the course of action. The object decks now have a zero in this location, which causes a zero to be placed in the result field if underflow is present and then continues processing. If an overflow is present, the machine halts.

Storage position 00401 is column 80 of the sixth card (not counting the two-card clearing routine that begins Programs 80-1, B, C, D, and E).

If a record mark is not found in the first N positions of IND, Program 80-4A halts. The address of the halt instruction is 01110, and the MAR register will display 01121.

The ADV option requires that the correlation matrix be fully inverted. If it is not inverted due to multicollinearity, the following error message is typed by 80-4C: "Matrix Almost Singular," and the machine halts. The address of the halt instruction is 01672, and Mar will display 01683.

IV. DESCRIPTION OF OUTPUT

A. Program 80-1

Program 80-1 reads and prints the Alpha card(s). It prints the date, problem number, number of variables, and number of observations.

B. Program 80-2

If CON 9, column 48 of the parameter card, is a digit, 80-2 punches a "sums" deck. If CON 5, column 44, is a blank or zero, the sums deck consists of a set of cards on which the sums of the first N original or transformed variables have been punched, and a second set on which the sums of squares and cross products of the first N original or transformed variables have been punched. Each set is preceded by a duplicate of the parameter card except that parameters have been flagged.

If CON 5, column 44, is a digit, two-pass input has been selected, and the second set consists of sums and sums of products of the variables after their means have been subtracted.

Only the upper triangular matrix is formed and punched. The sequence punched is:

1. Parameter card.
2. As many cards as needed, 8 numbers per card, containing the sums of the first N variables in SPS II internal floating point format.
3. Parameter card.
4. As many cards as needed, 8 numbers per card, containing the $\frac{N(N+1)}{2}$ sums of squares and cross products by rows of the upper triangular matrix in SPS II internal floating point format.

C. Program 80-3

If CON 10, column 49 of the parameter card, is a digit, 80-3 punches a "means" deck consisting of three sets of cards containing means, standard deviations, and the upper triangular correlation matrix. Each set is preceded by a flagged parameter card. Columns 71 through 80 of the parameter card contain the floated number of observations in SPS II internal floating point format. The sequence punched is:

1. Parameter card.
2. As many cards as needed, 8 numbers per card, containing the arithmetic means of the first N variables in SPS II internal floating point format.

$$\bar{X}_i = \frac{1}{M} \sum_m X_{im}$$

where M = NOBS, number of observations.

3. Parameter card.
4. As many cards as needed, 8 numbers per card, containing the standard deviations of the first N variables in SPS II internal floating point format.

$$s_i = \sqrt{\frac{1}{M} \sum_m (X_{im} - \bar{X}_i)^2}$$

5. Parameter card.
6. As many cards as needed, 8 numbers per card, containing $\frac{N(N+1)}{2}$ simple correlation coefficients in SPS II internal floating point format.

$$r_{ij} = \frac{\frac{1}{M} \sum_m (X_{im} - \bar{X}_i)(X_{jm} - \bar{X}_j)}{s_i s_j}$$

D. Program 80-4A--Printed Results

If CON 8, column 47, is zero or blank, the following regression statistics are printed.

1. Index of dependent variable.
2. Standard error of Y.X, square root of the unbiased estimator of

$$\sigma^2_{Y.X.}$$

$$s_{Y.X} = \sqrt{\frac{1}{M-N} \sum_m (Y_i - \hat{Y}_i)^2}$$

3. R Squared, coefficient of multiple determination, unadjusted for degrees of freedom.
4. Sum of squared residuals.

$$SQR = \sum_m (Y_i - \hat{Y}_i)^2$$

5. Number of independent variables used. May be less than N-1 if positive levels of FIN and FOUT are used or if the independent variables are linearly dependent.
6. Constant term.
7. For each independent variable used:
   a. Variable index.
   b. Regression coefficient.
   c. Standard error of regression coefficient.
   d. T ratio (b) divided by (c). This statistic is used to test whether the associated regression coefficient is significantly

different from zero. If the standard error of regression coefficient is zero, the T value is not computed. The number printed as the T value in this case is the number stored from previous computations. If CON 18, column 57, is a digit, the same set of regression statistics are printed for each excluded independent variable.

E. Program 80-4A--Punched Output

1. Step output

If CON 11, column 50, is a digit, all of the sequential "steps" are punched. If it is a blank or zero, only the final step is punched. The step output is read and printed or punched in explicit decimal format by 80-B or C and is also used as input to 80-D, the residual program. The format of successive steps is the same. If only the final step is punched, the "step number" is automatically set at "999." Otherwise, successive steps are numbered 1, 2, 3, etc. Step output consists of:

a. First card

Columns	
1- 3	Step number.
4- 6	Index of dependent variable.
7- 9	Number of independent variables used.
10-12	N.

Following five entries in SPS II internal floating point format.

Columns	
21-30	Constant term.
31-40	R Squared.
41-50	Standard error of estimate.

Columns	
51-60	F level at which last independent variable was added or deleted.
61-70	Sum of squared residuals.
74-76	Step number.
77-80	Sequence number.

Sequence number starts at 1 and continues for all steps. All step cards have a step and sequence number in columns 74-80, except the IND card(s).

b. IND card(s)

The first N columns of the IND card(s) record the current status of all variables. A zero indicates an excluded independent variable; a 1 indicates an included independent variable; a ‡ (0-2-8 multiple punch) indicates a dependent variable.

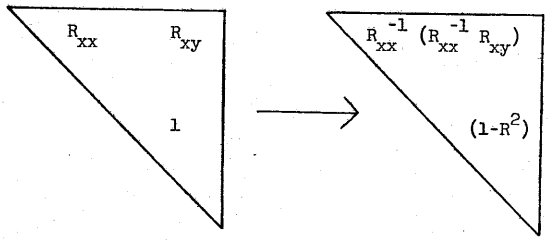
c. As many cards as needed for regression coefficients, 7 per card, in SPS II internal floating point format.

d. As many cards as needed for standard errors of regression coefficients, 7 per card, in SPS II internal floating point format.

e. As many cards as needed for t ratios, 7 per card, in SPS II internal floating point format.

2. Transformed upper triangular correlation matrix

If CON 12, column 51, is a digit, the transformed correlation matrix is punched. Assuming that the dependent variable, Y, is the last variable and that all independent variables, X, are used, the stepwise process begins with the upper-triangular simple correlation matrix and ends with a transformed correlation matrix.



Thus, the last column of the transformed correlation matrix consists of N-1 "normalized" regression coefficients and $1-R^2$, where R^2 is the unadjusted coefficient of multiple determination. Normalized regression coefficients are those obtained when each variable, X_I, is normalized by defining:

$$Z_I = \frac{X_I - \bar{X}_I}{S_I} .$$

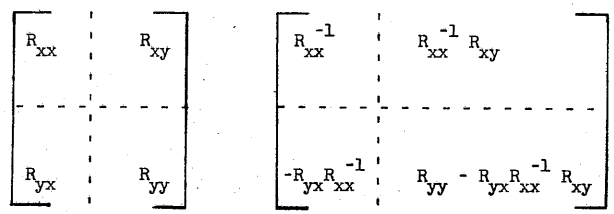
If L is the index of the dependent variable, I is the index of the Ith independent variable, β_I is the Ith normalized regression coefficient, and B_I is the Ith regression coefficient:

$$B_I = \frac{S_L}{S_I} \beta_I .$$

In other words, the actual regression coefficients are the normalized coefficients readjusted for the change in scale due to division by standard deviations.

The remaining elements of the transformed correlation matrix form the inverse of the matrix of simple correlation coefficients among the independent variables.

If there are several dependent variables, the transformation is:



In this case, the columns of R_{xx}^{-1} R_{xy} are columns of normalized regression coefficients, each column being associated with a different dependent variable.

The submatrix $R_{yy} - R_{yx}R_{xx}^{-1}$ R_{xy} is the normalized variance-covariance matrix of residuals of the separate regression equations, and the diagonal elements of $R_{yy} - R_{yx}R_{xx}^{-1}$ R_{xy} are the $(1-R^2)$'s for the separate regression equations.

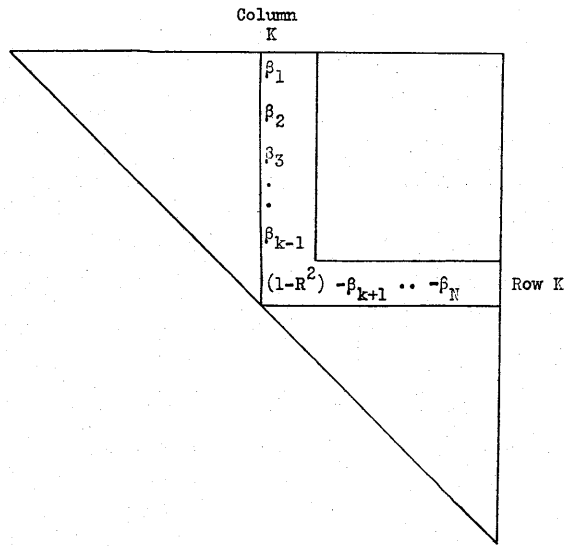
The Y's can either be "intentional" dependent variables as specified for 80-4B, Multiple Dependent Variable Regression, or they can be excluded independent variables if CON 18, column 57 of the parameter card is a digit and one or more independent variables have been excluded due to multicollinearity. Multicollinearity is here arbitrarily defined as a diagonal element of $(R_{yy} - R_{yx}R_{xx}^{-1}$ $R_{xy}) \leq 0.001$ which implies an $R^2 > 0.999$ between an excluded independent variable and the included set of independent variables.

Note (1) that only the upper triangle is recorded, (2) that the dependent variables or excluded independent variables are not necessarily grouped to the right, and (3) that the lower left-hand submatrix is the negative transpose of the upper right-hand submatrix.

Suppose that the dependent variables occur first. This implies that the matrix transformation would be:

$$\begin{bmatrix} R_{yy} & R_{yx} \\ R_{xy} & R_{xx} \end{bmatrix} \rightarrow \begin{bmatrix} R_{yy} - R_{yx}R_{xx}^{-1}R_{xy} & -R_{yx}R_{xx}^{-1} \\ R_{xx}^{-1}R_{xy} & R_{xx}^{-1} \end{bmatrix}$$

In this case, since the upper triangular matrix is stored, the rows of $-R_{yx}R_{xx}^{-1}$ would be the negative of the normalized regression coefficients, and the sign would have to be changed in computing the B's. In general, the dependent variable or excluded independent variable can appear in any location, and the following scheme holds:



Further clarification of the transformed correlation matrix follows. Consider the element in the Ith row and Jth column. I must be less than or equal to J since only the upper triangular matrix is present. All elements, where both I and J are indexes of dependent or excluded independent variables, form the upper triangular normalized variance-covariance matrix of residuals.

If the column index, J, is the index of a dependent or excluded independent variable and the row index, I, is the index of an included independent variable, the element is a normalized regression coefficient.

If the row index, I, is the index of a dependent or excluded independent variable and the column index, J, is the index of an included independent variable, the element is the negative of a normalized regression coefficient.

The punchout of the transformed correlation matrix is of the following form:

a. Parameter card.

b. As many cards as needed, 8 numbers per card, for the $\frac{N(N+1)}{2}$ elements of the upper triangular transformed correlation matrix.

3. Reinverted correlation matrix

If CON 13, column 52, is a digit, the transformed correlation matrix is reinverted and punched. The format is the same as for the transformed correlation matrix.

F. Program 80-4B

The printed and punched output of 80-4B is the same as that for 80-4A except that the step output is for the regression statistics of all specified dependent variables and, if CON 18, column 57, is a digit, of excluded independent variables.

G. Program 80-4C

The printed and punched output of 80-4C is the same as for 80-4A except that the step output consists of regression statistics for each of the specified alternate dependent variables.

The transformed correlation matrix in this case is the inverse of the correlation matrix for all variables, dependent as well as independent.

H. Programs 80-B and C

The printed output of 80-B and the punched output of 80-C consists of the translation of punched card output from 80-2, 3, 4A, 4B and/or 4C into explicit decimal format complete with alphabetic headings. See the sample problem output in Section V.

I. Program 80-D

By option, as indicated on the control card for 80-D, individual residual output may be printed, punched, printed and punched, or neither printed nor punched.

In all cases, the alphameric card is read and printed. Also printed are the data, problem number, number of variables, and number of observations.

In all cases, the summary statistics are also printed: (1) the number of observations actually used, (2) the sum of the residuals, (3) the average value of the residuals disregarding sign, (4) the computed sum of squared residuals, and (5) the Durbin-Watson test statistic for serial correlation. If the entire set of data used originally to compute the regression statistics are used in the residual program, the sum of residuals should be approximately equal to zero; the computed sum of squared residuals should be approximately the same as that computed by 80-4 by means of a short-cut formula.

For information about the Durbin-Watson statistic, see "Testing for Serial Correlation in Least-Squares Regression, I and II," Biometrika, Vol. 37, pp. 409-428 and Vol. 38, pp. 159-178.

If the individual residual data are printed and/or punched, the data given are (1) the sequence or observation number, (2) the actual value of the dependent variable, Y, (3) the predicted value based on the regression equation, $\hat{Y}$, and (4) the residual, $Y-\hat{Y}$.

J. Program 80-E

On sense switch control, 80-E prints in explicit decimal format the input data and/or prints the transformed data. In all cases, it prints in explicit decimal format the sums of the input data and, if transformations are used, the sums of the transformed data.

K. Explicit Decimal Format

The subroutine that translates from internal floating point form to decimal form uses a fixed format wherever possible: Up to four digits to the left of the decimal preceded by a minus sign where appropriate, the decimal, and five digits to the right of the decimal. If the numbers are too large or too small, the output format begins with the appropriate power of ten and follows with the decimal and five digits, that is:

$\pm$YY $\pm$.XXXXX

Because of the limitation on the size of number handled in the explicit decimal format, it is desirable to scale the variables so that all output numbers will have an absolute value less than 9999.00 and greater than 0.00009. Scaling by tens can be accomplished through selection of the appropriate data input format codes.

V. SYMBOL IDENTIFICATION, CORE LAYOUT, AND PROBLEM SIZE

A. Parameter Card

All of the following parameters,as well as the 18 one-digit constants, are contained on the parameter card as punched from memory. All but OBSER are on the parameter card prepared for input.

Symbol	Description	Field width	Field address
DATE	Date.	6	00407
PROB	Problem number.	2	00409
NOBS	Number of observations.	5	00414
NFORM	Number of 6-digit format codes used to describe data format.	3	00417
INVAR	Number of input variables.	3	00420
NOVAR	Number of words required in DATA1 to store all input and transformed variables. NOVAR $\geq$ INVAR NOVAR $\geq$ N	3	00423
N	Number of variables used in regression. Includes both dependent and independent variables.	3	00426
NDEP	Number of dependent variables. Used only with ADV regression	3	00429
NOTRAN	Number of transformations. Also number of 8-digit transformation codes defining transformations.	3	00432
NOCON	Number of transformation constants.	3	00435
NCOL	Number of card columns read. If NCOL is blank, up to 76 columns per card are read.	2	00437
NELIM	Number of variables eliminated when using the load and delete option. Also the number of 2-digit indexes read in to identify variables to be deleted.	3	00440
OBSER	Number of observations, internal floating point format.	10	00481

B. Addresses of Data Fields Computed for Each Problem

Symbol	Description	Location of field address of first field
IND	N 1-digit fields classifying variables as dependent, $\mp$, excluded independent, 0, or included independent, 1.	00486
ID	N 2-digit fields containing the indexes of the included independent variables.	00491
IDD	NDEP 2-digit fields containing the indexes of dependent variables. Used only with ADV.	00496
FORMAT	NFORM 6-digit format codes.	00501
INDEX	NOTRAN 8-digit transformation codes.	00506
CONST	NOCON 10-digit transformation constants (internal floating point).	00511
DATA1	NOVAR 10-digit fields. Used to store floated input and transformed variables.	00516
DATA2	INVAR 10-digit fields. Used to copy floated input variables.	00521
B	N 10-digit fields. Regression coefficients.	00526
SE	N 10-digit fields. Standard errors of regression coefficients.	00531
T	N 10-digit fields. T ratios.	00536
SUM1	N 10-digit fields. Sums of variables or means.	00541
SIGMA	N 10-digit fields. Standard deviations of variables.	00546
R	$\frac{N(N+1)}{2}$ 10-digit fields. Sums of squares and cross products or correlation coefficients.	00551
WT	One 5-digit field. Weight for weighted regression. (N+1)st location of DATA1.	00556

C. Memory Allocation, Programs 80-1 Through 80-4

Symbol	Number of fields	Field width	Field address of first field
IND	N	1	13,400
ID	N	2	+ N+1
IDD (ADV only)	N	2	+ 2N
FORMAT	NFORM	6	+ 2N+4
INDEX	NOTRAN	8	+ [Next largest multiple of 78 greater than 6(NFORM)] +4
CONST	NOCON	10	+ [Next largest multiple of 80 greater than 8(NOTRAN)] +2
DATA1	NOVAR	10	+ 10 NOCON
DATA2	INVAR	10	+ 10 NOVAR
B	N	10	+ 10 INVAR
SE	N	10	+ 10 N
T	N	10	+ 10 N
SUM1	N	10	+ 10 N
SIGMA	N	10	+ 10 N
R	$\frac{N(N+1)}{2}$	10	+ 10 N

D. Size of Problem

Since the addresses of data fields are computed for each problem, it is not possible to specify exactly how many variables can be handled. One procedure is to compute the address of R from the table in Part C. and add $5N(N+1)$. If this number does not exceed the capacity of the memory, the problem can be run. If the problem does exceed the capacity of memory, this will be detected by Program 80-1 as it clears R. If an address is formed exceeding memory capacity, the computer will halt on a MAR check.

As a rough indication, however, the following problem sizes are reasonable upper limits:

Memory capacity	N
20K	30
40K	65
60K	85

VI. SAMPLE PROBLEMS

A. STEPWISE REGRESSION.

THE CARD IMAGES USED IN THE FOLLOWING SAMPLE PROBLEM ARE GIVEN BELOW. THE FIRST SIX CARDS ARE HEADER CARDS AND FOLLOW PROGRAM 80-1. THE REMAINING CARDS ARE DATA CARDS AND FOLLOW PROGRAM 80-2. AS INDICATED ON THE PARAMETER CARD, CARD NUMBER THREE OF THE HEADER CARDS, THE OPTIONS SELECTED ARE

1. STEPWISE REGRESSION.
2. TWO PASS INPUT.
3. PUNCH SUMS DECK.
4. PUNCH MEANS DECK.
5. PUNCH STEPS.
6. PUNCH TRANSFORMED CORRELATION MATRIX.
7. PUNCH REINVERTED CORRELATION MATRIX.

```
PROGRAM 80, TEST PROBLEM, FERBER DATA. STEPWISE REGRESSION.
SENSE SWITCHES ONE AND TWO ON TO PRINT INPUT AND TRANSFORMED DATA.
0515630100031002005005005     4         1   1   11111
    ‡
0101020001020300010304001204010 0
0107000407 03
```

1	33480	3440	6110	2980
2	15370	3730	2560	7510
3	27900	3790	3700	0220
4	28770	3680	1550	3150
5	32560	3580	4020	0980
6	28270	3660	3640	7500
7	26740	3330	4320	8030
8	25600	3630	3470	2620
9	17550	3870	1350	2740
10	19400	3440	5250	7510
11	32750	3760	1880	5360
12	18790	3810	3360	10130
13	24550	3270	8300	0800
14	30370	3050	6830	10930
15	16310	3610	2600	7210
16	31990	3450	3260	2540
17	18360	3600	3070	3910
18	38100	3640	7680	4960
19	22770	3440	7860	5190
20	34050	3450	2560	2620
21	24120	2990	6140	5780
22	22640	3790	2900	3190
23	22950	3470	6650	1630
24	16790	3860	5720	10960
25	24490	3940	1930	0130
26	27050	3630	2210	2940
27	30520	3610	4350	0440
28	27770	3560	3950	2130
29	24310	3730	4370	0170
30	32790	3840	2780	2040
31	30380	4070	1620	1620


```
PROGRAM 80, TEST PROBLEM, FERBER DATA. STEPWISE REGRESSION.
SENSE SWITCHES ONE AND TWO ON TO PRINT INPUT AND TRANSFORMED DATA.
05 15 63
PROB 01          05 VAR       00031 OBSER
```

1.00000	33.48000	3.44000	6.11000	2.98000
33.48000	3.44000	6.11000	3.51094	2.98000
2.00000	15.37000	3.73000	2.56000	7.51000
15.37000	3.73000	2.56000	2.73241	7.51000
3.00000	27.90000	3.79000	3.70000	.22000
27.90000	3.79000	3.70000	3.32862	.22000
4.00000	28.77000	3.68000	1.55000	3.15000
28.77000	3.68000	1.55000	3.35933	3.15000
5.00000	32.56000	3.58000	4.02000	.98000
32.56000	3.58000	4.02000	3.48308	.98000
6.00000	28.27000	3.66000	3.64000	7.50000
28.27000	3.66000	3.64000	3.34180	7.50000
7.00000	26.74000	3.33000	4.32000	8.03000
26.74000	3.33000	4.32000	3.28616	8.03000
8.00000	25.60000	3.63000	3.47000	2.62000
25.60000	3.63000	3.47000	3.24259	2.62000
9.00000	17.55000	3.87000	1.35000	2.74000
17.55000	3.87000	1.35000	2.86505	2.74000
10.00000	19.40000	3.44000	5.25000	7.51000
19.40000	3.44000	5.25000	2.96527	7.51000
11.00000	32.75000	3.76000	1.88000	5.36000
32.75000	3.76000	1.88000	3.48890	5.36000
12.00000	18.79000	3.81000	3.36000	10.13000
18.79000	3.81000	3.36000	2.93332	10.13000
13.00000	24.55000	3.27000	8.30000	.80000
24.55000	3.27000	8.30000	3.20071	.80000
14.00000	30.37000	3.05000	6.83000	10.93000
30.37000	3.05000	6.83000	3.41345	10.93000
15.00000	16.31000	3.61000	2.60000	7.21000
16.31000	3.61000	2.60000	2.79177	7.21000
16.00000	31.99000	3.45000	3.26000	2.54000
31.99000	3.45000	3.26000	3.46542	2.54000
17.00000	18.36000	3.60000	3.07000	3.91000
18.36000	3.60000	3.07000	2.91017	3.91000
18.00000	38.10000	3.64000	7.68000	4.96000
38.10000	3.64000	7.68000	3.64021	4.96000
19.00000	22.77000	3.44000	7.86000	5.19000
22.77000	3.44000	7.86000	3.12544	5.19000
20.00000	34.05000	3.45000	2.56000	2.62000
34.05000	3.45000	2.56000	3.52783	2.62000
21.00000	24.12000	2.99000	6.14000	5.78000
24.12000	2.99000	6.14000	3.18304	5.78000
22.00000	22.64000	3.79000	2.90000	3.19000
22.64000	3.79000	2.90000	3.11971	3.19000

23.00000	22.95000	3.47000	6.65000	1.63000
22.95000	3.47000	6.65000	3.13331	1.63000
24.00000	16.79000	3.86000	5.72000	10.96000
16.79000	3.86000	5.72000	2.82078	10.96000
25.00000	24.49000	3.94000	1.93000	.13000
24.49000	3.94000	1.93000	3.19826	.13000
26.00000	27.05000	3.63000	2.21000	2.94000
27.05000	3.63000	2.21000	3.29768	2.94000
27.00000	30.52000	3.61000	4.35000	.44000
30.52000	3.61000	4.35000	3.41838	.44000
28.00000	27.77000	3.56000	3.95000	2.13000
27.77000	3.56000	3.95000	3.32395	2.13000
29.00000	24.31000	3.73000	4.37000	.17000
24.31000	3.73000	4.37000	3.19088	.17000
30.00000	32.79000	3.84000	2.78000	2.04000
32.79000	3.84000	2.78000	3.49012	2.04000
31.00000	30.38000	4.07000	1.62000	1.62000
30.38000	4.07000	1.62000	3.41378	1.62000

DEP VAR = 05
STD ERR Y.X = 2.75292
R SQUARED = .36438
SUM SQR RES = 197.04329
IND VAR USED = 04

CONSTANT TERM = 121.50376

VAR	COEFF	STD ERR	T RATIO
01	1.54226	.70715	2.18094
02	-4.72247	2.77896	-1.69936
03	.04037	.32815	.12304
04	-43.52735	17.41512	-2.49939

PROGRAM 80-B, PRINTED REPORT, DATA FROM PROGRAMS 80-1 THROUGH 80-4A.

05 15 63
PROB 01 05 VAR 00031 OBSER

SUMS OF VARIABLES

807.49000	111.72000	125.99000	100.20248	127.92000

SUMS OF SQUARES AND CROSS-PRODUCTS

1076.59310	-5.52406	29.84175	43.54082	-207.53780

	1.72053	-8.95880	-.26654	-5.40457
		117.55392	1.31591	35.79956
			1.78720	-9.32909
				310.00524

AVERAGES

26.04806	3.60387	4.06419	3.23233	4.12645

STANDARD DEVIATIONS

5.89311	.23558	1.94732	.24010	3.16230

CORRELATION MATRIX

1.00000	-.12835	.08388	.99262	-.35924
	1.00000	-.62994	-.15200	-.23401
		1.00000	.09078	.18753
			1.00000	-.39634
				1.00000

TRANSFORMED CORRELATION MATRIX

71.03785	-2.23070	-.93940	-70.76750	2.87408
	1.75323	1.07519	2.38312	-.35181
		1.67038	.94425	.02486
			71.52188	-3.30494
				.63561

REINVERTED CORRELATION MATRIX

.99999	-.12835	.08388	.99261	-.35924
	.99999	-.62994	-.15200	-.23401
		.99999	.09078	.18753
			.99999	-.39633
				.99999

STEP 001

```
DEP VAR        =    05
STD ERR Y.X    =     3.00176
R SQUARED      =      .15708
SUM SQR RES    =   261.30792
IND VAR USED   =    01

CONSTANT TERM =     20.99906

VAR       COEFF        STD ERR      T RATIO
04       -5.21993       2.24538    -2.32474
```

STEP 002

```
DEP VAR        =    05
STD ERR Y.X    =     2.88982
R SQUARED      =      .24572
SUM SQR RES    =   233.83002
IND VAR USED   =    02

CONSTANT TERM =     37.51973

VAR       COEFF        STD ERR      T RATIO
02       -4.04329       2.22902    -1.81393
04       -5.82295       2.18705    -2.66246
```

STEP 003

```
DEP VAR        =    05
STD ERR Y.X    =     2.70224
R SQUARED      =      .36401
SUM SQR RES    =   197.15803
IND VAR USED   =    03

CONSTANT TERM =    122.84497

VAR       COEFF        STD ERR      T RATIO
01        1.54976        .69154     2.24100
02       -4.93730       2.12217    -2.32652
04      -43.71246      17.03064    -2.56669
```


STEP 004

```
DEP VAR        =    05
STD ERR Y.X    =     2.75292
R SQUARED      =      .36438
SUM SQR RES    =   197.04329
IND VAR USED   =    04

CONSTANT TERM =    121.50376

VAR       COEFF        STD ERR      T RATIO
01        1.54226        .70715     2.18094
02       -4.72247       2.77896    -1.69936
03         .04037       .32815       .12304
04      -43.52735      17.41512    -2.49939
```

B. MDV REGRESSION.

PRINTED BELOW ARE THE CARD IMAGES OF THE HEADER CARDS USED FOR MDV REGRESSION. THE MDV SAMPLE PROBLEM FOLLOWS.

```
PROGRAM 80, TEST PROBLEM, FERBER DATA.  MDV REGRESSION.                ‡
VARIABLES 3 AND 5 DESIGNATED THE DEPENDENT VARIABLES.
0515630100031002005005005     4          1  1   11111
  ‡ ‡
0101020001020300010304001204010 0
010700040703
```

```
PROGRAM 80, TEST PROBLEM, FERBER DATA.  MDV REGRESSION.
VARIABLES 3 AND 5 DESIGNATED THE DEPENDENT VARIABLES.
05 15 63
PROB 01              05 VAR       00031 OBSER

02
04
01

DEP VAR        =    03
STD ERR Y.X    =     1.61446
R SQUARED      =      .40133
SUM SQR RES    =    70.37526
IND VAR USED   =    03

CONSTANT TERM =     33.21727
```

47

VAR	COEFF	STD ERR	T RATIO
01	.18583	.41316	.44978
02	-5.32057	1.26789	-4.19637
04	-4.58462	10.17499	-.45057

DEP VAR = 05
STD ERR Y.X = 2.70224
R SQUARED = .36401
SUM SQR RES = 197.15805
IND VAR USED = 03

CONSTANT TERM = 122.84496

VAR	COEFF	STD ERR	T RATIO
01	1.54976	.69155	2.24099
02	-4.93730	2.12217	-2.32652
04	-43.71245	17.03065	-2.56669

C. ADV REGRESSION.

PRINTED BELOW ARE THE CARD IMAGES OF THE HEADER CARDS USED FOR ADV REGRESSION. THE ADV SAMPLE PROBLEM FOLLOWS.

```
PROGRAM 80, TEST PROBLEM, FERBER DATA. ADV REGRESSION.
0515630100031002005005005  5  4          1 1   11111
0102030405
0101020001020300010304001204010 0
010700040703
```



```
PROGRAM 80, TEST PROBLEM, FERBER DATA. ADV REGRESSION.
05 15 63
PROB 01            05 VAR       00031 OBSER
```

DEP VAR = 01
STD ERR Y.X = .70195
R SQUARED = .98810
SUM SQR RES = 12.81144
IND VAR USED = 04

CONSTANT TERM = -105.75663

VAR	COEFF	STD ERR	T RATIO
02	1.13756	.71281	1.59587
03	.02978	.08349	.35667
04	25.03370	.59482	42.08589
05	.10027	.04597	2.18094

DEP VAR = 02
STD ERR Y.X = .18431
R SQUARED = .48664
SUM SQR RES = .88324
IND VAR USED = 04

CONSTANT TERM = 10.49025

VAR	COEFF	STD ERR	T RATIO
01	.07842	.04914	1.59587
03	-.06592	.01777	-3.70921
04	-2.12175	1.23002	-1.72496
05	-.02116	.01245	-1.69936

DEP VAR = 03
STD ERR Y.X = 1.64473
R SQUARED = .40168
SUM SQR RES = 70.33432
IND VAR USED = 04

CONSTANT TERM = 34.74932

VAR	COEFF	STD ERR	T RATIO
01	.16349	.45839	.35667
02	-5.24941	1.41523	-3.70921
04	-3.95462	11.56145	-.34205
05	.01441	.11713	.12304

DEP VAR = 04
STD ERR Y.X = .02783
R SQUARED = .98872
SUM SQR RES = .02014
IND VAR USED = 04

CONSTANT TERM = 2.40028

VAR	COEFF	STD ERR	T RATIO
01	.03936	.00093	42.08589
02	-.04839	.02805	-1.72496
03	-.00113	.00331	-.34205
05	-.00445	.00178	-2.49939

DEP VAR = 05
STD ERR Y.X = 2.75292
R SQUARED = .36438
SUM SQR RES = 197.04338
IND VAR USED = 04

CONSTANT TERM = 121.50368

VAR	COEFF	STD ERR	T RATIO
01	1.54225	.70715	2.18094
02	-4.72247	2.77896	-1.69936
03	.04037	.32815	.12304
04	-43.52732	17.41512	-2.49939

D. PROGRAM 80-D, RESIDUAL ANALYSIS.
RESIDUALS BASED ON FINAL STEP OF ADV SAMPLE PROBLEM.

05 15 63
PROB 01 05 VAR 00031 OBSER

OBS	ACTUAL	PRED	RES
0001	2.98000	4.31774	-1.33774
0002	7.51000	8.76193	-1.25193
0003	.22000	1.89774	-1.67774
0004	3.15000	2.33558	.81442
0005	.98000	3.36616	-2.38616
0006	7.50000	2.50642	4.99358
0007	8.03000	4.15452	3.87548
0008	2.62000	2.84168	-.22168
0009	2.74000	5.64074	-2.90074
0010	7.51000	6.31979	1.19021
0011	5.36000	2.46947	2.89053
0012	10.13000	4.94600	5.18400
0013	.80000	4.94037	-4.14037
0014	10.93000	5.63576	5.29424
0015	7.21000	8.19615	-.98615
0016	2.54000	3.83905	-1.29905
0017	3.91000	6.27052	-2.36052
0018	4.96000	4.93527	.02473
0019	5.19000	4.65078	.53922
0020	2.62000	4.27145	-1.65145
0021	5.78000	6.28143	-.50143
0022	3.19000	2.84638	.34362
0023	1.63000	4.39512	-2.76512
0024	10.96000	6.61928	4.34072
0025	.13000	1.53310	-1.40310
0026	2.94000	2.62896	.31104
0027	.44000	2.90793	-2.46793
0028	2.13000	2.99678	-.86678
0029	.17000	2.66683	-2.49683
0030	2.04000	2.13658	-.09658
0031	1.62000	.60958	1.01042

00031OBSERVATIONS
SUM RES = .00091
AVE AB RES= 1.98785
SSQR = 197.04434
DSQR/SSQR = 2.36817

E. ANALYSIS OF SUBGROUPS.

SAME DATA USED IN PREVIOUS EXAMPLES HAVE BEEN SEPARATED INTO TWO GROUPS, THE FIRST OF WHICH CONSISTS OF THE FIRST FIFTEEN OBSERVATIONS, THE SECOND OF WHICH CONSISTS OF THE LAST SIXTEEN OBSERVATIONS.

SUBGROUP 1, 15 OBSERVATIONS, ONE PASS.

09 06 63
PROB 01 05 VAR 00015 OBSER

SUMS OF VARIABLES

378.41000	53.65000	58.94000	47.94345	77.67000

SUMS OF SQUARES AND CROSS-PRODUCTS

05 .10094	1347.29160	1533.72130	1232.78930	1866.53350
	192.62250	205.50330	171.19956	275.06590
		286.59940	190.57294	305.42850
			154.23894	244.19053
				571.15030

AVERAGES

25.22733	3.57666	3.92933	3.19623	5.17800

STANDARD DEVIATIONS

6.04303	.22126	1.91493	.25827	3.35633

CORRELATION MATRIX

1.0000	-.30687	.26974	.99539	-.30526
	1.00000	-.83478	-.32454	-.24541
		1.00000	.29481	.00246
			1.00000	-.31229
				1.00000

STEP 999

DEP VAR = 05
STD ERR Y.X = 3.29620
R SQUARED = .35700
SUM SQR RES = 108.64977
IND VAR USED = 04

CONSTANT TERM = 93.12915

VAR	COEFF	STD ERR	T RATIO
01	.34406	1.52391	.22577
02	-13.73560	7.07790	-1.94063
03	-1.07502	.82464	-1.30362
04	-13.54074	35.90330	-.37714

SUBGROUP2, 16 OBSERVATIONS, ONE PASS.

09 06 63
PROB 02 05 VAR 00016 OBSER

SUMS OF VARIABLES

429.08000	58.07000	67.05000	52.25902	50.25000

SUMS OF SQUARES AND CROSS-PRODUCTS

05 .12016	1557.27410	1777.91610	1420.83210	1257.99710
	211.72250	239.58960	189.65068	180.53670
		343.00230	217.98523	250.26270
			171.43658	159.96104
				266.71070

AVERAGES

26.81750	3.62937	4.19062	3.26618	3.14062

STANDARD DEVIATIONS

5.64160	.24554	1.96883	.21632	2.60881

CORRELATION MATRIX

1.00000	-.00081	-.11364	.99228	-.38041
	1.00000	-.48609	-.01990	-.17946
		1.00000	-.14861	.48288
			1.00000	-.46125
				1.00000

STEP 999

DEP VAR = 05
STD ERR Y.X = 1.73234
R SQUARED = .69684
SUM SQR RES = 33.01137
IND VAR USED = 04

CONSTANT TERM = 160.38578

VAR	COEFF	STD ERR	T RATIO
01	2.29510	.68643	3.34350
02	-2.24307	2.16360	-1.03673
03	.19405	.28048	.69185
04	-64.74405	18.05107	-3.58671

SUBGROUP1, 15 OBSERVATIONS, TWO PASS.

09 06 63
PROB 01 05 VAR 00015 OBSER

SUMS OF VARIABLES

378.41000	53.65000	58.94000	47.94345	77.67000

SUMS OF SQUARES AND CROSS-PRODUCTS

547.77361	-6.15483	46.82227	23.30374	-92.87348
	.73433	-5.30543	-.27818	-2.73380
		55.00448	2.18712	.23717

			1.00059	-4.06068
				168.97502

AVERAGES

25.22733	3.57666	3.92933	3.19623	5.17800

STANDARD DEVIATIONS

6.04303	.22125	1.91493	.25827	3.35633

CORRELATION MATRIX

1.00000	-.30688	.26974	.99539	-.30526
	1.00000	-.83478	-.32453	-.24541
		1.00000	.29481	.00246
			1.00000	-.31228
				1.00000

STEP 999

DEP VAR = 05
STD ERR Y.X = 3.29628
R SQUARED = .35697
SUM SQR RES = 108.65518
IND VAR USED = 04

CONSTANT TERM = 93.05992

VAR	COEFF	STD ERR	T RATIO
01	.34271	1.52385	.22489
02	-13.73528	7.07833	-1.94046
03	-1.07511	.82472	-1.30359
04	-13.50861	35.90170	-.37626

SUBGROUP2, 16 OBSERVATIONS, TWO PASS.

09 06 63
PROB 02 05 VAR 00016 OBSER

SUMS OF VARIABLES

429.08000	58.07000	67.05000	52.25902	50.25000

SUMS OF SQUARES AND CROSS-PRODUCTS

509.24321	-.01812	-20.19727	19.37582	-89.58227
	.96469	-3.75999	-.01690	-1.83939
		62.02088	-1.01272	39.68379
			.74871	-4.16493
				108.89428

AVERAGES

26.81750	3.62937	4.19062	3.26618	3.14062

STANDARD DEVIATIONS

5.64160	.24554	1.96883	.21632	2.60881

CORRELATION MATRIX

1.00000	-.00081	-.11364	.99229	-.38041
	1.00000	-.48609	-.01989	-.17946
		1.00000	-.14861	.48288
			1.00000	-.46126
				1.00000

STEP 999

DEP VAR = 05
STD ERR Y.X = 1.73087
R SQUARED = .69736
SUM SQR RES = 32.95504
IND VAR USED = 04

CONSTANT TERM = 160.61097

VAR	COEFF	STD ERR	T RATIO
01	2.29870	.68635	3.34915
02	-2.24545	2.16179	-1.03869
03	.19354	.28027	.69055
04	-64.83929	18.04904	-3.59239

COMBINED GROUPS, ONE PASS.

09 06 63
PROB 01 05 VAR 00031 OBSER

SUMS OF VARIABLES

807.49000	111.72000	125.99000	100.20248	127.92000

SUMS OF SQUARES AND CROSS-PRODUCTS

05 .22110	2904.56570	3311.63740	2653.62140	3124.53060
	404.34500	445.09290	360.85024	455.60260
		629.60170	408.55817	555.69120
			325.67552	404.15157
				837.86100

AVERAGES

26.04806	3.60387	4.06419	3.23233	4.12645

STANDARD DEVIATIONS

5.89311	.23558	1.94732	.24011	3.16230

CORRELATION MATRIX

1.00000	-.12834	.08388	.99260	-.35924
	1.00000	-.62993	-.15200	-.23401
		1.00000	.09078	.18753
			1.00000	-.39633
				1.00000

STEP 999

DEP VAR = 05
STD ERR Y.X = 2.75374
R SQUARED = .36400
SUM SQR RES = 197.16039
IND VAR USED = 04

CONSTANT TERM = 121.25260

VAR	COEFF	STD ERR	T RATIO
01	1.53782	.70645	2.17680
02	-4.71950	2.77966	-1.69786
03	.04049	.32825	.12337
04	-43.41737	17.39774	-2.49557

COMBINED GROUPS, TWO PASS

09 06 63
PROB 02 05 VAR 00031 OBSER

SUMS OF VARIABLES

807.49000	111.72000	125.99000	100.20248	127.92000

SUMS OF SQUARES AND CROSS-PRODUCTS

1057.01680	-6.17295	26.62500	42.67956	-182.45575
	1.69902	-9.06542	-.29508	-4.57319
		117.02537	1.17439	39.92097
			1.74931	-8.22561
				277.86930

AVERAGES

26.04806	3.60387	4.06419	3.23233	4.12645

STANDARD DEVIATIONS

5.83929	.23410	1.94293	.23754	2.99391

CORRELATION MATRIX

1.00000	-.14566	.07570	.99253	-.33666
	1.00000	-.64290	-.17116	-.21047
		1.00000	.08208	.22138
			1.00000	-.37309
				1.00000

STEP 999

DEP VAR = 05
STD ERR Y.X = 2.66538
R SQUARED = .33525
SUM SQR RES = 184.71178
IND VAR USED = 04

CONSTANT TERM = 110.35052

VAR	COEFF	STD ERR	T RATIO
01	1.42606	.69031	2.06582
02	-3.84201	2.77233	-1.38583
03	.12273	.32381	.37903
04	-40.22568	17.04627	-2.35979

RESIDUAL ANALYSIS, COMBINED GROUPS, TWO PASS
STEP OUTPUT USED WITHOUT CHANGE. ALL OBSERVATIONS.

09 06 63
PROB 02 05 VAR 00031 OBSER

OBS	ACTUAL	PRED	RES
0001	2.98000	4.39828	-1.41828
0002	7.51000	8.33926	-.82926
0003	.22000	2.13434	-1.91434
0004	3.15000	2.29856	.85144
0005	.98000	3.41273	-2.43273
0006	7.50000	2.62413	4.87587
0007	8.03000	4.03176	3.99824
0008	2.62000	2.90167	-.28167
0009	2.74000	5.42630	-2.68630
0010	7.51000	6.16389	1.34611
0011	5.36000	2.49541	2.86459
0012	10.13000	4.92560	5.20440
0013	.80000	5.06493	-4.26493
0014	10.93000	5.47169	5.45831
0015	7.21000	7.75788	-.54788
0016	2.54000	3.71649	-1.17649
0017	3.91000	6.01488	-2.10488
0018	4.96000	5.21117	-.25117
0019	5.19000	4.84709	.34291
0020	2.62000	4.05791	-1.43791
0021	5.78000	5.97317	-.19317
0022	3.19000	2.93852	.25148
0023	1.63000	4.52327	-2.89327
0024	10.96000	6.69808	4.26192
0025	.13000	1.72180	-1.59180
0026	2.94000	2.59860	.34140
0027	.44000	3.03149	-2.59149
0028	2.13000	3.05118	-.92118
0029	.17000	2.86816	-2.69816
0030	2.04000	2.30646	-.26646
0031	1.62000	.91440	.70560

00031OBSERVATIONS
SUM RES = .00090
AVE AB RES= 1.96785
SSQR = 198.21127
DSQR/SSQR = 2.38650

GROUP 1, COLUMNS 21-30 OF FIRST STEP CARD MODIFIED TO REFLECT
APPROPRIATE CONST TERM FOR FIRST GROUP, 111.03216.

09 06 63
PROB 01 05 VAR 00015 OBSER

OBS	ACTUAL	PRED	RES
0001	2.98000	5.07992	-2.09992
0002	7.51000	9.02090	-1.51090
0003	.22000	2.81598	-2.59598
0004	3.15000	2.98020	.16980
0005	.98000	4.09437	-3.11437
0006	7.50000	3.30577	4.19423
0007	8.03000	4.71340	3.31660
0008	2.62000	3.58331	-.96331
0009	2.74000	6.10794	-3.36794
0010	7.51000	6.84553	.66447
0011	5.36000	3.17705	2.18295
0012	10.13000	5.60724	4.52276
0013	.80000	5.74657	-4.94657
0014	10.93000	6.15333	4.77667
0015	7.21000	8.43952	-1.22952

00015OBSERVATIONS
SUM RES = -.00103
AVE AB RES= 2.64373
SSQR = 138.48109
DSQR/SSQR = 2.47376

GROUP 2, COLUMNS 21-30 OF FIRST STEP CARD MODIFIED TO REFLECT APPROPRIATE CONST TERM FOR SECOND GROUP, 109.71869.

09 06 63
PROB 02 05 VAR 00016 OBSER

OBS	ACTUAL	PRED	RES
0001	2.54000	3.08466	-.54466
0002	3.91000	5.38305	-1.47305
0003	4.96000	4.57934	.38066
0004	5.19000	4.21526	.97474
0005	2.62000	3.42608	-.80608
0006	5.78000	5.34134	.43866
0007	3.19000	2.30669	.88331
0008	1.63000	3.89144	-2.26144
0009	10.96000	6.06625	4.89375
0010	.13000	1.08997	-.95997
0011	2.94000	1.96677	.97323
0012	.44000	2.39966	-1.95966
0013	2.13000	2.41935	-.28935
0014	.17000	2.23633	-2.06633
0015	2.04000	1.67463	.36537
0016	1.62000	.28257	1.33743

00016OBSERVATIONS
SUM RES = -.11339
AVE AB RES= 1.28798
SSQR = 46.23151
DSQR/SSQR = 2.81337

1620 USERS GROUP PROGRAM REVIEW AND EVALUATION

(fill out in typewriter or pencil, do not use ink)

Program No. _____ Date _____

Program Name: _____

1. Does the abstract adequately describe what the program is and what it does? Yes___ No___
   Comment _____

2. Does the program do what the abstract says? Yes___ No___
   Comment _____

3. Is the Description clear, understandable, and adequate? Yes___ No___
   Comment _____

4. Are the Operating Instructions understandable and in sufficient detail? Yes___ No___
   Comment _____
   Are the Sense Switch options adequately described (if applicable)? Yes___ No___
   Are the mnemonic labels identified or sufficiently understandable? Yes___ No___
   Comment _____

5. Does the source program compile satisfactorily (if applicable)? Yes___ No___
   Comment _____

6. Does the object program run satisfactorily? Yes___ No___
   Comment _____

7. Number of test cases run_____. Are any restrictions as to data, size, range, etc. covered adequately in description? Yes___ No___
   Comment _____

8. Does the Program Meet the minimal standards of the 1620 Users Group? Yes___ No___
   Comment _____

9. Were all necessary parts of the program received? Yes___ No___
   Comment _____

10. Please list on the back any suggestions to improve the usefulness of the program. These will be passed onto the author for his consideration.

Please return to:

Mr. Richard L. Pratt
Data Corporation
7500 Old Xenia Pike
Dayton, Ohio 45432

Your Name _____

Company _____

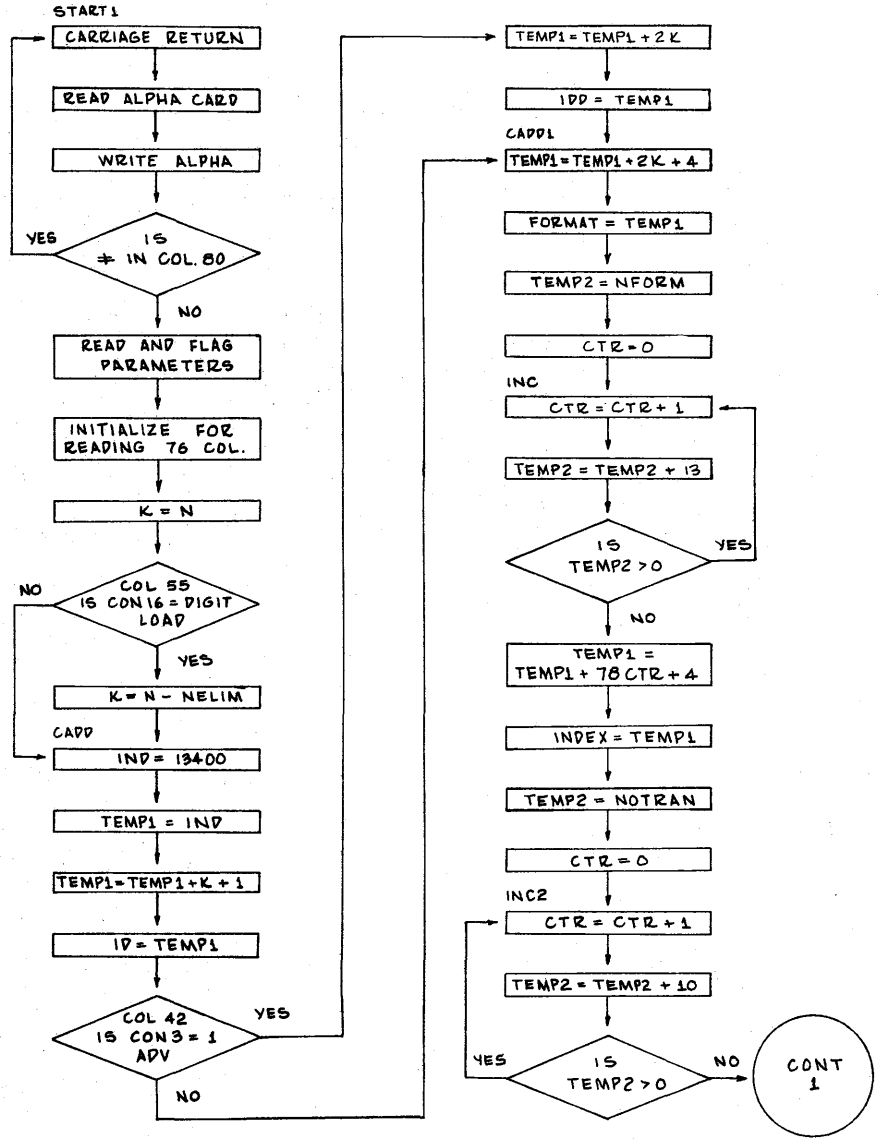
Address _____

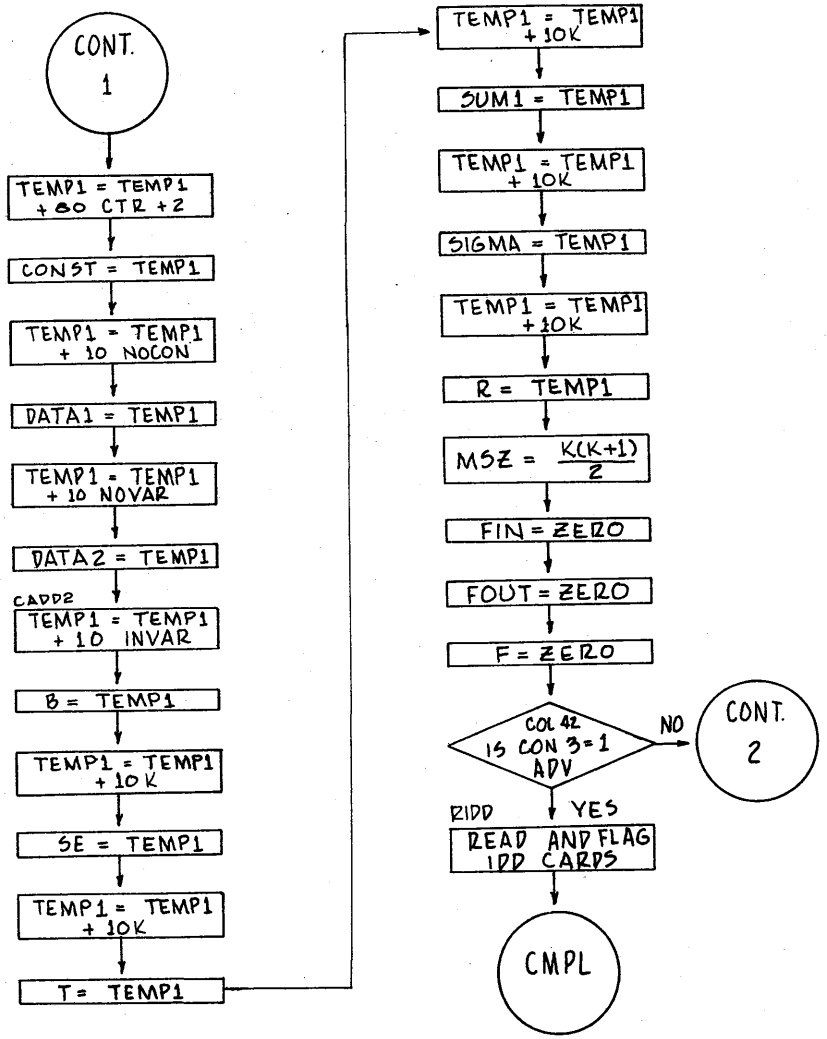
User Group Code _____

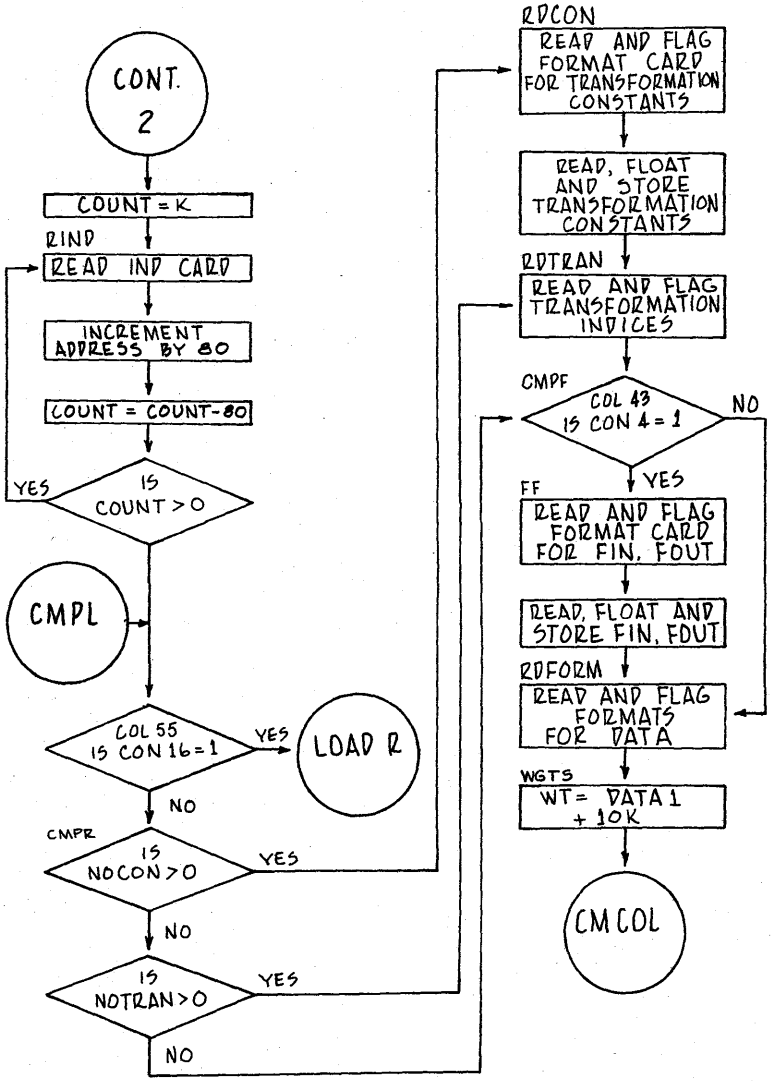
THIS REVIEW FORM IS PART OF THE 1620 USER GROUP ORGANIZATION'S PROGRAM REVIEW AND EVALUATION PROCEDURE. NONMEMBERS ARE CORDIALLY INVITED TO PARTICIPATE IN THIS EVALUATION.

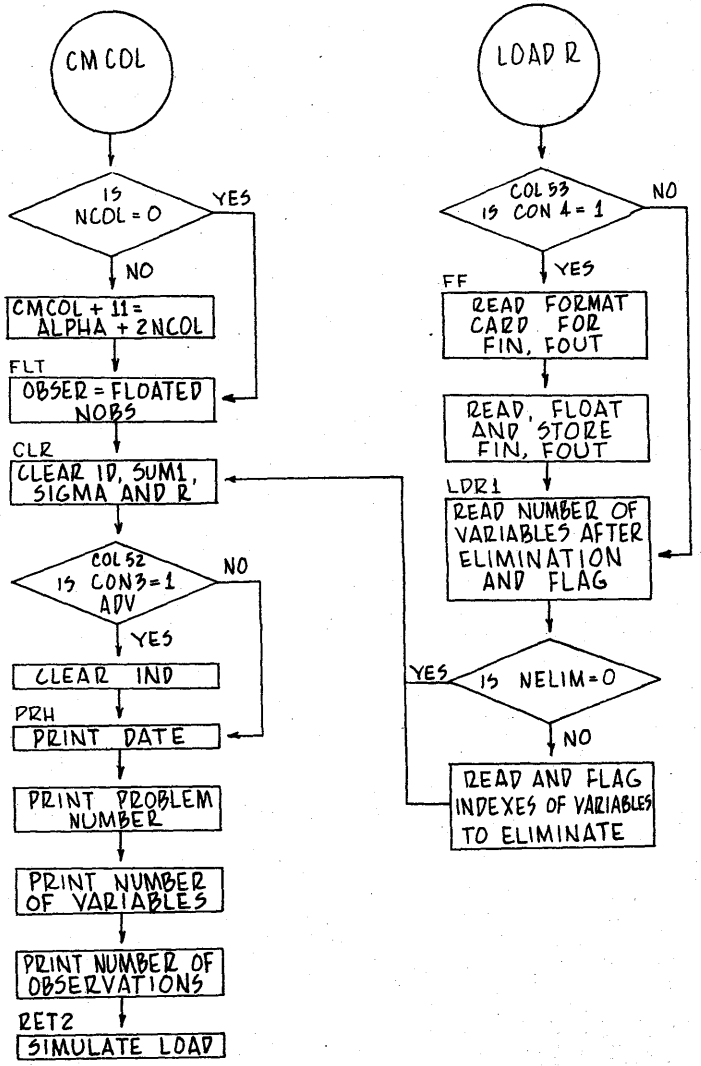
VII. FLOW CHARTS

PROGRAM 80-1, INITIALIZATION

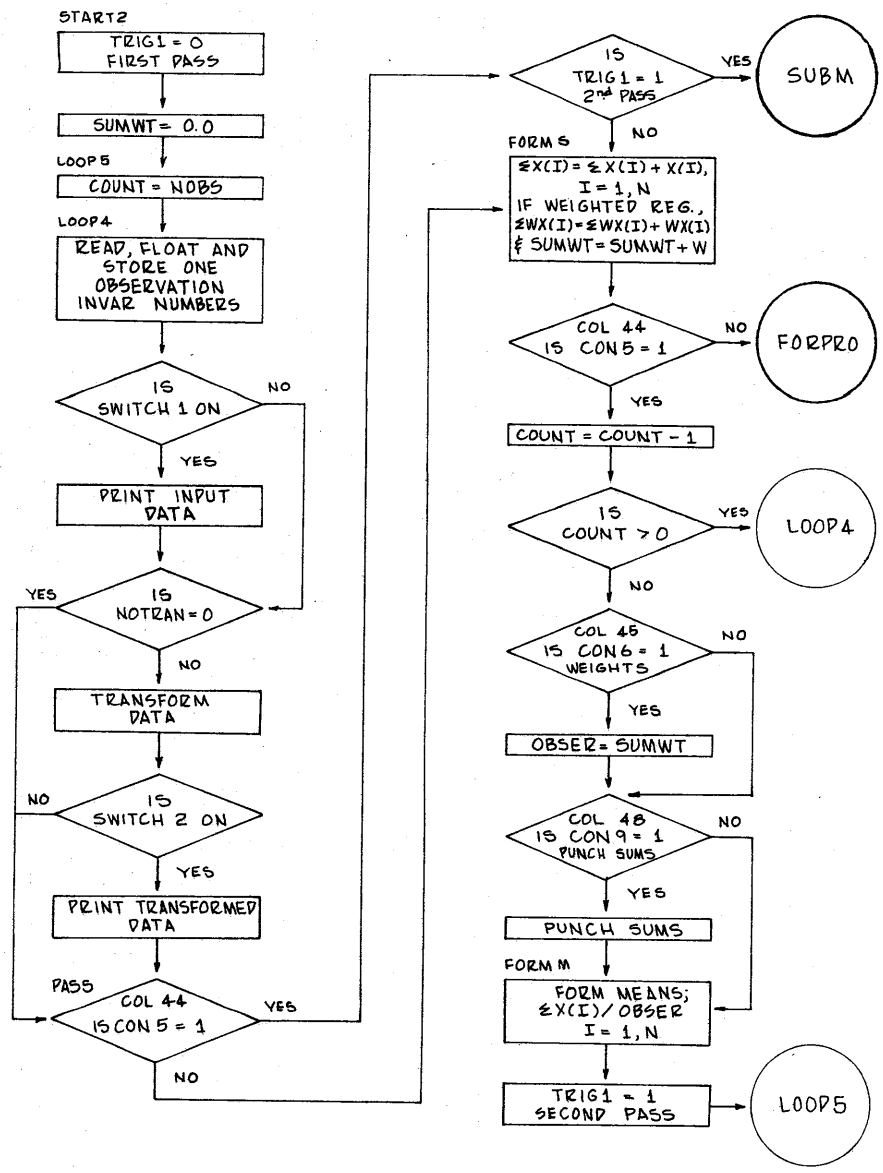


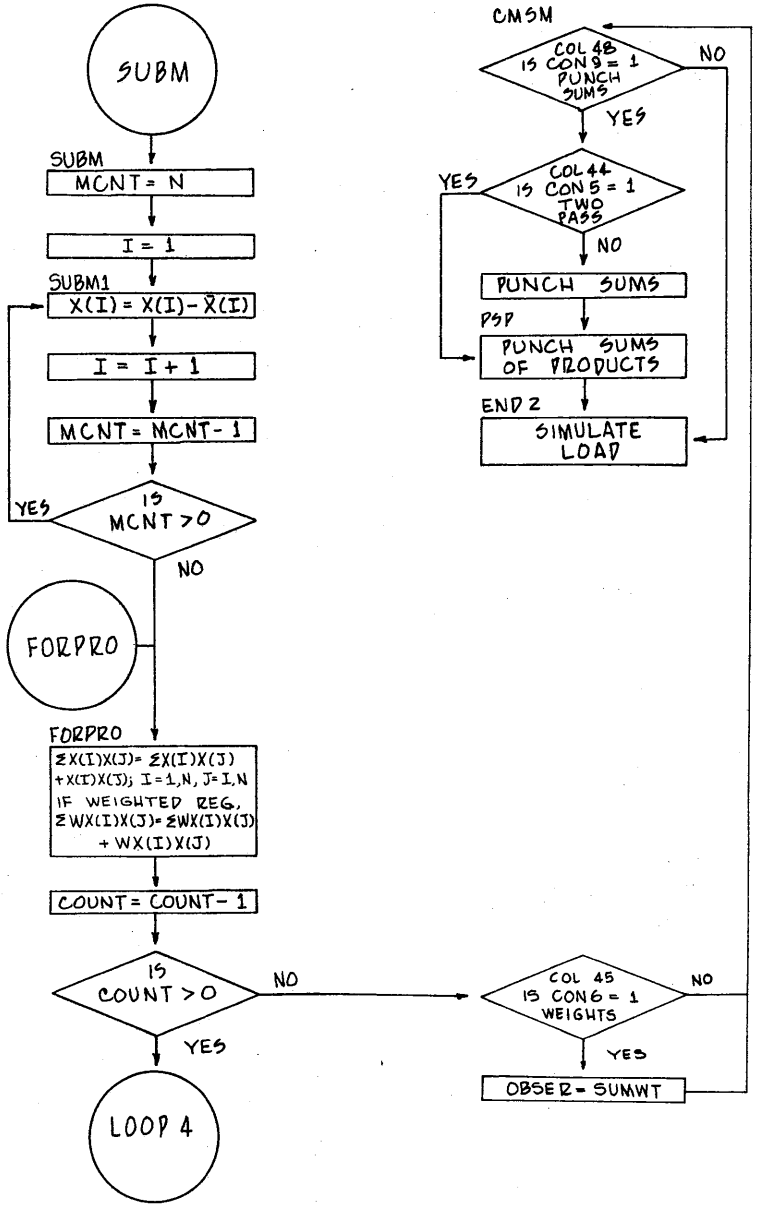



CONT. 2
COUNT = K
RIND
READ IND CARD
INCREMENT ADDRESS BY 80
COUNT = COUNT-80
YES
IS COUNT > 0
CMPL
COL 55 IS CON 16 = 1
YES
LOAD R
NO
CMPR
IS NOCON > 0
YES
NO
IS NOTRAN > 0
YES
NO
RDCON
READ AND FLAG FORMAT CARD FOR TRANSFORMATION CONSTANTS
READ, FLOAT AND STORE TRANSFORMATION CONSTANTS
RDTRAN
READ AND FLAG TRANSFORMATION INDICES
CMPF
COL 43 IS CON 4 = 1
NO
YES
FF
READ AND FLAG FORMAT CARD FOR FIN, FOUT
READ, FLOAT AND STORE FIN, FOUT
RDFORM
READ AND FLAG FORMATS FOR DATA
WGTS
WT = DATA 1 + 10K
CM COL

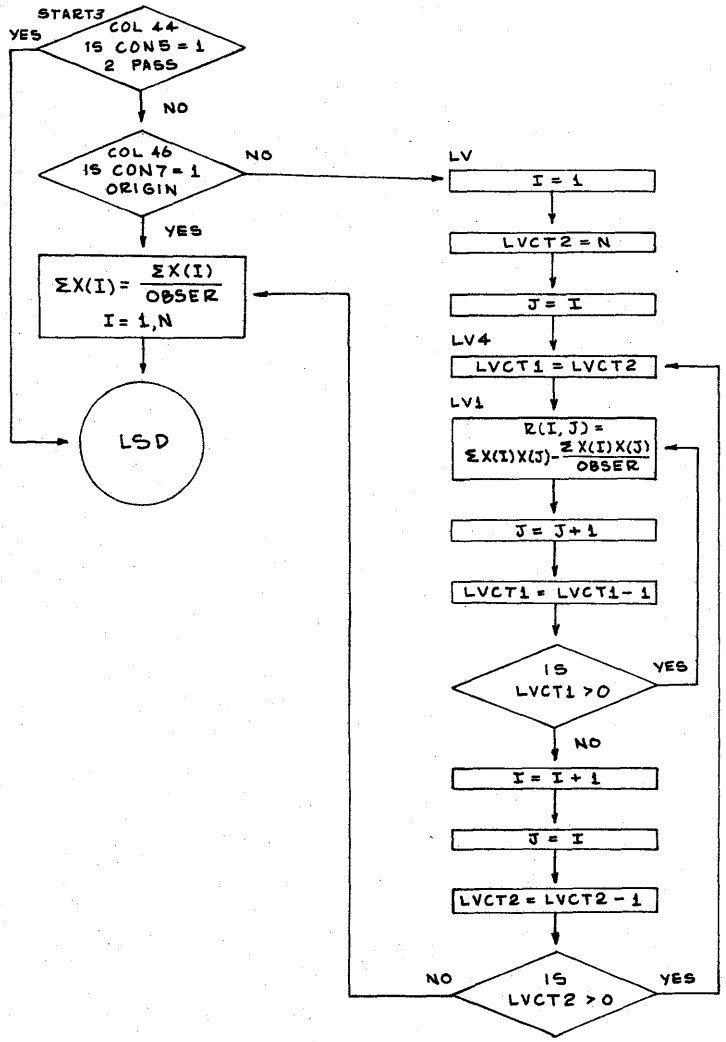

CM COL
IS NCOL = 0
YES
NO
CMCOL + 11 = ALPHA + 2NCOL
FLT
OBSER = FLOATED NOBS
CLR
CLEAR ID, SUM1, SIGMA AND R
COL 52 IS CON 3 = 1 ADV
NO
YES
CLEAR IND
PRH
PRINT DATE
PRINT PROBLEM NUMBER
PRINT NUMBER OF VARIABLES
PRINT NUMBER OF OBSERVATIONS
RET2
SIMULATE LOAD
LOAD R
COL 53 IS CON 4 = 1
NO
YES
FF
READ FORMAT CARD FOR FIN, FOUT
READ, FLOAT AND STORE FIN, FOUT
LDR1
READ NUMBER OF VARIABLES AFTER ELIMINATION AND FLAG
YES
IS NELIM = 0
NO
READ AND FLAG INDEXES OF VARIABLES TO ELIMINATE

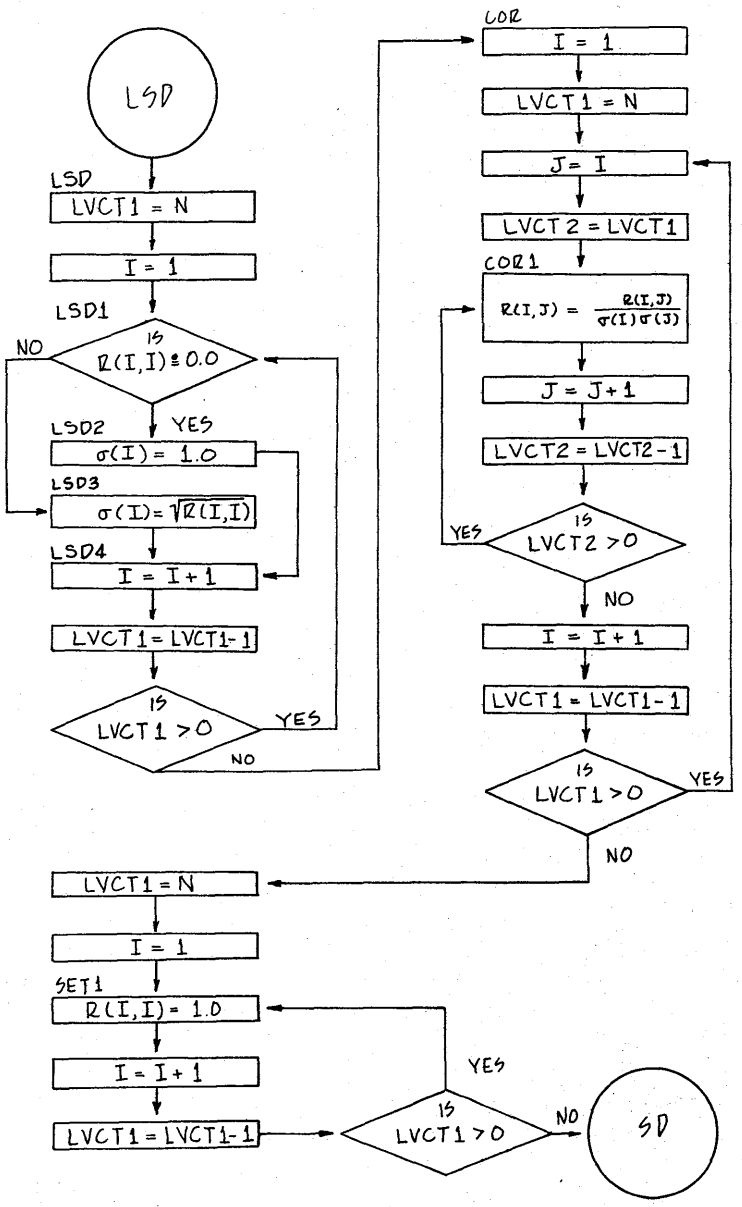
PROGRAM 80-2, READ, FLOAT AND STORE DATA, TRANSFORM DATA, FORM SUMS AND SUMS OF PRODUCTS.

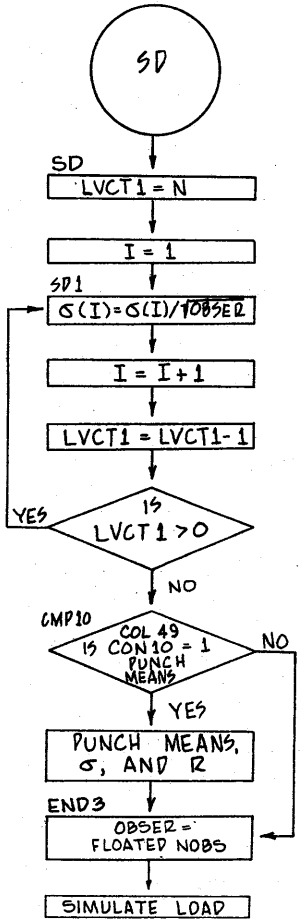




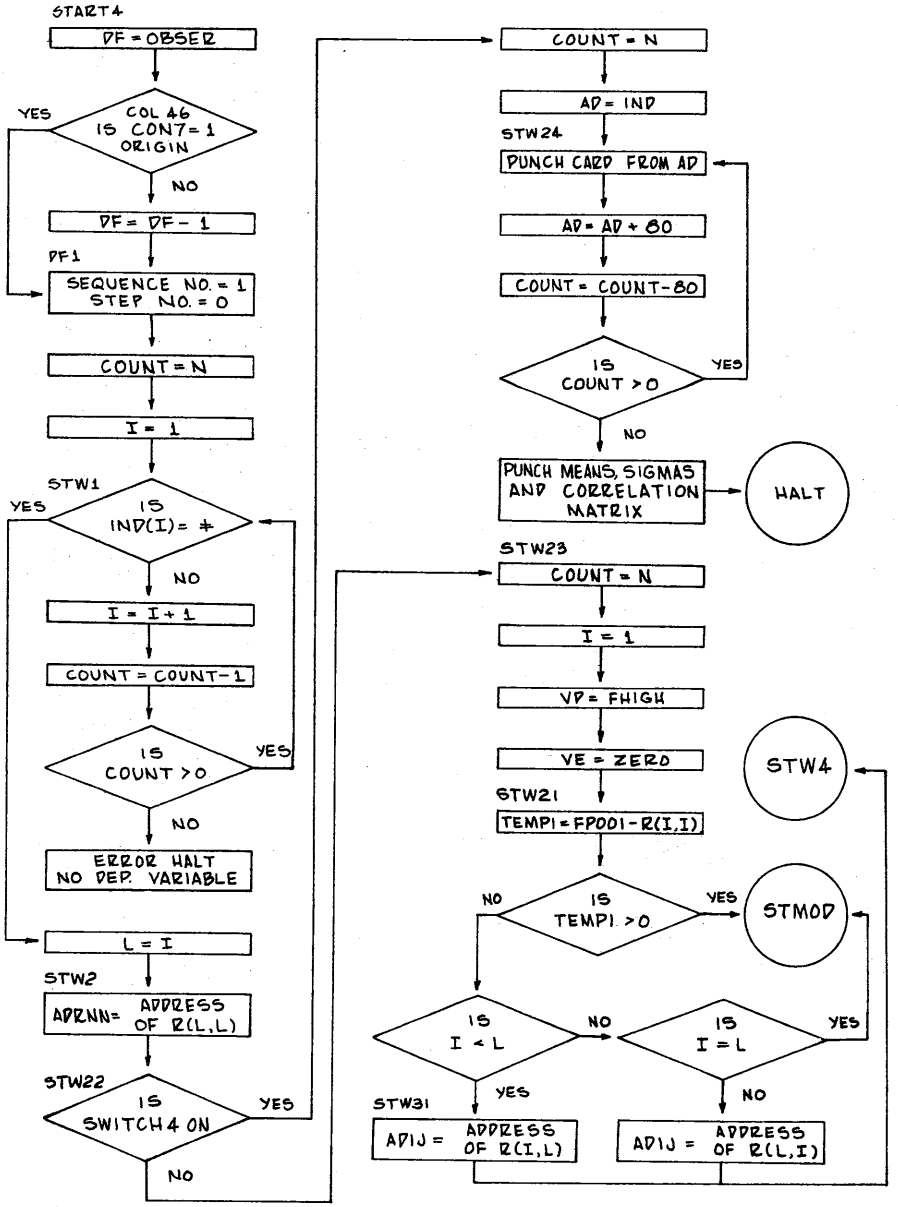
PROGRAM 80-3, FORM MEANS, STANDARD DEVIATIONS, AND CORRELATION MATRIX.

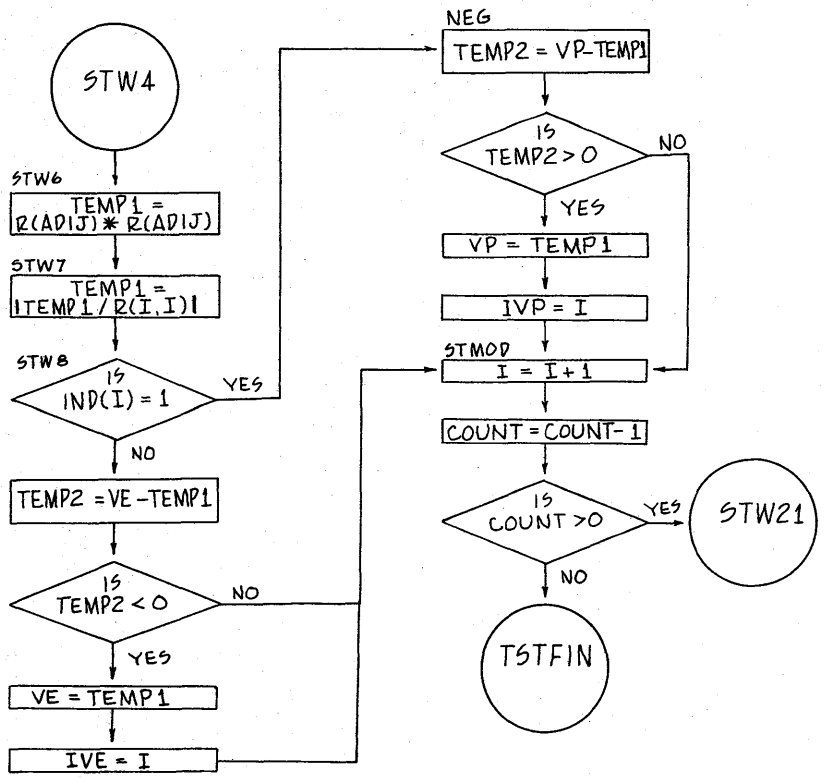


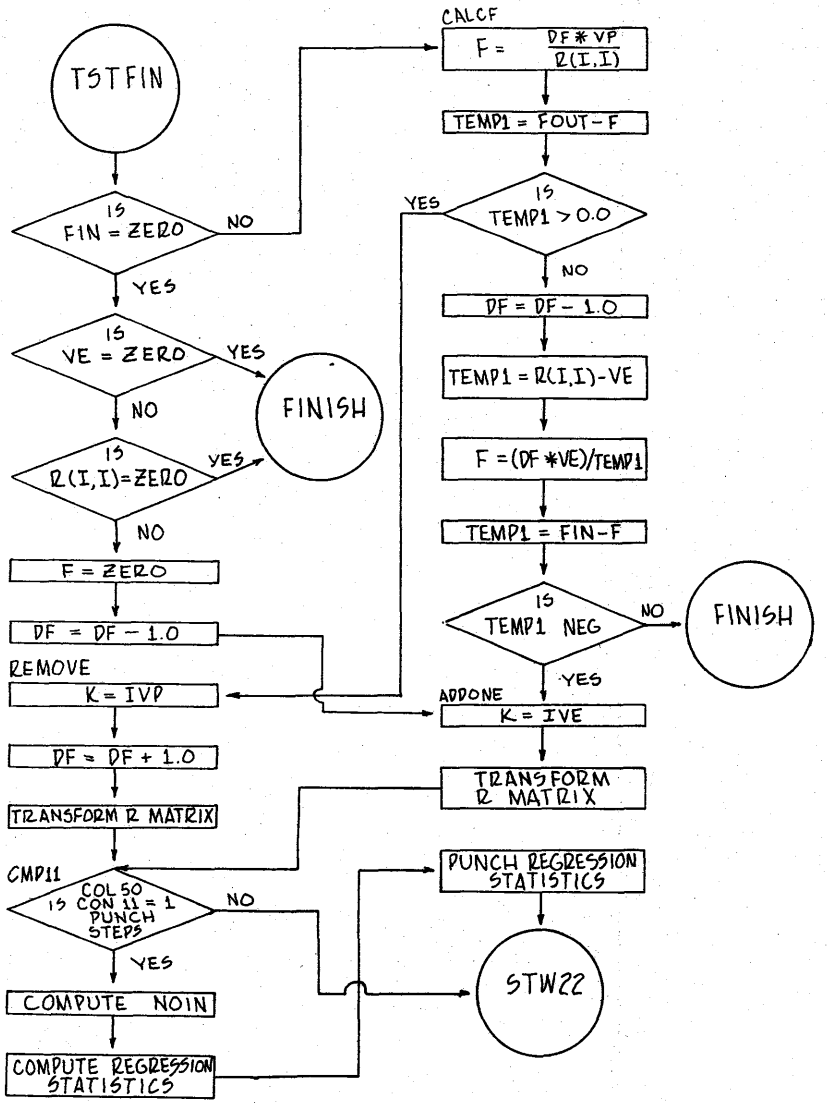


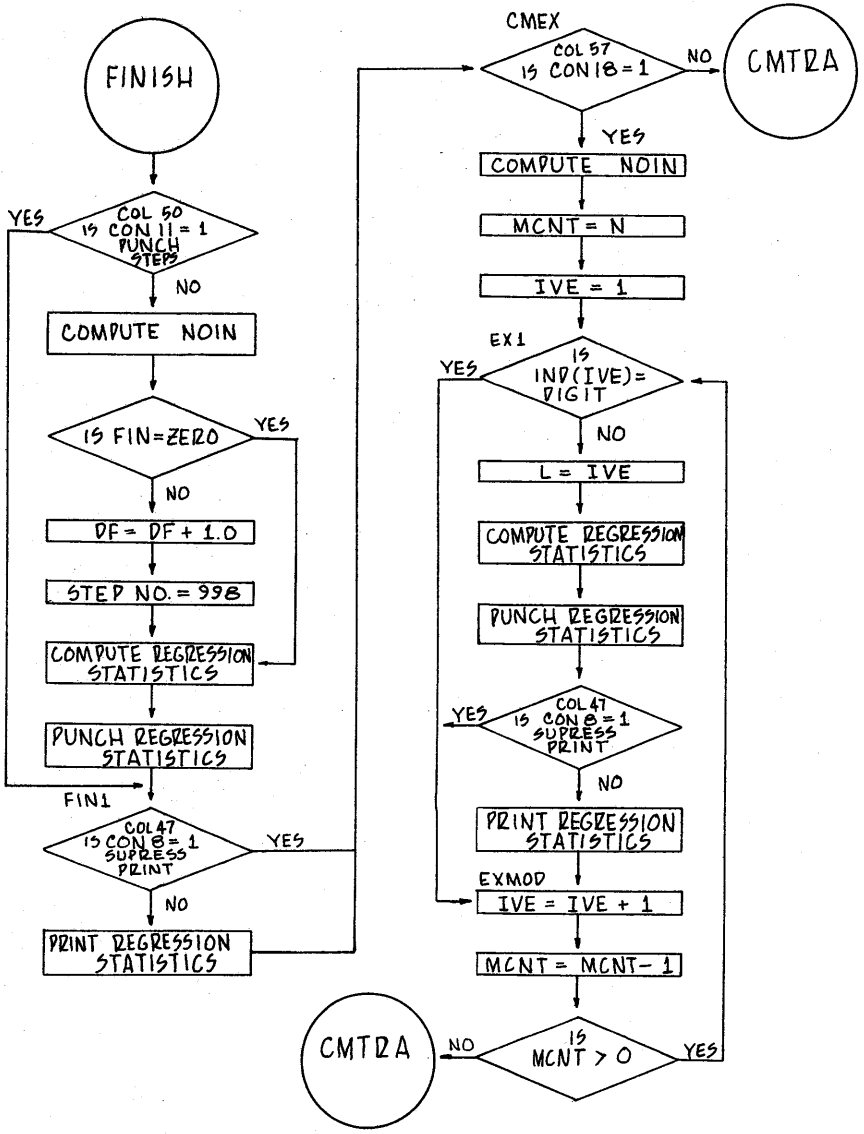


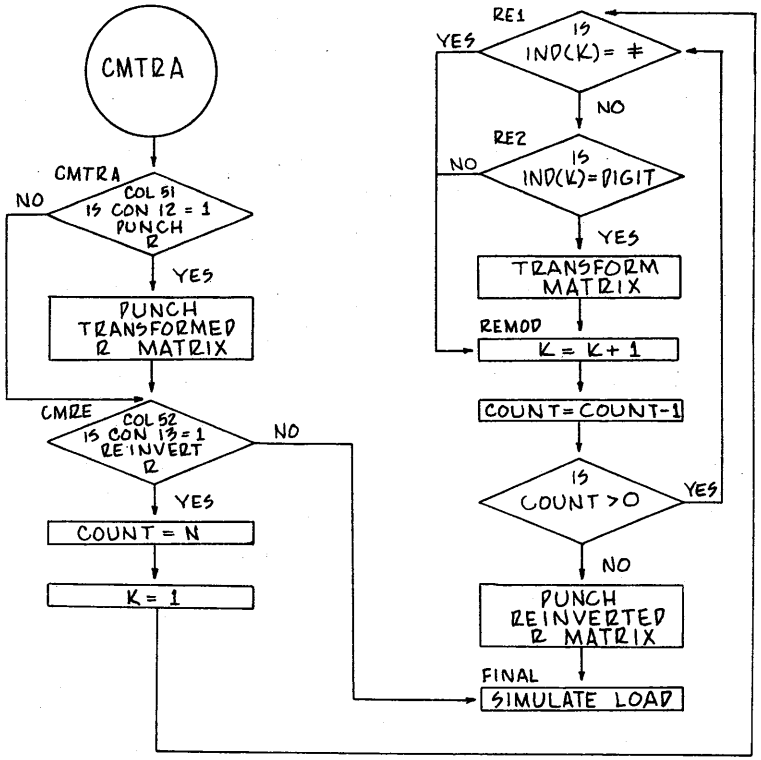
PROGRAM 80-4A, STEPWISE REGRESSION ANALYSIS



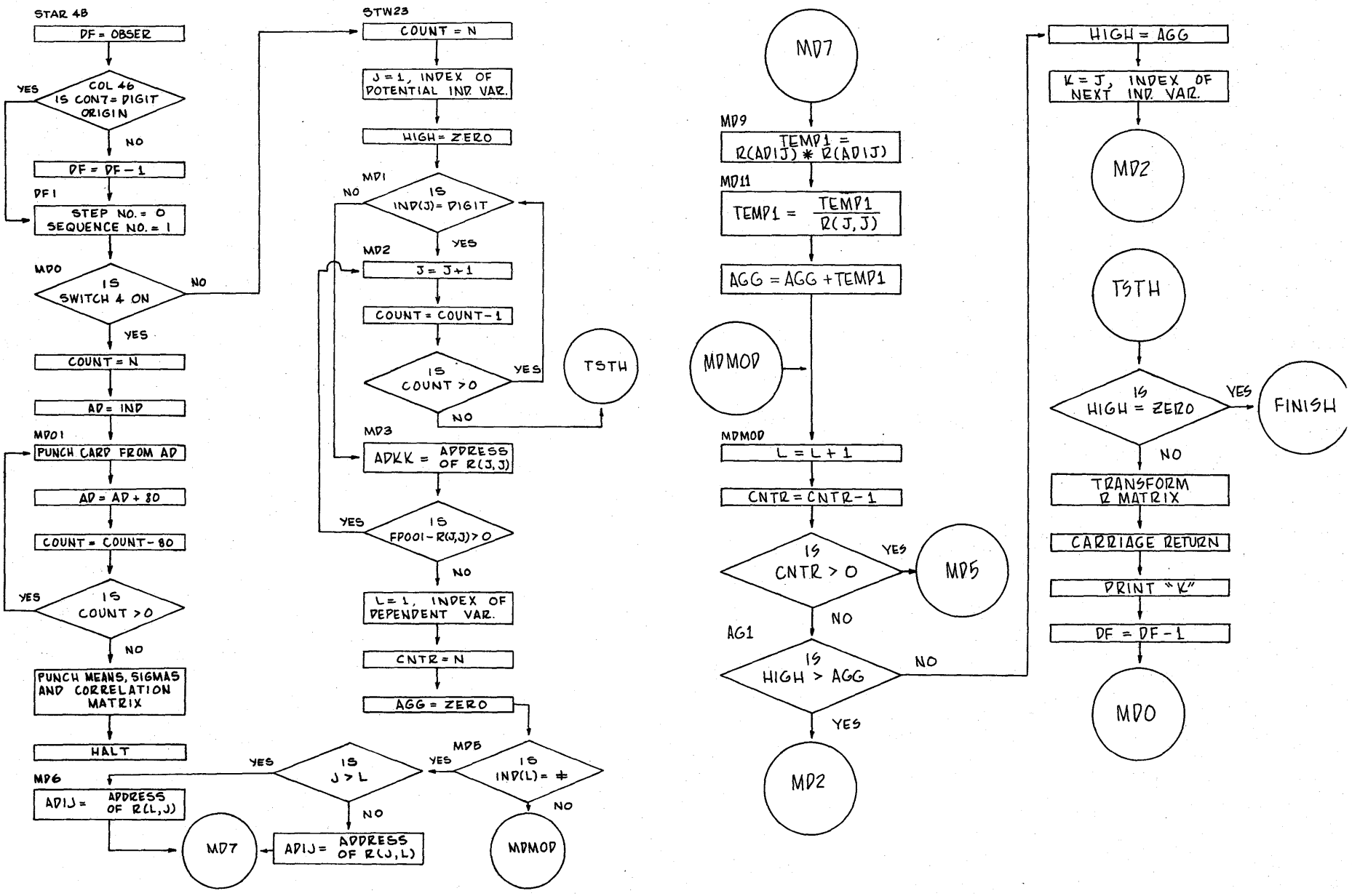

STW4
STW6
TEMP1 = R(ADIJ) * R(ADIJ)
STW7
TEMP1 = ITEMP1 / R(I,I)I
STW8
IS IND(I) = 1
YES
NO
TEMP2 = VE - TEMP1
IS TEMP2 < 0
NO
YES
VE = TEMP1
IVE = I
NEG
TEMP2 = VP - TEMP1
IS TEMP2 > 0
NO
YES
VP = TEMP1
IVP = I
STMOD
I = I + 1
COUNT = COUNT - 1
IS COUNT > 0
YES
NO
STW21
TSTFIN

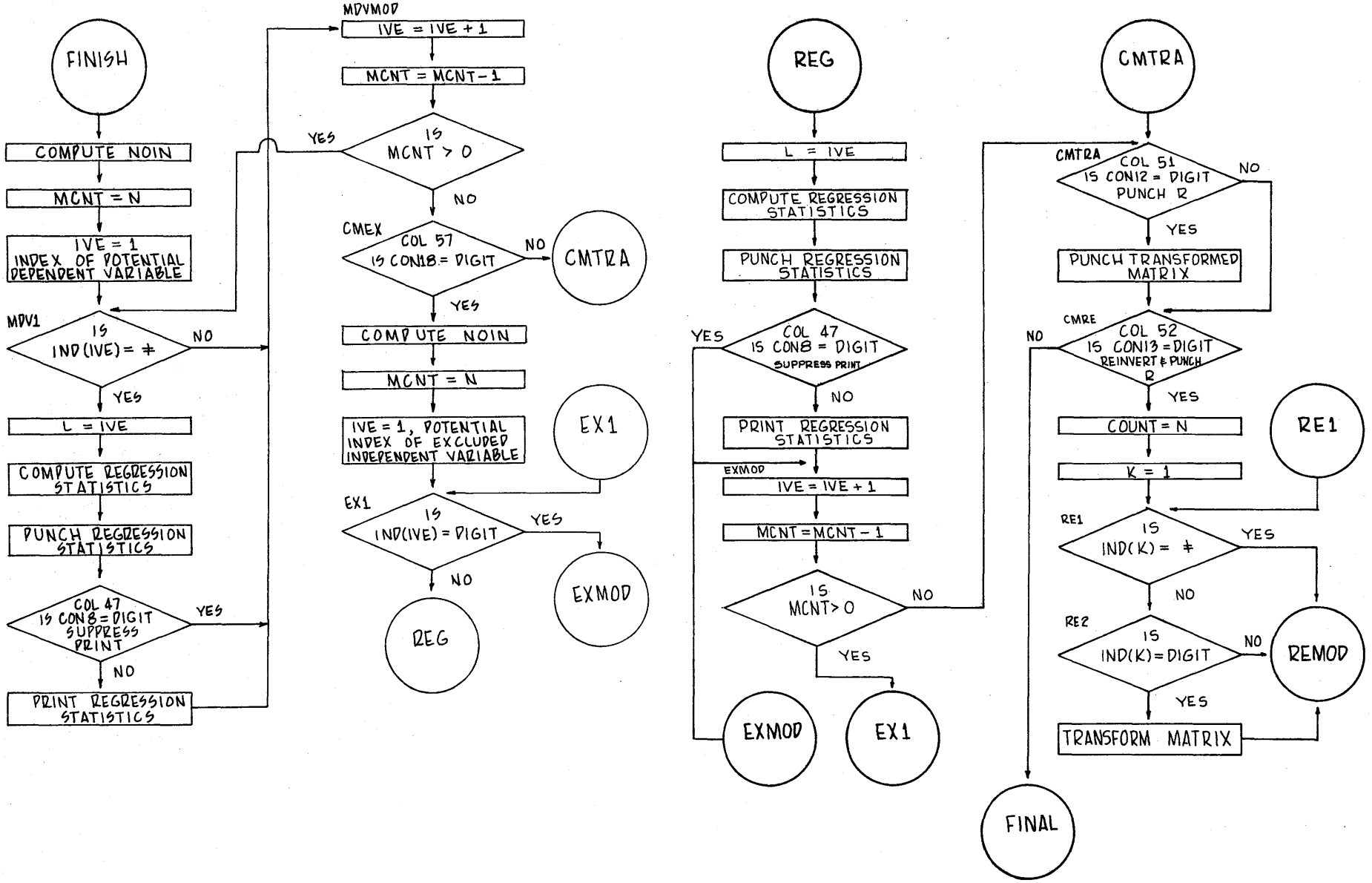

TSTFIN
IS FIN = ZERO
NO
YES
IS VE = ZERO
YES
NO
FINISH
IS R(I,I) = ZERO
YES
NO
F = ZERO
DF = DF - 1.0
REMOVE
K = IVP
DF = DF + 1.0
TRANSFORM R MATRIX
CMP11
IS COL 50 CON 11 = 1 PUNCH STEPS
NO
YES
COMPUTE NOIN
COMPUTE REGRESSION STATISTICS
CALCF
F = DF * VP / R(I,I)
TEMP1 = FOUT - F
IS TEMP1 > 0.0
YES
NO
DF = DF - 1.0
TEMP1 = R(I,I) - VE
F = (DF * VE) / TEMP1
TEMP1 = FIN - F
IS TEMP1 NEG
NO
FINISH
YES
ADDONE
K = IVE
TRANSFORM R MATRIX
PUNCH REGRESSION STATISTICS
STW22

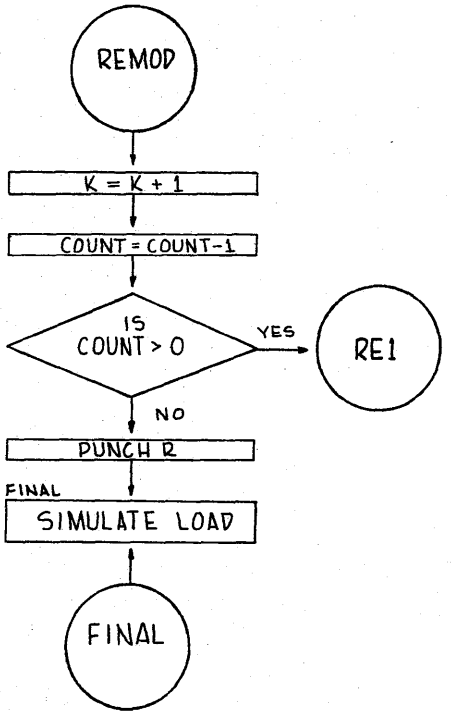

FINISH
COL 50 IS CON 11 = 1 PUNCH STEPS
YES
NO
COMPUTE NOIN
IS FIN=ZERO
YES
NO
DF = DF + 1.0
STEP NO. = 998
COMPUTE REGRESSION STATISTICS
PUNCH REGRESSION STATISTICS
FIN1
COL 47 IS CON 8 = 1 SUPRESS PRINT
YES
NO
PRINT REGRESSION STATISTICS
CMEX
COL 57 IS CON 18 = 1
NO
CMTRA
YES
COMPUTE NOIN
MCNT = N
IVE = 1
EX1
IS IND(IVE) = DIGIT
YES
NO
L = IVE
COMPUTE REGRESSION STATISTICS
PUNCH REGRESSION STATISTICS
COL 47 IS CON 8 = 1 SUPRESS PRINT
YES
NO
PRINT REGRESSION STATISTICS
EXMOD
IVE = IVE + 1
MCNT = MCNT - 1
CMTRA
IS MCNT > 0
NO
YES


CMTRA
CMTRA
COL 51 IS CON 12 = 1 PUNCH R
NO
YES
PUNCH TRANSFORMED R MATRIX
CMRE
COL 52 IS CON 13 = 1 RE-INVERT R
NO
YES
COUNT = N
K = 1
RE1
IS IND(K) = #
YES
NO
RE2
IS IND(K) = DIGIT
NO
YES
TRANSFORM MATRIX
REMOD
K = K + 1
COUNT = COUNT - 1
IS COUNT > 0
YES
NO
PUNCH REINVERTED R MATRIX
FINAL
SIMULATE LOAD

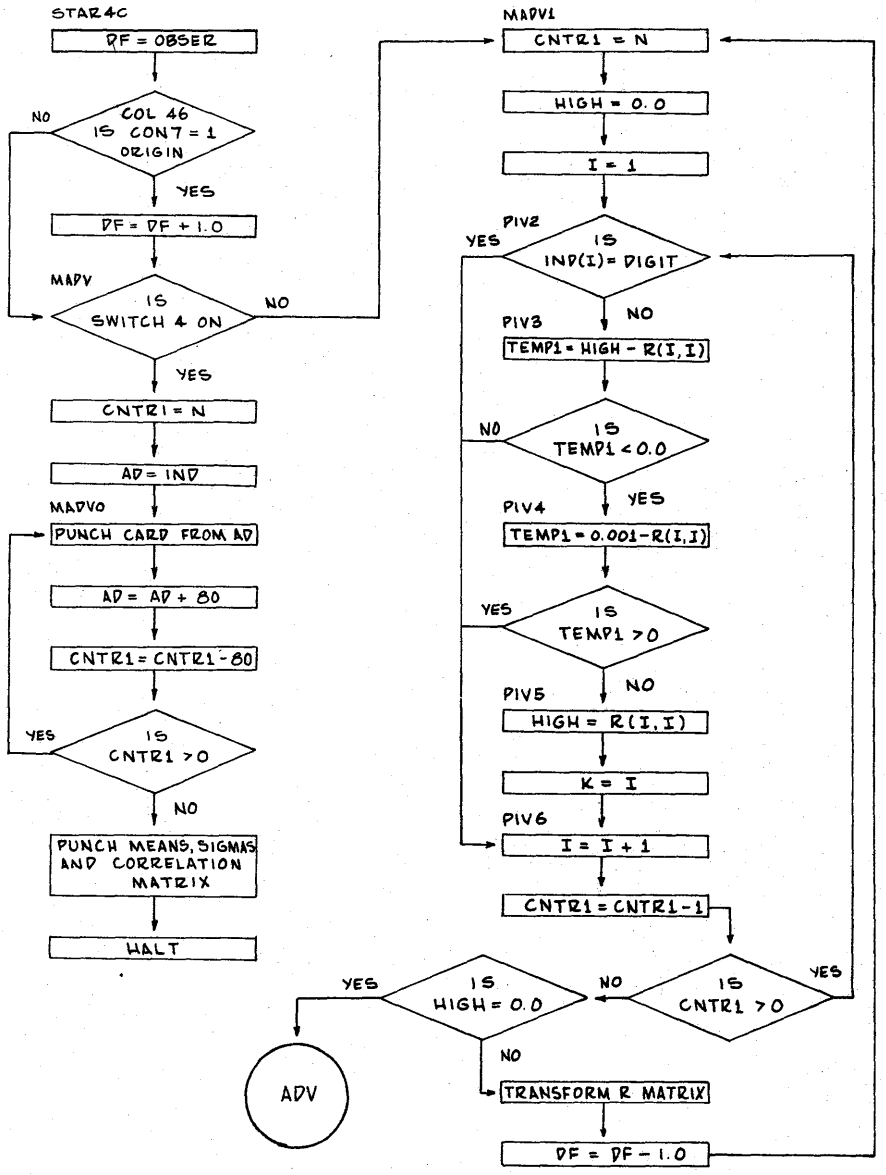
PROGRAM 80-4B, MULTIPLE DEPENDENT VARIABLE REGRESSION

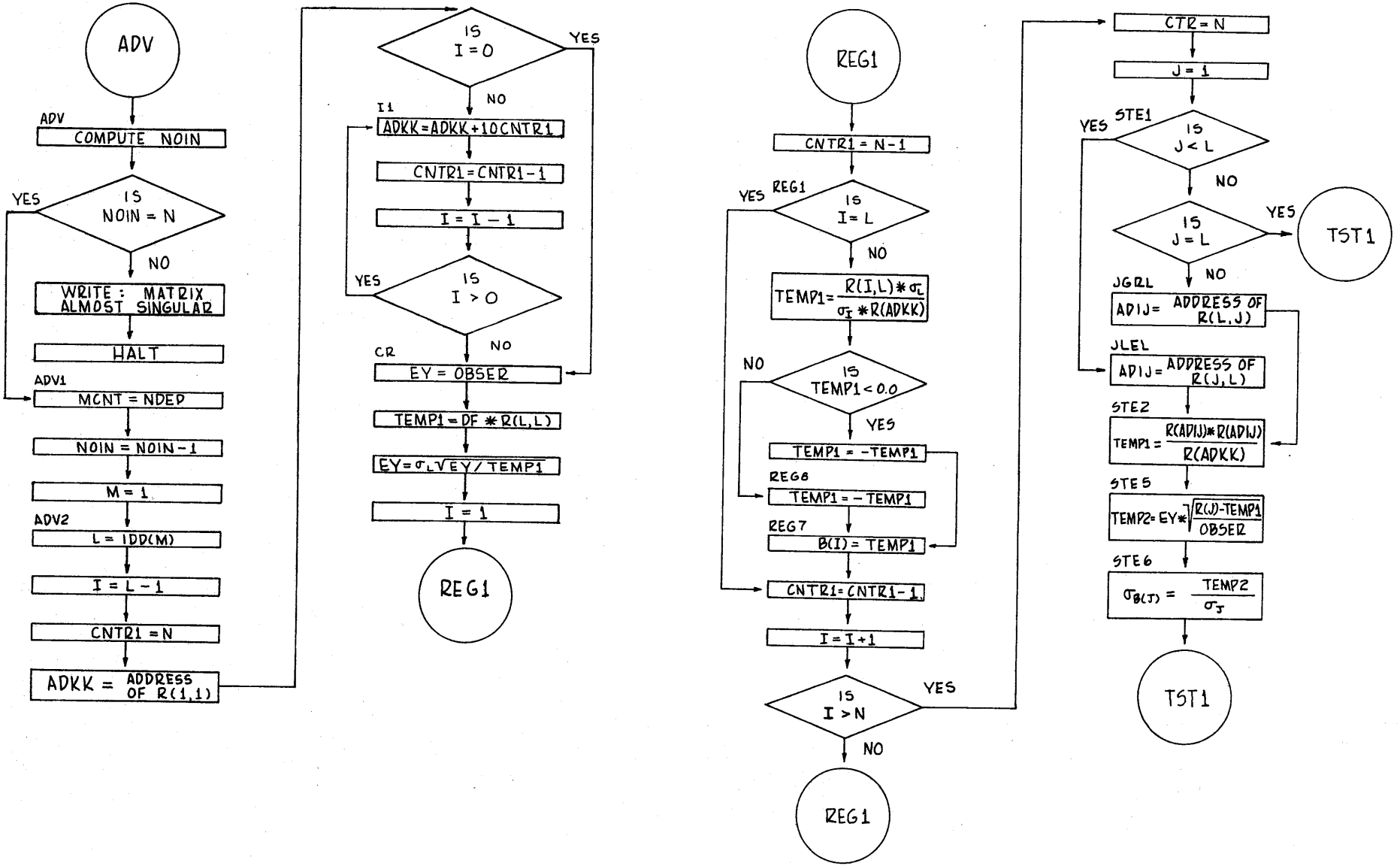


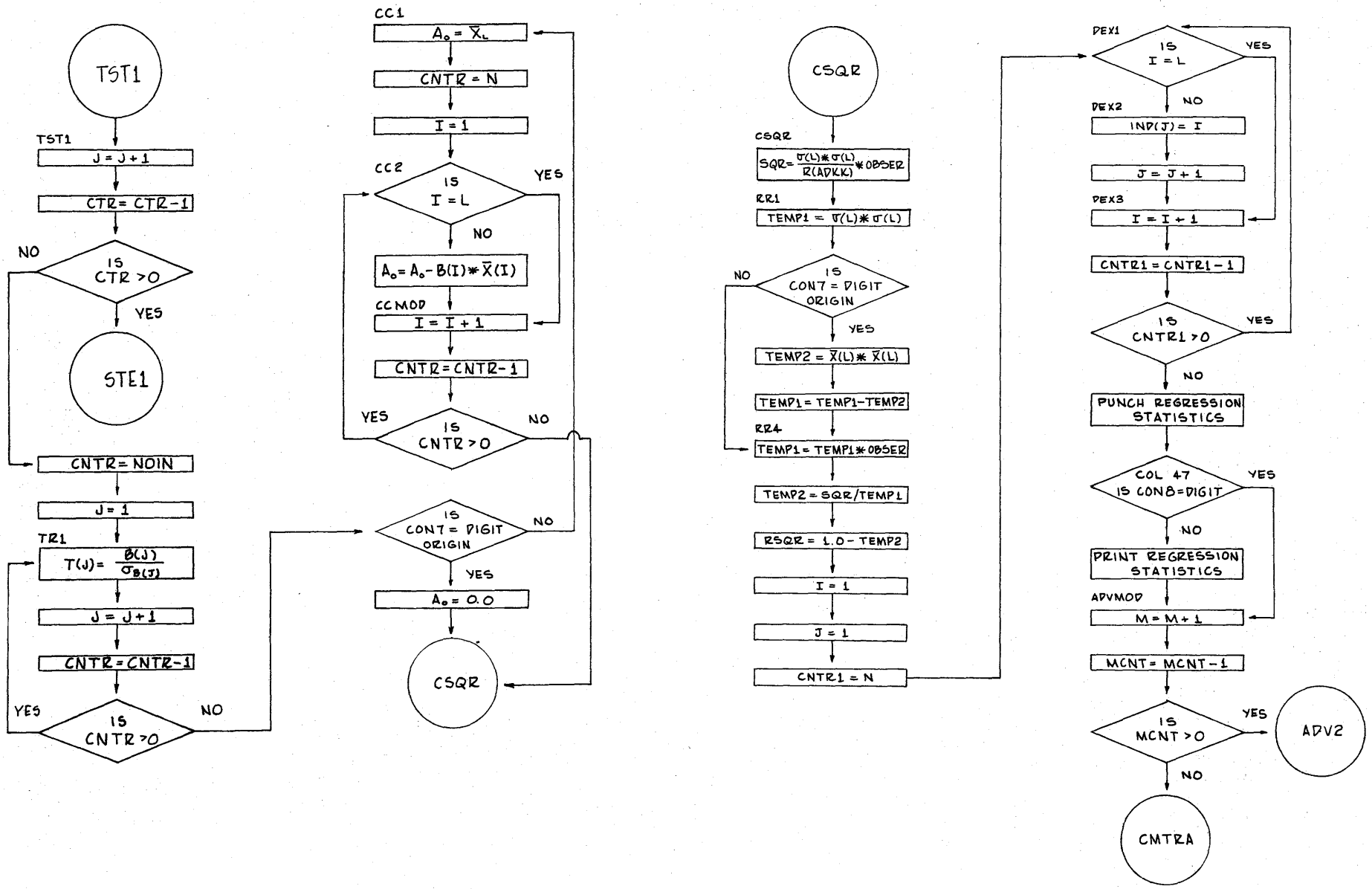

FINISH
COMPUTE NOIN
MCNT = N
IVE = 1
INDEX OF POTENTIAL DEPENDENT VARIABLE
MDV1
IS IND(IVE) = ≠
NO
YES
L = IVE
COMPUTE REGRESSION STATISTICS
PUNCH REGRESSION STATISTICS
COL 47 IS CON8 = DIGIT SUPPRESS PRINT
YES
NO
PRINT REGRESSION STATISTICS
MDVMOD
IVE = IVE + 1
MCNT = MCNT - 1
YES
IS MCNT > 0
NO
CMEX
COL 57 IS CON18 = DIGIT
NO
CMTRA
YES
COMPUTE NOIN
MCNT = N
IVE = 1, POTENTIAL INDEX OF EXCLUDED INDEPENDENT VARIABLE
EX1
EX1
IS IND(IVE) = DIGIT
YES
NO
EXMOD
REG
REG
L = IVE
COMPUTE REGRESSION STATISTICS
PUNCH REGRESSION STATISTICS
YES
COL 47 IS CON8 = DIGIT SUPPRESS PRINT
NO
PRINT REGRESSION STATISTICS
EXMOD
IVE = IVE + 1
MCNT = MCNT - 1
IS MCNT > 0
NO
YES
EXMOD
EX1
CMTRA
CMTRA
COL 51 IS CON12 = DIGIT PUNCH R
NO
YES
PUNCH TRANSFORMED MATRIX
CMRE
COL 52 IS CON13 = DIGIT REINVERT & PUNCH R
NO
YES
COUNT = N
K = 1
RE1
RE1
IS IND(K) = ≠
YES
NO
RE2
IS IND(K) = DIGIT
NO
YES
REMOD
TRANSFORM MATRIX
FINAL

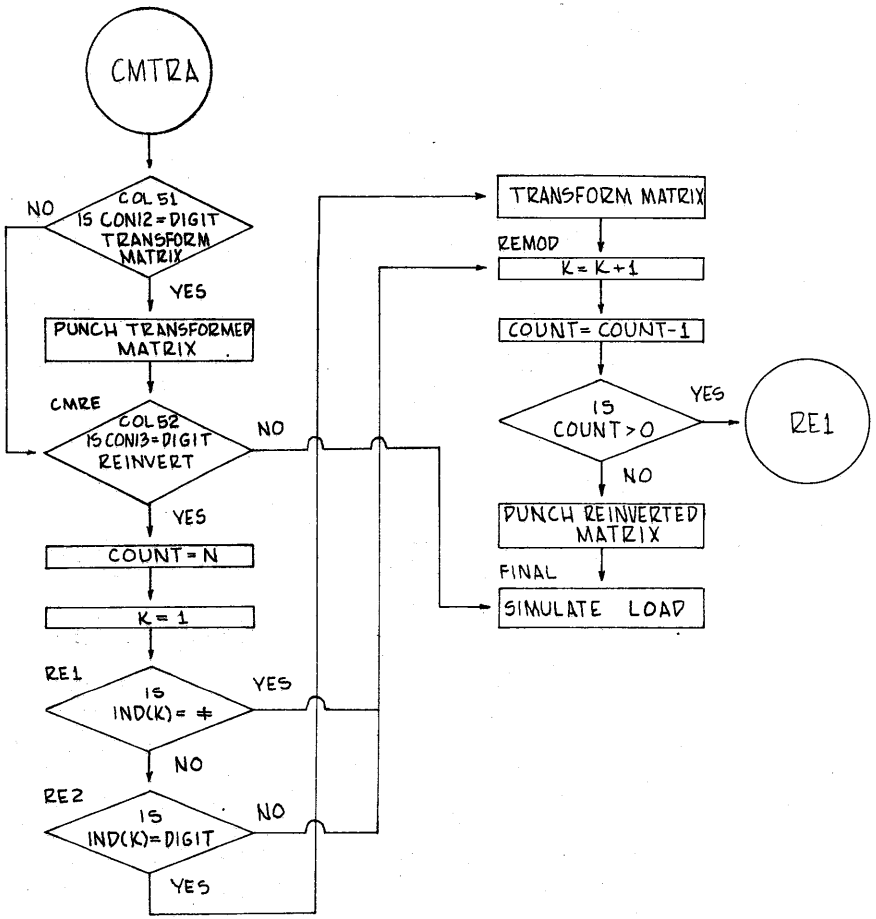


PROGRAM 80-4C, ALTERNATE DEPENDENT VARIABLE REGRESSION




ADV
ADV
COMPUTE NOIN
IS NOIN = N
YES
NO
WRITE : MATRIX ALMOST SINGULAR
HALT
ADV1
MCNT = NDEP
NOIN = NOIN - 1
M = 1
ADV2
L = IDD(M)
I = L - 1
CNTR1 = N
ADKK = ADDRESS OF R(1,1)
IS I = 0
YES
NO
I1
ADKK = ADKK + 10 CNTR1
CNTR1 = CNTR1 - 1
I = I - 1
IS I > 0
YES
NO
CR
EY = OBSER
TEMP1 = DF * R(L,L)
EY = σL √EY / TEMP1
I = 1
REG1
REG1
CNTR1 = N - 1
REG1
IS I = L
YES
NO
TEMP1 = R(I,L) * σL / σI * R(ADKK)
NO
IS TEMP1 < 0.0
YES
TEMP1 = -TEMP1
REG8
TEMP1 = - TEMP1
REG7
B(I) = TEMP1
CNTR1 = CNTR1 - 1
I = I + 1
IS I > N
YES
NO
REG1
CTR = N
J = 1
STE1
IS J < L
YES
NO
IS J = L
YES
TST1
NO
JGRL
ADIJ = ADDRESS OF R(L,J)
JLEL
ADIJ = ADDRESS OF R(J,L)
STE2
TEMP1 = R(ADIJ) * R(ADIJ) / R(ADKK)
STE5
TEMP2 = EY * √(R(J) - TEMP1 / OBSER)
STE6
σB(J) = TEMP2 / σJ
TST1


TST1
TST1
J = J + 1
CTR = CTR - 1
NO
IS CTR > 0
YES
STE1
CNTR = NOIN
J = 1
TR1
T(J) = B(J) / σB(J)
J = J + 1
CNTR = CNTR - 1
YES
IS CNTR > 0
NO
CC1
A0 = X̄L
CNTR = N
I = 1
CC2
IS I = L
YES
NO
A0 = A0 - B(I) * X̄(I)
CCMOD
I = I + 1
CNTR = CNTR - 1
YES
IS CNTR > 0
NO
IS CONT = DIGIT ORIGIN
NO
YES
A0 = 0.0
CSQR
CSQR
CSQR
SQR = σ(L) * σ(L) / R(ADKK) * OBSER
RR1
TEMP1 = σ(L) * σ(L)
NO
IS CONT = DIGIT ORIGIN
YES
TEMP2 = X̄(L) * X̄(L)
TEMP1 = TEMP1 - TEMP2
RR4
TEMP1 = TEMP1 * OBSER
TEMP2 = SQR / TEMP1
RSQR = 1.0 - TEMP2
I = 1
J = 1
CNTR1 = N
PEX1
IS I = L
YES
NO
PEX2
IND(J) = I
J = J + 1
PEX3
I = I + 1
CNTR1 = CNTR1 - 1
IS CNTR1 > 0
YES
NO
PUNCH REGRESSION STATISTICS
COL 47 IS CONB = DIGIT
YES
NO
PRINT REGRESSION STATISTICS
ADVMOD
M = M + 1
MCNT = MCNT - 1
IS MCNT > 0
YES
NO
ADV2
CMTRA



PROGRAM 80A, LOAD, DELETE AND/OR CUMULATE SUMS OR MEANS DECKS

I. NOBS(1), N(1); From parameter card read by 80-1.

NOBS(2), N(2); From parameter card--first card of sums or means deck.

N(3); Number of variables after elimination, read by 80-1.

II. INDEXES: Loading sums, means and standard deviations.

I; Index of variable on card, I = 1, 2, ..., 8.

Y(K); Variables on cards, K = 1, 2, ..., N(1).

X(J); Variables in memory, J = 1, 2, ..., N(3).

ELIM(M); Indexes of variables eliminated, M = 1, 2, ..., NELIM.

III. INDEXES: Loading sums of products or correlation coefficients.

I; Index of variable on card, I = 1, 2, ..., 8.

Y(L,K); Variables on cards,

$$L = 1, 2, \ldots, N(1);$$

$$K = L, L + 1, \ldots, N(1).$$

X(J); Variables in memory,

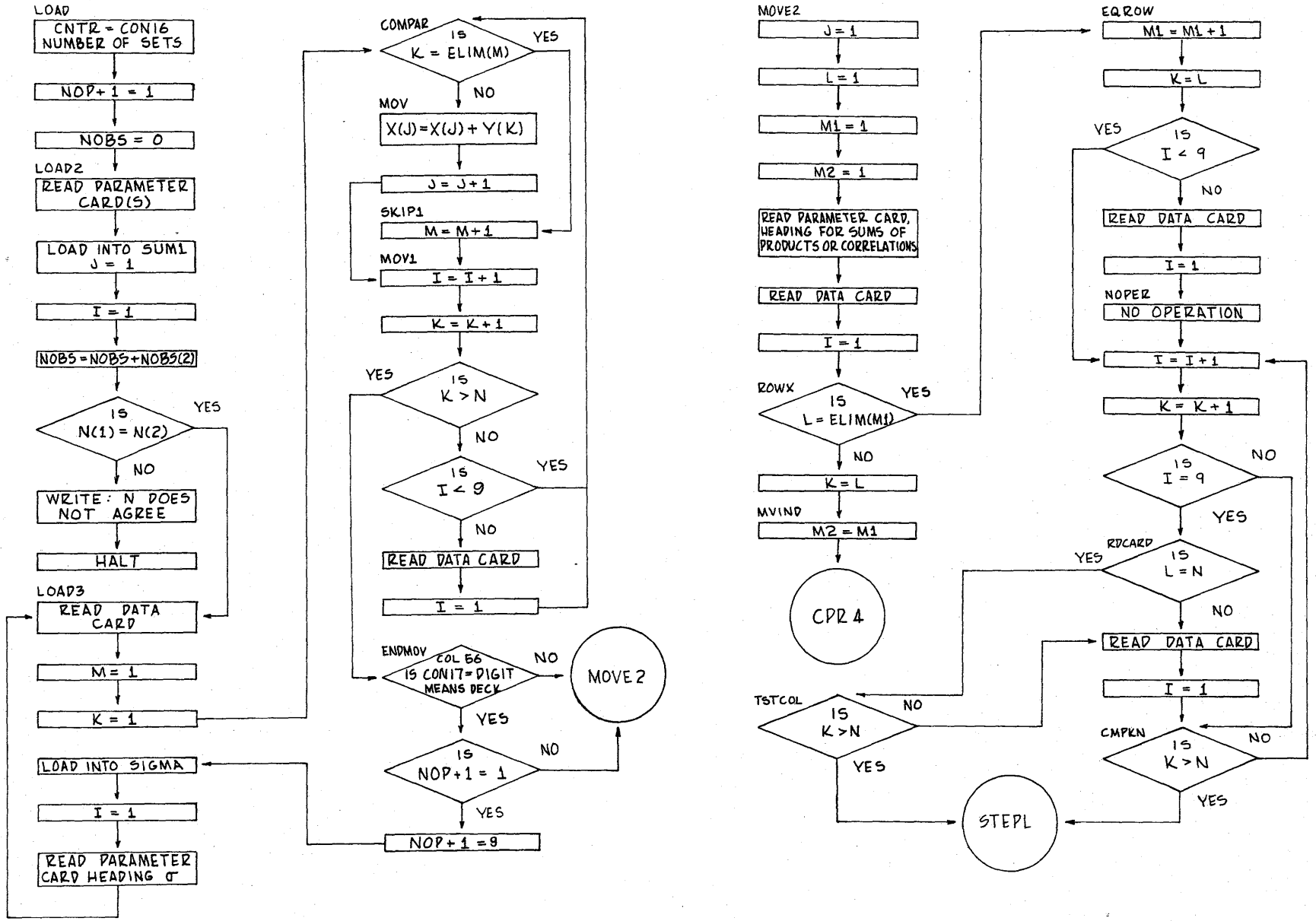
$$J = 1, 2, \ldots, \frac{N(3)\sqrt{N(3) + 17}}{2}.$$

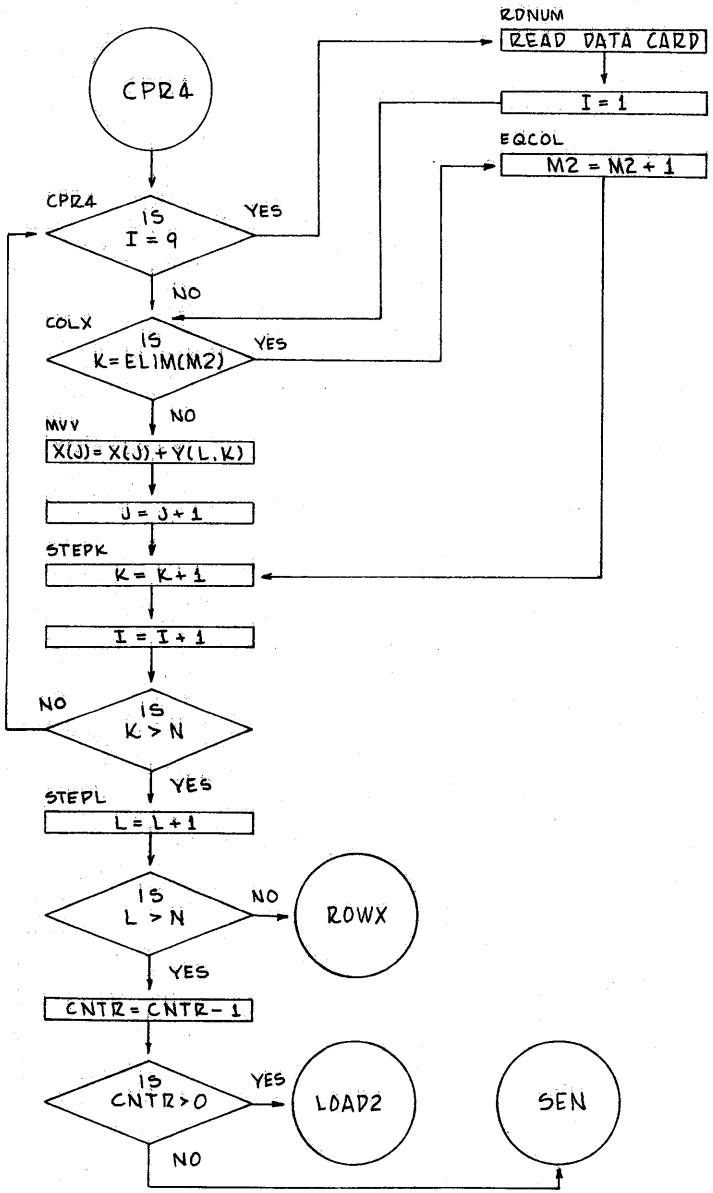
ELIM(M1 or M2) { M1 for row comparisons. M2 for column comparisons.

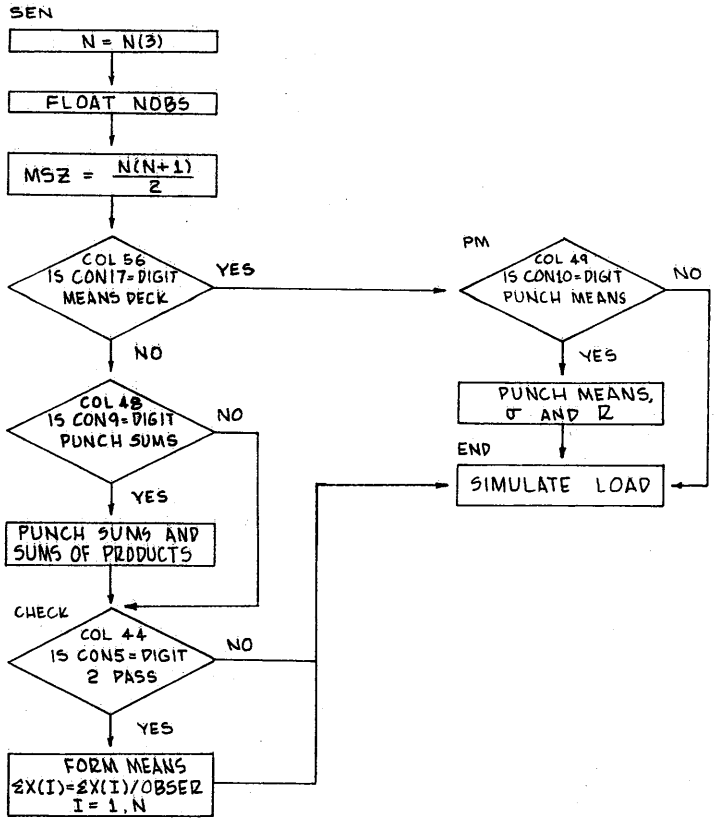
$$M1 = 1, 2, \ldots, NELIM$$

$$M2 = M1, M1 + 1, \ldots, NELIM$$

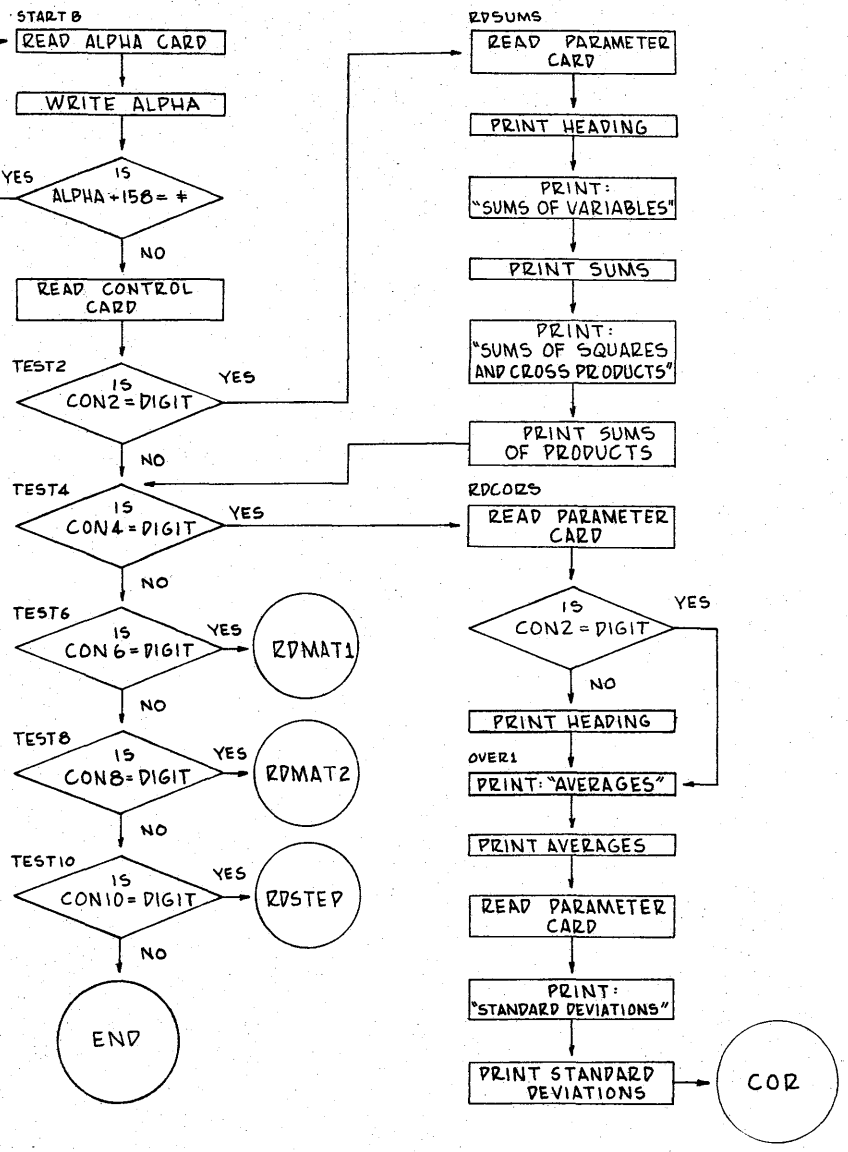
PROGRAM 80A – LOAD, DELETE AND/OR CUMULATE SUMS OR MEANS DECKS

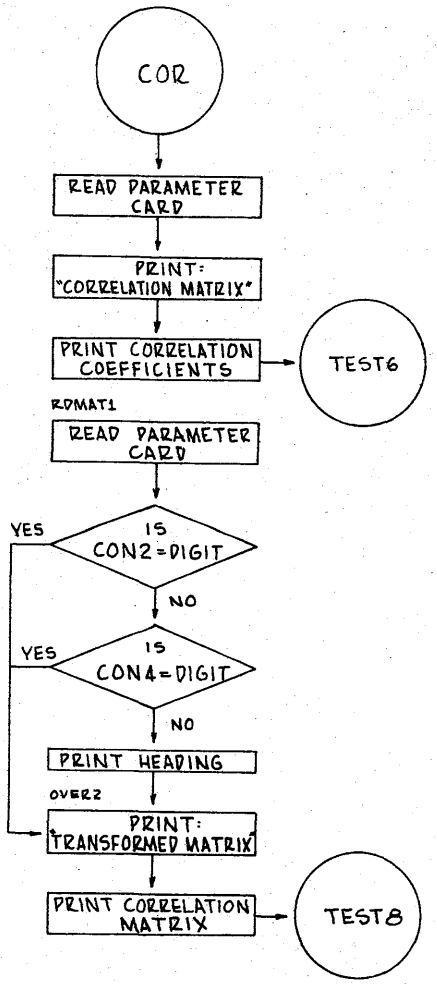


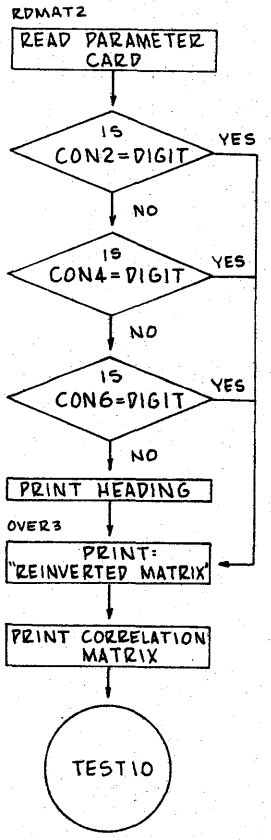

CPR4
RDNUM
READ DATA CARD
I = 1
EQCOL
M2 = M2 + 1
CPR4
IS I = 9
YES
NO
COLX
IS K = ELIM(M2)
YES
NO
MVV
X(J) = X(J) + Y(L, K)
J = J + 1
STEPK
K = K + 1
I = I + 1
NO
IS K > N
YES
STEPL
L = L + 1
IS L > N
NO
ROWX
YES
CNTR = CNTR - 1
IS CNTR > 0
YES
LOAD2
NO
SEN

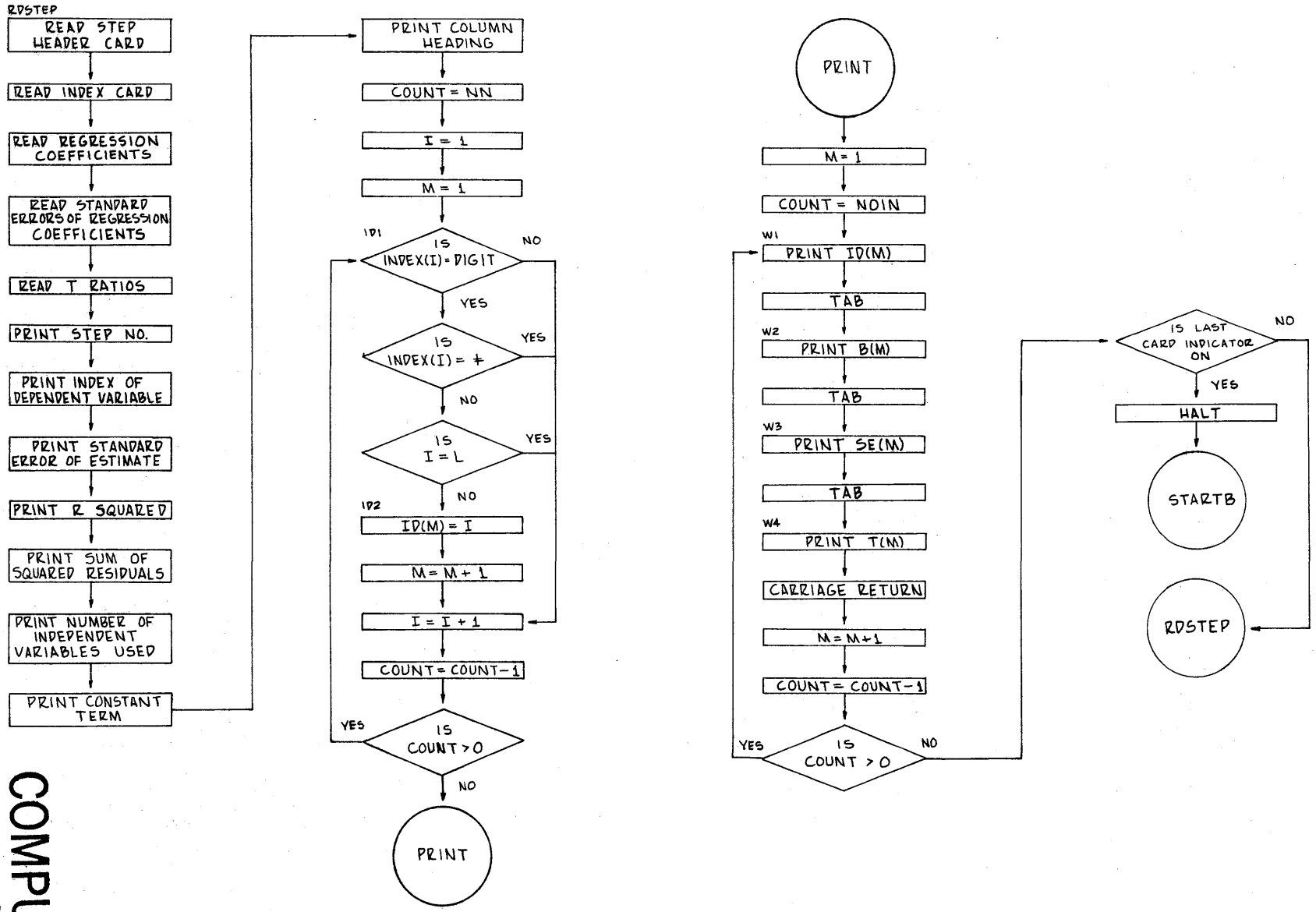

SEN
N = N(3)
FLOAT NOBS
MSZ = N(N+1)/2
COL 56 IS CON17=DIGIT MEANS DECK
YES
NO
PM
COL 49 IS CON10=DIGIT PUNCH MEANS
NO
YES
PUNCH MEANS, σ AND R
END
SIMULATE LOAD
COL 48 IS CON9=DIGIT PUNCH SUMS
NO
YES
PUNCH SUMS AND SUMS OF PRODUCTS
CHECK
COL 44 IS CON5=DIGIT 2 PASS
NO
YES
FORM MEANS ΣX(I)=ΣX(I)/OBSER I = 1, N

PROGRAM 80B – TYPE FINAL REPORT







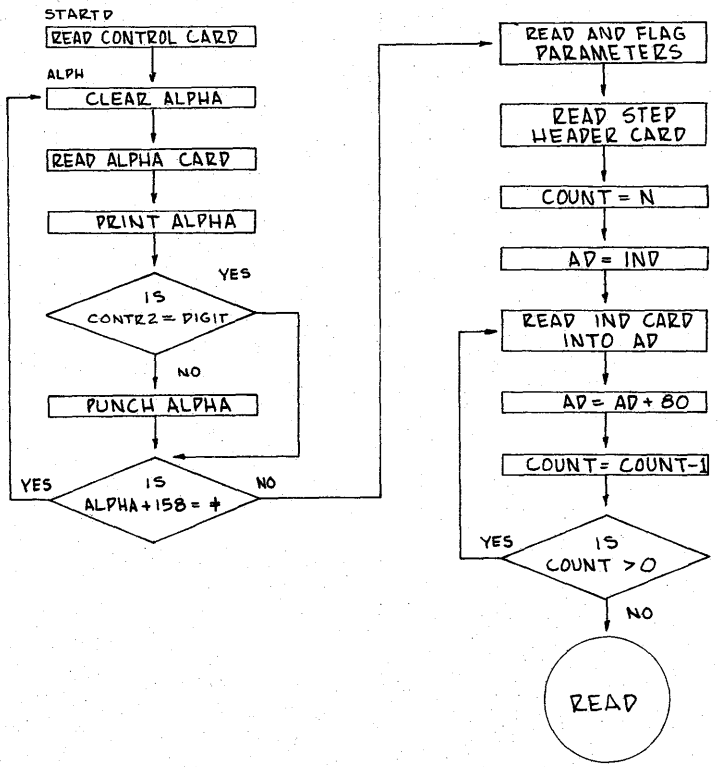


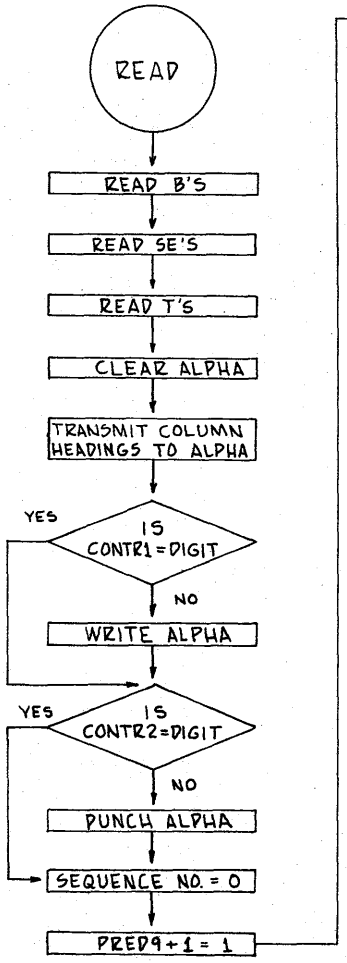
COMPUTER TECHNOLOGY

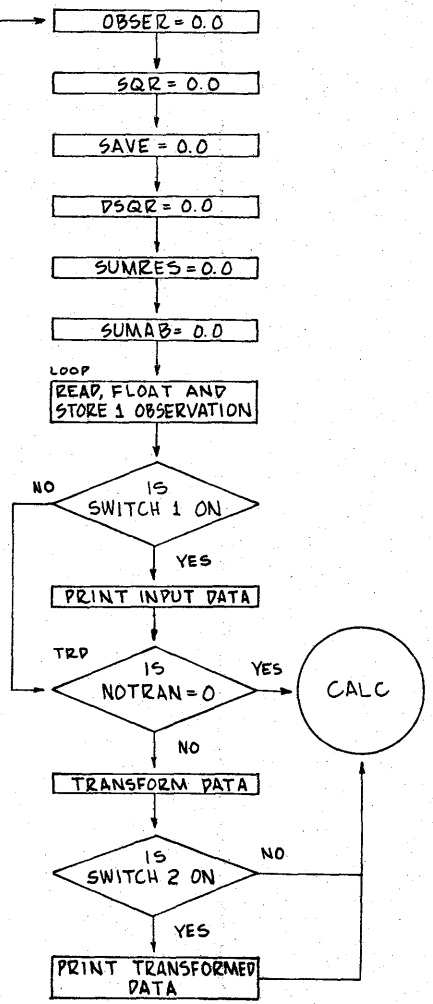
PROGRAM 80C - PUNCH FINAL REPORT

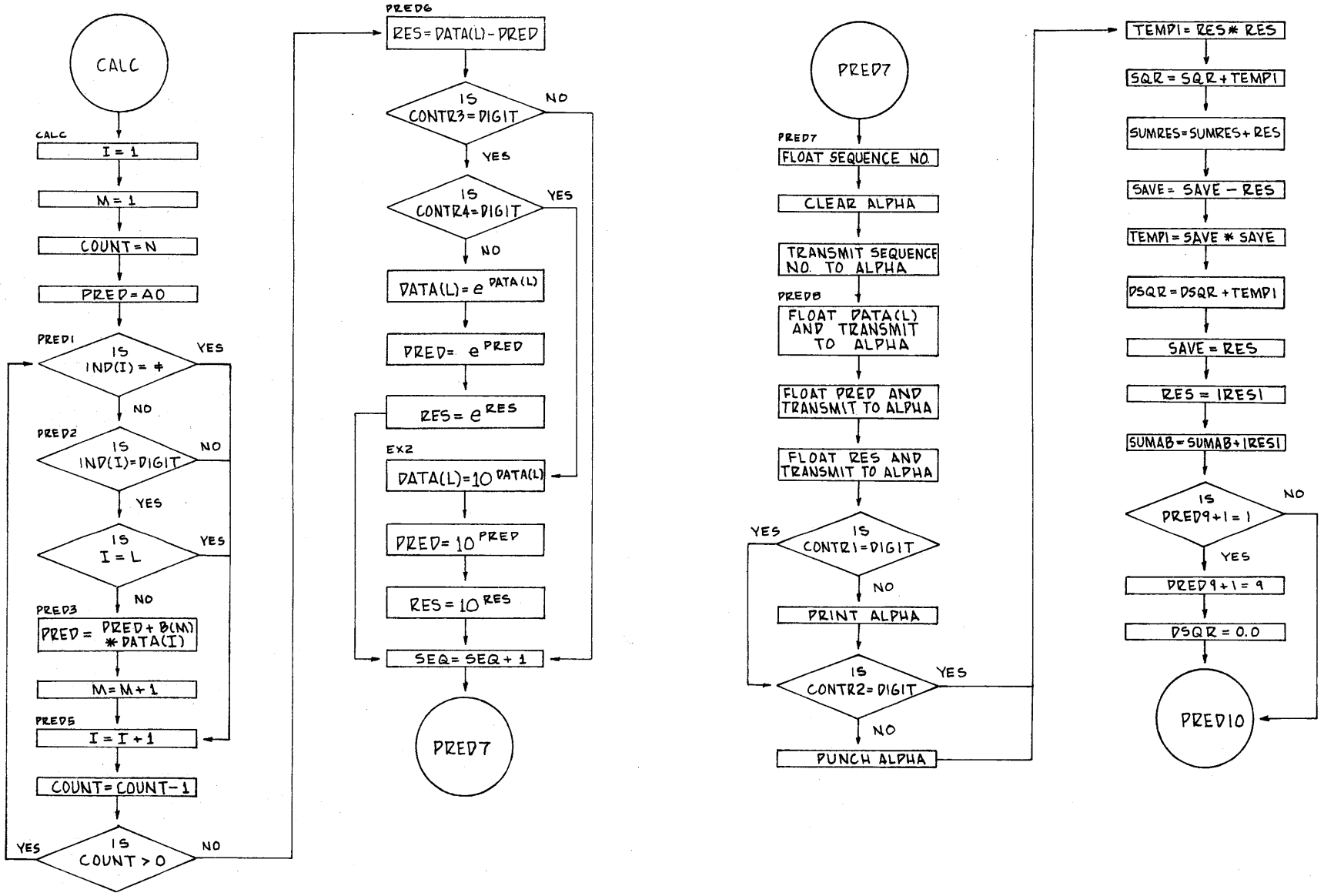
THE FLOW CHART FOR 80C IS ESSENTIALLY SIMILIAR TO THAT FOR 80B, EXCEPT THAT CARD IMAGES ARE PUNCHED INSTEAD OF TYPED.

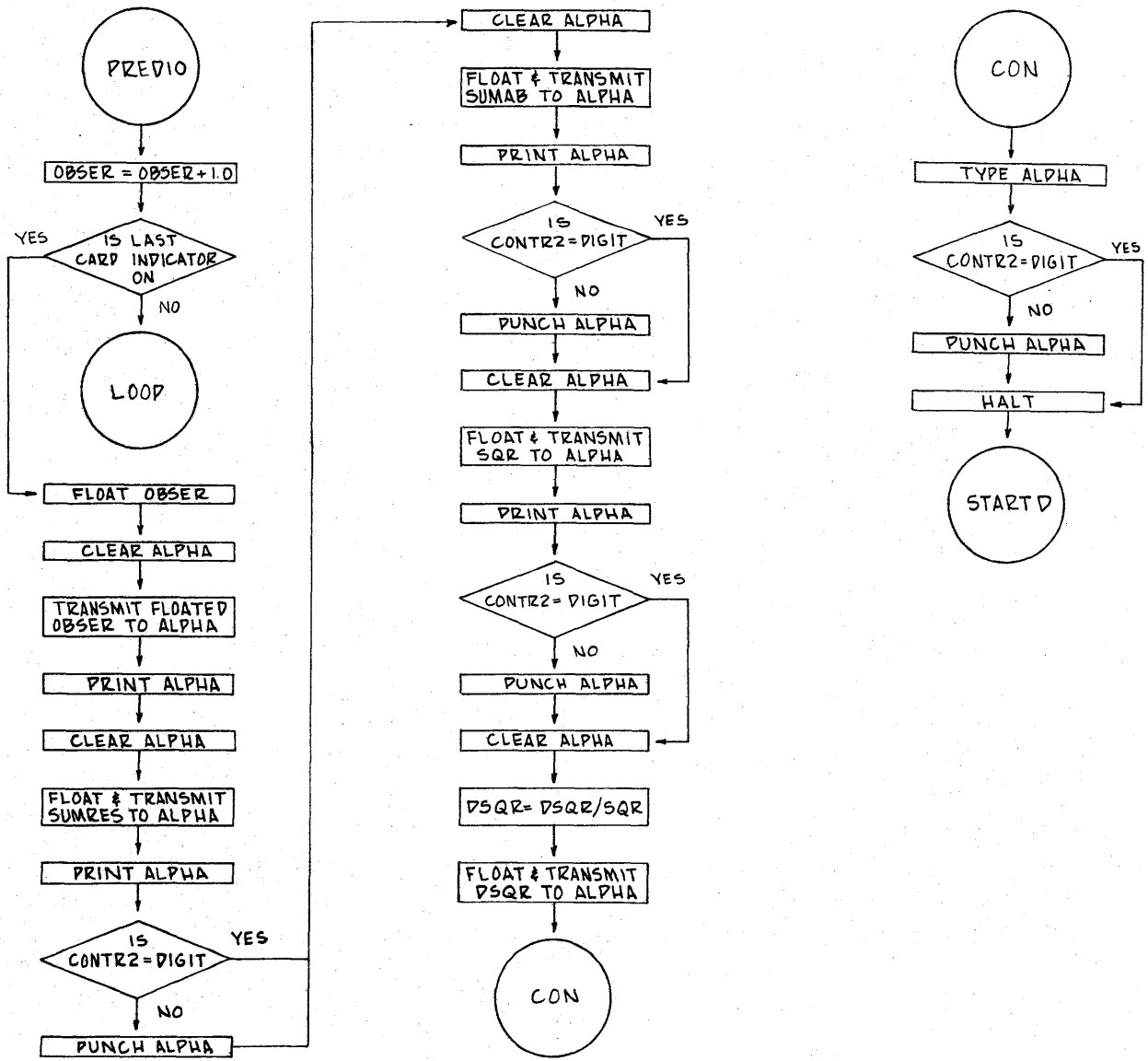
PROGRAM 80D - RESIDUAL ANALYSIS



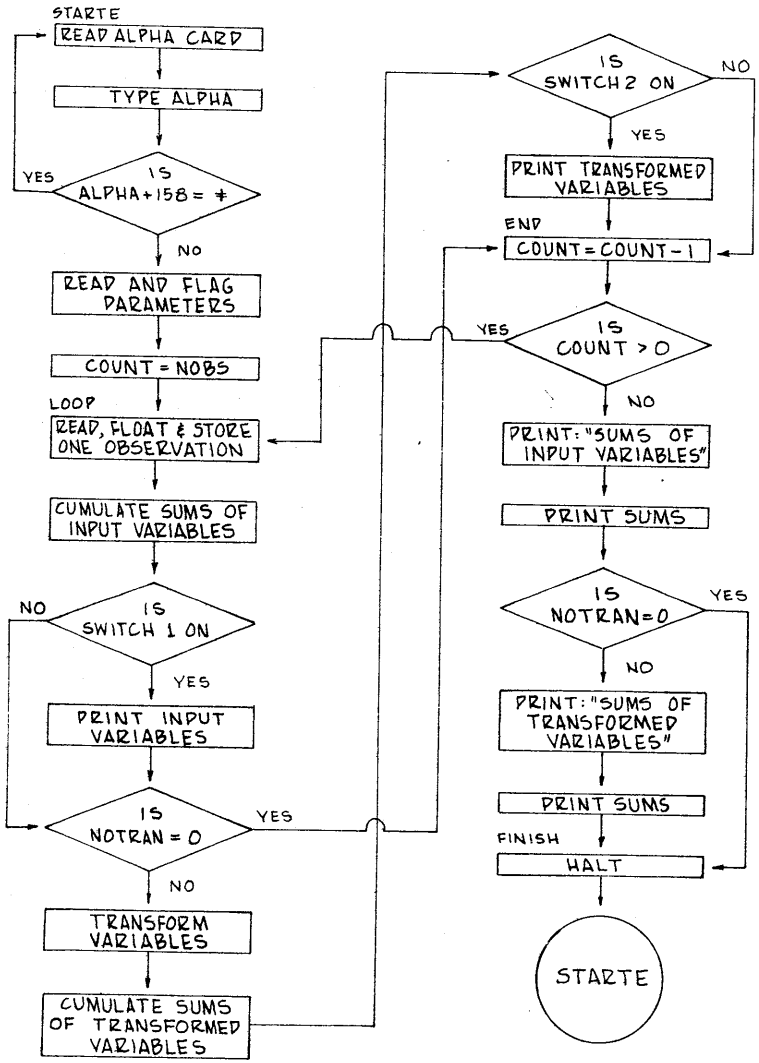





CALC
CALC
I = 1
M = 1
COUNT = N
PRED = A0
PRED1
IS IND(I) = +
YES
NO
PRED2
IS IND(I) = DIGIT
NO
YES
IS I = L
YES
NO
PRED3
PRED = PRED + B(M) * DATA(I)
M = M + 1
PRED5
I = I + 1
COUNT = COUNT - 1
IS COUNT > 0
YES
NO
PRED6
RES = DATA(L) - PRED
IS CONTR3 = DIGIT
NO
YES
IS CONTR4 = DIGIT
YES
NO
DATA(L) = e DATA(L)
PRED = e PRED
RES = e RES
EX2
DATA(L) = 10 DATA(L)
PRED = 10 PRED
RES = 10 RES
SEQ = SEQ + 1
PRED7
PRED7
FLOAT SEQUENCE NO.
CLEAR ALPHA
TRANSMIT SEQUENCE NO. TO ALPHA
PRED8
FLOAT DATA(L) AND TRANSMIT TO ALPHA
FLOAT PRED AND TRANSMIT TO ALPHA
FLOAT RES AND TRANSMIT TO ALPHA
YES
IS CONTR1 = DIGIT
NO
PRINT ALPHA
IS CONTR2 = DIGIT
YES
NO
PUNCH ALPHA
TEMP1 = RES * RES
SQR = SQR + TEMP1
SUMRES = SUMRES + RES
SAVE = SAVE - RES
TEMP1 = SAVE * SAVE
DSQR = DSQR + TEMP1
SAVE = RES
RES = |RES|
SUMAB = SUMAB + |RES|
IS PRED9+1 = 1
NO
YES
PRED9+1 = 9
DSQR = 0.0
PRED10


PREDIO
OBSER = OBSER+1.0
IS LAST CARD INDICATOR ON
YES
NO
LOOP
FLOAT OBSER
CLEAR ALPHA
TRANSMIT FLOATED OBSER TO ALPHA
PRINT ALPHA
CLEAR ALPHA
FLOAT & TRANSMIT SUMRES TO ALPHA
PRINT ALPHA
IS CONTR2=DIGIT
YES
NO
PUNCH ALPHA
CLEAR ALPHA
FLOAT & TRANSMIT SUMAB TO ALPHA
PRINT ALPHA
IS CONTR2=DIGIT
YES
NO
PUNCH ALPHA
CLEAR ALPHA
FLOAT & TRANSMIT SQR TO ALPHA
PRINT ALPHA
IS CONTR2=DIGIT
YES
NO
PUNCH ALPHA
CLEAR ALPHA
DSQR=DSQR/SQR
FLOAT & TRANSMIT DSQR TO ALPHA
CON
CON
TYPE ALPHA
IS CONTR2=DIGIT
YES
NO
PUNCH ALPHA
HALT
START D

PROGRAM 80E - SUM CHECK PROGRAM



```
00010*  PROGRAM 80-1, INITIALIZATION, MULTIPLE REGRESSION SYSTEM,
00020*  OCT. 10, 1963.
00030REF     DS    ,13400
00040        DORG  402
00050CONT    DSS   80
00060DATE    DS    6,CONT+5
00070PROB    DS    2,CONT+7
00080NOBS    DS    5,CONT+12
00090NFORM   DS    3,CONT+15
00100INVAR   DS    3,CONT+18
00110NOVAR   DS    3,CONT+21
00120N       DS    3,CONT+24
00130NDEP    DS    3,CONT+27
00140NOTRAN  DS    3,CONT+30
00150NOCON   DS    3,CONT+33
00160NCOL    DS    2,CONT+35
00170NELIM   DS    3,CONT+38
00180CON1    DS    1,CONT+39
00190CON2    DS    1,CONT+40
00200CON3    DS    1,CONT+41
00210CON4    DS    1,CONT+42
00220CON5    DS    1,CONT+43
00230CON6    DS    1,CONT+44
00240CON7    DS    1,CONT+45
00250CON8    DS    1,CONT+46
00260CON9    DS    1,CONT+47
00270CON10   DS    1,CONT+48
00280CON11   DS    1,CONT+49
00290CON12   DS    1,CONT+50
00300CON13   DS    1,CONT+51
00310CON14   DS    1,CONT+52
00320CON15   DS    1,CONT+53
00330CON16   DS    1,CONT+54
00340CON17   DS    1,CONT+55
00350CON18   DS    1,CONT+56
00360OBSER   DS    10,CONT+79
00370IND     DS    5
00380ID      DS    5
00390IDD     DS    5
00400FORMAT  DS    5
00410INDEX   DS    5
00420CONST   DS    5
00430DATA1   DS    5
00440DATA2   DS    5
00450B       DS    5
00460SE      DS    5
00470T       DS    5
00480SUM1    DS    5
00490SIGMA   DS    5
00500R       DS    5
00510WT      DS    5
00520ADKK    DS    5
00530ADRNN   DS    5
00540ADIJ    DS    5
00550ADRIJ   DS    5
```

```
13400 00000
00402
00402 00080
00407 00006
00409 00002
00414 00005
00417 00003
00420 00003
00423 00003
00426 00003
00429 00003
00432 00003
00435 00003
00437 00002
00440 00003
00441 00001
00442 00001
00443 00001
00444 00001
00445 00001
00446 00001
00447 00001
00448 00001
00449 00001
00450 00001
00451 00001
00452 00001
00453 00001
00454 00001
00455 00001
00456 00001
00457 00001
00458 00001
00481 00010
00486 00005
00491 00005
00496 00005
00501 00005
00506 00005
00511 00005
00516 00005
00521 00005
00526 00005
00531 00005
00536 00005
00541 00005
00546 00005
00551 00005
00556 00005
00561 00005
00566 00005
00571 00005
00576 00005
```

```
00560SIGN3   DS    5
00570COUNT   DS    5
00580CNTR    DS    3
00590CTR     DS    3
00600I       DS    3
00610J       DS    3
00620K       DS    3
00630L       DS    3
00640P       DS    3
00650Q       DS    3
00660MSZ     DS    4
00670IVE     DS    3
00680IVP     DS    3
00690TEMP1   DS    10
00700TEMP2   DS    10
00710AO      DS    10
00720EY      DS    10
00730RSQR    DS    10
00740SQR     DS    10
00750DF      DS    10
00760F       DS    10
00770FIN     DS    10
00780FOUT    DS    10
00790HIGH    DS    10
00800VP      DS    10
00810VE      DS    10
00820OUT     DS    80
```

```
00581 00005
00586 00005
00589 00003
00592 00003
00595 00003
00598 00003
00601 00003
00604 00003
00607 00003
00610 00003
00614 00004
00617 00003
00620 00003
00630 00010
00640 00010
00650 00010
00660 00010
00670 00010
00680 00010
00690 00010
00700 00010
00710 00010
00720 00010
00730 00010
00740 00010
00750 00010
00830 00080
```



```
00830        DC    1,
00840        DC    8,10000000
00850FP001   DC    2,-2
00860        DC    8,10000000
00870FHIGH   DC    2,50
00880        DC    8,0
00890ZERO    DC    2,-99
00900ZEROS   DC    10,0
00910        DC    8,10000000
00920ONE     DC    2,1
00925SUMWT   DS    10
00930*    *     *     *     *     *     *     *     *     *     *     *     *
00940*     SUBROUTINE TO READ, FLOAT, AND STORE NUMBERS UNDER     *
00950*       FORMAT CONTROL.  NEEDS NUMBER OF WORDS AND INITIAL   *
00960*       ADDRESS WHERE STORED.                                 *
00970*    *     *     *     *     *     *     *     *     *     *     *     *
00980WCTR    DS    3
00990        DS    5
01000RFS     TF    TRSMT+23,RFS-1,,SET UP STORE ADDRESS.
01010        TFM   READN-2,READN
01020        TF    FRMT+11,FORMAT
01030FRMT    TF    SPEC,99999
01040        SF    SPEC-1
01050        SF    SPEC-3
01060        B     99999,,,READN OR LOOP1
01070        DORG  *-3
01080READN   RACD  ALPHA
01090        TFM   READN-2,LOOP1
01100        TFM   ADDR,ALPHA-2
01110LOOP1   A     ADDR,SPEC-2
```

```
00831 00001
00839 00008
00841 00002
00849 00008
00851 00002
00859 00008
00861 00002
00871 00010
00879 00008
00881 00002
00891 00010
00894 00003
00899 00005
00900 26 01823 00899
00912 16 00978 0̄0980
00924 26 00947 00501
00936 26 01939 99999
00948 32 01938 00000
00960 32 01936 00000
00972 49 99999 00000
00980
00980 37 01983 00500
00992 16 00978 0̄1016
01004 16 01944 0̄1981
01016 21 01944 01937
```

```
01120          A     ADDR,SPEC-2
01130          TF    INPUT,ZEROS
01140          TF    INPUT-9,ZEROS-5
01150CMCOL     CM    ADDR,ALPHA+154
01160          BNL   READN
01162          CM    SPEC-4
01164          BE    STEP1
01170          TDM   SIGN2,0
01180          TF    D1+6,ADDR
01190          TF    D2+11,D1+6
01200          TF    PER+6,D1+6
01210          TF    D4+6,D1+6
01220          TF    RET+6,D1+6
01230          SM    RET+6,1,10
01240          TFM   D2+6,INPUT
01250          TFM   D5+6,INPUT
01260          TFM   SETFL+6,INPUT+1
01270          S     SETFL+6,SPEC-2
01280RET       SF    99999,,,ADDR-1
01290D1        CM    99999,70,10
01300          BL    PER
01310D2        TD    99999,99999,,INPUT,ADDR
01320          B     CHG+20
01330          DORG  *-3
01340PER       CM    99999,03,10,ADDR
01350          BE    CHG
01360D4        CM    99999,20,10
```

```
01028 21 01944 01937
01040 26 01958 00871
01052 26 01949 00866
01064 14 01944 02137
01076 46 00980 01300
01088 14 01935 00000
01100 46 01890 01200
01112 15 01974 00000
01124 26 01262 01944
01136 26 01291 01262
01148 26 01306 01262
01160 26 01330 01262
01172 26 01250 01262
01184 12 01250 00001
01196 16 01286 01958
01208 16 01354 01958
01220 16 01522 01959
01232 22 01522 01937
01244 32 99999 00000
01256 14 99999 00070
01268 47 01300 01300
01280 25 99999 99999
01292 49 01408 00000
01300
01300 14 99999 00003
01312 46 01388 01200
01324 14 99999 00020
```



```
01370          BE    MIN
01380D5        TDM   99999,0,,INPUT
01390          B     CHG+20
01400          DORG  *-3
01410MIN       SF    SIGN2
01420          B     PER+48
01430          DORG  *-3
01440CHG       AM    SETFL+6,1,10
01450          B     *+32
01460          DORG  *-3
01470          SM    D2+6,1,10
01480          SM    D5+6,1,10
01490          SM    D1+6,2,10
01500          SM    D2+11,2,10
01510          SM    PER+6,2,10
01520          SM    D4+6,2,10
01530          SM    RET+6,2,10
01540          C     D2+6,SETFL+6
01550          BNL   RET
01560SETFL     SF    99999,,,(INPUT+1)-(SPEC-2)
01570MOVE      CM    INPUT,0,10
01580          BE    ZEROX
01590          TF    COMN,ZEROS
01600          CF    COMN-9
01610          TFM   EXPNT,INPUT+1
01620          S     EXPNT,SETFL+6
01630          TF    BRNCH+11,SETFL+6
```

```
01336 46 01368 01200
01348 15 99999 00000
01360 49 01408 00000
01368
01368 32 01974 00000
01380 49 01348 00000
01388
01388 11 01522 00001
01400 49 01432 00000
01408
01408 12 01286 00001
01420 12 01354 00001
01432 12 01262 00002
01444 12 01291 00002
01456 12 01306 00002
01468 12 01330 00002
01480 12 01250 00002
01492 24 01286 01522
01504 46 01244 01300
01516 32 99999 00000
01528 14 01958 00000
01540 46 01912 01200
01552 26 01968 00871
01564 33 01959 00000
01576 16 01973 01959
01588 22 01973 01522
01600 26 01647 01522
```

```
01640          SF    EXPNT-1
01650          S     EXPNT,SPEC
01660BRNCH     BD    DIGIT,99999
01670          SM    EXPNT,1,10
01680          AM    BRNCH+11,1,10
01690          B     BRNCH
01700          DORG  *-3
01710DIGIT     TF    *+30,BRNCH+11
01720          AM    *+18,9,10
01730EX        TF    99999,EXPNT
01740          TF    *+18,BRNCH+11
01750          SF    99999
01760          TF    TRSMT+28,EX+6
01770          BNF   *+48,SIGN2
01780          TF    *+30,TRSMT+28
01790          SM    *+18,2,10
01800          SF    99999
01810TRSMT     TFLS  99999,99999


01820          AM    TRSMT+23,10,10
01830          SM    WCTR,1,10
01840          BNP   OVR2
01850          SM    SPEC-4,1,10
01860          BP    LOOP1
01870STEP1     AM    FRMT+11,6,10
01880          B     FRMT
```

```
01612 32 01972 00000
01624 22 01973 01939
01636 43 01680 99999
01648 12 01973 00001
01660 11 01647 00001
01672 49 01636 00000
01680
01680 26 01710 01647
01692 11 01710 00009
01704 26 99999 01973
01716 26 01734 01647
01728 32 99999 00000
01740 26 01828 01710
01752 44 01800 01974
01764 26 01794 01828
01776 12 01794 00002
01788 32 99999 00000
01800 16 05023 01823
01812 49 04992 00000
01819 00005    99999
01824 00005    99999
01830 11 01823 00010
01842 12 00894 00001
01854 47 01910 01100
01866 12 01935 00001
01878 46 01016 01100
01890 11 00947 00006
01902 49 00936 00000
```

```
01890          DORG  *-3
01900OVR2      BB
01910          DORG  *-9
01920ZEROX     TFM   TRSMT+28,ZERO
01930          B     TRSMT
01940          DORG  *-3
01950SPEC      DS    8
01960ADDR      DS    5
01970INPUT     DS    14
01980COMN      DS    10
01990EXPNT     DS    5
02000SIGN2     DS    1
02001PNUM      DS    4
02002MCNT      DS    3
02003ALPHA     DAS   80
02004          DAC   1,@
02010PRBL      DAC   6,PROB @
02020VRBL      DAC   5, VAR@
02030OBSR      DAC   7, OBSER@
02060START1    RCTY
02070          RACD  ALPHA
02080          WATY  ALPHA
02090          BNR   *+20,ALPHA+158
02100          B     START1
02110          DORG  *-3
02120          RNCD  CONT
02130          SF    DATE-5
```



```
01910
01910 42 00000 00000
01912
01912 16 01828 00861
01924 49 01800 00000
01932
01939 00008
01944 00005
01958 00014
01968 00010
01973 00005
01974 00001
01978 00004
01981 00003
01983 00080
02143 00001
02145 00006
02157 00005
02167 00007
02180 34 00000 00102
02192 37 01983 00500
02204 39 01983 00100
02216 45 02236 02141
02228 49 02180 00000
02236
02236 36 00402 00500
02248 32 00402 00000
```

```
02140          SF    DATE-3
02150          SF    DATE-1
02160          SF    PROB-1
02170          SF    NOBS-4
02180          SF    NFORM-2
02190          SF    NVAR-2
02200          SF    NOVAR-2
02210          SF    N-2
02220          SF    NDEP-2
02230          SF    NOTRAN-2
02240          SF    NOCON-2
02250          SF    NCOL-1
02260          SF    NELIM-2
02270          TFM   CMCOL+11,ALPHA+152
02271          TF    K,N
02272          BD    *+20,CON16
02273          B     CADD
02274          DORG  *-3
02275          S     K,NELIM
02280*
02290*     COMPUTE ADDRESSES FOR DATA FIELDS.
02300*
02310CADD      TFM   IND,REF
02320          TF    TEMP1,IND
02330          A     TEMP1,K
02340          AM    TEMP1,1,10
02350          TF    IO,TEMP1
02360          BD    *+20,CON3
```

```
02260 32 00404 00000
02272 32 00406 00000
02284 32 00408 00000
02296 32 00410 00000
02308 32 00415 00000
02320 32 00418 00000
02332 32 00421 00000
02344 32 00424 00000
02356 32 00427 00000
02368 32 00430 00000
02380 32 00433 00000
02392 32 00436 00000
02404 32 00438 00000
02416 16 01075 02135
02428 26 00601 00426
02440 43 02460 00456
02452 49 02472 00000
02460
02460 22 00601 00440


02472 16 00486 13400
02484 26 00630 00486
02496 21 00630 00601
02508 11 00630 00001
02520 26 00491 00630
02532 43 02552 00443
```



```
02370          B     CADD1
02380          DORG  *-3
02390          A     TEMP1,K
02400          A     TEMP1,K
02410          TF    IDD,TEMP1
02420CADD1     A     TEMP1,K
02430          A     TEMP1,K
02440          AM    TEMP1,4,10
02450          TF    FORMAT,TEMP1
02460          TF    TEMP2,NFORM
02470          TFM   CTR,0,10
02480INC       AM    CTR,1,10
02490          SM    TEMP2,13,10
02500          BP    INC
02510          MM    CTR,78,10
02520          A     TEMP1,99
02530          AM    TEMP1,4,10
02540          TF    INDEX,TEMP1
02550          TF    TEMP2,NOTRAN
02560          TFM   CTR,0,10
02570INC2      AM    CTR,1,10
02580          SM    TEMP2,10,10
02590          BP    INC2
02600          MM    CTR,80,10
02610          A     TEMP1,99
02620          AM    TEMP1,2,10
02630          TF    CONST,TEMP1
```

```
02544 49 02588 00000
02552
02552 21 00630 00601
02564 21 00630 00601
02576 26 00496 00630
02588 21 00630 00601
02600 21 00630 00601
02612 11 00630 00004
02624 26 00501 00630
02636 26 00640 00417
02648 16 00592 00000
02660 11 00592 00001
02672 12 00640 00013
02684 46 02660 01100
02696 13 00592 00078
02708 21 00630 00099
02720 11 00630 00004
02732 26 00506 00630
02744 26 00640 00432
02756 16 00592 00000
02768 11 00592 00001
02780 12 00640 00010
02792 46 02768 01100
02804 13 00592 00080
02816 21 00630 00099
02828 11 00630 00002
02840 26 00511 00630
```

```
02650          A     TEMP1-1,NOCON
02660          TF    DATA1,TEMP1
02670          A     TEMP1-1,NOVAR
02680          TF    DATA2,TEMP1
02690CADD2     A     TEMP1-1,INVAR
02700          TF    B,TEMP1
02710          A     TEMP1-1,K
02720          TF    SE,TEMP1
02730          A     TEMP1-1,K
02740          TF    T,TEMP1
02750          A     TEMP1-1,K
02760          TF    SUM1,TEMP1
02770          A     TEMP1-1,K
02780          TF    SIGMA,TEMP1
02790          A     TEMP1-1,K
02800          TF    R,TEMP1
02810          SM    K,5,10
02820          TF    TEMP1,99
02830          TF    TEMP2,K
02840          AM    TEMP2,1,10
02850          M     TEMP1,TEMP2
02860          SF    95
02870          TF    NSZ,98
02880          TFLS  FIN,ZERO
```

```
02852 21 00629 00435
02864 26 00516 00630
02876 21 00629 00423
02888 26 00521 00630
02900 21 00629 00420
02912 26 00526 00630
02924 21 00629 00601
02936 26 00531 00630
02948 21 00629 00601
02960 26 00536 00630
02972 21 00629 00601
02984 26 00541 00630
02996 21 00629 00601
03008 26 00546 00630
03020 21 00629 00601
03032 26 00551 00630
03044 13 00601 00005
03056 26 00630 00099
03068 26 00640 00601
03080 11 00640 00001
03092 23 00630 00640
03104 32 00095 00000
03116 26 00614 00098
03128 16 05023 03151
03140 49 04992 00000
03147 00005    00710
03152 00005    00861
```



```
02890          TFLS FOUT,ZERO
02900          TFLS F,ZERO
02910*
02920*     IS ADV USED.
02930*
02940          BD    RIDD,CON3
02950*
02960*     READ IND CARD(S).
02970*
02980          TF    COUNT,K
02990          TF    *+18,IND
03000RIND      RNCD  99999
03005          AM    RIND+6,80,10
03010          SM    COUNT,80,10
03020          BP    RIND
03030          B     CMPL
03040          DORG  *-3
03050RIDD      TF    RF1+6,IDD
03060          SM    RF1+6,1,10
03070          TFM   RF2+11,80,10
03080          TFM   RF3+11,40,10
03090          TFM   RF5+11,2,10
03100          BT    RF,NDEP
03110*
03120*     IS LOAD ROUTINE USED.
03130*
03140CMPL      BD    LOADR,CON16
03150*
03160*     IS THE NUMBER OF TRANSFORMATION CONSTANTS = ZERO.
03170*
```

```
03158 16 05023 03181
03170 49 04992 00000
03177 00005    00720
03182 00005    00861
03188 16 05023 03211
03200 49 04992 00000
03207 00005    00700
03212 00005    00861
03218 43 03310 00443
03230 26 00586 00601
03242 26 03260 00486
03254 36 99999 00500
03266 11 03260 00080
03278 12 00586 00080
03290 46 03254 01100
03302 49 03382 00000
03310
03310 26 04682 00496
03322 12 04682 00001
03334 16 04699 00080
03346 16 04711 00040
03358 16 04759 00002
03370 27 04652 00429
03382 43 04340 00456
```

```
03180CMPR    CM    NOCON,0,10                    03394 14 00435 00000
03190        BP    RDCON                         03406 46 03450 01100
03200*
03210*  IS THE NUMBER OF TRANSFORMATIONS= ZERO.
03220*
03230        CM    NOTRAN,0,10                   03418 14 00432 00000
03240        BP    RDTRAN                        03430 46 03546 01100
03250        B     CMPF                          03442 49 03618 00000
03260        DORG  *-3                           03450
03270*
03280*      READ FORMATS FOR TRANSFORMATION CONSTANTS, ONE CARD.
03290*
03300RDCON   TF    RF1+6,FORMAT                  03450 26 04682 00501
03310        SM    RF1+6,5,10                    03462 12 04682 00005
03320        TFM   RF2+11,78,10                  03474 16 04699 00078
03330        TFM   RF3+11,13,10                  03486 16 04711 00013
03340        TFM   RF5+11,6,10                   03498 16 04759 00006
03350        BTM   RF,13,10                      03510 17 04652 00013
03360*
03370*      READ, FLOAT AND STORE TRANSFORMATION CONSTANTS.
03380*
03390        TF    WCTR,NOCON                    03522 26 00894 00435
03400        BT    RFS,CONST                     03534 27 00900 00511
03410*
03420*      READ TRANSFORMATION INDEXES.
03430*
03440RDTRAN  TF    RF1+6,INDEX                   03546 26 04682 00506
03450        SM    RF1+6,7,10                    03558 12 04682 00007
03460        TFM   RF2+11,80,10                  03570 16 04699 00080
03470        TFM   RF3+11,10,10                  03582 16 04711 00010
03480        TFM   RF5+11,8,10                   03594 16 04759 00008
03490        BT    RF,NOTRAN                     03606 27 04652 00432
03500*
```



```
03510*
03520*  ARE FIN AND FOUT READ.
03530*
03540CMPF    BD    *+20,CON4                     03618 43 03638 00444
03550        B     RDFORM                        03630 49 03658 00000
03560        DORG  *-3                           03638
03570        TFM   RET7+6,RDFORM                 03638 16 04646 03658
03580        B     FF                            03650 49 04544 00000
03590        DORG  *-3                           03658
03600*
03610*      READ FORMATS FOR DATA.
03620*
03630RDFORM  TF    RF1+6,FORMAT                  03658 26 04682 00501
03640        SM    RF1+6,5,10                    03670 12 04682 00005
03650        TFM   RF2+11,78,10                  03682 16 04699 00078
03660        TFM   RF3+11,13,10                  03694 16 04711 00013
03670        TFM   RF5+11,6,10                   03706 16 04759 00006
03680        BT    RF,NFORM                      03718 27 04652 00417
03690*
03700*      SET UP ADDRESS OF WEIGHTS.
03710*
03720WGTS    TF    WT,DATA1                      03730 26 00556 00516
03730        A     WT-1,K                        03742 21 00555 00601
03740*
03750*  SET UP NUMBER OF CARD COLUMNS TO READ.
03760*
03770        CM    NCOL,0,10                     03754 14 00437 00000
03780        BE    FLT                           03766 46 03814 01200
03790        TFM   CMCOL+11,ALPHA                03778 16 01075 01983
03800        A     CMCOL+11,NCOL                 03790 21 01075 00437
03810        A     CMCOL+11,NCOL                 03802 21 01075 00437
03820*
03830*      FLOAT NUMBER OF OBSERVATIONS.
03840*
```

```
03850FLT    BT   CONV,NOBS

03860*
03870*
03880*  CLEAR ID,SUM1,SIGMA, AND R
03890*
03900CLR    TF   CLR2+6,ID
03910       TF   CNTR,K
03920CLR2   TFM   99999,0,10
03930       AM   CLR2+6,2,10
03940       SM   CNTR,1,10
03950       BP   CLR2
03960       TF   COUNT,MSZ
03970       A    COUNT,K
03980       A    COUNT,K
03990       TF   CLR3+23,SUM1
04000CLR3   TFLS 99999,ZERO
04010       AM   CLR3+23,10,10
04020       SM   COUNT,1,10
04030       BP   CLR3
04040*
04050*      IS IT ADV.
04060*
04070       BD   *+20,CON3
04080       B    PRH
04090       DORG *-3
04100       TF   CLR1+6,IND
04110       TF   CNTR,K
04120CLR1   TDM  99999
04130       AM   CLR1+6,1,10
04140       SM   CNTR,1,10
```

```
03814 27 04792 00414

03826 26 03856 00491
03838 26 00589 00601
03850 16 99999 00000
03862 11 03856 00002
03874 12 00589 00001
03886 46 03850 01100
03898 26 00586 00614
03910 21 00586 00601
03922 21 00586 00601
03934 26 03969 00541
03946 16 05023 03969
03958 49 04992 00000
03965 00005    99999
03970 00005    00861
03976 11 03969 00010
03988 12 00586 00001
04000 46 03946 01100

04012 43 04032 00443
04024 49 04104 00000
04032
04032 26 04062 00486
04044 26 00589 00601
04056 15 99999 00000
04068 11 04062 00001
04080 12 00589 00001
```



```
04150       BP   CLR1
04160PRH    RCTY
04170       BT   WRNUM,DATE-4
04180       SPTY
04190       BT   WRNUM,DATE-2
04200       SPTY
04210       BT   WRNUM,DATE
04220       RCTY
04230       WATY PRBL
04240       BT   WRNUM,PROB
04250       TBTY
04260       BT   WRNUM,K
04270       WATY VRBL
04280       TBTY
04290       TF   OUT,NOBS
04300       CF   OUT-4
04310       WNTY OUT-4
04320       WATY OBSR
04330       RCTY
04340RET2   RNCD 0
04350       B    0
04360       DORG *-3
04370LOADR  BD   *+20,CON4
04380       B    LDR1
04390       DORG *-3
04400       TFM  RET7+6,*+20
04410       B    FF
```

```
04092 46 04056 01100
04104 34 00000 00102
04116 27 04952 00403
04128 34 00000 00101
04140 27 04952 00405
04152 34 00000 00101
04164 27 04952 00407
04176 34 00000 00102
04188 39 02145 00100
04200 27 04952 00409
04212 34 00000 00108
04224 27 04952 00601
04236 39 02157 00100
04248 34 00000 00108
04260 26 00830 00414
04272 33 00826 00000
04284 38 00826 00100
04296 39 02167 00100
04308 34 00000 00102
04320 36 00000 00500
04332 49 00000 00000
04340
04340 43 04360 00444
04352 49 04380 00000
04360
04360 16 04646 04380
04372 49 04544 00000
```

```
04420        DORG *-3
04430LOR1    TF   *+30,FORMAT
04440        SM   *+18,5,10
04450RNC     RNCD 99999
04451        TF   *+18,RNC+6
04452        SF   99999
04453        CM   NELIN,0,10
04454        BE   CLR
04460        TF   RF1+6,FORMAT
04470        SM   RF1+6,1,10
04480        TFM  RF2+11,80,10
04490        TFM  RF3+11,40,10
04500        TFM  RF5+11,2,10
04510        BT   RF,NELIN
04520        B    CLR
04530        DORG *-3
04540*    *    *    *    *    *    *    *    *    *
04550*  SUBROUTINE FOR READING FIN AND FOUT.       *
04560*    *    *    *    *    *    *    *    *    *
04570FF      TF   RF1+6,FORMAT
04580        SM   RF1+6,5,10
04590        TFM  RF2+11,78,10
04600        TFM  RF3+11,13,10
04610        TFM  RF5+11,6,10
04620        BTM  RF,2,10
04630*
04640*     READ,FLOAT AND STORE FIN AND FOUT.
04650        TFM  WCTR,2,10
04660        BTM  RFS,FIN
```

```
04380
04380 26 04410 00501
04392 12 04410 00005
04404 36 99999 00500
04416 26 04434 04410
04428 32 99999 00000
04440 14 00440 00000
04452 46 03826 01200
04464 26 04682 00501
04476 12 04682 00001
04488 16 04699 00080
04500 16 04711 00040
04512 16 04759 00002
04524 27 04652 00440
04536 49 03826 00000
04544
04544 26 04682 00501
04556 12 04682 00005
04568 16 04699 00078
04580 16 04711 00013
04592 16 04759 00006
04604 17 04652 00002

04616 16 00894 00002
04628 17 00900 00710
```



```
04670RET7    B    99999
04680        DORG *-3
04690*    *    *    *    *    *    *    *    *    *
04700*     SUBROUTINE TO READ AND FLAG FORMATS , TRANSFORMATION INDEXES,  *
04710*       AND IDD, INDEXES OF DEPENDENT VARIABLES FOR ADV.             *
04720*    *    *    *    *    *    *    *    *    *
04730        DS   3
04740RF      TF   CNTR,RF-1
04750        TF   RF4+6,RF1+6
04760RF1     RNCD 99999
04770RF2     AM   RF1+6,99999
04780RF3     SM   CNTR,99999
04790        BP   RF1
04800        TF   CNTR,RF-1
04810RF4     SF   99999
04820RF5     AM   RF4+6,99999
04830        SM   CNTR,1,10
04840        BP   RF4
04850        BB
04860        DORG *-9
04870*    *    *    *    *    *    *    *
04880*     SUBROUTINE TO FLOAT NOBS.      *
04890*    *    *    *    *    *    *    *
04900        DS   5
04910CONV    TFM  EXP3,5,10
04920        TFM  TESTD+11,CONV-5
04930        TFM  MVWRD+6,OBSER-5
04940        TF   OBSER,ZEROS
04950TESTD   BD   SETM,99999
04960        AM   TESTD+11,1,10
```

```
04640 49 99999 00000
04648
04650 00003
04652 26 00589 04651
04664 26 04742 04682
04676 36 99999 00500
04688 11 04682 99999
04700 12 00589 99999
04712 46 04676 01100
04724 26 00589 04651
04736 32 99999 00000
04748 11 04742 99999
04760 12 00589 00001
04772 46 04736 01100
04784 42 00000 00000
04786

04790 00005
04792 16 04947 00005
04804 16 04851 04787
04816 16 04926 00476
04828 26 00481 00871
04840 43 04896 99999
04852 11 04851 00001
```

```
04970          SM    EXP3,1,10
04980          SM    NVWRD+6,1,10
04990          B     TESTD
05000          DORG  *-3
05010SETN      TF    *+18,TESTD+11
05020          SF    99999
05030NVWRD     TF    99999,CONV-1
05040          TF    OBSER,EXP3
05050          BB
05060          DORG  *-9
05070EXP3      DS    2
05080          DS    4
05090WRNUM     TF    OUT,NO
05100NO        DS    ,WRNUM-1
05110          CF    OUT-1
05120          WNTY  OUT-1
05130          BB
05140          DORG  *-9
05145          DAC   1,0
05150          DEND  START1
LOAD SUBROUTINES
```

```
04864 12 04947 00001
04876 12 04926 00001
04888 49 04840 00000
04896
04896 26 04914 04851
04908 32 99999 00000
04920 26 99999 04791
04932 26 00481 04947
04944 42 00000 00000
04946
04947 00002
04951 00004
04952 26 00830 04951
04951 00000
04964 33 00829 00000
04976 38 00829 00100
04988 42 00000 00000
04990
04991 00001
02180
04992 16 05426 05884
05004 49 05116 0
```

```
END OF PASSII
13400   REF     00402   CONT    00407   DATE    00409   PROB    00414   NOBS
00417   NFORM   00420   INVAR   00423   NOVAR   00426   N       00429   NDEP
00432  *NOTRAN  00435   NOCON   00437   NCOL    00440   NELIM   00441   CON1
00442   CON2    00443   CON3    00444   CON4    00445   CON5    00446   CON6
00447   CON7    00448   CON8    00449   CON9    00450   CON10   00451   CON11
00452   CON12   00453   CON13   00454   CON14   00455   CON15   00456   CON16
00457   CON17   00458   CON18   00481   OBSER   00486   IND     00491   ID
00496   IDD     00501  *FORMAT  00506   INDEX   00511   CONST   00516   DATA1
00521   DATA2   00526   B       00531   SE      00536   T       00541   SUM1
00546   SIGMA   00551   R       00556   WT      00561   ADKK    00566   ADRNN
00571   ADIJ    00576   ADRIJ   00581   SIGN3   00586   COUNT   00589   CNTR
00592   CTR     00595   I       00598   J       00601   K       00604   L
00607   P       00610   Q       00614   NSZ     00617   IVE     00620   IVP
00630   TEMP1   00640   TEMP2   00650   A0      00660   EY      00670   RSQR
00680   SQR     00690   DF      00700   F       00710   FIN     00720   FOUT
00730   HIGH    00740   VP      00750   VE      00830   OUT     00841   FP001
00851   FHIGH   00861   ZERO    00871   ZEROS   00881   ONE     00891   SUMWT
00894   WCTR    00900   RFS     00936   FRMT    00980   READN   01016   LOOP1
01064   CHCOL   01244   RET     01256   D1      01280   D2      01300   PER
01324   D4      01348   D5      01368   MIN     01388   CHG     01516   SETFL
01528   MOVE    01636   BRNCH   01680   DIGIT   01704   EX      01800   TRSMT
01890   STEP1   01910   OVR2    01912   ZEROX   01939   SPEC    01944   ADDR
01958   INPUT   01968   CONN    01973   EXPNT   01974   SIGN2   01978   PNUM
01981   NCNT    01983   ALPHA   02145   PRBL    02157   VRBL    02167   OBSR
02180  *START1  02472   CADD    02588   CADD1   02660   INC     02768   INC2
02900   CADD2   03254   RIND    03310   RIDD    03382   CMPL    03394   CMPR
03450   RDCON   03546  *RDTRAN  03618   CMPF    03658  *RDFORM  03730   WGTS
03814   FLT     03826   CLR     03850   CLR2    03946   CLR3    04056   CLR1
04104   PRH     04320   RET2    04340   LOADR   04380   LDR1    04404   RNC
04544   FF      04640   RET7    04652   RF      04676   RF1     04688   RF2
04700   RF3     04736   RF4     04748   RF5     04792   CONV    04840   TESTD
04896   SETN    04920   NVWRD   04947   EXP3    04952   WRNUM   04951   NO
```

```
05160*  PROGRAM 80-2, READ,FLOAT AND STORE DATA, FORM TRANSFORMED
05170*  DATA, FORM SUMS AND SUMS OF PRODUCTS, OCT. 4, 1963.
05190        DORG 402                                          00402
05200CONT    DSS  80                                           00402 00080
05210DATE    DS   6,CONT+5                                     00407 00006
05220PROB    DS   2,CONT+7                                     00409 00002
05230NOBS    DS   5,CONT+12                                    00414 00005
05240NFORM   DS   3,CONT+15                                    00417 00003
05250INVAR   DS   3,CONT+18                                    00420 00003
05260NOVAR   DS   3,CONT+21                                    00423 00003
05270N       DS   3,CONT+24                                    00426 00003
05280NDEP    DS   3,CONT+27                                    00429 00003
05290NOTRAN  DS   3,CONT+30                                    00432 00003
05300NOCON   DS   3,CONT+33                                    00435 00003
05310NCOL    DS   2,CONT+35                                    00437 00002
05320NELIM   DS   3,CONT+38                                    00440 00003
05330CON1    DS   1,CONT+39                                    00441 00001
05340CON2    DS   1,CONT+40                                    00442 00001
05350CON3    DS   1,CONT+41                                    00443 00001
05360CON4    DS   1,CONT+42                                    00444 00001
05370CON5    DS   1,CONT+43                                    00445 00001
05380CON6    DS   1,CONT+44                                    00446 00001
05390CON7    DS   1,CONT+45                                    00447 00001
05400CON8    DS   1,CONT+46                                    00448 00001
05410CON9    DS   1,CONT+47                                    00449 00001
05420CON10   DS   1,CONT+48                                    00450 00001
05430CON11   DS   1,CONT+49                                    00451 00001
05440CON12   DS   1,CONT+50                                    00452 00001
```



```
05450CON13   DS   1,CONT+51                                    00453 00001
05460CON14   DS   1,CONT+52                                    00454 00001
05470CON15   DS   1,CONT+53                                    00455 00001
05480CON16   DS   1,CONT+54                                    00456 00001
05490CON17   DS   1,CONT+55                                    00457 00001
05500CON18   DS   1,CONT+56                                    00458 00001
05510OBSER   DS   10,CONT+79                                   00481 00010
05520IND     DS   5                                            00486 00005
05530ID      DS   5                                            00491 00005
05540IDD     DS   5                                            00496 00005
05550FORMAT  DS   5                                            00501 00005
05560INDEX   DS   5                                            00506 00005
05570CONST   DS   5                                            00511 00005
05580DATA1   DS   5                                            00516 00005
05590DATA2   DS   5                                            00521 00005
05600B       DS   5                                            00526 00005
05610SE      DS   5                                            00531 00005
05620T       DS   5                                            00536 00005
05630SUM1    DS   5                                            00541 00005
05640SIGMA   DS   5                                            00546 00005
05650R       DS   5                                            00551 00005
05660WT      DS   5                                            00556 00005
05670ADKK    DS   5                                            00561 00005
05680ADRNN   DS   5                                            00566 00005
05690ADIJ    DS   5                                            00571 00005
05700ADRIJ   DS   5                                            00576 00005
05710SIGN3   DS   5                                            00581 00005
```

```
05720COUNT  DS   5                       00586 00005
05730CNTR   DS   3                       00589 00003
05740CTR    DS   3                       00592 00003
05750I      DS   3                       00595 00003
05760J      DS   3                       00598 00003
05770K      DS   3                       00601 00003
05780L      DS   3                       00604 00003
05790P      DS   3                       00607 00003
05800Q      DS   3                       00610 00003
05810MSZ    DS   4                       00614 00004
05820IVE    DS   3                       00617 00003
05830IVP    DS   3                       00620 00003
05840TEMP1  DS   10                      00630 00010
05850TEMP2  DS   10                      00640 00010
05860AO     DS   10                      00650 00010
05870EY     DS   10                      00660 00010
05880RSCR   DS   10                      00670 00010
05890SCR    DS   10                      00680 00010
05900DF     DS   10                      00690 00010
05910F      DS   10                      00700 00010
05920FIN    DS   10                      00710 00010
05930FOUT   DS   10                      00720 00010
05940HIGH   DS   10                      00730 00010
05950VP     DS   10                      00740 00010
05960VE     DS   10                      00750 00010
05970OUT    DS   80                      00830 00080
05980       DC   1,@                     00831 00001
```



```
05990       DC   8,10000000                          00839 00008
06000FP001  DC   2,-2                                00841 00002
06010       DC   8,10000000                          00849 00008
06020FHIGH  DC   2,50                                00851 00002
06030       DC   8,0                                 00859 00008
06040ZERO   DC   2,-99                               00861 00002
06050ZEROS  DC   10,0                                00871 00010
06060       DC   8,10000000                          00879 00008
06070ONE    DC   2,1                                 00881 00002
06075SUMWT  DS   10                                  00891 00010
06080*   *   *   *   *   *   *   *   *   *   *   *   *
06090*      SUBROUTINE TO READ, FLOAT, AND STORE NUMBERS UNDER    *
06100*        FORMAT CONTROL.  NEEDS NUMBER OF WORDS AND INITIAL  *
06110*        ADDRESS WHERE STORED.                               *
06120*   *   *   *   *   *   *   *   *   *   *   *   *
06130WCTR   DS   3                                   00894 00003
06140       DS   5                                   00899 00005
06150RFS    TF   TRSMT+23,RFS-1,,SET UP STORE ADDRESS.
                                                     00900 26 01823 00899
06160       TFM  READN-2,READN                       00912 16 00978 0̄0980
06170       TF   FRMT+11,FORMAT                      00924 26 00947 00501
06180FRMT   TF   SPEC,99999                          00936 26 01939 99999
06190       SF   SPEC-1                              00948 32 01938 00000
06200       SF   SPEC-3                              00960 32 01936 00000
06210       B    99999,,,READN OR LOOP1              00972 49 99999 00000
06220       DORG *-3                                 00980
06230READN  RACD ALPHA                               00980 37 01983 00500
06240       TFM  READN-2,LOOP1                       00992 16 00978 0̄1016
06250       TFM  ADDR,ALPHA-2                        01004 16 01944 0̄1981
06260LOOP1  A    ADDR,SPEC-2                         01016 21 01944 01937
```

```
06270          A     ADDR,SPEC-2
06280          TF    INPUT,ZEROS
06290          TF    INPUT-9,ZEROS-5
06300CMCOL     CM    ADDR,ALPHA+154
06310          BNL   READN
06312          CM    SPEC-4,0,10
06314          BE    STEP1
06320          TDM   SIGN2,0
06330          TF    D1+6,ADDR
06340          TF    D2+11,D1+6
06350          TF    PER+6,D1+6
06360          TF    D4+6,D1+6
06370          TF    RET+6,D1+6
06380          SM    RET+6,1,10
06390          TFM   D2+6,INPUT
06400          TFM   D5+6,INPUT
06410          TFM   SETFL+6,INPUT+1
06420          S     SETFL+6,SPEC-2
06430RET       SF    99999,,,ADDR-1
06440D1        CM    99999,70,10
06450          BL    PER
06460D2        TD    99999,99999,,INPUT,ADDR
06470          B     CHG+20
06480          DORG  *-3
06490PER       CM    99999,03,10,ADDR
06500          BE    CHG
06510D4        CM    99999,20,10
```

```
01028 21 01944 01937
01040 26 01958 00871
01052 26 01949 00866
01064 14 01944 02137
01076 46 00980 01300
01088 14 01935 00000
01100 46 01890 01200
01112 15 01974 00000
01124 26 01262 01944
01136 26 01291 01262
01148 26 01306 01262
01160 26 01330 01262
01172 26 01250 01262
01184 12 01250 00001
01196 16 01286 01958
01208 16 01354 01958
01220 16 01522 01959
01232 22 01522 01937
01244 32 99999 00000
01256 14 99999 00070
01268 47 01300 01300
01280 25 99999 99999
01292 49 01408 00000
01300
01300 14 99999 00003
01312 46 01388 01200
01324 14 99999 00020
```



```
06520          BE    MIN
06530D5        TDM   99999,0,,INPUT
06540          B     CHG+20
06550          DORG  *-3
06560MIN       SF    SIGN2
06570          B     PER+48
06580          DORG  *-3
06590CHG       AM    SETFL+6,1,10
06600          B     *+32
06610          DORG  *-3
06620          SM    D2+6,1,10
06630          SM    D5+6,1,10
06640          SM    D1+6,2,10
06650          SM    D2+11,2,10
06660          SM    PER+6,2,10
06670          SM    D4+6,2,10
06680          SM    RET+6,2,10
06690          C     D2+6,SETFL+6
06700          BNL   RET
06710SETFL     SF    99999,,,(INPUT+1)-(SPEC-2)
06720MOVE      CM    INPUT,0,10
06730          BE    ZEROX
06740          TF    COMN,ZEROS
06750          CF    COMN-9
06760          TFM   EXPNT,INPUT+1
06770          S     EXPNT,SETFL+6
06780          TF    BRNCH+11,SETFL+6
```

```
01336 46 01368 01200
01348 15 99999 00000
01360 49 01408 00000
01368
01368 32 01974 00000
01380 49 01348 00000
01388
01388 11 01522 00001
01400 49 01432 00000
01408
01408 12 01286 00001
01420 12 01354 00001
01432 12 01262 00002
01444 12 01291 00002
01456 12 01306 00002
01468 12 01330 00002
01480 12 01250 00002
01492 24 01286 01522
01504 46 01244 01300
01516 32 99999 00000
01528 14 01958 00000
01540 46 01912 01200
01552 26 01968 00871
01564 33 01959 00000
01576 16 01973 01959
01588 22 01973 01522
01600 26 01647 01522
```

```
06790          SF    EXPNT-1
06800          S     EXPNT,SPEC
06810BRNCH     BD    DIGIT,99999
06820          SM    EXPNT,1,10
06830          AM    BRNCH+11,1,10
06840          B     BRNCH
06850          DORG  *-3
06860DIGIT     TF    *+30,BRNCH+11
06870          AM    *+18,9,10
06880EX        TF    99999,EXPNT
06890          TF    *+18,BRNCH+11
06900          SF    99999
06910          TF    TRSMT+28,EX+6
06920          BNF   *+48,SIGN2
06930          TF    *+30,TRSMT+28
06940          SM    *+18,2,10
06950          SF    99999
06960TRSMT     TFLS  99999,99999


06970          AM    TRSMT+23,10,10
06980          SM    WCTR,1,10
06990          BNP   OVR2
07000          SM    SPEC-4,1,10
07010          BP    LOOP1
07020STEP1     AM    FRMT+11,6,10
07030          B     FRMT
```

```
01612 32 01972 00000
01624 22 01973 01939
01636 43 01680 99999
01648 12 01973 00001
01660 11 01647 00001
01672 49 01636 00000
01680
01680 26 01710 01647
01692 11 01710 00009
01704 26 99999 01973
01716 26 01734 01647
01728 32 99999 00000
01740 26 01828 01710
01752 44 01800 01974
01764 26 01794 01828
01776 12 01794 00002
01788 32 99999 00000
01800 16 06741 01823
01812 49 06690 00000
01819 00005    99999
01824 00005    99999
01830 11 01823 00010
01842 12 00894 00001
01854 47 01910 01100
01866 12 01935 00001
01878 46 01016 01100
01890 11 00947 00006
01902 49 00936 00000
```



```
07040          DORG  *-3
07050OVR2      BB
07060          DORG  *-9
07070ZEROX     TFM   TRSMT+28,ZERO
07080          B     TRSMT
07090          DORG  *-3
07100SPEC      DS    8
07110ADDR      DS    5
07120INPUT     DS    14
07130COMN      DS    10
07140EXPNT     DS    5
07150SIGN2     DS    1
07160PNUM      DS    4
07170NCNT      DS    3
07073ALPHA     DAS   80
07175          DAC   1,@
07180START2    TDM   TRIG1,0,,SET TRIGGER 1 FOR FIRST PASS.
07185          TFLS  SUMWT,ZERO


07187          TF    SUMS2+28,WT
07189          TF    SUMS25+28,WT
07190*
07200*  FORM SUMS AND SUMS OF PRODUCTS.
07210*
07220LOOP5     TF    COUNT,NOBS
07230*
07240*      READ, FLOAT, AND STORE OBSERVATION.
07250*
07260LOOP4     TF    WCTR,INVAR
```

```
01910
01910 42 00000 00000
01912
01912 16 01828 00861
01924 49 01800 00000
01932
01939 00008
01944 00005
01958 00014
01968 00010
01973 00005
01974 00001
01978 00004
01981 00003
01983 00080
02143 00001
02144 15 02301 00000
02156 16 06741 02179
02168 49 06690 00000
02175 00005    00891
02180 00005    00861
02186 26 05894 00556
02198 26 06016 00556
02210 26 00586 00414
02222 26 00894 00420
```

```
07270          BT    RFS,DATA1                    02234 27 00900 00516
07280*
07290*       IF SWITCH 1 ON, PRINT INPUT DATA.
07300*
07310          BNC1  CMNO                         02246 47 02302 00100
07320          TF    WORDS,INVAR                  02258 26 02914 00420
07330          TF    PRINT1+28,DATA1              02270 26 02956 00516
07340          TFM   RET1+6,*+20                  02282 16 03024 02302
07350          B     PRINT                        02294 49 02916 00000
07360          DORG  *-4                          02301
07370TRIG1     DS    1                            02301 00001
07380*
07390*       IS NOTRAN = ZERO.
07400*
07410CMNO      CM    NOTRAN,0,10                  02302 14 00432 00000
07420          BE    PASS                         02314 46 02394 01200
07430*
07440*       TRANSFORM DATA
07450*
07460          BTM   TFS,0,10                     02326 17 03214 00000
07470*
07480*       IF SWITCH 2 ON, PRINT TRANSFORMED DATA.
07490*
07500          BNC2  PASS                         02338 47 02394 00200
07510          TF    WORDS,N                      02350 26 02914 00426
07520          TF    PRINT1+28,DATA1              02362 26 02956 00516
07530          TFM   RET1+6,*+20                  02374 16 03024 02394
07540          B     PRINT                        02386 49 02916 00000
07550          DORG  *-3                          02394
07560*
07570*       IS IT ONE PASS INPUT.
07580*
07590PASS      BD    *+20,CON5,,BRANCH IF TWO PASS.
                                                  02394 43 02414 00445
07600          B     FORMS                        02406 49 02426 00000
```



```
07610          DORG  *-3                          02414
07620*
07630*       IS IT FIRST PASS
07640*
07650          BD    SUBM,TRIG1                   02414 43 02608 02301
07660*
07670*       FORM SUMS OF DATA.
07680*
07690FORMS     BTM   SUMS,0,10                    02426 17 05780 00000
07700*
07710*       IS IT ONE PASS INPUT
07720*
07730          BD    *+20,CON5                    02438 43 02458 00445
07740          B     FORPRO                       02450 49 02722 00000
07750          DORG  *-3                          02458
07760          SM    COUNT,1,10                   02458 12 00586 00001
07770          BP    LOOP4                        02470 46 02222 01100
07771          BD    *+20,CON6                    02482 43 02502 00446
07772          B     CPS                          02494 49 02532 00000
07773          DORG  *-3                          02502
07774          TFLS  OBSER,SUMWT                  02502 16 06741 02525
                                                  02514 49 06690 00000
                                                  02521 00005    00481
                                                  02526 00005    00891
07780*
07800*       ARE SUMS PUNCHED.
07810*
07820CPS       BD    *+20,CON9                    02532 43 02552 00449
07830          B     FORMM                        02544 49 02576 00000
07840          DORG  *-3                          02552
07850*
07860*       PUNCH SUMS
07870*
07880          TF    PNUM,N                       02552 26 01978 00426
07890          BT    PNCH,SUM1                    02564 27 03032 00541
```

```
07900*
07910*      FORM MEANS AT SUM1.
07920*
07930FORMN  BTM  MEANS,0,10
07940*
07950*  SET TRIGGER 1 FOR SECOND PASS.
07960*
07970       TDM  TRIG1,1
07980       B    LOOP5
07990       DORG *-3
08000*
08010*      SUBTRACT MEANS FROM DATA
08020*
08030SUBM   TF   MCNT,N
08040       TF   SUBM1+23,DATA1
08050       TF   SUBM1+28,SUM1
08060SUBM1  FS   99999,99999
08070       AM   SUBM1+23,10,10
08080       AM   SUBM1+28,10,10
08090       SM   MCNT,1,10
08100       BP   SUBM1
08110*
08120*      FORM SUMS OF PRODUCTS
08130*
08140FORPRO BTM  PROD,0,10
08150       SM   COUNT,1,10
08160       BP   LOOP4
08162       BD   *+20,CON6
08164       B    CMSM
08166       DORG *-3
```

```
02576 17 03120 00000
02588 15 02301 00001
02600 49 02210 00000
02608
02608 26 01981 00426
02620 26 02667 00516
02632 26 02672 00541
02644 16 06741 02667
02656 49 06450 00000
02663 00005    99999
02668 00005    99999
02674 11 02667 00010
02686 11 02672 00010
02698 12 01981 00001
02710 46 02644 01100
02722 17 06022 00000
02734 12 00586 00001
02746 46 02222 01100
02758 43 02778 00446
02770 49 02808 00000
02778
```



```
08168       TFLS OBSER,SUMWT
08170*
08180*  ARE SUMS PUNCHED.
08190*
08200CMSM   BD   *+20,CON9
08210       B    END2
08220       DORG *-3
08230*
08240*  IS IT ONE PASS INPUT.
08250*
08260       BD   PSP,CON5
08270*
08280*  PUNCH SUM1.
08290       TF   PNUM,N
08300       BT   PNCH,SUM1
08310*
08320*  PUNCH SUMS OF PRODUCTS.
08330*
08340PSP    TF   PNUM,MSZ
08350       BT   PNCH,R
08360END2   RNCD 0
08370       B    0
08380*    *    *    *    *    *    *    *    *
08390*      SUBROUTINE FOR PRINTING N WORDS.   *
08400*    *    *    *    *    *    *    *    *
08410WORDS  DS   3
08420PRINT  RCTY
08430PRINT1 BTFS FLTFIX,99999
08440       WATY OUTPUT-20
08450       TBTY
08460       AM   PRINT1+28,10,10
```

```
02778 16 06741 02801
02790 49 06690 00000
02797 00005    00481
02802 00005    00891
02808 43 02828 00449
02820 49 02888 00000
02828
02828 43 02864 00445
02840 26 01978 00426
02852 27 03032 00541
02864 26 01978 00614
02876 27 03032 00551
02888 36 00000 00500
02900 49 00000 00000
02914 00003
02916 34 00000 00102
02928 16 06741 02951
02940 49 06710 00000
02947 00005    04864
02952 00005    99999
02958 39 05731 00100
02970 34 00000 00108
02982 11 02956 00010
```

```
08470          SM    WORDS,1,10
08480          BP    PRINT1
08490RET1      B     99999
08500          DORG  *-3
08510*    *    *    *    *    *
08520*  PUNCH SUBROUTINE.      *
08530*    *    *    *    *    *
08540          DS    5
08550PNCH      WNCD  402
08560          TF    PNCH1+6,PNCH-1
08570          SM    PNCH1+6,9,10
08580PNCH1     WNCD  99999
08590          AM    PNCH1+6,80,10
08600          SM    PNUM,8,10
08610          BP    PNCH1
08620          BB
08630          DORG  *-9
08640*    *    *    *    *    *    *
08650*  SUBROUTINE TO FORM MEANS.   *
08660*    *    *    *    *    *    *
08670          DS    2
08680MEANS     TF    MCNT,N
08690          TF    DIVS+23,SUM1
08700DIVS      FD    99999,OBSER

08710          AM    DIVS+23,10,10
08720          SM    MCNT,1,10
08730          BP    DIVS
08740          BB
```

```
02994 12 02914 00001
03006 46 02928 01100
03018 49 99999 00000
03026


03030 00005
03032 38 00402 00400
03044 26 03074 03031
03056 12 03074 00009
03068 38 99999 00400
03080 11 03074 00080
03092 12 01978 00008
03104 46 03068 01100
03116 42 00000 00000
03118


03119 00002
03120 26 01981 00426
03132 26 03167 00541
03144 16 06741 03167
03156 49 06510 00000
03163 00005    99999
03168 00005    00481
03174 11 03167 00010
03186 12 01981 00001
03198 46 03144 01100
03210 42 00000 00000
```



```
08750          DORG  *-9
08760*    *    *    *    *    *    *    *
08770*  SUBROUTINE TO TRANSFORM DATA      *
08780*    *    *    *    *    *    *    *
08790          DS    2
08800TFS       TF    CNT,INVAR
08810          TF    MV+23,DATA2
08820          TF    MV+28,DATA1
08830MV        TFLS  99999,99999

08840          AM    MV+23,10,10
08850          AM    MV+28,10,10
08860          SM    CNT,1,10
08870          BP    MV
08880          TF    CNT,NOTRAN
08890TRNF      TF    *+23,INDEX
08900          TF    SPEC,99999
08910          SF    SPEC-1
08920          SF    SPEC-3
08930          SF    SPEC-5
08940          TF    TRF+28,DATA1
08950          SM    TRF+28,10,10
08960          A     TRF+27,SPEC-2
08970TRF       TFLS  WORK,99999

08980          TF    MVE+23,DATA1
08990          SM    MVE+23,10,10
```

```
03212
03213 00002
03214 26 04742 00420
03226 26 03273 00521
03238 26 03278 00516
03250 16 06741 03273
03262 49 06690 00000
03269 00005    99999
03274 00005    99999
03280 11 03273 00010
03292 11 03278 00010
03304 12 04742 00001
03316 46 03250 01100
03328 26 04742 00432
03340 26 03363 00506
03352 26 01939 99999
03364 32 01938 00000
03376 32 01936 00000
03388 32 01934 00000
03400 26 03464 00516
03412 12 03464 00010
03424 21 03463 01937
03436 16 06741 03459
03448 49 06690 00000
03455 00005    04752
03460 00005    99999
03466 26 04695 00516
03478 12 04695 00010
```

```
09000          A     MVE+22,SPEC-4
09010          MM    SPEC-6,5,10
09020          TFM   *+35,TRCON-5
09030          A     *+23,99
09040          TF    *+18,99999
09050BRCH      B     99999
09060          DORG  *-3
09070*
09080*     HERE ARE THE TRANSFORMATION SUBROUTINES.
09090*
09100RETURN    TF    TRNF1+28,DATA2
09110          SM    TRNF1+28,10,10
09120          A     TRNF1+27,SPEC-2
09130TRNF1     TFLS  WORK,99999


09140          B     MVE
09150          DORG  *-3
09160CHSIGN    BNF   OVR1,WORK-2
09170          CF    WORK-2
09180          B     MVE
09190          DORG  *-3
09200OVR1      SF    WORK-2
09210          B     MVE
09220          DORG  *-3
09230SCALE     TF    FADD+28,CONST
09240          SM    FADD+28,10,10
09250          A     FADD+27,SPEC
09260FADD      FA    WORK,99999
```

```
03490 21 04694 01935
03502 13 01933 00005
03514 16 03549 04752
03526 21 03549 00099
03538 26 03556 99999
03550 49 99999 00000
03558

03558 26 03622 00521
03570 12 03622 00010
03582 21 03621 01937
03594 16 06741 03617
03606 49 06690 00000
03613 00005    04752
03618 00005    99999
03624 49 04672 00000
03632

03632 44 03664 04750
03644 33 04750 00000
03656 49 04672 00000
03664

03664 32 04750 00000
03676 49 04672 00000
03684

03684 26 03748 00511
03696 12 03748 00010
03708 21 03747 01939
03720 16 06741 03743
```



```
09270          B     MVE
09280          DORG  *-3
09290NAGN      TF    FMUL+28,CONST
09300          SM    FMUL+28,10,10
09310          A     FMUL+27,SPEC
09320FMUL      FM    WORK,99999


09330          B     MVE
09340          DORG  *-3
09350SUM       TF    FADD1+28,DATA1
09360          SM    FADD1+28,10,10
09370          A     FADD1+27,SPEC
09380FADD1     FA    WORK,99999


09390          B     MVE
09400          DORG  *-3
09410SUB       TF    FSUB+28,DATA1
09420          SM    FSUB+28,10,10
09430          A     FSUB+27,SPEC
09440FSUB      FS    WORK,99999


09450          B     MVE
09460          DORG  *-3
09470MPY       TF    FMUL1+28,DATA1
```

```
03732 49 06470 00000
03739 00005    04752
03744 00005    99999
03750 49 04672 00000
03758

03758 26 03822 00511
03770 12 03822 00010
03782 21 03821 01939
03794 16 06741 03817
03806 49 06490 00000
03813 00005    04752
03818 00005    99999
03824 49 04672 00000
03832

03832 26 03896 00516
03844 12 03896 00010
03856 21 03895 01939
03868 16 06741 03891
03880 49 06470 00000
03887 00005    04752
03892 00005    99999
03898 49 04672 00000
03906

03906 26 03970 00516
03918 12 03970 00010
03930 21 03969 01939
03942 16 06741 03965
03954 49 06450 00000
03961 00005    04752
03966 00005    99999
03972 49 04672 00000
03980

03980 26 04044 00516
```

```
09480          SM    FMUL1+28,10,10
09490          A     FMUL1+27,SPEC
09500FMUL1     FM    WORK,99999

09510          B     MVE
09520          DORG  *-3
09530DVDE      TF    FDIV+28,DATA1
09540          SM    FDIV+28,10,10
09550          A     FDIV+27,SPEC
09560FDIV      FD    WORK,99999

09570          B     MVE
09580          DORG  *-3
09590RCPR      TFLS  TEMP1,ONE

09600          FD    TEMP1,WORK

09610          TFLS  WORK,TEMP1

09620          B     MVE
09630          DORG  *-3
09640POWER     TF    AA+28,CONST
09650          SM    AA+28,10,10
09660          A     AA+27,SPEC
```

```
03992 12 04044 00010

04004 21 04043 01939

04016 16 06741 04039
04028 49 06490 00000
04035 00005    04752
04040 00005    99999

04046 49 04672 00000

04054

04054 26 04118 00516

04066 12 04118 00010

04078 21 04117 01939

04090 16 06741 04113
04102 49 06510 00000
04109 00005    04752
04114 00005    99999

04120 49 04672 00000

04128

04128 16 06741 04151
04140 49 06690 00000
04147 00005    00630
04152 00005    00881

04158 16 06741 04181
04170 49 06510 00000
04177 00005    00630
04182 00005    04752

04188 16 06741 04211
04200 49 06690 00000
04207 00005    04752
04212 00005    00630

04218 49 04672 00000

04226

04226 26 04320 00511

04238 12 04320 00010

04250 21 04319 01939
```



```
09670          FLN   WORK,WORK

09680AA        FM    WORK,99999

09690          FEX   WORK,WORK

09700          B     MVE
09710          DORG  *-3
09720LN        FLN   WORK,WORK

09730          B     MVE
09740          DORG  *-3
09750LOG       FLOG  WORK,WORK

09760          B     MVE
09770          DORG  *-3
09780EXN       FEX   WORK,WORK

09790          B     MVE
09800          DORG  *-3
09810EXT       FEXT  WORK,WORK

09820          B     MVE
```

```
04262 16 06741 04285
04274 49 06670 00000
04281 00005    04752
04286 00005    04752

04292 16 06741 04315
04304 49 06490 00000
04311 00005    04752
04316 00005    99999

04322 16 06741 04345
04334 49 06630 00000
04341 00005    04752
04346 00005    04752

04352 49 04672 00000

04360

04360 16 06741 04383
04372 49 06670 00000
04379 00005    04752
04384 00005    04752

04390 49 04672 00000

04398

04398 16 06741 04421
04410 49 06650 00000
04417 00005    04752
04422 00005    04752

04428 49 04672 00000

04436

04436 16 06741 04459
04448 49 06630 00000
04455 00005    04752
04460 00005    04752

04466 49 04672 00000

04474

04474 16 06741 04497
04486 49 06610 00000
04493 00005    04752
04498 00005    04752

04504 49 04672 00000
```

```
09830          DORG *-3
09840SIN       FSIN WORK,WORK
09850          B    MVE
09860          DORG *-3
09870COS       FCOS WORK,WORK
09880          B    MVE
09890          DORG *-3
09900ARCTAN    FATN WORK,WORK
09910          B    MVE
09920          DORG *-3
09930SQRT      FSQR WORK,WORK
09940          B    MVE
09950          DORG *-3
09960DUMMY     B    99999
09970          DORG *-3
09980MVE       TFLS 99999,WORK
09990          AM   TRNF+23,8,10
10000          SM   CNT,1,10
10010          BP   TRNF+12
```

```
04512

04512 16 06741 04535
04524 49 06570 00000
04531 00005    04752
04536 00005    04752

04542 49 04672 00000

04550

04550 16 06741 04573
04562 49 06550 00000
04569 00005    04752
04574 00005    04752

04580 49 04672 00000

04588

04588 16 06741 04611
04600 49 06590 00000
04607 00005    04752
04612 00005    04752

04618 49 04672 00000

04626

04626 16 06741 04649
04638 49 06530 00000
04645 00005    04752
04650 00005    04752

04656 49 04672 00000

04664

04664 49 99999 00000

04672

04672 16 06741 04695
04684 49 06690 00000
04691 00005    99999
04696 00005    04752

04702 11 03363 00008

04714 12 04742 00001

04726 46 03352 01100
```



```
10020          BB
10030          DORG *-9
10040CNT       DS   3
10050WORK      DS   10
10060TRCON     DSA  MVE,RETURN,CHSIGN,SCALE,MAGN,SUM,SUB,MPY,DVDE,RCPR
10070          DSA  POWER,LN,LOG,EXN,EXT,SIN,COS,ARCTAN,SQRT,DUMMY
10080*  *  *  *  *  *  *  *  *  *  *  *  *  *
10090*  SUBROUTINE FOR PREPARING DATA FOR ALPHAMERICAL PRINTING OR  *
10100*  PUNCHING.  INTERNAL FORMAT IS SPSII.                        *
10110*  *  *  *  *  *  *  *  *  *  *  *  *  *
10120          DS   10
10130FLTFIX    CF   ARG-9
10140ARG       DS   ,FLTFIX-1
10150          TF   OUTPUT,SEVENS
10160          CF   OUTPUT-9
10170          TF   OUTPUT-10,DCMAL
10180          TFM  OUTPUT-19,0,9
10190          TFM  SIGN,0,10
10200          BNF  JUMP,ARG-2
10210          TDM  SIGN-1,2,11
```

```
04738 42 00000 00000

04740

04742 00003

04752 00010

04757 00005    04672
04762 00005    03558
04767 00005    03632
04772 00005    03684
04777 00005    03758
04782 00005    03832
04787 00005    03906
04792 00005    03980
04797 00005    04054
04802 00005    04128

04807 00005    04226
04812 00005    04360
04817 00005    04398
04822 00005    04436
04827 00005    04474
04832 00005    04512
04837 00005    04550
04842 00005    04588
04847 00005    04626
04852 00005    04664

04862 00010

04864 33 04854 00000

04863 00000

04876 26 05751 05763

04888 33 05742 00000

04900 26 05741 05773

04912 16 05732 00000

04924 16 05775 00000

04936 44 04972 04861

04948 15 05774 00002
```

```
10220          CF    ARG-2
10230JUMP      CM    ARG,99,1011
10240          BE    VRALPH
10250          CM    ARG,0,10
10260          BNP   DECIML
10270          CM    ARG,4,10
10280          BH    LARGE
10290          TFM   TRNMT+11,ARG-9
10300          TFM   *+42,OUTPUT-10
10310          S     *+30,ARG
10320          S     *+18,ARG
10330TRNMT     TD    99999,99999
10340          AM    TRNMT+11,1,10
10350          AM    TRNMT+6,2,10
10360          CM    TRNMT+6,OUTPUT-12
10370          BNH   TRNMT
10380          TF    WRITE+23,TRNMT+11
10390          TFM   EXPNT2,5,10
10400          S     EXPNT2,ARG
10410          TFM   *+47,SEVENS
10420          S     *+35,EXPNT2
10430          S     *+23,EXPNT2
10440          A     OUTPUT-12,99999
10450WRITE     TFM   *+18,OUTPUT-8
10460          TD    OUTPUT-8,0
10470          AM    WRITE+23,1,10
10480          AM    WRITE+18,2,10
```

```
04960 33 04861 00000
04972 14 04863 00099
04984 46 05308 01200
04996 14 04863 00000
05008 47 05354 01100
05020 14 04863 00004
05032 46 05434 01100
05044 16 05103 04854
05056 16 05098 05741
05068 22 05098 04863
05080 22 05098 04863
05092 25 99999 99999
05104 11 05103 00001
05116 11 05098 00002
05128 14 05098 05739
05140 47 05092 01100
05152 26 05259 05103
05164 16 05777 00005
05176 22 05777 04863
05188 16 05235 05763
05200 22 05235 05777
05212 22 05235 05777
05224 21 05739 99999
05236 16 05254 05743
05248 25 05743 00000
05260 11 05259 00001
05272 11 05254 00002
```



```
10490          CM    WRITE+18,OUTPUT
10500          BNH   WRITE+12
10510VRALPH    TD    SETZRO,OUTPUT-18
10520          B     SETSIC
10530          DORG  *-3
10540SETZRO    TDM   OUTPUT,0
10550          TF    OUTPUT-20,SIGN
10560          BB
10570          DORG  *-9
10580DECIML    CM    ARG,4,1011
10590          BNH   LARGE
10600          TFM   WRITE+23,ARG-9
10610          TFM   WRITE+18,OUTPUT-8
10620          S     WRITE+18,ARG
10630          S     WRITE+18,ARG
10640          B     WRITE+12
10650          DORG  *-3
10660LARGE     TF    OUTPUT-17,SEVENS-7
10670          BNF   JUMP2,ARG
10680          TFM   OUTPUT-20,20,10
10690          CF    ARG
10700          CF    OUTPUT-19
10710JUMP2     TD    OUTPUT-16,ARG
10720          TD    OUTPUT-18,ARG-1
10730          CF    OUTPUT-18
10740          TF    OUTPUT-12,SIGN
10750          CF    OUTPUT-13
```

```
05284 14 05254 05751
05296 47 05248 01100
05308 43 05328 05733
05320 49 05640 00000
05328
05328 15 05751 00000
05340 26 05731 05775
05352 42 00000 00000
05354
05354 14 04863 00004
05366 47 05434 01100
05378 16 05259 04854
05390 16 05254 05743
05402 22 05254 04863
05414 22 05254 04863
05426 49 05248 00000
05434
05434 26 05734 05756
05446 44 05494 04863
05458 16 05731 00020
05470 33 04863 00000
05482 33 05732 00000
05494 25 05735 04863
05506 25 05733 04862
05518 33 05733 00000
05530 26 05739 05775
05542 33 05738 00000
```

```
10760          TFM   WR+11,ARG-9
10770          TFM   WR+6,OUTPUT-8
10780WR        TD    99999,99999
10790          AM    WR+11,1,10
10800          AM    WR+6,2,10
10810          CM    WR+6,OUTPUT
10820          BNH   WR
10830          BB
10840          DORG  *-9
10850SETSIG    TFM   SETS+11,OUTPUT-16
10860SETS      BD    SET,OUTPUT-16
10870          AM    SETS+11,2,10
10880          B     SETS
10890          DORG  *-3
10900SET       TF    *+30,SETS+11
10910          SM    *+18,2,10
10920          TF    99999,SIGN
10930          BB
10940          DORG  *-9
10950          DAS   14
10960OUTPUT    DS    2
10970          DAC   1,Ō
10980SEVENS    DC    10,7070707070
10990DCMAL     DC    10,0000000003
11000SIGN      DS    2
11010EXPNT2    DS    2
```

```
05554 16 05589 Ō4854
05566 16 05584 Ō5743
05578 25 99999 99999
05590 11 05589 000Ō1
05602 11 05584 000Ō2
05614 14 05584 Ō5751
05626 47 05578 01100
05638 42 00000 00000
05640
05640 16 05663 Ō5735
05652 43 05684 05735
05664 11 05663 000Ō2
05676 49 05652 00000
05684
05684 26 05714 05663
05696 12 05714 000Ō2
05708 26 99999 05775
05720 42 00000 00000
05722
05723 00014
05751 00002
05753 00001
05763 00010
05773 00010
05775 00002
05777 00002
```



```
11020*     *    *    *    *    *    *    *    *
11030*      SUBROUTINE TO FORM SUMS OF DATA.    *
11040*     *    *    *    *    *    *    *    *
11050          DS    2
11060SUMS      TF    CNT,N
11070          TF    SUMS1+28,DATA1
11080          TF    SUMS3+23,SUM1
11090SUMS1     TFLS  TEMP1,99999
11092          BD    *+20,CON6
11094          B     SUMS3
11096          DORG  *-3
11100SUMS2     FM    TEMP1,99999
11102SUMS3     FA    99999,TEMP1
11104          AM    SUMS1+28,10,10
11110          AM    SUMS3+23,10,10
11120          SM    CNT,1,10
11130          BP    SUMS1
11131          BD    *+14,CON6
11132          BB
11133          DORG  *-9
11135SUMS25    FA    SUMWT,99999
11140          BB
```

```
05779 00002
05780 26 04742 00426
05792 26 05844 00516
05804 26 05919 00541
05816 16 06741 Ō5839
05828 49 06690 00000
05835 00005    ŌŌ630
05840 00005    99999
05846 43 05866 00446
05858 49 05896 00000
05866
05866 16 06741 Ō5889
05878 49 06490 00000
05885 00005    ŌŌ630
05890 00005    99999
05896 16 06741 Ō5919
05908 49 06470 00000
05915 00005    99999
05920 00005    ŌŌ630
05926 11 05844 000T0
05938 11 05919 000T0
05950 12 04742 000Ō1
05962 46 05816 01100
05974 43 05988 00446
05986 42 00000 00000
05988
05988 16 06741 Ō6011
06000 49 06470 00000
06007 00005    ŌŌ891
06012 00005    99999
06018 42 00000 00000
```

```
11150          DORG *-9
                                                          06020
11160*   *    *    *    *    *    *    *    *    *    *
11170*   SUBROUTINE TO FORM SUMS OF PRODUCTS.              *
11180*   *    *    *    *    *    *    *    *    *    *
11190          DS    2
11200PROD      TF    PROD2+28,DATA1                       06021 00002
11210          TF    PROD4+28,WT                          06022 26 06110 00516
11220          TF    PROD8+23,R                           06034 26 06184 00556
11240          TF    WCNT,N                               06046 26 06317 00551
11250PROD1     TF    RCNT,WCNT                            06058 26 06444 00426
11260PROD2     TFLS  WORK,99999                           06070 26 06447 06444
                                                          06082 16 06741 06105
                                                          06094 49 06690 00000
                                                          06101 00005    04752
                                                          06106 00005    99999
11270PROD3     C     WORK,ZERO
11280          BE    PROD11                               06112 24 04752 00861
11290          BD    PROD4,CON6                           06124 46 06422 01200
11300          B     PROD5                                06136 43 06156 00446
11310          DORG *-3                                   06148 49 06186 00000
11320PROD4     FM    WORK,99999                           06156
                                                          06156 16 06741 06179
                                                          06168 49 06490 00000
                                                          06175 00005    04752
                                                          06180 00005    99999
11330PROD5     TF    PROD6+6,PROD2+28
11340          TF    PROD7+28,PROD2+28                    06186 26 06216 06110
11350PROD6     C     99999,ZERO                           06198 26 06262 06110
11360          BE    MOD1                                 06210 24 99999 00861
11370PROD7     TFLS  TEMP1,99999                          06222 46 06324 01200
                                                          06234 16 06741 06257
                                                          06246 49 06690 00000
                                                          06253 00005    00630
                                                          06258 00005    99999
11380          FM    TEMP1,WORK
                                                          06264 16 06741 06287
                                                          06276 49 06490 00000
                                                          06283 00005    00630
                                                          06288 00005    04752
```



```
11390PROD8     FA    99999,TEMP1
                                                          06294 16 06741 06317
                                                          06306 49 06470 00000
                                                          06313 00005    99999
                                                          06318 00005    00630
11400MOD1      AM    PROD6+6,10,10                        06324 11 06216 00010
11410          AM    PROD7+28,10,10                       06336 11 06262 00010
11420          AM    PROD8+23,10,10                       06348 11 06317 00010
11430          SM    RCNT,1,10                            06360 12 06447 00001
11440          BP    PROD6                                06372 46 06210 01100
11450MOD2      AM    PROD2+28,10,10                       06384 11 06110 00010
11460          SM    WCNT,1,10                            06396 12 06444 00001
11470          BP    PROD1                                06408 46 06070 01100
11490          BB                                         06420 42 00000 00000
11500          DORG *-9                                   06422
11540PROD11    A     PROD8+22,WCNT                        06422 21 06316 06444
11550          B     MOD2                                 06434 49 06384 00000
11560          DORG *-3                                   06442
11570WCNT      DS    3                                    06444 00003
11580RCNT      DS    3                                    06447 00003
11605          DAC   1,0                                  06449 00001
11600          DEND  START2                               02144
```

LOAD SUBROUTINES

```
06450 16 07144 07790
06462 49 06730 0
06470 16 07144 07834
06482 49 06730 0
06490 16 07144 08334
06502 49 06730 0
06510 16 07144 08574
06522 49 06730 0
06530 16 07144 08910
06542 49 06834 0
06550 16 07144 09490
06562 49 06834 0
06570 16 07144 09522
06582 49 06834 0
06590 16 07144 10334
06602 49 06834 0
06610 16 07144 11324
06622 49 06834 0
06630 16 07144 11344
06642 49 06834 0
06650 16 07144 12064
06662 49 06834 0
06670 16 07144 12084
06682 49 06834 0
06690 16 07144 12906
06702 49 06834 0
06710 16 07144 12938
06722 49 06834 0
```

END OF PASS1 1

00402	CONT	00407	DATE	00409	PROB	00414	NOBS	00417	NFORM
00420	INVAR	00423	NOVAR	00426	N	00429	NDEP	00432	*NOTRAN
00435	NOCON	00437	NCOL	00440	NELIM	00441	CON1	00442	CON2
00443	CON3	00444	CON4	00445	CON5	00446	CON6	00447	CON7
00448	CON8	00449	CON9	00450	CON10	00451	CON11	00452	CON12
00453	CON13	00454	CON14	00455	CON15	00456	CON16	00457	CON17
00458	CON18	00481	OBSER	00486	IND	00491	ID	00496	IDD
00501	*FORMAT	00506	INDEX	00511	CONST	00516	DATA1	00521	DATA2
00526	B	00531	SE	00536	T	00541	SUM1	00546	SIGMA
00551	R	00556	WT	00561	ADKK	00566	ADRNN	00571	ADIJ
00576	ADRIJ	00581	SIGN3	00586	COUNT	00589	CNTR	00592	CTR
00595	I	00598	J	00601	K	00604	L	00607	P
00610	Q	00614	MSZ	00617	IVE	00620	IVP	00630	TEMP1
00640	TEMP2	00650	A0	00660	EY	00670	RSQR	00680	SQR
00690	DF	00700	F	00710	FIN	00720	FOUT	00730	HIGH
00740	VP	00750	VE	00830	OUT	00841	FP001	00851	FHIGH
00861	ZERO	00871	ZEROS	00881	ONE	00891	SUMWT	00894	WCTR
00900	RFS	00936	FRMT	00980	READN	01016	LOOP1	01064	CMCOL
01244	RET	01256	D1	01280	D2	01300	PER	01324	D4
01348	D5	01368	MIN	01388	CHG	01516	SETFL	01528	MOVE
01636	BRNCH	01680	DIGIT	01704	EX	01800	TRSMT	01890	STEP1
01910	OVR2	01912	ZEROX	01939	SPEC	01944	ADDR	01958	INPUT
01968	COIN	01973	EXPNT	01974	SIGN2	01978	PNUM	01981	MCNT
01983	ALPHA	02144	*START2	02210	LOOP5	02222	LOOP4	02301	TRIG1
02302	CHNO	02394	PASS	02426	FORMS	02532	CPS	02576	FORMM
02608	SUBM	02644	SUBM1	02722	*FORPRO	02808	CMSM	02864	PSP
02888	END2	02914	WORDS	02916	PRINT	02928	*PRINT1	03018	RET1
03032	PNCH	03068	PNCH1	03120	MEANS	03144	DIVS	03214	TFS
03250	MV	03340	TRNF	03436	TRF	03550	BRCH	03558	*RETURN
03594	TRNF1	03632	*CHSIGN	03664	OVR1	03684	SCALE	03720	FADD
03758	MAGN	03794	FMUL	03832	SUM	03868	FADD1	03906	SUB

```
03942  FSUB     03980  MPY      04016  FMUL1    04054  DVDE     04090  FDIV
04128  RCPR     04226  POWER    04292  AA       04360  LN       04398  LOG
04436  EXN      04474  EXT      04512  SIN      04550  COS      04588 *ARCTAN
04626  SQRT     04664  DUMMY    04672  HVE      04742  CNT      04752  WORK
04757  TRCON    04864 *FLTFIX    04863  ARG      04972  JUMP     05092  TRNMT
05236  WRITE    05308 *WRALPH    05328 *SETZRO    05354 *DECIML    05434  LARGE
05494  JUMP2    05578  WR       05640 *SETSIG    05652  SETS     05684  SET
05751 *OUTPUT   05763 *SEVENS    05773  DCMAL    05775  SIGN     05777 *EXPNT2
05780  SUMS     05816  SUMS1    05866  SUMS2    05896  SUMS3    05988 *SUMS25
06022  PROD     06070  PROD1    06082  PROD2    06112  PROD3    06156  PROD4
06186  PROD5    06210  PROD6    06234  PROD7    06294  PROD8    06324  MOD1
06384  MOD2     06422 *PROD11    06444  WCNT     06447  RCNT
```

```
11610*  PROGRAM 80-3, FORM MEANS, STANDARD DEVIATIONS AND CORRELATION
11620*  MATRIX,  FEB 14, 1963.
11630         DORG 402
11640CONT     DSS  80                          00402
11650DATE     DS   6,CONT+5                    00402 00080
11660PROB     DS   2,CONT+7                    00407 00006
11670NOBS     DS   5,CONT+12                   00409 00002
11680NFORM    DS   3,CONT+15                   00414 00005
11690INVAR    DS   3,CONT+18                   00417 00003
11700NOVAR    DS   3,CONT+21                   00420 00003
11710N        DS   3,CONT+24                   00423 00003
11720NDEP     DS   3,CONT+27                   00426 00003
11730NOTRAN   DS   3,CONT+30                   00429 00003
11740NOCON    DS   3,CONT+33                   00432 00003
11750NCOL     DS   2,CONT+35                   00435 00003
11760NELIM    DS   3,CONT+38                   00437 00002
11770CON1     DS   1,CONT+39                   00440 00003
11780CON2     DS   1,CONT+40                   00441 00001
11790CON3     DS   1,CONT+41                   00442 00001
11800CON4     DS   1,CONT+42                   00443 00001
11810CON5     DS   1,CONT+43                   00444 00001
11820CON6     DS   1,CONT+44                   00445 00001
11830CON7     DS   1,CONT+45                   00446 00001
11840CON8     DS   1,CONT+46                   00447 00001
11850CON9     DS   1,CONT+47                   00448 00001
11860CON10    DS   1,CONT+48                   00449 00001
11870CON11    DS   1,CONT+49                   00450 00001
11880CON12    DS   1,CONT+50                   00451 00001
                                               00452 00001
```

```
11890CON13   DS    1,CONT+51          00453 00001
11900CON14   DS    1,CONT+52          00454 00001
11910CON15   DS    1,CONT+53          00455 00001
11920CON16   DS    1,CONT+54          00456 00001
11930CON17   DS    1,CONT+55          00457 00001
11940CON18   DS    1,CONT+56          00458 00001
11950OBSER   DS    10,CONT+79         00481 00010
11960IND     DS    5                  00486 00005
11970ID      DS    5                  00491 00005
11980IDD     DS    5                  00496 00005
11990FORMAT  DS    5                  00501 00005
12000INDEX   DS    5                  00506 00005
12010CONST   DS    5                  00511 00005
12020DATA1   DS    5                  00516 00005
12030DATA2   DS    5                  00521 00005
12040B       DS    5                  00526 00005
12050SE      DS    5                  00531 00005
12060T       DS    5                  00536 00005
12070SUM1    DS    5                  00541 00005
12080SIGMA   DS    5                  00546 00005
12090R       DS    5                  00551 00005
12100WT      DS    5                  00556 00005
12110ADKK    DS    5                  00561 00005
12120ADRNN   DS    5                  00566 00005
12130ADIJ    DS    5                  00571 00005
12140ADRIJ   DS    5                  00576 00005
12150SIGN3   DS    5                  00581 00005
```



```
12160COUNT   DS    5                  00586 00005
12170CNTR    DS    3                  00589 00003
12180CTR     DS    3                  00592 00003
12190I       DS    3                  00595 00003
12200J       DS    3                  00598 00003
12210K       DS    3                  00601 00003
12220L       DS    3                  00604 00003
12230P       DS    3                  00607 00003
12240Q       DS    3                  00610 00003
12250NSZ     DS    4                  00614 00004
12260IVE     DS    3                  00617 00003
12270IVP     DS    3                  00620 00003
12280TEMP1   DS    10                 00630 00010
12290TEMP2   DS    10                 00640 00010
12300AO      DS    10                 00650 00010
12310EY      DS    10                 00660 00010
12320RSQR    DS    10                 00670 00010
12330SQR     DS    10                 00680 00010
12340DF      DS    10                 00690 00010
12350F       DS    10                 00700 00010
12360FIN     DS    10                 00710 00010
12370FOUT    DS    10                 00720 00010
12380HIGH    DS    10                 00730 00010
12390VP      DS    10                 00740 00010
12400VE      DS    10                 00750 00010
12410OUT     DS    80                 00830 00080
12420        DC    1,@                00831 00001
```

```
12430          DC    8,10000000                    00839 00008
12440FPOOI     DC    2,-2                          00841 00002
12450          DC    8,10000000                    00849 00008
12460FHIGH     DC    2,50                          00851 00002
12470          DC    8,0                           00859 00008
12480ZERO      DC    2,-99                         00861 00002
12490ZEROS     DC    10,0                          00871 00010
12500          DC    8,10000000                    00879 00008
12510ONE       DC    2,1                           00881 00002
12515SUMWT     DS    10                            00891 00010
12520NCNT      DS    3                             00894 00003
12530PNUM      DS    4                             00898 00004
12535ESSZER    DC    2,-7                          00900 00002
12540*
12550*  IS IT ONE PASS INPUT.
12560*
12570START3    BD    LSD,CON5                      00902 43 01214 00445
12580*
12590*  IS IT FORCED THROUGH THE ORIGIN.
12600*
12610          BD    LSD-12,CON7                   00914 43 01202 00447
12620*
12630*  FORM LARGE VARIANCE-COVARIANCE MATRIX.
12640*
12650LV        TF    LV3+23,R                      00926 26 01099 00551
12660          TF    LV1+28,SUM1                   00938 26 01014 00541
12670          TF    LV2+28,SUM1                   00950 26 01044 00541
12680          TF    LVCT2,N                       00962 26 01340 00426
12690LV4       TF    LVCT1,LVCT2                   00974 26 01337 01340
12700LV1       TFLS  TEMP1,99999                   00986 16 02491 01009
                                                   00998 49 02460 00000
                                                   01005 00005    00630
                                                   01010 00005    99999
```



```
12710LV2       FM    TEMP1,99999                   01016 16 02491 01039
                                                   01028 49 02400 00000
                                                   01035 00005    00630
                                                   01040 00005    99999
12720          FD    TEMP1,OBSER                   01046 16 02491 01069
                                                   01058 49 02420 00000
                                                   01065 00005    00630
                                                   01070 00005    00481
12730LV3       FS    99999,TEMP1                   01076 16 02491 01099
                                                   01088 49 02380 00000
                                                   01095 00005    99999
                                                   01100 00005    00630
12740          AM    LV2+28,10,10                  01106 11 01044 00010
12750          AM    LV3+23,10,10                  01118 11 01099 00010
12760          SM    LVCT1,1,10                    01130 12 01337 00001
12770          BP    LV1                           01142 46 00986 01100
12780          AM    LV1+28,10,10                  01154 11 01014 00010
12790          TF    LV2+28,LV1+28                 01166 26 01044 01014
12800          SM    LVCT2,1,10                    01178 12 01340 00001
12810          BP    LV4                           01190 46 00974 01100
12820*
12830*  FORM MEANS.
12840*
12850          BTM   MEANS,0,10                    01202 17 02032 00000
12860*
12870*  FORM LARGE STANDARD DEVIATIONS.
12880*
12890LSD       TF    LVCT1,N                       01214 26 01337 00426
12900          TF    LSD1+6,R                      01226 26 01280 00551
12910          TF    LSD2+23,SIGMA                 01238 26 01321 00546
12920          TF    LSD3+28,R                     01250 26 01370 00551
12930          TF    LSD3+23,SIGMA                 01262 26 01365 00546
12940LSD1      C     99999,ESSZER                  01274 24 99999 00900
12950          BNN   LSD3                          01286 46 01342 01300
```

```
12960LSD2    TFLS 99999,ONE
12970        B    LSD4
12980        DORG *-4
12990LVCT1   DS   3
13000LVCT2   DS   3
13010LSD3    FSQR 99999,99999
13020LSD4    A    LSD1+5,LVCT1
13030        A    LSD3+27,LVCT1
13040        AM   LSD2+23,10,10
13050        AM   LSD3+23,10,10
13060        SM   LVCT1,1,10
13070        BP   LSD1
13080*
13090*  FORM CORRELATION MATRIX
13100*
13110COR     TF   COR1+23,R
13120        TF   COR2+23,R
13130        TF   COR1+28,SIGMA
13140        TF   COR2+28,SIGMA
13150        TF   LVCT1,N
13160        TF   LVCT2,LVCT1
13170COR1    FD   99999,99999
13180COR2    FD   99999,99999
```

```
01298 16 02491 01321
01310 49 02460 00000
01317 00005    99999
01322 00005    00881
01328 49 01372 00000
01335
01337 00003
01340 00003
01342 16 02491 01365
01354 49 02440 00000
01361 00005    99999
01366 00005    99999
01372 21 01279 01337
01384 21 01369 01337
01396 11 01321 000T0
01408 11 01365 000T0
01420 12 01337 0000I
01432 46 01274 01100
01444 26 01539 00551
01456 26 01569 00551
01468 26 01544 00546
01480 26 01574 00546
01492 26 01337 00426
01504 26 01340 01337
01516 16 02491 01539
01528 49 02420 00000
01535 00005    99999
01540 00005    99999
01546 16 02491 01569
01558 49 02420 00000
01565 00005    99999
01570 00005    99999
```



```
13190        AM   COR2+28,10,10
13200        AM   COR1+23,10,10
13210        AM   COR2+23,10,10
13220        SM   LVCT2,1,10
13230        BP   COR1
13240        AM   COR1+28,10,10
13250        TF   COR2+28,COR1+28
13260        SM   LVCT1,1,10
13270        BP   COR1-12
13280*
13290*  SET R(I,I) = ONE.
13300*
13310        TF   LVCT1,N
13320        TF   SET1+23,R
13330SET1    TFLS 99999,ONE
13340        A    SET1+22,LVCT1
13350        SM   LVCT1,1,10
13360        BP   SET1
13370*
13380*  FORM STANDARD DEVIATIONS.
13390*
13400SD      TF   LVCT1,N
13410        TF   SD1+23,SIGMA
13420        FSQR TEMP1,OBSER
13430SD1     FD   99999,TEMP1
13440        AM   SD1+23,10,10
```

```
01576 11 01574 000T0
01588 11 01539 000T0
01600 11 01569 000T0
01612 12 01340 0000I
01624 46 01516 01100
01636 11 01544 000T0
01648 26 01574 01544
01660 12 01337 0000I
01672 46 01504 01100
01684 26 01337 00426
01696 26 01731 00551
01708 16 02491 01731
01720 49 02460 00000
01727 00005    99999
01732 00005    00881
01738 21 01730 01337
01750 12 01337 0000I
01762 46 01708 01100
01774 26 01337 00426
01786 26 01851 00546
01798 16 02491 01821
01810 49 02440 00000
01817 00005    00630
01822 00005    00481
01828 16 02491 01851
01840 49 02420 00000
01847 00005    99999
01852 00005    00630
01858 11 01851 000T0
```

```
13450          SM    LVCT1,1,10
13460          BP    SD1
13470          B     CMP10
13480          DORG  *-3
13600*
13610*  ARE MEANS, SD, AND CORMAT PUNCHED.
13620*
13630CMP10     BD    *+20,CON10
13640          B     END3
13650          DORG  *-3
13660          TF    PNUM,N
13670          BT    PNCH,SUM1
13680          TF    PNUM,N
13690          BT    PNCH,SIGMA
13700          TF    PNUM,NSZ
13710          BT    PNCH,R
13720END3      BT    CONV,NOBS
13725          RNCD  0
13730          B     0
13740*    *    *    *    *    *    *
13750*  SUBROUTINE TO FORM MEANS.    *
13760*    *    *    *    *    *    *
13770          DS    2
13780MEANS     TF    MCNT,N
13790          TF    DIVS+23,SUM1
13800DIVS      FD    99999,OBSER
13810          AM    DIVS+23,10,10
13820          SM    MCNT,1,10
13830          BP    DIVS
```

```
01870 12 01337 00001
01882 46 01828 01100
01894 49 01902 00000
01902

01902 43 01922 00450
01914 49 01994 00000
01922
01922 26 00898 00426
01934 27 02130 00541
01946 26 00898 00426
01958 27 02130 00546
01970 26 00898 00614
01982 27 02130 00551
01994 27 02222 00414
02006 36 00000 00500
02018 49 00000 00000

02031 00002
02032 26 00894 00426
02044 26 02079 00541
02056 16 02491 02079
02068 49 02420 00000
02075 00005    99999
02080 00005    00481
02086 11 02079 00010
02098 12 00894 00001
02110 46 02056 01100
```

```
13840          BD
13850          DORG  *-9
13860*    *    *    *    *    *
13870*  PUNCH SUBROUTINE.       *
13880*    *    *    *    *    *
13890          DS    5
13900PNCH      WNCD  402
13910          TF    PNCH1+6,PNCH-1
13920          SM    PNCH1+6,9,10
13930PNCH1     WNCD  99999
13940          AM    PNCH1+6,80,10
13950          SM    PNUM,8,10
13960          BP    PNCH1
13970          BB
13980          DORG  *-9
13990*    *    *    *    *    *    *
14000*  SUBROUTINE TO FLOAT NOBS.
14010*
14020          DS    5
14030CONV      TFM   EXP3,5,10
14040          TFM   TESTD+11,CONV-5
14050          TFM   MVWRD+6,OBSER-5
14060          TF    OBSER,ZEROS
14070TESTD     BD    SETM,99999
14080          AM    TESTD+11,1,10
14090          SM    EXP3,1,10
14100          SM    MVWRD+6,1,10
14110          B     TESTD
14120          DORG  *-3
14130SETM      TF    *+18,TESTD+11
```



```
02122 42 00000 00000
02124

02128 00005
02130 38 00402 00400
02142 26 02172 02129
02154 12 02172 00009
02166 38 99999 00400
02178 11 02172 00080
02190 12 00898 00008
02202 46 02166 01100
02214 42 00000 00000
02216
      *
      *

02220 00005
02222 16 02377 00005
02234 16 02281 02217
02246 16 02356 00476
02258 26 00481 00871
02270 43 02326 99999
02282 11 02281 00001
02294 12 02377 00001
02306 12 02356 00001
02318 49 02270 00000
02326
02326 26 02344 02281
```

```
14140          SF    99999
14150NVWRD     TF    99999,CONV-1
14060          TF    OBSER,EXP3
14070          BB
14080          DORG  *-9
14085EXP3      DS    2
14090          DAC   1,0
14100          DEND  START3
LOAD SUBROUTINES
```

```
02338 32 99999 00000
02350 26 99999 02221
02362 26 00481 02377
02374 42 00000 00000
02376
02377 00002
02379 00001
00902
02380 16 02894 03352
02392 49 02480 0
02400 16 02894 03896
02412 49 02480 0
02420 16 02894 04136
02432 49 02480 0
02440 16 02894 04472
02452 49 02584 0
02460 16 02894 05052
02472 49 02584 0
```

```
END OF PASSII
00402 CONT    00407 DATE    00409 PROB    00414 NOBS    00417 NE
00420 INVAR   00423 NOVAR   00426 N       00429 NDEP    00432 *NOT
00435 NOCON   00437 NCOL    00440 NELIM   00441 CON1    00442 CO
00443 CON3    00444 CON4    00445 CON5    00446 CON6    00447 CO
00448 CON8    00449 CON9    00450 CON10   00451 CON11   00452 CO
00453 CON13   00454 CON14   00455 CON15   00456 CON16   00457 CO
00458 CON18   00481 OBSER   00486 IND     00491 ID      00496 ID
00501 *FORMAT 00506 INDEX   00511 CONST   00516 DATA1   00521 DA
00526 B       00531 SE      00536 T       00541 SUM1    00546 SI
00551 R       00556 WT      00561 ADKK    00566 ADRNN   00571 AD
00576 ADRIJ   00581 SIGN3   00586 COUNT   00589 CNTR    00592 CT
00595 I       00598 J       00601 K       00604 L       00607 P
00610 Q       00614 HSZ     00617 IVE     00620 IVP     00630 TE
00640 TEMP2   00650 A0      00660 EY      00670 RSCR    00680 SC
00690 DF      00700 F       00710 FIN     00720 FOUT    00730 HI
00740 VP      00750 VE      00830 OUT     00841 FP001   00851 FH
00861 ZERO    00871 ZEROS   00881 ONE     00891 SUMWT   00894 MC
00898 PNUM    00900 *ESSZER 00902 *START3 00926 LV      00974 LV
00986 LV1     01016 LV2     01076 LV3     01214 LSD     01274 LS
01298 LSD2    01337 LVCT1   01340 LVCT2   01342 LSD3    01372 LS
01444 COR     01516 COR1    01546 COR2    01708 SET1    01774 SD
01828 SD1     01902 CMP10   01994 END3    02032 MEANS   02056 DI
02130 PNCH    02166 PNCH1   02222 CONV    02270 TESTD   02326 SE
02350 NVWRD   02377 EXP3
```

14000* PROGRAM 80-4A, STEPWISE REGRESSION, MAY 7, 1963.

14010	DORG	402	00402	
14020CONT	DSS	80	00402	00080
14030DATE	DS	6,CONT+5	00407	00006
14040PROB	DS	2,CONT+7	00409	00002
14050NOBS	DS	5,CONT+12	00414	00005
14060NFORM	DS	3,CONT+15	00417	00003
14070INVAR	DS	3,CONT+18	00420	00003
14080NOVAR	DS	3,CONT+21	00423	00003
14090N	DS	3,CONT+24	00426	00003
14100NDEP	DS	3,CONT+27	00429	00003
14110NOTRAN	DS	3,CONT+30	00432	00003
14120NOCON	DS	3,CONT+33	00435	00003
14130NCOL	DS	2,CONT+35	00437	00002
14140NELIM	DS	3,CONT+38	00440	00003
14150CON1	DS	1,CONT+39	00441	00001
14160CON2	DS	1,CONT+40	00442	00001
14170CON3	DS	1,CONT+41	00443	00001
14180CON4	DS	1,CONT+42	00444	00001
14190CON5	DS	1,CONT+43	00445	00001
14200CON6	DS	1,CONT+44	00446	00001
14210CON7	DS	1,CONT+45	00447	00001
14220CON8	DS	1,CONT+46	00448	00001
14230CON9	DS	1,CONT+47	00449	00001
14240CON10	DS	1,CONT+48	00450	00001
14250CON11	DS	1,CONT+49	00451	00001
14260CON12	DS	1,CONT+50	00452	00001

14270CON13	DS	1,CONT+51	00453	00001
14280CON14	DS	1,CONT+52	00454	00001
14290CON15	DS	1,CONT+53	00455	00001
14300CON16	DS	1,CONT+54	00456	00001
14310CON17	DS	1,CONT+55	00457	00001
14320CON18	DS	1,CONT+56	00458	00001
14330OBSER	DS	10,CONT+79	00481	00010
14340IND	DS	5	00486	00005
14350ID	DS	5	00491	00005
14360IDD	DS	5	00496	00005
14370FORMAT	DS	5	00501	00005
14380INDEX	DS	5	00506	00005
14390CONST	DS	5	00511	00005
14400DATA1	DS	5	00516	00005
14410DATA2	DS	5	00521	00005
14420B	DS	5	00526	00005
14430SE	DS	5	00531	00005
14440T	DS	5	00536	00005
14450SUM1	DS	5	00541	00005
14460SIGMA	DS	5	00546	00005
14470R	DS	5	00551	00005
14480WT	DS	5	00556	00005
14490ADKK	DS	5	00561	00005
14500ADRNN	DS	5	00566	00005
14510ADIJ	DS	5	00571	00005
14520ADRIJ	DS	5	00576	00005
14530SIGN3	DS	5	00581	00005

```
14540COUNT  DS   5                    00586 00005
14550CNTR   DS   3                    00589 00003
14560CTR    DS   3                    00592 00003
14570I      DS   3                    00595 00003
14580J      DS   3                    00598 00003
14590K      DS   3                    00601 00003
14600L      DS   3                    00604 00003
14610P      DS   3                    00607 00003
14620Q      DS   3                    00610 00003
14630NSZ    DS   4                    00614 00004
14640IVE    DS   3                    00617 00003
14650IVP    DS   3                    00620 00003
14660TEMP1  DS   10                   00630 00010
14670TEMP2  DS   10                   00640 00010
14680A0     DS   10                   00650 00010
14690EY     DS   10                   00660 00010
14700RSQR   DS   10                   00670 00010
14710SQR    DS   10                   00680 00010
14720DF     DS   10                   00690 00010
14730F      DS   10                   00700 00010
14740FIN    DS   10                   00710 00010
14750FOUT   DS   10                   00720 00010
14760HIGH   DS   10                   00730 00010
14770VP     DS   10                   00740 00010
14780VE     DS   10                   00750 00010
14790OUT    DS   80                   00830 00080
14800       DC   1,0                  00831 00001
```



```
14810       DC   8,10000000           00839 00008
14820FP001  DC   2,-2                 00841 00002
14830       DC   8,10000000           00849 00008
14840FHIGH  DC   2,50                 00851 00002
14850       DC   8,0                  00859 00008
14860ZERO   DC   2,-99                00861 00002
14870ZEROS  DC   10,0                 00871 00010
14880       DC   8,10000000           00879 00008
14890ONE    DC   2,1                  00881 00002
14900PNUM   DS   4                    00885 00004
14910NCNT   DS   3                    00888 00003
14920NOIN   DS   3                    00891 00003
14930RCNT   DS   3                    00894 00003
14940CNTR1  DS   3                    00897 00003
14950*  INITIALIZE DEGREES OF FREEDOM.
14960*
14970START4 TFLS DF,OBSER             00898 16 10647 00921
                                      00910 49 10596 00000
                                      00917 00005    00690
                                      00922 00005    00481
14980*
14990*  IS IT FORCED THROUGH THE ORIGIN.
15000*
15010       BD   DF1,CON7             00928 43 00970 00447
15020       FS   DF,ONE               00940 16 10647 00963
                                      00952 49 10496 00000
                                      00959 00005    00690
                                      00964 00005    00881
15030*
15040*  INITIALIZE SEQUENCE NUMBER AND STEP NUMBER.
15050*
15060DF1    TFM  PST2+11,0,9          00970 16 09171 00000
15070       TFM  PST2+23,1,8          00982 16 09183 00001
15080*
```

```
15090*      DETERMINE INDEX OF DEPENDENT VARIABLE.                00994 26 00586 00426
15100*
15110STW    TF    COUNT,N                                         01006 26 01041 00486
15120       TF    STW1+11,IND                                     01018 16 00595 00001
15130       TFM   I,1,10                                          01030 45 01062 99999
15140STW1   BNR   *+32,99999                                      01042 26 00604 00595
15150       TF    L,I                                             01054 49 01112 00000
15160       B     STW2                                            01062
15170       DORG  *-3                                             01062 11 01041 00001
15180       AM    STW1+11,1,10                                    01074 11 00595 00001
15190       AM    I,1,10                                          01086 12 00586 00001
15200       SM    COUNT,1,10                                      01098 46 01030 01100
15210       BP    STW1                                            01110 48 00000 00000
15220       H     ,,,ERROR HALT. NO DEPENDENT VARIABLE.           01112
15230       DORG  *-9
15240*
15250*   CALCULATE ADDRESS OF R(L,L), ADRNN.
15260*
15270STW2   TF    P,L                                             01112 26 00607 00604
15280       TF    Q,L                                             01124 26 00610 00604
15290       BTM   CADIJ,0,10                                      01136 17 04948 00000
15300       TF    ADRNN,ADIJ                                      01148 26 00566 00571
15310*
15320*  SELECT VARIABLE TO ADD OR DELETE.
15330*
15340STW22  BNC4  STW23                                           01160 47 01318 00400
15345       TF    COUNT,N                                         01172 26 00586 00426
15350       TF    *+18,IND                                        01184 26 01202 00486
15360STW24  WNCD  99999                                           01196 38 99999 00400
15362       AM    STW24+6,80,10                                   01208 11 01202 00080
15364       SM    COUNT,80,10                                     01220 12 00586 00080
```



```
15366       BP    STW24                                           01232 46 01196 01100
15370       TF    PNUM,N                                          01244 26 00885 00426
15380       BT    PNCH,SUM1                                       01256 27 09442 00541
15390       TF    PNUM,N                                          01268 26 00885 00426
15400       BT    PNCH,SIGMA                                      01280 27 09442 00546
15410       TF    PNUM,MSZ                                        01292 26 00885 00614
15420       BT    PNCH,R                                          01304 27 09442 00551
15430       H                                                     01316 48 00000 00000
15440       DORG  *-9                                             01318
15450STW23  TF    COUNT,N                                         01318 26 00586 00426
15460       TFM   I,1,10                                          01330 16 00595 00001
15470       TFLS  VP,FHIGH                                        01342 16 10647 01365
                                                                  01354 49 10596 00000
                                                                  01361 00005 00740
                                                                  01366 00005 00851
15480       TFLS  VE,ZERO                                         01372 16 10647 01395
                                                                  01384 49 10596 00000
                                                                  01391 00005 00750
                                                                  01396 00005 00861
15490       TF    STW3+28,R                                       01402 26 01496 00551
15500       TF    STW7+28,R                                       01414 26 01738 00551
15510       TF    STW8+11,IND                                     01426 26 01763 00486
15520*
15530*  IS R(I,I) TOO SMALL.
15540STW21  TFLS  TEMP1,FP001                                     01438 16 10647 01461
                                                                  01450 49 10596 00000
                                                                  01457 00005 00630
                                                                  01462 00005 00841
15550STW3   FS    TEMP1,99999                                     01468 16 10647 01491
                                                                  01480 49 10496 00000
                                                                  01487 00005 00630
                                                                  01492 00005 99999
15560       BP    STMOD                                           01498 46 02000 01100
15570*
```

```
15580*  CALCULATE VARIANCE DECREASE OR INCREASE.
15590*
15600         C     I,L                                  01510 24 00595 00604
15610         BN    STW31                                01522 47 01520 01300
15620         BE    STMOD                                01534 46 02000 01200
15630         TF    P,L                                  01546 26 00607 00604
15640         TF    O,I                                  01558 26 00610 00595
15650         BTM   CADIJ,0,10                           01570 17 04948 00000
15660         B     STW4                                 01582 49 01626 00000
15670         DORG  *-3                                  01590
15680STW31    TF    P,I                                  01590 26 00607 00595
15690         TF    O,L                                  01602 26 00610 00604
15700         BTM   CADIJ,0,10                           01614 17 04948 00000
15710STW4     TF    STW5+28,ADIJ                         01626 26 01678 00571
15720         TF    STW6+28,ADIJ                         01638 26 01708 00571
15730STW5     TFLS  TEMP1,99999                          01650 16 10647 01673
                                                         01662 49 10596 00000
                                                         01669 00005    00630
                                                         01674 00005    99999
15740STW6     FM    TEMP1,99999                          01680 16 10647 01703
                                                         01692 49 10536 00000
                                                         01699 00005    00630
                                                         01704 00005    99999
15750STW7     FD    TEMP1,99999                          01710 16 10647 01733
                                                         01722 49 10556 00000
                                                         01729 00005    00630
                                                         01734 00005    99999
15760         CF    TEMP1-2                              01740 33 00628 00000
15770STW8     BD    NEG,99999                            01752 43 01886 99999
15780         TFLS  TEMP2,VE                             01764 16 10647 01787
                                                         01776 49 10596 00000
                                                         01783 00005    00640
                                                         01788 00005    00750
15790         FS    TEMP2,TEMP1                          01794 16 10647 01817
                                                         01806 49 10496 00000
                                                         01813 00005    00640
                                                         01818 00005    00630
15800         BNN   STMOD                                01824 46 02000 01300
15810         TFLS  VE,TEMP1                             01836 16 10647 01859
                                                         01848 49 10596 00000
                                                         01855 00005    00750
                                                         01860 00005    00630
15820         TF    IVE,I                                01866 26 00617 00595
15830         B     STMOD                                01878 49 02000 00000
15840         DORG  *-3                                  01886
15850NEG      TFLS  TEMP2,VP                             01886 16 10647 01909
                                                         01898 49 10596 00000
                                                         01905 00005    00640
                                                         01910 00005    00740
15860         FS    TEMP2,TEMP1                          01916 16 10647 01939
                                                         01928 49 10496 00000
                                                         01935 00005    00640
                                                         01940 00005    00630
15870         BNP   STMOD                                01946 47 02000 01100
15880         TFLS  VP,TEMP1                             01958 16 10647 01981
                                                         01970 49 10596 00000
                                                         01977 00005    00740
                                                         01982 00005    00630
15890         TF    IVP,I                                01988 26 00620 00595
15900STMOD    A     STW3+27,COUNT                        02000 21 01495 00586
15910         A     STW7+27,COUNT                        02012 21 01737 00586
15920         AM    STW8+11,1,10                         02024 11 01763 00001
15930         AM    1,1,10                               02036 11 00595 00001
15940         SM    COUNT,1,10                           02048 12 00586 00001
15950         BP    STW21                                02060 46 01438 01100
15960*
15970*  TEST FOR FINISH IF FIN = ZERO.
15980*
15990         C     FIN,ZERO                             02072 24 00710 00861
```

```
16000        BNE   CALCF
16010        C     VE,ZERO
16020        BE    FINISH
16030        TF    *+18,ADRNN
16040        C     99999,ZERO
16050        BE    FINISH
16060        TFLS  F,ZERO


16070        FS    DF,ONE


16080        B     ADDONE
16090        DORG  *-3
16100*
16110*  CALCULATE F VALUES.
16120*
16130CALCF   TFLS  F,VP


16140        TF    CAF1+28,ADRNN
16150        TF    CAF2+28,ADRNN
16160CAF1    FD    F,99999


16170        FM    F,DF


16180        TFLS  TEMP1,FOUT
```

```
02084 47 02224 01200

02096 24 00750 00861

02108 46 02828 01200

02120 26 02138 00566

02132 24 99999 00861

02144 46 02828 01200

02156 16 10647 0̄2179
02168 49 10596 00000
02175 00005    0̄0700
02180 00005    0̄0861

02186 16 10647 0̄2209
02198 49 10496 00000
02205 00005    0̄0690
02210 00005    0̄0881

02216 49 02662 00000

02224

02224 16 10647 0̄2247
02236 49 10596 00000
02243 00005    0̄0700
02248 00005    0̄0740

02254 26 02306 00566

02266 26 02468 00566

02278 16 10647 0̄2301
02290 49 10556 00000
02297 00005    0̄0700
02302 00005    99999

02308 16 10647 0̄2331
02320 49 10536 00000
02327 00005    0̄0700
02332 00005    0̄0690

02338 16 10647 0̄2361
02350 49 10596 00000
02357 00005    0̄0630
02362 00005    0̄0720
```

```
16190        FS    TEMP1,F


16200        BP    REMOVE
16210        FS    DF,ONE


16220CAF2    TFLS  TEMP1,99999


16230        FS    TEMP1,VE


16240        TFLS  F,VE


16250        FD    F,TEMP1


16260        FM    F,DF


16270        TFLS  TEMP1,FIN


16280        FS    TEMP1,F


16290        BNN   FINISH
16300ADDONE  TF    K,1VE
16310        TFM   RET3+6,CNP11
```



```
02368 16 10647 0̄2391
02380 49 10496 00000
02387 00005    0̄0630
02392 00005    0̄0700

02398 46 02694 01100

02410 16 10647 0̄2433
02422 49 10496 00000
02429 00005    0̄0690
02434 00005    0̄0881

02440 16 10647 0̄2463
02452 49 10596 00000
02459 00005    0̄0630
02464 00005    99999

02470 16 10647 0̄2493
02482 49 10496 00000
02489 00005    0̄0630
02494 00005    0̄0750

02500 16 10647 0̄2523
02512 49 10596 00000
02519 00005    0̄0700
02524 00005    0̄0750

02530 16 10647 0̄2553
02542 49 10556 00000
02549 00005    0̄0700
02554 00005    0̄0630

02560 16 10647 0̄2583
02572 49 10536 00000
02579 00005    0̄0700
02584 00005    0̄0690

02590 16 10647 0̄2613
02602 49 10596 00000
02609 00005    0̄0630
02614 00005    0̄0710

02620 16 10647 0̄2643
02632 49 10496 00000
02639 00005    0̄0630
02644 00005    0̄0700

02650 46 02828 01300

02662 26 00601 00617

02674 16 05246 0̄2756
```

```
16320          B     MT                                  02686 49 03478 00000
16330          DORG  *-3                                 02694
16340REMOVE    TF    K,IVP                               02694 26 00601 00620
16350          FA    DF,ONE                              02706 16 10647 02729
                                                         02718 49 10516 00000
                                                         02725 00005    00690
                                                         02730 00005    00881
16360          TFM   RET3+6,*+20                         02736 16 05246 02756
16370          B     MT                                  02748 49 03478 00000
16380          DORG  *-3                                 02756
16390*
16400*  ARE STEPS PUNCHED
16410*
16420CHP11     BD    *+20,CON11                          02756 43 02776 00451
16430          B     STW22                               02768 49 01160 00000
16440          DORG  *-3                                 02776
16450*
16460*  COMPUTE NOIN
16470*
16480          BTM   CNOIN,0,10                          02776 17 07598 00000
16490*
16500*  COMPUTE REGRESSION STATISTICS.
16510*
16520          TFM   RET5+6,*+20                         02788 16 07594 02808
16530          B     CREG                                02800 49 05296 00000
16540          DORG  *-3                                 02808
16550*
16560*  PUNCH REGRESSION STATISTICS.
16570*
16580          TFM   RET4+6,STW22                        02808 16 09154 01160
16590          B     PST                                 02820 49 08798 00000
16600          DORG  *-3                                 02828
16610*
16620*   WERE STEPS PUNCHED.
16630*
16640FINISHED  FIN1,CON11                                02828 43 02958 00451
```



```
16650*
16660*  COMPUTE REGRESSION STATISTICS AND PUNCH FINAL STEP.
16670*
16680          BTM   CNOIN,0,10                          02840 17 07598 00000
16690          C     FIN,ZERO                            02852 24 00710 00861
16700          BE    *+42                                02864 46 02906 01200
16710          FA    DF,ONE                              02876 16 10647 02899
                                                         02888 49 10516 00000
                                                         02895 00005    00690
                                                         02900 00005    00881
16720          TFM   PST2+11,998,9                       02906 16 09171 00998
16730          TFM   RET5+6,*+20                         02918 16 07594 02938
16740          B     CREG                                02930 49 05296 00000
16750          DORG  *-3                                 02938
16760          TFM   RET4+6,*+20                         02938 16 09154 02958
16770          B     PST                                 02950 49 08798 00000
16780          DORG  *-3                                 02958
16790*
16800*  ARE REGRESSION STATISTICS PRINTED.
16810*
16820FIN1      BD    CMEX,CON8,,IS PRINTING SUPPRESSED.  02958 43 02990 00448
16830          TFM   RET6+6,CMEX                         02970 16 08796 02990
16840          B     PREG                                02982 49 08052 00000
16850          DORG  *-3                                 02990
16860*
16870*  ARE REGRESSION STATISTICS WANTED FOR EXCLUDED INDEPENDENT
16880*    VARIABLES.
16890*
16900CMEX      BD    *+20,CON18                          02990 43 03010 00458
16910          B     CMTRA                               03002 49 03202 00000
16920          DORG  *-3                                 03010
16930          BTM   CNOIN,0,10                          03010 17 07598 00000
16940          TF    NCNT,N                              03022 26 00888 00426
```

```
16950          TFM   IVE,1,10
16960          TF    EX1+11,IND
16970EX1       BD    EXMOD,99999
16980          TF    L,IVE
16990          TFM   RET5+6,*+20
17000          B     CREGO
17010          DORG  *-3
17020          TFM   RET4+6,*+20
17030          B     PST
17040          DORG  *-3
17050          BD    EXMOD,CON8
17060          TFM   RET6+6,*+20
17070          B     PREG
17080          DORG  *-3
17090EXMOD     AM    IVE,1,10
17100          AM    EX1+11,1,10
17110          SM    ICNT,1,10
17120          BP    EX1
17130*
17140*       IS TRANSFORMED MATRIX PUNCHED.
17150*
17160CMTRA     BD    *+20,CON12
17170          B     CMRE
17180          DORG  *-3
17190          TF    PNUM,MSZ
17200          BT    PNCH,R
17210*
17220*   IS MATRIX REINVERTED.
17230*
17240CMRE      BD    *+20,CON13
```

```
03034 16 00617 00001
03046 26 03069 00486
03058 43 03154 99999
03070 26 00604 00617
03082 16 07594 03102
03094 49 05248 00000
03102
03102 16 09154 03122
03114 49 08798 00000
03122
03122 43 03154 00448
03134 16 08796 03154
03146 49 08052 00000
03154
03154 11 00617 00001
03166 11 03069 00001
03178 12 00888 00001
03190 46 03058 01100


03202 43 03222 00452
03214 49 03246 00000
03222
03222 26 00885 00614
03234 27 09442 00551


03246 43 03266 00453
```



```
17250          B     FINAL
17260          DORG  *-3
17270*
17280*  REINVERT MATRIX AND PUNCH.
17290*
17300          TF    COUNT,N
17310          TFM   K,1,10
17320          TF    RE1+11,IND
17330          TF    RE2+11,IND
17340RE1       BNR   *+20,99999
17350          B     REMOD
17360          DORG  *-3
17370RE2       BD    *+20,99999
17380          B     REMOD
17390          DORG  *-3
17400          TFM   RET3+6,*+20
17410          B     MT
17420          DORG  *-3
17430REMOD     AM    K,1,10
17440          AM    RE1+11,1,10
17450          AM    RE2+11,1,10
17460          SM    COUNT,1,10
17470          BP    RE1
17480          TF    PNUM,MSZ
17490          BT    PNCH,R
17500FINAL     RNCD  0
17510          B     0
17520          DORG  *-3
17530*   *   *   *   *   *   *   *   *
17540*  MATRIX TRANSFORMATION SUBROUTINE.   *
17550*   *   *   *   *   *   *   *   *
```

```
03258 49 03458 00000
03266

03266 26 00586 00426
03278 16 00601 00001
03290 26 03325 00486
03302 26 03345 00486
03314 45 03334 99999
03326 49 03374 00000
03334
03334 43 03354 99999
03346 49 03374 00000
03354
03354 16 05246 03374
03366 49 03478 00000
03374
03374 11 00601 00001
03386 11 03325 00001
03398 11 03345 00001
03410 12 00586 00001
03422 46 03314 01100
03434 26 00885 00614
03446 27 09442 00551
03458 36 00000 00500
03470 49 00000 00000
03478
```

```
17560*     TEST IF ADDING OR DELETING VARIABLE
17570*
17580IT    TF    IT1+11,IND          03478 26 03525 00486
17590      SM    IT1+11,1,10         03490 12 03525 00001
17600      A     IT1+11,K            03502 21 03525 00601
17610IT1   BD    DEL,99999           03514 43 03558 99999
17620      TFM   GTFM1+11,0          03526 16 03851 00000
17630      TDM   CA99+11,1           03538 15 05101 00001
17640      B     IT2                 03550 49 03582 00000
17650      DORG  *-3                 03558
17660DEL   TFM   GTFM1+11,5          03558 16 03851 00005
17670      TDM   CA99+11,0           03570 15 05101 00000
17680IT2   TF    P,K                 03582 26 00607 00601
17690      TF    O,K                 03594 26 00610 00601
17700CKK1  BTM   CADIJ,0,10          03606 17 04948 00000
17710      TF    CKK2+28,ADIJ        03618 26 03682 00571
17720      TF    CKK3+23,ADIJ        03630 26 03707 00571
17730      TF    CKK4+23,ADIJ        03642 26 03737 00571
17740*
17750*  COMPUTE INVERSE OF PIVOT ELEMENT.
17760*
17770CKK2  TFLS  TEMP1,99999         03654 16 10647 03677
                                    03666 49 10596 00000
                                    03673 00005    00630
                                    03678 00005    99999
17780CKK3  TFLS  99999,ONE           03684 16 10647 03707
                                    03696 49 10596 00000
                                    03703 00005    99999
                                    03708 00005    00881
17790CKK4  FD    99999,TEMP1         03714 16 10647 03737
                                    03726 49 10556 00000
                                    03733 00005    99999
                                    03738 00005    00630
```



```
17800      TF    GTFM7+28,ADIJ       03744 26 04132 00571
17810      TF    RTFM1+28,ADIJ       03756 26 04698 00571
17820      TF    RTFM1+23,ADIJ       03768 26 04693 00571
17830      TF    CTFM2+28,ADIJ       03780 26 04844 00571
17840      AM    RTFM1+23,10,10      03792 11 04693 00010
17850*
17860*  GENERAL MATRIX ELEMENT TRANSFORMATION.
17870*
17880GENTFM TFM  I,1,10              03804 16 00595 00001
17890      TFM   J,1,10              03816 16 00598 00001
17900      TF    ADRIJ,R             03828 26 00576 00551
17910GTFM1 TFM   SIGN3,0             03840 16 00581 00000
17920      C     K,I                 03852 24 00601 00595
17930      BE    NEXT                03864 46 04522 01200
17940      C     K,J                 03876 24 00601 00598
17950      BE    NEXT                03888 46 04522 01200
17960      BH    KGRJ                03900 46 04246 01100
17970      A     SIGN3,GTFM1+11      03912 21 00581 03851
17980      TF    P,K                 03924 26 00607 00601
17990      TF    O,J                 03936 26 00610 00598
18000GTFM2 BTM   CADIJ,0,10          03948 17 04948 00000
18010      TF    GTFM4+28,ADIJ       03960 26 04072 00571
18020      C     I,K                 03972 24 00595 00601
18030      BH    IGRK                03984 46 04378 01100
18040      TF    P,I                 03996 26 00607 00595
18050      TF    O,K                 04008 26 00610 00601
18060GTFM3 BTM   CADIJ,0,10          04020 17 04948 00000
18070      TF    GTFM41+28,ADIJ      04032 26 04102 00571
```

```
18080GTFM4  TFLS  TEMP1,99999
                                        04044 16 10647 04067
                                        04056 49 10596 00000
                                        04063 00005    00630
                                        04068 00005    99999
18090GTFM41 FM    TEMP1,99999
                                        04074 16 10647 04097
                                        04086 49 10536 00000
                                        04093 00005    00630
                                        04098 00005    99999
18100GTFM7  FM    TEMP1,99999
                                        04104 16 10647 04127
                                        04116 49 10536 00000
                                        04123 00005    00630
                                        04128 00005    99999
18110       BD    GTFM5,SIGN3
                                        04134 43 04196 00581
18120       TF    GTFM6+23,ADRIJ
                                        04146 26 04181 00576
18130GTFM6  FS    99999,TEMP1
                                        04158 16 10647 04181
                                        04170 49 10496 00000
                                        04177 00005    99999
                                        04182 00005    00630
18140       B     NEXT
                                        04188 49 04522 00000
18150       DORG  *-3
                                        04196
18160GTFM5  TF    GTFM8+23,ADRIJ
                                        04196 26 04231 00576
18170GTFM8  FA    99999,TEMP1
                                        04208 16 10647 04231
                                        04220 49 10516 00000
                                        04227 00005    99999
                                        04232 00005    00630
18180       B     NEXT
                                        04238 49 04522 00000
18190       DORG  *-3
                                        04246
18200*
18210*  K GREATER THAN J.
18220*
18230KGRJ   TF    P,J
                                        04246 26 00607 00598
18240       TF    0,K
                                        04258 26 00610 00601
18250       TF    KGRJ1+11,IND
                                        04270 26 04349 00486
18260       SM    KGRJ1+11,1,10
                                        04282 12 04349 00001
18270       A     KGRJ1+11,J
                                        04294 21 04349 00598
18280       TF    KGRJ11+11,KGRJ1+11
                                        04306 26 04329 04349
```



```
18290KGRJ11 BNR   KGRJ1,99999
                                        04318 45 04338 99999
18300       B     GTFM2
                                        04330 49 03948 00000
18310       DORG  *-3
                                        04338
18320KGRJ1  BD    KGRJ2,99999
                                        04338 43 04358 99999
18330       B     GTFM2
                                        04350 49 03948 00000
18340       DORG  *-3
                                        04358
18350KGRJ2  AM    SIGN3,5,10
                                        04358 11 00581 00005
18360       B     GTFM2
                                        04370 49 03948 00000
18370       DORG  *-3
                                        04378
18380*
18390*  I GREATER THAN K.
18400*
18410IGRK   TF    P,K
                                        04378 26 00607 00601
18420       A     SIGN3,GTFM1+11
                                        04390 21 00581 03851
18430       TF    0,I
                                        04402 26 00610 00595
18440       TF    IGRK1+11,IND
                                        04414 26 04493 00486
18450       SM    IGRK1+11,1,10
                                        04426 12 04493 00001
18460       A     IGRK1+11,I
                                        04438 21 04493 00595
18470       TF    IGRK11+11,IGRK1+11
                                        04450 26 04473 04493
18480IGRK11 BNR   IGRK1,99999
                                        04462 45 04482 99999
18490       B     GTFM3
                                        04474 49 04020 00000
18500       DORG  *-3
                                        04482
18510IGRK1  BD    IGRK2,99999
                                        04482 43 04502 99999
18520       B     GTFM3
                                        04494 49 04020 00000
18530       DORG  *-3
                                        04502
18540IGRK2  AM    SIGN3,5,10
                                        04502 11 00581 00005
18550       B     GTFM3
                                        04514 49 04020 00000
18560       DORG  *-3
                                        04522
```

```
18570*
18580*  SET UP NEXT TRANSFORMATION.
18590*
18600NEXT   AM   ADRIJ,10,10          04522 11 00576 00010
18610       C    N,J                  04534 24 00426 00598
18620       BE   N1                   04546 46 04578 01200
18630       AM   J,1,10               04558 11 00598 00001
18640       B    GTFM1                04570 49 03840 00000
18650       DORG *-3                  04578
18660N1     C    N,I                  04578 24 00426 00595
18670       BE   ROWTFM               04590 46 04634 01200
18680       AM   I,1,10               04602 11 00595 00001
18690       TF   J,I                  04614 26 00598 00595
18700       B    GTFM1                04626 49 03840 00000
18710       DORG *-3                  04634
18720*
18730*  PIVOT ROW TRANSFORMATION.
18740*
18750ROWTFM TF   J,K                  04634 26 00598 00601
18760       C    J,N                  04646 24 00598 00426
18770       BE   COLTFM               04658 46 04732 01200
18780RTFM1  FM   99999,99999          04670 16 10647 04693
                                      04682 49 10536 00000
                                      04689 00005    99999
                                      04694 00005    99999
18790       AM   J,1,10               04700 11 00598 00001
18800       AM   RTFM1+23,10,10       04712 11 04693 00010
18810       B    ROWTFM+12            04724 49 04646 00000
18820       DORG *-3                  04732
18830*
18840*  PIVOT COLUMN TRANSFORMATION
18850*
18860COLTFM TF   I,K                  04732 26 00595 00601
```



```
18870CTFM4  SM   I,1,10               04744 12 00595 00001
18880       BE   CA98                 04756 46 05054 01200
18890       TF   P,I                  04768 26 00607 00595
18900       TF   C,K                  04780 26 00610 00601
18910CTFM1  BTM  CADIJ,0,10           04792 17 04948 00000
18920       TF   CTFM2+23,ADIJ        04804 26 04839 00571
18930CTFM2  FM   99999,99999          04816 16 10647 04839
                                      04828 49 10536 00000
                                      04835 00005    99999
                                      04840 00005    99999
18940       TF   CTFM3+11,CTFM2+23    04846 26 04905 04839
18950       SM   CTFM3+11,2,10        04858 12 04905 00002
18960       TF   CTFM5+6,CTFM3+11     04870 26 04912 04905
18970       TF   CTFM6+6,CTFM3+11     04882 26 04932 04905
18980CTFM3  BNF  CTFM6,99999          04894 44 04926 99999
18990CTFM5  CF   99999                04906 33 99999 00000
19000       B    CTFM4                04918 49 04744 00000
19010       DORG *-3                  04926
19020CTFM6  SF   99999                04926 32 99999 00000
19030       B    CTFM4                04938 49 04744 00000
19040       DORG *-3                  04946
19050*
19060*  CALCULATE ELEMENT ADDRESSES.
19070*
19080       DS   2                    04947 00002
19090CADIJ  S    C,P                  04948 22 00610 00607
19100       TF   ADIJ,R               04960 26 00571 00551
19110       TF   CNTR1,N              04972 26 00897 00426
19120AAA    SM   P,1,10               04984 12 00607 00001
19130       BE   BB                   04996 46 05040 01200
```

```
19140          A     ADIJ-1,CNTR1                05008 21 00570 00897
19150          SM    CNTR1,1,10                  05020 12 00897 00001
19160          B     AAA                         05032 49 04984 00000
19170          DORG  *-3                         05040
19180BB        A     ADIJ-1,C                    05040 21 00570 00610
19190          BB                                05052 42 00000 00000
19200          DORG  *-9                         05054
19210*
19220*  SET IND.
19230*
19240CA98      TF    CA99+6,IND                  05054 26 05096 00486
19250          SM    CA99+6,1,10                 05066 12 05096 00001
19260          A     CA99+6,K                    05078 21 05096 00601
19270CA99      TDN   99999,0                     05090 15 99999 00000
19280*
19290*  SET NEGATIVE DIAGONAL ELEMENTS = ZERO.
19300*
19310          TF    CNTR1,N                     05102 26 00897 00426
19320          TF    SP1+11,R                    05114 26 05149 00551
19330          SM    SP1+11,2,10                 05126 12 05149 00002
19340SP1       BNF   SP3,99999                   05138 44 05204 99999
19350          TF    SP2+23,SP1+11               05150 26 05197 05149
19360          AM    SP2+23,2,10                 05162 11 05197 00002
19370SP2       TFLS  99999,ZERO                  05174 16 10647 05197
                                                 05186 49 10596 00000
                                                 05193 00005    99999
                                                 05198 00005    00861
19380SP3       A     SP1+10,CNTR1                05204 21 05148 00897
19390          SM    CNTR1,1,10                  05216 12 00897 00001
19400          BP    SP1                         05228 46 05138 01100
19410RET3      B     99999                       05240 49 99999 00000
```



```
19420          DORG  *-3                         05248
19430*  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *
19440*  SUBROUTINE TO CALCULATE REGRESSION STATISTICS FOR STEP OR MDV.  *
19450*  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *
19460*
19470CREGO     TF    P,L                         05248 26 00607 00604
19480          TF    C,L                         05260 26 00610 00604
19490          BTM   CADIJ,0,10                  05272 17 04948 00000
19500          TF    ADRNN,ADIJ                  05284 26 00566 00571
19510CREG      TF    CALCE+28,ADRNN              05296 26 05372 00566
19520          TF    CE1+28,SIGMA                05308 26 05516 00546
19530          SM    CE1+28,10,10                05320 12 05516 00010
19540          A     CE1+27,L                    05332 21 05515 00604
19550CALCE     TFLS  EY,99999                    05344 16 10647 05367
                                                 05356 49 10596 00000
                                                 05363 00005    00660
                                                 05368 00005    99999
19560          C     DF,ZERO                     05374 24 00690 00861
19570          BE    CALCB                       05386 46 05518 01200
19580          FD    EY,DF                       05398 16 10647 05421
                                                 05410 49 10556 00000
                                                 05417 00005    00660
                                                 05422 00005    00690
19590          FM    EY,OBSER                    05428 16 10647 05451
                                                 05440 49 10536 00000
                                                 05447 00005    00660
                                                 05452 00005    00481
19600          FSQR  EY,EY                       05458 16 10647 05481
                                                 05470 49 10576 00000
                                                 05477 00005    00660
                                                 05482 00005    00660
19610CE1       FM    EY,99999                    05488 16 10647 05511
                                                 05500 49 10536 00000
                                                 05507 00005    00660
                                                 05512 00005    99999
19620*
19630*  CALCULATE COEFFICIENTS, STANDARD ERRORS AND T RATIOS.
19640*
```

```
19650CALCB  TFN  I,1,10
19660       TF   RCNT,N
19670       TF   CA1+11,IND
19680       TF   CA4+28,SIGMA
19690       SM   CA4+28,10,10
19700       A    CA4+27,L
19710       TF   CA5+28,SIGMA
19720       TF   CA6+23,B
19730       TF   SE3+28,SIGMA
19740       TF   SE4+23,SE
19750       TF   T1+23,T
19760       TF   T1+28,B
19770       TF   T2+23,T
19780       TF   T2+28,SE
19790       TF   SETID+6,ID
19800CA1    BD   *+20,99999
19810       B    BMOD
19820       DORG *-3
19830       TF   *+23,CA1+11
19840       BNR  *+20,99999
19850       B    BMOD
19860       DORG *-3
19870CA2    C    I,L
19880       BE   BMOD
19890       BP   IGRL
19900ILL    TF   P,I
19910       TF   Q,L
```

```
05518 16 00595 00001
05530 26 00894 00426
05542 26 05709 00486
05554 26 05948 00546
05566 12 05948 00010
05578 21 05947 00604
05590 26 05978 00546
05602 26 06071 00526
05614 26 06274 00546
05626 26 06299 00531
05638 26 06353 00536
05650 26 06358 00526
05662 26 06383 00536
05674 26 06388 00531
05686 26 06396 00491
05698 43 05718 99999
05710 49 06486 00000
05718
05718 26 05741 05709
05730 45 05750 99999
05742 49 06486 00000
05750
05750 24 00595 00604
05762 46 06486 01200
05774 46 05842 01100
05786 26 00607 00595
05798 26 00610 00604
```



```
19920       BTM  CADIJ,0,10
19930       TF   CA3+28,ADIJ
19940       B    CA3
19950       DORG *-3
19960IGRL   TF   P,L
19970       TF   Q,I
19980       BTM  CADIJ,0,10
19990       TF   CA3+28,ADIJ
20000CA3    TFLS TEMP1,99999
20010CA4    FN   TEMP1,99999
20020CA5    FD   TEMP1,99999
20030       C    I,L
20040       BN   CA6
20050       BNF  CA55,TEMP1-2
20060       CF   TEMP1-2
20070       B    CA6
20080       DORG *-3
20090CA55   SF   TEMP1-2
20100CA6    TFLS 99999,TEMP1
20110*
20120*  CALCULATE SE OF B(I).
20130*
```

```
05810 17 04948 00000
05822 26 05918 00571
05834 49 05890 00000
05842
05842 26 00607 00604
05854 26 00610 00595
05866 17 04948 00000
05878 26 05918 00571
05890 16 10647 05913
05902 49 10596 00000
05909 00005    00630
05914 00005    99999
05920 16 10647 05943
05932 49 10536 00000
05939 00005    00630
05944 00005    99999
05950 16 10647 05973
05962 49 10556 00000
05969 00005    00630
05974 00005    99999
05980 24 00595 00604
05992 47 06048 01300
06004 44 06036 00628
06016 33 00628 00000
06028 49 06048 00000
06036
06036 32 00628 00000
06048 16 10647 06071
06060 49 10596 00000
06067 00005    99999
06072 00005    00630
```

```
20140          TF    P,1                    06078 26 00607 00595
20150          TF    0,1                    06090 26 00610 00595
20160          BTM   CADIJ,0,10             06102 17 04948 00000
20170          TF    SE1+28,ADIJ            06114 26 06154 00571
20180SE1       TFLS  TEMP1,99999            06126 16 10647 06149
                                            06138 49 10596 00000
                                            06145 00005    00630
                                            06150 00005    99999
20190SE2       FD    TEMP1,OBSER            06156 16 10647 06179
                                            06168 49 10556 00000
                                            06175 00005    00630
                                            06180 00005    00481
20200          FSCR  TEMP1,TEMP1            06186 16 10647 06209
                                            06198 49 10576 00000
                                            06205 00005    00630
                                            06210 00005    00630
20210          FM    TEMP1,EY               06216 16 10647 06239
                                            06228 49 10536 00000
                                            06235 00005    00630
                                            06240 00005    00660
20220SE3       FD    TEMP1,99999            06246 16 10647 06269
                                            06258 49 10556 00000
                                            06265 00005    00630
                                            06270 00005    99999
20230SE4       TFLS  99999,TEMP1            06276 16 10647 06299
                                            06288 49 10596 00000
                                            06295 00005    99999
                                            06300 00005    00630
20240*
20250*  TEST IF EY = ZERO.
20260*
20270          C     EY,ZERO                06306 24 00660 00861
20280          BE    SETID                  06318 46 06390 01200
20290*
20300*  COMPUTE T(I).
20310*
20320T1        TFLS  99999,99999            06330 16 10647 06353
                                            06342 49 10596 00000
                                            06349 00005    99999
                                            06354 00005    99999
```



```
20330T2        FD    99999,99999            06360 16 10647 06383
                                            06372 49 10556 00000
                                            06379 00005    99999
                                            06384 00005    99999
20340*
20350*  SET ID.
20360*
20370SETID     TF    99999,1                06390 26 99999 00595
20380          AM    CA6+23,10,10           06402 11 06071 00010
20390          AM    SE4+23,10,10           06414 11 06299 00010
20400          AM    T1+23,10,10            06426 11 06353 00010
20410          AM    T1+28,10,10            06438 11 06358 00010
20420          AM    T2+23,10,10            06450 11 06383 00010
20430          AM    T2+28,10,10            06462 11 06388 00010
20440          AM    SETID+6,2,10           06474 11 06396 00002
20450BMOD      AM    CA1+11,1,10            06486 11 05709 00001
20460          AM    CA5+28,10,10           06498 11 05978 00010
20470          AM    SE3+28,10,10           06510 11 06274 00010
20480          AM    1,1,10                 06522 11 00595 00001
20490          SM    RCNT,1,10              06534 12 00894 00001
20500          BP    CA1                    06546 46 05698 01100
20510*
20520*  CALCULATE CONSTANT TERM
20530*
20540          BD    *+20,CON7              06558 43 06578 00447
20550          B     CA0                    06570 49 06616 00000
20560          DORG  *-3                    06578
20570          TFLS  A0,ZERO                06578 16 10647 06601
                                            06590 49 10596 00000
                                            06597 00005    00650
                                            06602 00005    00861
20580          B     CSCR                   06608 49 06992 00000
20590          DORG  *-3                    06616
```

```
20600CA0    TF    CA01+28,SUM1
20610       SM    CA01+28,10,10
20620       A     CA01+27,L
20630CA01   TFLS  A0,99999

20640       TF    RCNT,N
20650       TFM   1,1,10
20660       TF    CA02+11,IND
20670       TF    CA03+11,IND
20680       TF    CA04+28,B
20690       TF    CA05+28,SUM1
20700       C     L,1
20710       BE    CAMOD
20720CA02   BD    CA03,99999
20730       B     CAMOD
20740       DORG  *-3
20750CA03   BNR   *+20,99999
20760       B     CAMOD
20770       DORG  *-3
20780CA04   TFLS  TEMP1,99999

20790CA05   FM    TEMP1,99999

20800       FS    A0,TEMP1
```

```
06616 26 06680 00541
06628 12 06680 000T0
06640 21 06679 00604
06652 16 10647 0667 5
06664 49 10596 00000
06671 00005    00650
06676 00005    99999
06682 26 00894 00426
06694 16 00595 0000 1
06706 26 06789 00486
06718 26 06809 00486
06730 26 06846 00526
06742 26 06876 00541
06754 24 00604 00595
06766 46 06920 01200
06778 43 06798 99999
06790 49 06920 00000
06798
06798 45 06818 99999
06810 49 06920 00000
06818
06818 16 10647 0684 1
06830 49 10596 00000
06837 00005    00630
06842 00005    99999
06848 16 10647 0687 1
06860 49 10536 00000
06867 00005    00630
06872 00005    99999
06878 16 10647 0690 1
06890 49 10496 00000
06897 00005    00650
06902 00005    00630
```



```
20810       AM    CA04+28,10,10
20820CAMOD  AM    CA02+11,1,10
20830       AM    CA03+11,1,10
20840       AM    CA05+28,10,10
20850       AM    1,1,10
20860       SM    RCNT,1,10
20870       BP    CA02

20880*
20890*  CALCULATE SUM OF SQUARED RESIDUALS.
20900*
20910CSQR   TF    SQR1+28,ADRNN
20920       TF    SQR2+28,SIGMA
20930       SM    SQR2+28,10,10
20940       A     SQR2+27,L
20950       TF    SQR3+28,SQR2+28
20960SQR1   TFLS  SQR,99999

20970SQR2   FM    SQR,99999

20980SQR3   FM    SQR,99999

20990       FM    SQR,OBSER

21000*
21010*  CALCULATE RSQR.
21020*
21030       TF    CR1+28,SIGMA
21040       SM    CR1+28,10,10
```

```
06908 11 06846 000T0
06920 11 06789 0000 1
06932 11 06809 0000 1
06944 11 06876 000T0
06956 11 00595 0000 1
06968 12 00894 0000 1
06980 46 06778 01100
06992 26 07080 00566
07004 26 07110 00546
07016 12 07110 000T0
07028 21 07109 00604
07040 26 07140 07110
07052 16 10647 0707 5
07064 49 10596 00000
07071 00005    00680
07076 00005    99999
07082 16 10647 0710 5
07094 49 10536 00000
07101 00005    00680
07106 00005    99999
07112 16 10647 0713 5
07124 49 10536 00000
07131 00005    00680
07136 00005    99999
07142 16 10647 0716 5
07154 49 10536 00000
07161 00005    00680
07166 00005    00481
07172 26 07248 00546
07184 12 07248 000T0
```

```
21050          A     CR1+27,L
21060          TF    CR2+28,CR1+28
21070CR1       TFLS  TEMP1,99999
21080CR2       FM    TEMP1,99999
21090          BD    *+20,CON7
21100          B     CR4
21110          DORG  *-3
21120          TF    CR3+28,SUM1
21130          SM    CR3+28,10,10
21140          A     CR3+28,L
21150          TF    CR35+28,CR3+28
21160CR3       TFLS  TEMP2,99999
21170CR35      FM    TEMP2,99999
21180          FS    TEMP1,TEMP2
21190CR4       FM    TEMP1,OBSER
21200          TFLS  TEMP2,SCR
```

```
07196 21 07247 00604

07208 26 07278 07248

07220 16 10647 07243
07232 49 10596 00000
07239 00005    00630
07244 00005    99999

07250 16 10647 07273
07262 49 10536 00000
07269 00005    00630
07274 00005    99999

07280 43 07300 00447

07292 49 07438 00000

07300

07300 26 07376 00541

07312 12 07376 00010

07324 21 07375 00604

07336 26 07406 07376

07348 16 10647 07371
07360 49 10596 00000
07367 00005    00640
07372 00005    99999

07378 16 10647 07401
07390 49 10536 00000
07397 00005    00640
07402 00005    99999

07408 16 10647 07431
07420 49 10496 00000
07427 00005    00630
07432 00005    00640

07438 16 10647 07461
07450 49 10536 00000
07457 00005    00630
07462 00005    00481

07468 16 10647 07491
07480 49 10596 00000
07487 00005    00640
07492 00005    00680
```



```
21210          FD    TEMP2,TEMP1
21220          TFLS  RSQR,ONE
21230          FS    RSQR,TEMP2
21240RET5      B     99999
21250          DORG  *-3
21260*    *    *    *    *    *    *    *
21270*    SUBROUTINE TO CALCULATE NOIN.    *
21280*    *    *    *    *    *    *    *
21290          DS    2
21300CNOIN     TFM   NOIN,0,9
21310          TF    CN1+11,IND
21320          TF    CNTR1,N
21330CN1       BD    *+20,99999
21340          B     CNMOD
21350          DORG  *-3
21360          TF    CN2+11,CN1+11
21370CN2       BNR   *+20,99999
21380          B     CNMOD
21390          DORG  *-3
21400          AM    NOIN,1,10
21410CNMOD     AM    CN1+11,1,10
21420          SM    CNTR1,1,10
21430          BP    CN1
21440          BB
```

```
07498 16 10647 07521
07510 49 10556 00000
07517 00005    00640
07522 00005    00630

07528 16 10647 07551
07540 49 10596 00000
07547 00005    00670
07552 00005    00881

07558 16 10647 07581
07570 49 10496 00000
07577 00005    00670
07582 00005    00640

07588 49 99999 00000

07596

07597 00002

07598 16 00891 00000

07610 26 07645 00486

07622 26 00897 00426

07634 43 07654 99999

07646 49 07698 00000

07654

07654 26 07677 07645

07666 45 07686 99999

07678 49 07698 00000

07686

07686 11 00891 00001

07698 11 07645 00001

07710 12 00897 00001

07722 46 07634 01100

07734 42 00000 00000
```

```
21450          DORG *-9                                    07736
21460HDNG0     DAC  21,DEP VAR      =     @                07737 00021
21470HDNG1     DAC  18,STD ERR Y.X  =  @                   07779 00018
21480HDNG2     DAC  18,R SQUARED    =  @                   07815 00018
21490HDNG3     DAC  18,SUM SQR RES  =  @                   07851 00018
21500HDNG4     DAC  21,IND VAR USED =     @                07887 00021
21510HDNG5     DAC  18,CONSTANT TERM =  @                  07929 00018
21520HDNG6     DAC  16,VAR       COEFF@                    07965 00016
21530HDNG7     DAC  28,       STD ERR      T RATIO@        07997 00028
21540*  *   *   *   *   *   *   *   *   *   *   *
21550*  SUBROUTINE TO PRINT REGRESSION STATISTICS.    *
21560*  *   *   *   *   *   *   *   *   *   *   *
21570PREG      RCTY                                        08052 34 00000 00102
21580          RCTY                                        08064 34 00000 00102
21590          WATY   HDNG0                                08076 39 07737 00100
21600          BT   WRNUM,L                                08088 27 09532 00604
21610          RCTY                                        08100 34 00000 00102
21620          WATY HDNG1                                  08112 39 07779 00100
21630          BTFS FLTFIX,EY                              08124 16 10647 ð8147
                                                           08136 49 10616 00000
                                                           08143 00005    ð9580
                                                           08148 00005    ð0660
21640          WATY OUTPUT-20                              08154 39 10447 00100
21650          RCTY                                        08166 34 00000 00102
21660          WATY HDNG2                                  08178 39 07815 00100
21670          BTFS FLTFIX,RSQR                            08190 16 10647 ð8213
                                                           08202 49 10616 00000
                                                           08209 00005    ð9580
                                                           08214 00005    ð0670
21680          WATY OUTPUT-20                              08220 39 10447 00100
21690          RCTY                                        08232 34 00000 00102
```



```
21700          WATY HDNG3                                  08244 39 07851 00100
21710          BTFS FLTFIX,SQR                             08256 16 10647 ð8279
                                                           08268 49 10616 00000
                                                           08275 00005    ð9580
                                                           08280 00005    ð0680
21720          WATY OUTPUT-20                              08286 39 10447 00100
21730          RCTY                                        08298 34 00000 00102
21740          WATY HDNG4                                  08310 39 07887 00100
21750          BT   WRNUM,NOIN                            08322 27 09532 00891
21760          RCTY                                        08334 34 00000 00102
21770          RCTY                                        08346 34 00000 00102
21780          WATY HDNG5                                  08358 39 07929 00100
21790          BTFS FLTFIX,AO                              08370 16 10647 ð8393
                                                           08382 49 10616 00000
                                                           08389 00005    ð9580
                                                           08394 00005    ð0650
21800          WATY OUTPUT-20                              08400 39 10447 00100
21810          RCTY                                        08412 34 00000 00102
21820          RCTY                                        08424 34 00000 00102
21830          WATY HDNG6                                  08436 39 07965 00100
21840          WATY HDNG7                                  08448 39 07997 00100
21850          RCTY                                        08460 34 00000 00102
21860          TF   CNTR1,NOIN                            08472 26 00897 00891
21870          TF   W1+11,ID                               08484 26 08543 00491
21880          TF   W2+28,B                                08496 26 08584 00526
21890          TF   W3+28,SE                               08508 26 08638 00531
21900          TF   W4+28,T                                08520 26 08692 00536
21910W1        BT   WRNUM,99999                            08532 27 09532 99999
21920          TBTY                                        08544 34 00000 00108
21930W2        BTFS FLTFIX,99999                           08556 16 10647 ð8579
                                                           08568 49 10616 00000
                                                           08575 00005    ð9580
                                                           08580 00005    99999
```

```
21940          WATY OUTPUT-20
21950          TBTY
21960W3        BTFS FLTFIX,99999
21970          WATY OUTPUT-20
21980          TBTY
21990W4        BTFS FLTFIX,99999
22000          WATY OUTPUT-20
22010          RCTY
22020          AM   W1+11,2,10
22030          AM   W2+28,10,10
22040          AM   W3+28,10,10
22050          AM   W4+28,10,10
22060          SM   CNTR1,1,10
22070          BP   W1
22080RET6      B    99999
22090          DORG *-3
22100*  *   *   *   *   *   *   *   *
22110*  SUBROUTINE TO PUNCH STEP RESULTS.   *
22120*  *   *   *   *   *   *   *   *
22130PST       AM   PST2+11,1,10
22140          TF   OUT-77,PST2+11
22150          TF   OUT-74,L
22160          TF   OUT-71,NOIN
22170          TF   OUT-68,N
22180          TFLS OUT-50,AO
```

```
08586 39 10447 00100
08598 34 00000 00108
08610 16 10647 08633
08622 49 10616 00000
08629 00005    09580
08634 00005    99999
08640 39 10447 00100
08652 34 00000 00108
08664 16 10647 08687
08676 49 10616 00000
08683 00005    09580
08688 00005    99999
08694 39 10447 00100
08706 34 00000 00102
08718 11 08543 00002
08730 11 08584 00010
08742 11 08638 00010
08754 11 08692 00010
08766 12 00897 00001
08778 46 08532 01100
08790 49 99999 00000
08798
08798 11 09171 00001
08810 26 00753 09171
08822 26 00756 00604
08834 26 00759 00891
08846 26 00762 00426
08858 16 10647 08881
08870 49 10596 00000
08877 00005    00780
08882 00005    00650
```



```
22190          TFLS OUT-40,RSCR
22200          TFLS OUT-30,EY
22210          TFLS OUT-20,F
22220          TFLS OUT-10,SCR
22230          TFM  BR+6,*+20
22240          B    PST2
22250          DORG *-3
22260          TF   COUNT,N
22270          TF   CD+6,IND
22280CD        WNCD 99999
22290          AM   CD+6,80,10
22300          SM   COUNT,80,10
22310          BP   CD
22320          AM   PST2+23,1,10
22330          BT   MOVER,B
22340          BT   MOVER,SE
22350          BT   MOVER,T
22360RET4      B    99999
22370PST2      TFM  OUT-4,0,9
22380          TFM  OUT,1,8
22390          WNCD OUT-79
```

```
08888 16 10647 08911
08900 49 10596 00000
08907 00005    00790
08912 00005    00670
08918 16 10647 08941
08930 49 10596 00000
08937 00005    00800
08942 00005    00660
08948 16 10647 08971
08960 49 10596 00000
08967 00005    00810
08972 00005    00700
08978 16 10647 09001
08990 49 10596 00000
08997 00005    00820
09002 00005    00680
09008 16 09214 09028
09020 49 09160 00000
09028
09028 26 00586 00426
09040 26 09058 00486
09052 38 99999 00400
09064 11 09058 00080
09076 12 00586 00080
09088 46 09052 01100
09100 11 09183 00001
09112 27 09220 00526
09124 27 09220 00531
09136 27 09220 00536
09148 49 99999 00000
09160 16 00826 00000
09172 16 00830 00001
09184 38 00751 00400
```

```
22400          AM    PST2+23,1,10
22410BR        B     99999
22420MOVER     TF    MV4+28,NAD
22430NAD       DS    ,MOVER-1
22440          TF    TEMP1,NOIN
22450MV1       CM    TEMP1,7,10
22460          BP    MV2
22470          TF    COUNT,TEMP1
22480          B     MV3
22490          DORG  *-3
22500MV2       TFM   COUNT,7,10
22510MV3       TFM   MV4+23,OUT-70
22520MV4       TFLS  99999,99999


22530          AM    MV4+23,10,10
22540          AM    MV4+28,10,10
22550          SM    COUNT,1,10
22560          BP    MV4
22570          TFM   BR+6,*+20
22580          B     PST2
22590          DORG  *-3
22600          SM    TEMP1,7,10
22610          BP    MV1
22620          BB
22630          DORG  *-9
22640*    *    *    *    *    *
22650*  PUNCH SUBROUTINE.      *
22660*    *    *    *    *    *
```

```
09196 11 09183 00001
09208 49 99999 00000
09220 26 09340 09219
09219 00000
09232 26 00630 00891
09244 14 00630 00007
09256 46 09288 01100
09268 26 00586 00630
09280 49 09300 00000
09288
09288 16 00586 00007
09300 16 09335 00760
09312 16 10647 09335
09324 49 10596 00000
09331 00005    99999
09336 00005    99999
09342 11 09335 00010
09354 11 09340 00010
09366 12 00586 00001
09378 46 09312 01100
09390 16 09214 09410
09402 49 09160 00000
09410
09410 12 00630 00007
09422 46 09244 01100
09434 42 00000 00000
09436
```



```
22670          DS    5
22680PNCH      WNCD  402
22690          TF    PNCH1+6,PNCH-1
22700          SM    PNCH1+6,9,10
22710PNCH1     WNCD  99999
22720          AM    PNCH1+6,80,10
22730          SM    PNUM,8,10
22740          BP    PNCH1
22750          BB
22760          DORG  *-9
22770          DS    4
22780WRNUM     TF    OUT,NO
22790NO        DS    ,WRNUM-1
22800          CF    OUT-1
22810          WNTY  OUT-1
22820          BB
22830          DORG  *-9
22840*    *    *    *    *    *    *    *    *    *    *    *    *    *
22850*  SUBROUTINE FOR PREPARING DATA FOR ALPHAMERICAL PRINTING OR      *
22860*  PUNCHING.  INTERNAL FORMAT IS SPSII.                            *
22870*    *    *    *    *    *    *    *    *    *    *    *    *    *
22880          DS    10
22890FLTFIX    CF    ARG-9
22900ARG       DS    ,FLTFIX-1
22910          TF    OUTPUT,SEVENS
22920          CF    OUTPUT-9
22930          TF    OUTPUT-10,DCMAL
22940          TFM   OUTPUT-19,0,9
22950          TFM   SIGN,0,10
22960          BNF   JUMP,ARG-2
```

```
09440 00005
09442 38 00402 00400
09454 26 09484 09441
09466 12 09484 00009
09478 38 99999 00400
09490 11 09484 00080
09502 12 00885 00008
09514 46 09478 01100
09526 42 00000 00000
09528
09531 00004
09532 26 00830 09531
09531 00000
09544 33 00829 00000
09556 38 00829 00100
09568 42 00000 00000
09570
09579 00010
09580 33 09570 00000
09579 00000
09592 26 10467 10479
09604 33 10458 00000
09616 26 10457 10489
09628 16 10448 00000
09640 16 10491 00000
09652 44 09688 09577
```

```
22970          TDN   SIGN-1,2,11
22980          CF    ARG-2
22990JUMP      CM    ARG,99,1011
23000          BE    WRALPH
23010          CM    ARG,0,10
23020          BNP   DECIML
23030          CM    ARG,4,10
23040          BH    LARGE
23050          TFM   TRNMT+11,ARG-9
23060          TFM   *+42,OUTPUT-10
23070          S     *+30,ARG
23080          S     *+18,ARG
23090TRNMT     TD    99999,99999
23100          AM    TRNMT+11,1,10
23110          AM    TRNMT+6,2,10
23120          CM    TRNMT+6,OUTPUT-12
23130          BNH   TRNMT
23140          TF    WRITE+23,TRNMT+11
23150          TFM   EXPNT2,5,10
23160          S     EXPNT2,ARG
23170          TFM   *+47,SEVENS
23180          S     *+35,EXPNT2
23190          S     *+23,EXPNT2
23200          A     OUTPUT-12,99999
23210WRITE     TFM   *+18,OUTPUT-8
23220          TD    OUTPUT-8,0
```

```
09664 15 10490 00002
09676 33 09577 00000
09688 14 09579 00099
09700 46 10024 01200
09712 14 09579 00000
09724 47 10070 01100
09736 14 09579 00004
09748 46 10150 01100
09760 16 09819 09570
09772 16 09814 10457
09784 22 09814 09579
09796 22 09814 09579
09808 25 99999 99999
09820 11 09819 00001
09832 11 09814 00002
09844 14 09814 10455
09856 47 09808 01100
09868 26 09975 09819
09880 16 10493 00005
09892 22 10493 09579
09904 16 09951 10479
09916 22 09951 10493
09928 22 09951 10493
09940 21 10455 99999
09952 16 09970 10459
09964 25 10459 00000
```



```
23230          AM    WRITE+23,1,10
23240          AM    WRITE+18,2,10
23250          CM    WRITE+18,OUTPUT
23260          BNH   WRITE+12
23270WRALPH    BD    SETZRO,OUTPUT-18
23280          B     SETSIG
23290          DORG  *-3
23300SETZRO    TDM   OUTPUT,0
23310          TF    OUTPUT-20,SIGN
23320          BB
23330          DORG  *-9
23340DECIML    CM    ARG,4,1011
23350          BNH   LARGE
23360          TFM   WRITE+23,ARG-9
23370          TFM   WRITE+18,OUTPUT-8
23380          S     WRITE+18,ARG
23390          S     WRITE+18,ARG
23400          B     WRITE+12
23410          DORG  *-3
23420LARGE     TF    OUTPUT-17,SEVENS-7
23430          BNF   JUMP2,ARG
23440          TFM   OUTPUT-20,20,10
23450          CF    ARG
23460          CF    OUTPUT-19
23470JUMP2     TD    OUTPUT-16,ARG
23480          TD    OUTPUT-18,ARG-1
23490          CF    OUTPUT-18
```

```
09976 11 09975 00001
09988 11 09970 00002
10000 14 09970 10467
10012 47 09964 01100
10024 43 10044 10449
10036 49 10356 00000
10044
10044 15 10467 00000
10056 26 10447 10491
10068 42 00000 00000
10070
10070 14 09579 00004
10082 47 10150 01100
10094 16 09975 09570
10106 16 09970 10459
10118 22 09970 09579
10130 22 09970 09579
10142 49 09964 00000
10150
10150 26 10450 10472
10162 44 10210 09579
10174 16 10447 00020
10186 33 09579 00000
10198 33 10448 00000
10210 25 10451 09579
10222 25 10449 09578
10234 33 10449 00000
```

```
23500          TF    OUTPUT-12,SIGN
23510          CF    OUTPUT-13
23520          TFM   WR+11,ARG-9
23530          TFM   WR+6,OUTPUT-8
23540WR        TD    99999,99999
23550          AM    WR+11,1,10
23560          AM    WR+6,2,10
23570          CM    WR+6,OUTPUT
23580          BNH   WR
23590          BB
23600          DORG  *-9
23610SETSIG    TFM   SETS+11,OUTPUT-16
23620SETS      BD    SET,OUTPUT-16
23630          AM    SETS+11,2,10
23640          B     SETS
23650          DORG  *-3
23660SET       TF    *+30,SETS+11
23670          SM    *+18,2,10
23680          TF    99999,SIGN
23690          BB
23700          DORG  *-9
23710          DAS   14
23720OUTPUT    DS    2
23730          DAC   1,@
23740SEVENS    DC    10,7070707070
23750DCMAL     DC    10,0000000003
23760SIGN      DS    2
```

```
10246 26 10455 10491
10258 33 10454 00000
10270 16 10305 09570
10282 16 10300 10459
10294 25 99999 99999
10306 11 10305 00001
10318 11 10300 00002
10330 14 10300 10467
10342 47 10294 01100
10354 42 00000 00000
10356
10356 16 10379 10451
10368 43 10400 10451
10380 11 10379 00002
10392 49 10368 00000
10400
10400 26 10430 10379
10412 12 10430 00002
10424 26 99999 10491
10436 42 00000 00000
10438
10439 00014
10467 00002
10469 00001
10479 00010
10489 00010
10491 00002
```



```
23770EXPNT2 DS    2
23780       DAC   1,0
23790       DEND  START4
LOAD SUBROUTINES
```

```
10493 00002
10495 00001
00898
10496 16 11050 11508
10508 49 10636 0
10516 16 11050 11552
10528 49 10636 0
10536 16 11050 12052
10548 49 10636 0
10556 16 11050 12292
10568 49 10636 0
10576 16 11050 12628
10588 49 10740 0
10596 16 11050 13208
10608 49 10740 0
10616 16 11050 13240
10628 49 10740 0
```

END OF PASS II

00402 CONT	00407 DATE	00409 PROB	00414 NOBS	00417 NFORM
00420 INVAR	00423 NOVAR	00426 N	00429 NDEP	00432 *NOTRAN
00435 NOCON	00437 NCOL	00440 NELIM	00441 CON1	00442 CON2
00443 CON3	00444 CON4	00445 CON5	00446 CON6	00447 CON7
00448 CON8	00449 CON9	00450 CON10	00451 CON11	00452 CON12
00453 CON13	00454 CON14	00455 CON15	00456 CON16	00457 CON17
00458 CON18	00481 OBSER	00486 IND	00491 ID	00496 IDD
00501 *FORMAT	00506 INDEX	00511 CONST	00516 DATA1	00521 DATA2
00526 B	00531 SE	00536 T	00541 SUM1	00546 SIGMA
00551 R	00556 WT	00561 ADKK	00566 ADRNN	00571 ADIJ
00576 ADRIJ	00581 SIGN3	00586 COUNT	00589 CNTR	00592 CTR
00595 I	00598 J	00601 K	00604 L	00607 P
00610 O	00614 NSZ	00617 IVE	00620 IVP	00630 TEMP1
00640 TEMP2	00650 A0	00660 EY	00670 RSCR	00680 SCR
00690 DF	00700 F	00710 FIN	00720 FOUT	00730 HIGH
00740 VP	00750 VE	00830 OUT	00841 FP001	00851 FHIGH
00861 ZERO	00871 ZEROS	00881 ONE	00885 PNUM	00888 MCNT
00891 NOIN	00894 RCNT	00897 CNTR1	00898 *START4	00970 DF1
00994 STW	01030 STW1	01112 STW2	01160 STW22	01196 STW24
01318 STW23	01438 STW21	01468 STW3	01590 STW31	01626 STW4
01650 STW5	01680 STW6	01710 STW7	01752 STW8	01886 NEG
02000 STMOD	02224 CALCF	02278 CAF1	02440 CAF2	02662 *ADDONE
02694 *REMOVE	02756 CHP11	02828 *FINISH	02958 FIN1	02990 CMEX
03058 EX1	03154 EXMOD	03202 CMTRA	03246 CMRE	03314 RE1
03334 RE2	03374 REMOD	03458 FINAL	03478 MT	03514 MT1
03558 DEL	03582 MT2	03606 CKK1	03654 CKK2	03684 CKK3
03714 CKK4	03804 *GENTFM	03840 GTFM1	03948 GTFM2	04020 GTFM3
04044 GTFM4	04074 *GTFM41	04104 GTFM7	04158 GTFM6	04196 GTFM5
04208 GTFM8	04246 KGRJ	04318 *KGRJ11	04338 KGRJ1	04358 KGRJ2
04378 IGRK	04462 *IGRK11	04482 IGRK1	04502 IGRK2	04522 NEXT
04578 N1	04634 *ROWTFM	04670 RTFM1	04732 *COLTFM	04744 CTFM4

04792 CTFM1	04816 CTFM2	04894 CTFM3	04906 CTFM5	04926 CTFM6
04948 CADIJ	04984 AAA	05040 BB	05054 CA98	05090 CA99
05138 SP1	05174 SP2	05204 SP3	05240 RET3	05248 CREGO
05296 CREG	05344 CALCE	05488 CE1	05518 CALCB	05698 CA1
05750 CA2	05786 ILL	05842 IGRL	05890 CA3	05920 CA4
05950 CA5	06036 CA55	06048 CA6	06126 SE1	06156 SE2
06246 SE3	06276 SE4	06330 T1	06360 T2	06390 SETID
06486 SMOD	06616 CA0	06652 CA01	06778 CA02	06798 CA03
06818 CA04	06848 CA05	06920 CAMOD	06992 CSCR	07052 SCR1
07082 SCR2	07112 SCR3	07220 CR1	07250 CR2	07348 CR3
07378 CR35	07438 CR4	07588 RET5	07598 CNOIN	07634 CN1
07666 CN2	07698 CNMOD	07737 HDNG0	07779 HDNG1	07815 HDNG2
07851 HDNG3	07887 HDNG4	07929 HDNG5	07965 HDNG6	07997 HDNG7
08052 PREG	08532 W1	08556 W2	08610 W3	08664 W4
08790 RET6	08798 PST	09052 CD	09148 RET4	09160 PST2
09208 BR	09220 MOVER	09219 MAD	09244 MV1	09288 MV2
09300 MV3	09312 MV4	09442 PNCH	09478 PNCH1	09532 WRNUM
09531 NO	09580 *FLTFIX	09579 ARG	09688 JUMP	09808 TRNMT
09952 WRITE	10024 *WRALPH	10044 *SETZRO	10070 *DECIML	10150 LARGE
10210 JUMP2	10294 WR	10356 *SETSIG	10368 SETS	10400 SET
10467 *OUTPUT	10479 *SEVENS	10489 DCMAL	10491 SIGN	10493 *EXPNT2

```
00010*  PROGRAM 80-4B, MDV REGRESSION, OCT. 10, 1963.
00020*
00030         DORG 402                                    00402
00040CONT     DSS  80                                     00402 00080
00050DATE     DS   6,CONT+5                               00407 00006
00060PROB     DS   2,CONT+7                               00409 00002
00070NOBS     DS   5,CONT+12                              00414 00005
00080NFORM    DS   3,CONT+15                              00417 00003
00090NVAR     DS   3,CONT+18                              00420 00003
00100NOVAR    DS   3,CONT+21                              00423 00003
00110N        DS   3,CONT+24                              00426 00003
00120NDEP     DS   3,CONT+27                              00429 00003
00130NOTRAN   DS   3,CONT+30                              00432 00003
00140NOCON    DS   3,CONT+33                              00435 00003
00150NCOL     DS   2,CONT+35                              00437 00002
00160NELIM    DS   3,CONT+38                              00440 00003
00170CON1     DS   1,CONT+39                              00441 00001
00180CON2     DS   1,CONT+40                              00442 00001
00190CON3     DS   1,CONT+41                              00443 00001
00200CON4     DS   1,CONT+42                              00444 00001
00210CON5     DS   1,CONT+43                              00445 00001
00220CON6     DS   1,CONT+44                              00446 00001
00230CON7     DS   1,CONT+45                              00447 00001
00240CON8     DS   1,CONT+46                              00448 00001
00250CON9     DS   1,CONT+47                              00449 00001
00260CON10    DS   1,CONT+48                              00450 00001
00270CON11    DS   1,CONT+49                              00451 00001
```



```
00280CON12    DS   1,CONT+50                              00452 00001
00290CON13    DS   1,CONT+51                              00453 00001
00300CON14    DS   1,CONT+52                              00454 00001
00310CON15    DS   1,CONT+53                              00455 00001
00320CON16    DS   1,CONT+54                              00456 00001
00330CON17    DS   1,CONT+55                              00457 00001
00340CON18    DS   1,CONT+56                              00458 00001
00350OBSER    DS.  10,CONT+79                             00481 00010
00360IND      DS   5                                      00486 00005
00370ID       DS   5                                      00491 00005
00380IDD      DS   5                                      00496 00005
00390FORMAT   DS   5                                      00501 00005
00400INDEX    DS   5                                      00506 00005
00410CONST    DS   5                                      00511 00005
00420DATA1    DS   5                                      00516 00005
00430DATA2    DS   5                                      00521 00005
00440B        DS   5                                      00526 00005
00450SE       DS   5                                      00531 00005
00460T        DS   5                                      00536 00005
00470SUM1     DS   5                                      00541 00005
00480SIGMA    DS   5                                      00546 00005
00490R        DS   5                                      00551 00005
00500WT       DS   5                                      00556 00005
00510ADKK     DS   5                                      00561 00005
00520ADRNN    DS   5                                      00566 00005
00530ADIJ     DS   5                                      00571 00005
```

```
00540ADRIJ      DS    5
00550SIGN3      DS    5
00560COUNT      DS    5
00570CNTR       DS    3
00580CTR        DS    3
00590I          DS    3
00600J          DS    3
00610K          DS    3
00620L          DS    3
00630P          DS    3
00640Q          DS    3
00650MSZ        DS    4
00660IVE        DS    3
00670IVP        DS    3
00680TEMP1      DS    10
00690TEMP2      DS    10
00700A0         DS    10
00710EY         DS    10
00720RSQR       DS    10
00730SQR        DS    10
00740DF         DS    10
00750F          DS    10
00760FIN        DS    10
00770FOUT       DS    10
00780HIGH       DS    10
00790VP         DS    10
00800VE         DS    10
```

```
00576 00005
00581 00005
00586 00005
00589 00003
00592 00003
00595 00003
00598 00003
00601 00003
00604 00003
00607 00003
00610 00003
00614 00004
00617 00003
00620 00003
00630 00010
00640 00010
00650 00010
00660 00010
00670 00010
00680 00010
00690 00010
00700 00010
00710 00010
00720 00010
00730 00010
00740 00010
00750 00010
```



```
00810OUT        DS    80
00820           DC    1,@
00830           DC    8,10000000
00840FPOO1      DC    2,-2
00850           DC    8,10000000
00860FHIGH      DC    2,50
00870           DC    8,0
00880ZERO       DC    2,-99
00890ZEROS      DC    10,0
00900           DC    8,10000000
00910ONE        DC    2,1
00920PNUM       DS    4
00930MCNT       DS    3
00940NOIN       DS    3
00950RCNT       DS    3
00960CNTR1      DS    3
00970AGG        DS    10
00980*
00990*  INITIALIZE DEGREES OF FREEDOM
01000*
01010STAR4B TFLS DF,OBSER



01020*
01030*  IS IT FORCED THROUGH THE ORIGIN.
01040*
01050           BD    DF1,CON7

01060           FS    DF,ONE
```

```
00830 00080
00831 00001
00839 00008
00841 00002
00849 00008
00851 00002
00859 00008
00861 00002
00871 00010
00879 00008
00881 00002
00885 00004
00888 00003
00891 00003
00894 00003
00897 00003
00907 00010

00908 16 00911 00931
00920 49 00860 00000
00927 00005    00690
00932 00005    00481

00938 43 00980 00447

00950 16 00911 00973
00962 49 00760 00000
00969 00005    00690
00974 00005    00881
```

```
01070*
01080*  INITIALIZE STEP AND SEQUENCE NUMBER.
01090*
01100DF1    TFM   PST2+11,0,9
01110       TFM   PST2+23,1,8
01120*
01130*  TRANSFORM MATRIX FOR MDV REGRESSION.
01140*
01150*  SET INDEX FOR INDEPENDENT VARIABLE.
01160MD0    BNC4  STW23
01165       TF    COUNT,N
01170       TF    *+18,IND
01180MD01   WNCD  99999
01182       AM    MD01+6,80,10
01184       SM    COUNT,80,10
01186       BP    MD01
01190       TF    PNUM,N
01200       BT    PNCH,SUM1
01210       TF    PNUM,N
01220       BT    PNCH,SIGMA
01230       TF    PNUM,MSZ
01240       BT    PNCH,R
01250       H
01260       DORG  *-9
01270STW23  TF    COUNT,N
01280       TFM   J,1,10
01290       TFLS  HIGH,ZERO
01300       TF    MD1+11,IND
```

```
00980 16 08435 00000
00992 16 08447 00001

01004 47 01162 00400
01016 26 00586 00426
01028 26 01046 00486
01040 38 99999 00400
01052 11 01046 00080
01064 12 00586 00080
01076 46 01040 01100
01088 26 00885 00426
01100 27 08706 00541
01112 26 00885 00426
01124 27 08706 00546
01136 26 00885 00614
01148 27 08706 00551
01160 48 00000 00000
01162
01162 26 00586 00426
01174 16 00598 00001
01186 16 09911 01209
01198 49 09860 00000
01205 00005    00730
01210 00005    00861
01216 26 01239 00486
```



```
01310MD1    BD    *+20,99999
01320       B     MD3
01330       DORG  *-3
01340MD2    AM    MD1+11,1,10
01350       AM    J,1,10
01360       SM    COUNT,1,10
01370       BP    MD1
01380       B     TSTH
01390       DORG  *-3
01400*
01410*  IS R(J,J) GREATER THAN FP001
01420*
01430MD3    TF    P,J
01440       TF    Q,J
01450       BTM   CADIJ,0,10
01460       TF    ADKK,ADIJ
01470       TF    MD4+28,ADKK
01480       TF    MD11+28,ADKK
01490       TFLS  TEMP1,FP001
01500MD4    FS    TEMP1,99999
01510       BP    MD2
01520*
01530*  AGGREGATE VARIANCE DECREASES.
01540*
01550       TFM   L,1,10
01560       TF    CNTR,N
```

```
01228 43 01248 99999
01240 49 01304 00000
01248
01248 11 01239 00001
01260 11 00598 00001
01272 12 00586 00001
01284 46 01228 01100
01296 49 01944 00000
01304

01304 26 00607 00598
01316 26 00610 00598
01328 17 04212 00000
01340 26 00561 00571
01352 26 01434 00561
01364 26 01742 00561
01376 16 09911 01399
01388 49 09860 00000
01395 00005    00630
01400 00005    00841
01406 16 09911 01429
01418 49 09760 00000
01425 00005    00630
01430 00005    99999
01436 46 01248 01100

01448 16 00604 00001
01460 26 00589 00426
```

```
01570          TFLS AGG,ZERO


01580          TF   MD5+11,IND
01590MD5       BNR  MDMOD,99999
01600          C    J,L
01610          BP   MD6
01620          TF   P,J
01630          TF   Q,L
01640          BTM  CADIJ,0,10
01650          B    MD7
01660          DORG *-3
01670MD6       TF   P,L
01680          TF   Q,J
01690          BTM  CADIJ,0,10
01700MD7       TF   MD9+28,ADIJ
01710          TF   MD10+28,ADIJ
01720MD9       TFLS TEMP1,99999


01730MD10      FM   TEMP1,99999


01740MD11      FD   TEMP1,99999


01750          FA   AGG,TEMP1
```

```
01472 16 09911 01495
01484 49 09860 00000
01491 00005    00907
01496 00005    00861

01502 26 01525 00486

01514 45 01774 99999

01526 24 00598 00604

01538 46 01594 01100

01550 26 00607 00598

01562 26 00610 00604

01574 17 04212 00000

01586 49 01630 00000

01594

01594 26 00607 00604

01606 26 00610 00598

01618 17 04212 00000

01630 26 01682 00571

01642 26 01712 00571

01654 16 09911 01677
01666 49 09860 00000
01673 00005    00630
01678 00005    99999

01684 16 09911 01707
01696 49 09800 00000
01703 00005    00630
01708 00005    99999

01714 16 09911 01737
01726 49 09820 00000
01733 00005    00630
01738 00005    99999

01744 16 09911 01767
01756 49 09780 00000
01763 00005    00907
01768 00005    00630
```



```
01760MDMOD     AM   L,1,10
01770          AM   MD5+11,1,10
01780          SM   CNTR,1,10
01790          BP   MD5
01800*
01810*  COMPARE AGG WITH HIGH.
01820AG1       TFLS TEMP1,HIGH


01830          FS   TEMP1,AGG


01840          BP   MD2
01850          TFLS HIGH,AGG


01860          TF   K,J
01870          B    MD2
01880          DORG *-3
01890*
01900*  TEST IF HIGH = ZERO.
01910*
01920TSTH      C    HIGH,ZERO
01930          BE   FINISH
01940          TFM  RET3+6,*+20
01950          B    MT
01960          DORG *-3
01970          RCTY
01980          TF   OUT,K
01990          WNTY OUT-1
```

```
01774 11 00604 00001

01786 11 01525 00001

01798 12 00589 00001

01810 46 01514 01100


01822 16 09911 01845
01834 49 09860 00000
01841 00005    00630
01846 00005    00730

01852 16 09911 01875
01864 49 09760 00000
01871 00005    00630
01876 00005    00907

01882 46 01248 01100

01894 16 09911 01917
01906 49 09860 00000
01913 00005    00730
01918 00005    00907

01924 26 00601 00598

01936 49 01248 00000

01944


01944 24 00730 00861

01956 46 02062 01200

01968 16 04510 01988

01980 49 02742 00000

01988

01988 34 00000 00102

02000 26 00830 00601

02012 38 00829 00100
```

```
02000          FS    DF,ONE


02010          B     MDO
02020          DORG  *-3
02030FINISH    BTM   CNOIN,0,10
02040          TF    MCNT,N
02050          TFM   IVE,1,10
02060          TF    MDV1+11,IND
02070MDV1      BNR   MDVMOD,99999
02080          TF    L,IVE
02090          TFM   RET5+6,*+20
02100          B     CREGO
02110          DORG  *-3
02120          TFM   RET4+6,*+20
02130          B     PST
02140          DORG  *-3
02150          BD    MDVMOD,CON8
02160          TFM   RET6+6,*+20
02170          B     PREG
02180          DORG  *-3
02190MDVMOD    AM    IVE,1,10
02200          AM    MDV1+11,1,10
02210          SM    MCNT,1,10
02220          BP    MDV1
02230*  ARE REGRESSION STATISTICS WANTED FOR EXCLUDED INDEPENDENT
02240*    VARIABLES.
02250*
02260CMEX      BD    *+20,CON18
```

```
02024 16 09911 ð2047
02036 49 09760 00000
02043 00005    ð0690
02048 00005    ð0881
02054 49 01004 00000
02062
02062 17 06862 000ð0
02074 26 00888 00426
02086 16 00617 000ð1
02098 26 02121 00486
02110 45 02206 99999
02122 26 00604 00617
02134 16 06858 ð2154
02146 49 04512 00000
02154
02154 16 08418 ð2174
02166 49 08062 00000
02174
02174 43 02206 00448
02186 16 08060 ð2206
02198 49 07316 00000
02206
02206 11 00617 000ð1
02218 11 02121 000ð1
02230 12 00888 000ð1
02242 46 02110 01100
02254 43 02274 00458
```



```
02270          B     CMTRA
02280          DORG  *-3
02290          BTM   CNOIN,0,10
02300          TF    MCNT,N
02310          TFM   IVE,1,10
02320          TF    EX1+11,IND
02330EX1       BD    EXMOD,99999
02340          TF    L,IVE
02350          TFM   RET5+6,*+20
02360          B     CREGO
02370          DORG  *-3
02380          TFM   RET4+6,*+20
02390          B     PST
02400          DORG  *-3
02410          BD    EXMOD,CON8
02420          TFM   RET6+6,*+20
02430          B     PREG
02440          DORG  *-3
02450EXMOD     AM    IVE,1,10
02460          AM    EX1+11,1,10
02470          SM    MCNT,1,10
02480          BP    EX1
02490*
02500*       IS TRANSFORMED MATRIX PUNCHED.
02510*
02520CMTRA     BD    *+20,CON12
02530          B     CMRE
02540          DORG  *-3
```

```
02266 49 02466 00000
02274
02274 17 06862 000ð0
02286 26 00888 00426
02298 16 00617 000ð1
02310 26 02333 00486
02322 43 02418 99999
02334 26 00604 00617
02346 16 06858 ð2366
02358 49 04512 00000
02366
02366 16 08418 ð2386
02378 49 08062 00000
02386
02386 43 02418 00448
02398 16 08060 ð2418
02410 49 07316 00000
02418
02418 11 00617 000ð1
02430 11 02333 000ð1
02442 12 00888 000ð1
02454 46 02322 01100

02466 43 02486 00452
02478 49 02510 00000
02486
```

```
02550          TF    PNUM,MSZ
02560          BT    PNCH,R
02570*
02580*   IS MATRIX REINVERTED.
02590*
02600CMRE      BD    *+20,CON13
02610          B     FINAL
02620          DORG  *-3
02630*
02640*   REINVERT MATRIX AND PUNCH.
02650*
02660          TF    COUNT,N
02670          TFM   K,1,10
02680          TF    RE1+11,IND
02690          TF    RE2+11,IND
02700RE1       BNR   *+20,99999
02710          B     REMOD
02720          DORG  *-3
02730RE2       BD    *+20,99999
02740          B     REMOD
02750          DORG  *-3
02760          TFM   RET3+6,*+20
02770          B     MT
02780          DORG  *-3
02790REMOD     AM    K,1,10
02800          AM    RE1+11,1,10
02810          AM    RE2+11,1,10
02820          SM    COUNT,1,10
02830          BP    RE1
02840          TF    PNUM,MSZ
```

```
02486 26 00885 00614
02498 27 08706 00551

02510 43 02530 00453
02522 49 02722 00000
02530

02530 26 00586 00426
02542 16 00601 000ō1
02554 26 02589 00486
02566 26 02609 00486
02578 45 02598 99999
02590 49 02638 00000
02598
02598 43 02618 99999
02610 49 02638 00000
02618
02618 16 04510 ō2638
02630 49 02742 00000
02638
02638 11 00601 000ō1
02650 11 02589 000ō1
02662 11 02609 000ō1
02674 12 00586 000ō1
02686 46 02578 01100
02698 26 00885 00614
```



```
02850          BT    PNCH,R
02860FINAL     RNCD  0
02870          B     0
02880          DORG  *-3
02890*    *    *    *    *    *    *    *    *
02900*   MATRIX TRANSFORMATION SUBROUTINE.    *
02910*    *    *    *    *    *    *    *    *
02920*    TEST IF ADDING OR DELETING VARIABLE
02930*
02940MT        TF    MT1+11,IND
02950          SM    MT1+11,1,10
02960          A     MT1+11,K
02970MT1       BD    DEL,99999
02980          TFM   GTFM1+11,0
02990          TDM   CA99+11,1
03000          B     MT2
03010          DORG  *-3
03020DEL       TFM   GTFM1+11,5
03030          TDM   CA99+11,0
03040MT2       TF    P,K
03050          TF    Q,K
03060CKK1      BTM   CADIJ,0,10
03070          TF    CKK2+28,ADIJ
03080          TF    CKK3+23,ADIJ
03090          TF    CKK4+23,ADIJ
03100*
03110*   COMPUTE INVERSE OF PIVOT ELEMENT.
03120*
03130CKK2      TFLS  TEMP1,99999
```

```
02710 27 08706 00551
02722 36 00000 00500
02734 49 00000 00000
02742

02742 26 02789 00486
02754 12 02789 000ō1
02766 21 02789 00601
02778 43 02822 99999
02790 16 03115 ō0000
02802 15 04365 00001
02814 49 02846 00000
02822
02822 16 03115 ō0005
02834 15 04365 00000
02846 26 00607 00601
02858 26 00610 00601
02870 17 04212 000ō0
02882 26 02946 00571
02894 26 02971 00571
02906 26 03001 00571

02918 16 09911 ō2941
02930 49 09860 00000
02937 00005    ō0630
02942 00005    99999
```

```
03140CKK3    TFLS 99999,ONE
03150CKK4    FD   99999,TEMP1
03160        TF   GTFM7+28,ADIJ
03170        TF   RTFM1+28,ADIJ
03180        TF   RTFM1+23,ADIJ
03190        TF   CTFM2+28,ADIJ
03200        AM   RTFM1+23,10,10
03210*
03220*  GENERAL MATRIX ELEMENT TRANSFORMATION.
03230*
03240GENTFM  TFM  I,1,10
03250        TFM  J,1,10
03260        TF   ADRIJ,R
03270GTFM1   TFM  SIGN3,0
03280        C    K,I
03290        BE   NEXT
03300        C    K,J
03310        BE   NEXT
03320        BH   KGRJ
03330        A    SIGN3,GTFM1+11
03340        TF   P,K
03350        TF   Q,J
03360GTFM2   BTM  CADIJ,0,10
03370        TF   GTFM4+28,ADIJ
03380        C    I,K
```

```
02948 16 09911 00271
02960 49 09860 00000
02967 00005    99999
02972 00005    00881
02978 16 09911 00301
02990 49 09820 00000
02997 00005    99999
03002 00005    00630
03008 26 03396 00571
03020 26 03962 00571
03032 26 03957 00571
03044 26 04108 00571
03056 11 03957 00010
03068 16 00595 00001
03080 16 00598 00001
03092 26 00576 00551
03104 16 00581 00000
03116 24 00601 00595
03128 46 03786 01200
03140 24 00601 00598
03152 46 03786 01200
03164 46 03510 01100
03176 21 00581 03115
03188 26 00607 00601
03200 26 00610 00598
03212 17 04212 00000
03224 26 03336 00571
03236 24 00595 00601
```



```
03390        BH   IGRK
03400        TF   P,I
03410        TF   Q,K
03420GTFM3   BTM  CADIJ,0,10
03430        TF   GTFM41+28,ADIJ
03440GTFM4   TFLS TEMP1,99999
03450GTFM41  FM   TEMP1,99999
03460GTFM7   FM   TEMP1,99999
03470        BD   GTFM5,SIGN3
03480        TF   GTFM6+23,ADRIJ
03490GTFM6   FS   99999,TEMP1
03500        B    NEXT
03510        DORG *-3
03520GTFM5   TF   GTFM8+23,ADRIJ
03530GTFM8   FA   99999,TEMP1
03540        B    NEXT
03550        DORG *-3
03560*
03570*  K GREATER THAN J.
03580*
03590KGRJ    TF   P,J
```

```
03248 46 03642 01100
03260 26 00607 00595
03272 26 00610 00601
03284 17 04212 00000
03296 26 03366 00571
03308 16 09911 00331
03320 49 09860 00000
03327 00005    00630
03332 00005    99999
03338 16 09911 00361
03350 49 09800 00000
03357 00005    00630
03362 00005    99999
03368 16 09911 00391
03380 49 09800 00000
03387 00005    00630
03392 00005    99999
03398 43 03460 00581
03410 26 03445 00576
03422 16 09911 00345
03434 49 09760 00000
03441 00005    99999
03446 00005    00630
03452 49 03786 00000
03460
03460 26 03495 00576
03472 16 09911 00395
03484 49 09780 00000
03491 00005    99999
03496 00005    00630
03502 49 03786 00000
03510
03510 26 00607 00598
```

```
03600          TF    Q,K
03610          TF    KGRJ1+11,IND
03620          SM    KGRJ1+11,1,10
03630          A     KGRJ1+11,J
03640          TF    KGRJ11+11,KGRJ1+11
03650KGRJ11    BNR   KGRJ1,99999
03660          B     GTFM2
03670          DORG  *-3
03680KGRJ1     BD    KGRJ2,99999
03690          B     GTFM2
03700          DORG  *-3
03710KGRJ2     AM    SIGN3,5,10
03720          B     GTFM2
03730          DORG  *-3
03740*
03750*  I GREATER THAN K.
03760*
03770IGRK      TF    P,K
03780          A     SIGN3,GTFM1+11
03790          TF    Q,I
03800          TF    IGRK1+11,IND
03810          SM    IGRK1+11,1,10
03820          A     IGRK1+11,I
03830          TF    IGRK11+11,IGRK1+11
03840IGRK11    BNR   IGRK1,99999
03850          B     GTFM3
03860          DORG  *-3
03870IGRK1     BD    IGRK2,99999
```

```
03522 26 00610 00601
03534 26 03613 00486
03546 12 03613 00001
03558 21 03613 00598
03570 26 03593 03613
03582 45 03602 99999
03594 49 03212 00000
03602
03602 43 03622 99999
03614 49 03212 00000
03622
03622 11 00581 00005
03634 49 03212 00000
03642


03642 26 00607 00601
03654 21 00581 03115
03666 26 00610 00595
03678 26 03757 00486
03690 12 03757 00001
03702 21 03757 00595
03714 26 03737 03757
03726 45 03746 99999
03738 49 03284 00000
03746
03746 43 03766 99999
```



```
03880          B     GTFM3
03890          DORG  *-3
03900IGRK2     AM    SIGN3,5,10
03910          B     GTFM3
03920          DORG  *-3
03930*
03940*  SET UP NEXT TRANSFORMATION.
03950*
03960NEXT      AM    ADRIJ,10,10
03970          C     N,J
03980          BE    N1
03990          AM    J,1,10
04000          B     GTFM1
04010          DORG  *-3
04020N1        C     N,I
04030          BE    ROWTFM
04040          AM    I,1,10
04050          TF    J,I
04060          B     GTFM1
04070          DORG  *-3
04080*
04090*  PIVOT ROW TRANSFORMATION.
04100*
04110ROWTFM    TF    J,K
04120          C     J,N
04130          BE    COLTFM
04140RTFM1     FM    99999,99999
```

```
03758 49 03284 00000
03766
03766 11 00581 00005
03778 49 03284 00000
03786


03786 11 00576 00010
03798 24 00426 00598
03810 46 03842 01200
03822 11 00598 00001
03834 49 03104 00000
03842
03842 24 00426 00595
03854 46 03898 01200
03866 11 00595 00001
03878 26 00598 00595
03890 49 03104 00000
03898


03898 26 00598 00601
03910 24 00598 00426
03922 46 03996 01200
03934 16 09911 03957
03946 49 09800 00000
03953 00005    99999
03958 00005    99999
```

```
04150          AM    J,1,10
04160          AM    RTFM1+23,10,10
04170          B     ROWTFM+12
04180          DORG  *-3
04190*
04200*  PIVOT COLUMN TRANSFORMATION
04210*
04220COLTFM    TF    I,K
04230CTFM4     SM    I,1,10
04240          BE    CA98
04250          TF    P,I
04260          TF    Q,K
04270CTFM1     BTM   CADIJ,0,10
04280          TF    CTFM2+23,ADIJ
04290CTFM2     FM    99999,99999


04300          TF    CTFM3+11,CTFM2+23
04310          SM    CTFM3+11,2,10
04320          TF    CTFM5+6,CTFM3+11
04330          TF    CTFM6+6,CTFM3+11
04340CTFM3     BNF   CTFM6,99999
04350CTFM5     CF    99999
04360          B     CTFM4
04370          DORG  *-3
04380CTFM6     SF    99999
04390          B     CTFM4
04400          DORG  *-3
```

```
03964 11 00598 00001
03976 11 03957 00010
03988 49 03910 00000
03996


03996 26 00595 00601
04008 12 00595 00001
04020 46 04318 01200
04032 26 00607 00595
04044 26 00610 00601
04056 17 04212 00000
04068 26 04103 00571
04080 16 09911 04103
04092 49 09800 00000
04099 00005    99999
04104 00005    99999
04110 26 04169 04103
04122 12 04169 00002
04134 26 04176 04169
04146 26 04196 04169
04158 44 04190 99999
04170 33 99999 00000
04182 49 04008 00000
04190
04190 32 99999 00000
04202 49 04008 00000
04210
```



```
04410*
04420*  CALCULATE ELEMENT ADDRESSES.
04430*
04440          DS    2
04450CADIJ     S     Q,P
04460          TF    ADIJ,R
04470          TF    CNTR1,N
04480AAA       SM    P,1,10
04490          BE    BB
04500          A     ADIJ-1,CNTR1
04510          SM    CNTR1,1,10
04520          B     AAA
04530          DORG  *-3
04540BB        A     ADIJ-1,Q
04550          BB
04560          DORG  *-9
04570*
04580*  SET IND.
04590*
04600CA98      TF    CA99+6,IND
04610          SM    CA99+6,1,10
04620          A     CA99+6,K
04630CA99      TDM   99999,0
04640*
04650*  SET NEGATIVE DIAGONAL ELEMENTS = ZERO.
04660*
04670          TF    CNTR1,N
04680          TF    SP1+11,R
04690          SM    SP1+11,2,10
04700SP1       BNF   SP3,99999
04710          TF    SP2+23,SP1+11
```

```
04211 00002
04212 22 00610 00607
04224 26 00571 00551
04236 26 00897 00426
04248 12 00607 00001
04260 46 04304 01200
04272 21 00570 00897
04284 12 00897 00001
04296 49 04248 00000
04304
04304 21 00570 00610
04316 42 00000 00000
04318
04318 26 04360 00486
04330 12 04360 00001
04342 21 04360 00601
04354 15 99999 00000
04366 26 00897 00426
04378 26 04413 00551
04390 12 04413 00002
04402 44 04468 99999
04414 26 04461 04413
```

```
04720        AM    SP2+23,2,10
04730SP2     TFLS  99999,ZERO
04740SP3     A     SP1+10,CNTR1
04750        SM    CNTR1,1,10
04760        BP    SP1
04770RET3    B     99999
04780        DORG  *-3
04790*    *    *    *    *    *    *    *    *    *    *    *    *    *    *
04800*  SUBROUTINE TO CALCULATE REGRESSION STATISTICS FOR STEP OR MDV.    *
04810*    *    *    *    *    *    *    *    *    *    *    *    *    *    *
04820*
04830CREGO   TF    P,L
04840        TF    Q,L
04850        BTM   CADIJ,0,10
04860        TF    ADRNN,ADIJ
04870CREG    TF    CALCE+28,ADRNN
04880        TF    CE1+28,SIGMA
04890        SM    CE1+28,10,10
04900        A     CE1+27,L
04910CALCE   TFLS  EY,99999
04920        C     DF,ZERO
04930        BE    CALCB
04940        FD    EY,DF
```

```
04426 11 04461 00002

04438 16 09911 04461
04450 49 09860 00000
04457 00005    99999
04462 00005    00861

04468 21 04412 00897

04480 12 00897 00001

04492 46 04402 01100

04504 49 99999 00000

04512

04512 26 00607 00604

04524 26 00610 00604

04536 17 04212 00000

04548 26 00566 00571

04560 26 04636 00566

04572 26 04780 00546

04584 12 04780 00010

04596 21 04779 00604

04608 16 09911 04631
04620 49 09860 00000
04627 00005    00660
04632 00005    99999

04638 24 00690 00861

04650 46 04782 01200

04662 16 09911 04685
04674 49 09820 00000
04681 00005    00660
04686 00005    00690
```



```
04950        FM    EY,OBSER
04960        FSQR  EY,EY
04970CE1     FM    EY,99999
04980*
04990*   CALCULATE COEFFICIENTS, STANDARD ERRORS AND T RATIOS.
05000*
05010CALCB   TFM   1,1,10
05020        TF    RCNT,N
05030        TF    CA1+11,IND
05040        TF    CA4+28,SIGMA
05050        SM    CA4+28,10,10
05060        A     CA4+27,L
05070        TF    CA5+28,SIGMA
05080        TF    CA6+23,B
05090        TF    SE3+28,SIGMA
05100        TF    SE4+23,SE
05110        TF    T1+23,T
05120        TF    T1+28,B
05130        TF    T2+23,T
05140        TF    T2+28,SE
05150        TF    SETID+6,ID
05160CA1     BD    *+20,99999
05170        B     BMOD
05180        DORG  *-3
```

```
04692 16 09911 04715
04704 49 09800 00000
04711 00005    00660
04716 00005    00481

04722 16 09911 04745
04734 49 09840 00000
04741 00005    00660
04746 00005    00660

04752 16 09911 04775
04764 49 09800 00000
04771 00005    00660
04776 00005    99999

04782 16 00595 00001

04794 26 00894 00426

04806 26 04973 00486

04818 26 05212 00546

04830 12 05212 00010

04842 21 05211 00604

04854 26 05242 00546

04866 26 05335 00526

04878 26 05538 00546

04890 26 05563 00531

04902 26 05617 00536

04914 26 05622 00526

04926 26 05647 00536

04938 26 05652 00531

04950 26 05660 00491

04962 43 04982 99999

04974 49 05750 00000

04982
```

```
05190          TF    *+23,CA1+11
05200          BNR   *+20,99999
05210          B     BMOD
05220          DORG  *-3
05230CA2       C     I,L
05240          BE    BMOD
05250          BP    IGRL
05260ILL       TF    P,I
05270          TF    Q,L
05280          BTM   CADIJ,0,10
05290          TF    CA3+28,ADIJ
05300          B     CA3
05310          DORG  *-3
05320IGRL      TF    P,L
05330          TF    Q,I
05340          BTM   CADIJ,0,10
05350          TF    CA3+28,ADIJ
05360CA3       TFLS  TEMP1,99999


05370CA4       FM    TEMP1,99999


05380CA5       FD    TEMP1,99999


05390          C     I,L
```

```
04982 26 05005 04973
04994 45 05014 99999
05006 49 05750 00000
05014
05014 24 00595 00604
05026 46 05750 01200
05038 46 05106 01100
05050 26 00607 00595
05062 26 00610 00604
05074 17 04212 00000
05086 26 05182 00571
05098 49 05154 00000
05106
05106 26 00607 00604
05118 26 00610 00595
05130 17 04212 00000
05142 26 05182 00571
05154 16 09911 05177
05166 49 09860 00000
05173 00005    00630
05178 00005    99999
05184 16 09911 05207
05196 49 09800 00000
05203 00005    00630
05208 00005    99999
05214 16 09911 05237
05226 49 09820 00000
05233 00005    00630
05238 00005    99999
05244 24 00595 00604
```



```
05400          BN    CA6
05410          BNF   CA55,TEMP1-2
05420          CF    TEMP1-2
05430          B     CA6
05440          DORG  *-3
05450CA55      SF    TEMP1-2
05460CA6       TFLS  99999,TEMP1


05470*
05480*  CALCULATE SE OF B(I).
05490*
05500          TF    P,I
05510          TF    Q,I
05520          BTM   CADIJ,0,10
05530          TF    SE1+28,ADIJ
05540SE1       TFLS  TEMP1,99999


05550SE2       FD    TEMP1,OBSER


05560          FSQR  TEMP1,TEMP1


05570          FM    TEMP1,EY


05580SE3       FD    TEMP1,99999
```

```
05256 47 05312 01300
05268 44 05300 00628
05280 33 00628 00000
05292 49 05312 00000
05300
05300 32 00628 00000
05312 16 09911 05335
05324 49 09860 00000
05331 00005    99999
05336 00005    00630
05342 26 00607 00595
05354 26 00610 00595
05366 17 04212 00000
05378 26 05418 00571
05390 16 09911 05413
05402 49 09860 00000
05409 00005    00630
05414 00005    99999
05420 16 09911 05443
05432 49 09820 00000
05439 00005    00630
05444 00005    00481
05450 16 09911 05473
05462 49 09840 00000
05469 00005    00630
05474 00005    00630
05480 16 09911 05503
05492 49 09800 00000
05499 00005    00630
05504 00005    00660
05510 16 09911 05533
05522 49 09820 00000
05529 00005    00630
05534 00005    99999
```

```
05590SE4    TFLS 99999,TEMP1

05600*
05610*  TEST IF EY = ZERO.
05620*
05630       C    EY,ZERO
05640       BE   SETID
05650*
05660*   COMPUTE T(I).
05670*
05680T1     TFLS 99999,99999

05690T2     FD   99999,99999

05700*
05710*  SET ID.
05720*
05730SETID  TF   99999,I
05740       AM   CA6+23,10,10
05750       AM   SE4+23,10,10
05760       AM   T1+23,10,10
05770       AM   T1+28,10,10
05780       AM   T2+23,10,10
05790       AM   T2+28,10,10
05800       AM   SETID+6,2,10
05810BMOD   AM   CA1+11,1,10
05820       AM   CA5+28,10,10
05830       AM   SE3+28,10,10
05840       AM   I,1,10
```

```
05540 16 09911 ð5563
05552 49 09860 00000
05559 00005    99999
05564 00005    ð0630

05570 24 00660 00861

05582 46 05654 01200

05594 16 09911 ð5617
05606 49 09860 00000
05613 00005    99999
05618 00005    99999

05624 16 09911 ð5647
05636 49 09820 00000
05643 00005    99999
05648 00005    99999

05654 26 99999 00595
05666 11 05335 000Tð
05678 11 05563 000Tð
05690 11 05617 000Tð
05702 11 05622 000Tð
05714 11 05647 000Tð
05726 11 05652 000Tð
05738 11 05660 000ð2
05750 11 04973 000ð1
05762 11 05242 000Tð
05774 11 05538 000Tð
05786 11 00595 000ð1
```



```
05850       SM   RCNT,1,10
05860       BP   CA1
05870*
05880*  CALCULATE CONSTANT TERM
05890*
05900       BD   *+20,CON7
05910       B    CAO
05920       DORG *-3
05930       TFLS AO,ZERO

05940       B    CSQR
05950       DORG *-3
05960CAO    TF   CA01+28,SUM1
05970       SM   CA01+28,10,10
05980       A    CA01+27,L
05990CA01   TFLS AO,99999

06000       TF   RCNT,N
06010       TFM  I,1,10
06020       TF   CA02+11,IND
06030       TF   CA03+11,IND
06040       TF   CA04+28,B
06050       TF   CA05+28,SUM1
06060       C    L,I
06070       BE   CAMOD
06080CA02   BD   CA03,99999
06090       B    CAMOD
```

```
05798 12 00894 000ð1
05810 46 04962 01100

05822 43 05842 00447
05834 49 05880 00000
05842
05842 16 09911 ð5865
05854 49 09860 00000
05861 00005    ð0650
05866 00005    ð0861
05872 49 06256 00000
05880
05880 26 05944 00541
05892 12 05944 000Tð
05904 21 05943 00604
05916 16 09911 ð5939
05928 49 09860 00000
05935 00005    ð0650
05940 00005    99999
05946 26 00894 00426
05958 16 00595 000ð1
05970 26 06053 00486
05982 26 06073 00486
05994 26 06110 00526
06006 26 06140 00541
06018 24 00604 00595
06030 46 06184 01200
06042 43 06062 99999
06054 49 06184 00000
```

```
06100          DORG *-3
06110CA03      BNR  *+20,99999
06120          B    CAMOD
06130          DORG *-3
06140CA04      TFLS TEMP1,99999

06150CA05      FM   TEMP1,99999

06160          FS   A0,TEMP1

06170          AM   CA04+28,10,10
06180CAMOD     AM   CA02+11,1,10
06190          AM   CA03+11,1,10
06200          AM   CA05+28,10,10
06210          AM   1,1,10
06220          SM   RCNT,1,10
06230          BP   CA02
06240*
06250*   CALCULATE SUM OF SQUARED RESIDUALS.
06260*
06270CSQR      TF   SQR1+28,ADRNN
06280          TF   SQR2+28,SIGMA
06290          SM   SQR2+28,10,10
06300          A    SQR2+27,L
06310          TF   SQR3+28,SQR2+28
06320SQR1      TFLS SQR,99999
```

```
06062

06062 45 06082 99999

06074 49 06184 00000

06082

06082 16 09911 0ð6105
06094 49 09860 00000
06101 00005    0ð630
06106 00005    99999

06112 16 09911 0ð6135
06124 49 09800 00000
06131 00005    0ð630
06136 00005    99999

06142 16 09911 0ð6165
06154 49 09760 00000
06161 00005    0ð650
06166 00005    0ð630

06172 11 06110 000T0

06184 11 06053 000ð1

06196 11 06073 000ð1

06208 11 06140 000T0

06220 11 00595 000ð1

06232 12 00894 000ð1

06244 46 06042 01100


06256 26 06344 00566

06268 26 06374 00546

06280 12 06374 000T0

06292 21 06373 00604

06304 26 06404 06374

06316 16 09911 0ð6339
06328 49 09860 00000
06335 00005    0ð680
06340 00005    99999
```



```
06330SQR2      FM   SQR,99999


06340SQR3      FM   SQR,99999


06350          FM   SQR,OBSER

06360*
06370*   CALCULATE RSQR.
06380*
06390          TF   CR1+28,SIGMA
06400          SM   CR1+28,10,10
06410          A    CR1+27,L
06420          TF   CR2+28,CR1+28
06430CR1       TFLS TEMP1,99999

06440CR2       FM   TEMP1,99999


06450          BD   *+20,CON7
06460          B    CR4
06470          DORG *-3
06480          TF   CR3+28,SUM1
06490          SM   CR3+28,10,10
06500          A    CR3+27,L
06510          TF   CR35+28,CR3+28
06520CR3       TFLS TEMP2,99999
```

```
06346 16 09911 0ð6369
06358 49 09800 00000
06365 00005    0ð680
06370 00005    99999

06376 16 09911 0ð6399
06388 49 09800 00000
06395 00005    0ð680
06400 00005    99999

06406 16 09911 0ð6429
06418 49 09800 00000
06425 00005    0ð680
06430 00005    0ð481


06436 26 06512 00546

06448 12 06512 000T0

06460 21 06511 00604

06472 26 06542 06512

06484 16 09911 0ð6507
06496 49 09860 00000
06503 00005    0ð630
06508 00005    99999

06514 16 09911 0ð6537
06526 49 09800 00000
06533 00005    0ð630
06538 00005    99999

06544 43 06564 00447

06556 49 06702 00000

06564

06564 26 06640 00541

06576 12 06640 000T0

06588 21 06639 00604

06600 26 06670 06640

06612 16 09911 0ð6635
06624 49 09860 00000
06631 00005    0ð640
06636 00005    99999
```

```
06530CR35   FM    TEMP2,99999

06540       FS    TEMP1,TEMP2

06550CR4    FM    TEMP1,OBSER

06560       TFLS  TEMP2,SQR

06570       FD    TEMP2,TEMP1

06580       TFLS  RSQR,ONE

06590       FS    RSQR,TEMP2

06600RET5   B     99999
06610       DORG  *-3
06620*    *    *    *    *    *    *    *
06630*  SUBROUTINE TO CALCULATE NOIN.  *
06640*    *    *    *    *    *    *    *
06650       DS    2
06660CNOIN  TFM   NOIN,0,9
06670       TF    CN1+11,IND
06680       TF    CNTR1,N
06690CN1    BD    *+20,99999
```

```
06642 16 09911 00665
06654 49 09800 00000
06661 00005    00640
06666 00005    99999

06672 16 09911 00695
06684 49 09760 00000
06691 00005    00630
06696 00005    00640

06702 16 09911 00725
06714 49 09800 00000
06721 00005    00630
06726 00005    00481

06732 16 09911 00755
06744 49 09860 00000
06751 00005    00640
06756 00005    00680

06762 16 09911 00785
06774 49 09820 00000
06781 00005    00640
06786 00005    00630

06792 16 09911 00815
06804 49 09860 00000
06811 00005    00670
06816 00005    00881

06822 16 09911 00845
06834 49 09760 00000
06841 00005    00670
06846 00005    00640

06852 49 99999 00000

06860



06861 00002

06862 16 00891 00000

06874 26 06909 00486

06886 26 00897 00426

06898 43 06918 99999
```



```
06700       B     CNMOD
06710       DORG  *-3
06720       TF    CN2+11,CN1+11
06730CN2    BNR   *+20,99999
06740       B     CNMOD
06750       DORG  *-3
06760       AM    NOIN,1,10
06770CNMOD  AM    CN1+11,1,10
06780       SM    CNTR1,1,10
06790       BP    CN1
06800       BB
06810       DORG  *-9
06820HDNG0  DAC   21,DEP VAR       =     @
06830HDNG1  DAC   18,STD ERR Y.X   =  @
06840HDNG2  DAC   18,R SQUARED     =  @
06850HDNG3  DAC   18,SUM SQR RES   =  @
06860HDNG4  DAC   21,IND VAR USED  =     @
06870HDNG5  DAC   18,CONSTANT TERM =  @
06880HDNG6  DAC   16,VAR       COEFF@
06890HDNG7  DAC   28,       STD ERR      T RATIO@
06900*    *    *    *    *    *    *    *    *    *
06910*  SUBROUTINE TO PRINT REGRESSION STATISTICS.    *
06920*    *    *    *    *    *    *    *    *    *
06930PREG   RCTY
06940       RCTY
06950       WATY  HDNG0
06960       BT    WRNUM,L
06970       RCTY
```

```
06910 49 06962 00000
06918
06918 26 06941 06909
06930 45 06950 99999
06942 49 06962 00000
06950
06950 11 00891 00001
06962 11 06909 00001
06974 12 00897 00001
06986 46 06898 01100
06998 42 00000 00000
07000
07001 00021
07043 00018
07079 00018
07115 00018
07151 00021
07193 00018
07229 00016
07261 00028

07316 34 00000 00102
07328 34 00000 00102
07340 39 07001 00100
07352 27 08796 00604
07364 34 00000 00102
```

```
06980          WATY HDNG1
06990          BTFS FLTFIX,EY


07000          WATY OUTPUT-20
07010          RCTY
07020          WATY HDNG2
07030          BTFS FLTFIX,RSQR


07040          WATY OUTPUT-20
07050          RCTY
07060          WATY HDNG3
07070          BTFS FLTFIX,SQR


07080          WATY OUTPUT-20
07090          RCTY
07100          WATY HDNG4
07110          BT   WRNUM,NOIN
07120          RCTY
07130          RCTY
07140          WATY HDNG5
07150          BTFS FLTFIX,AO


07160          WATY OUTPUT-20
07170          RCTY
```

```
07376 39 07043 00100

07388 16 09911 07411
07400 49 09880 00000
07407 00005    08844
07412 00005    00660

07418 39 09711 00100

07430 34 00000 00102

07442 39 07079 00100

07454 16 09911 07477
07466 49 09880 00000
07473 00005    08844
07478 00005    00670

07484 39 09711 00100

07496 34 00000 00102

07508 39 07115 00100

07520 16 09911 07543
07532 49 09880 00000
07539 00005    08844
07544 00005    00680

07550 39 09711 00100

07562 34 00000 00102

07574 39 07151 00100

07586 27 08796 00891

07598 34 00000 00102

07610 34 00000 00102

07622 39 07193 00100

07634 16 09911 07657
07646 49 09880 00000
07653 00005    08844
07658 00005    00650

07664 39 09711 00100

07676 34 00000 00102
```

```
07180          RCTY
07190          WATY HDNG6
07200          WATY HDNG7
07210          RCTY
07220          TF   CNTR1,NOIN
07230          TF   W1+11,ID
07240          TF   W2+28,B
07250          TF   W3+28,SE
07260          TF   W4+28,T
07270W1        BT   WRNUM,99999
07280          TBTY
07290W2        BTFS FLTFIX,99999


07300          WATY OUTPUT-20
07310          TBTY
07320W3        BTFS FLTFIX,99999


07330          WATY OUTPUT-20
07340          TBTY
07350W4        BTFS FLTFIX,99999


07360          WATY OUTPUT-20
07370          RCTY
07380          AM   W1+11,2,10
07390          AM   W2+28,10,10
```



```
07688 34 00000 00102

07700 39 07229 00100

07712 39 07261 00100

07724 34 00000 00102

07736 26 00897 00891

07748 26 07807 00491

07760 26 07848 00526

07772 26 07902 00531

07784 26 07956 00536

07796 27 08796 99999

07808 34 00000 00108

07820 16 09911 07843
07832 49 09880 00000
07839 00005    08844
07844 00005    99999

07850 39 09711 00100

07862 34 00000 00108

07874 16 09911 07897
07886 49 09880 00000
07893 00005    08844
07898 00005    99999

07904 39 09711 00100

07916 34 00000 00108

07928 16 09911 07951
07940 49 09880 00000
07947 00005    08844
07952 00005    99999

07958 39 09711 00100

07970 34 00000 00102

07982 11 07807 00002

07994 11 07848 00010
```

```
07400          AM    W3+28,10,10
07410          AM    W4+28,10,10
07420          SM    CNTR1,1,10
07430          BP    W1
07440RET6      B     99999
07450          DORG  *-3
07460*    *    *    *    *    *    *    *    *
07470*  SUBROUTINE TO PUNCH STEP RESULTS.    *
07480*    *    *    *    *    *    *    *    *
07490PST       AM    PST2+11,1,10
07500          TF    OUT-77,PST2+11
07510          TF    OUT-74,L
07520          TF    OUT-71,NOIN
07530          TF    OUT-68,N
07540          TFLS  OUT-50,AO
07550          TFLS  OUT-40,RSOR
07560          TFLS  OUT-30,EY
07570          TFLS  OUT-20,F
07580          TFLS  OUT-10,SOR
07590          TFN   BR+6,*+20
```

```
08006 11 07902 000T0
08018 11 07956 000T0
08030 12 00897 000D1
08042 46 07796 01100
08054 49 99999 00000
08062
```

```
08062 11 08435 000D1
08074 26 00753 08435
08086 26 00756 00604
08098 26 00759 00891
08110 26 00762 00426
08122 16 09911 D8145
08134 49 09860 00000
08141 00005    D0780
08146 00005    D0650
08152 16 09911 D8175
08164 49 09860 00000
08171 00005    D0790
08176 00005    D0670
08182 16 09911 D8205
08194 49 09860 00000
08201 00005    D0800
08206 00005    D0660
08212 16 09911 D8235
08224 49 09860 00000
08231 00005    D0810
08236 00005    D0700
08242 16 09911 D8265
08254 49 09860 00000
08261 00005    D0820
08266 00005    D0680
08272 16 08478 D8292
```



```
07600          B     PST2
07610          DORG  *-3
07620          TF    COUNT,N
07630          TF    CD+6,IND
07640CD        WNCD  99999
07650          AM    CD+6,80,10
07660          SM    COUNT,80,10
07670          BP    CD
07680          AM    PST2+23,1,10
07690          BT    MOVER,B
07700          BT    MOVER,SE
07710          BT    MOVER,T
07720RET4      B     99999
07730PST2      TFM   OUT-4,0,9
07740          TFN   OUT,1,8
07750          WNCD  OUT-79
07760          AM    PST2+23,1,10
07770BR        B     99999
07780MOVER     TF    MV4+28,MAD
07790MAD       DS    ,MOVER-1
07800          TF    TEMP1,NOIN
07810MV1       CM    TEMP1,7,10
07820          BP    MV2
07830          TF    COUNT,TEMP1
07840          B     MV3
07850          DORG  *-3
07860MV2       TFM   COUNT,7,10
```

```
08284 49 08424 00000
08292
08292 26 00586 00426
08304 26 08322 00486
08316 38 99999 00400
08328 11 08322 000B0
08340 12 00586 000B0
08352 46 08316 01100
08364 11 08447 000D1
08376 27 08484 00526
08388 27 08484 00531
08400 27 08484 00536
08412 49 99999 00000
08424 16 00826 00D00
08436 16 00830 0D001
08448 38 00751 00400
08460 11 08447 000D1
08472 49 99999 00000
08484 26 08604 08483
08483 00000
08496 26 00630 00891
08508 14 00630 000D7
08520 46 08552 01100
08532 26 00586 00630
08544 49 08564 00000
08552
08552 16 00586 000D7
```

```
07870MV3     TFM   MV4+23,OUT-70
07880MV4     TFLS  99999,99999



07890        AM    MV4+23,10,10
07900        AM    MV4+28,10,10
07910        SM    COUNT,1,10
07920        BP    MV4
07930        TFM   BR+6,*+20
07940        B     PST2
07950        DORG  *-3
07960        SM    TEMP1,7,10
07970        BP    MV1
07980        BB
07990        DORG  *-9
08000*   *   *   *   *   *
08010*  PUNCH SUBROUTINE.    *
08020*   *   *   *   *   *
08030        DS    5
08040PNCH    WNCD  402
08050        TF    PNCH1+6,PNCH-1
08060        SM    PNCH1+6,9,10
08070PNCH1   WNCD  99999
08080        AM    PNCH1+6,80,10
08090        SM    PNUM,8,10
08100        BP    PNCH1
08110        BB
08120        DORG  *-9
```

```
08564 16 08599 00760

08576 16 09911 08599
08588 49 09860 00000
08595 00005    99999
08600 00005    99999

08606 11 08599 00010
08618 11 08604 00010
08630 12 00586 00001
08642 46 08576 01100
08654 16 08478 08674
08666 49 08424 00000
08674

08674 12 00630 00007
08686 46 08508 01100
08698 42 00000 00000
08700



08704 00005
08706 38 00402 00400
08718 26 08748 08705
08730 12 08748 00009
08742 38 99999 00400
08754 11 08748 00080
08766 12 00885 00008
08778 46 08742 01100
08790 42 00000 00000
08792
```



```
08130        DS    4
08140WRNUM   TF    OUT,NO
08150NO      DS    ,WRNUM-1
08160        CF    OUT-1
08170        WNTY  OUT-1
08180        BB
08190        DORG  *-9
08200*   *   *   *   *   *   *   *   *   *   *   *   *   *
08210*  SUBROUTINE FOR PREPARING DATA FOR ALPHAMERICAL PRINTING OR   *
08220*  PUNCHING.  INTERNAL FORMAT IS SPSII.                          *
08230*   *   *   *   *   *   *   *   *   *   *   *   *   *
08240        DS    10
08250FLTFIX  CF    ARG-9
08260ARG     DS    ,FLTFIX-1
08270        TF    OUTPUT,SEVENS
08280        CF    OUTPUT-9
08290        TF    OUTPUT-10,DCMAL
08300        TFM   OUTPUT-19,0,9
08310        TFM   SIGN,0,10
08320        BNF   JUMP,ARG-2
08330        TDM   SIGN-1,2,11
08340        CF    ARG-2
08350JUMP    CM    ARG,99,1011
08360        BE    WRALPH
08370        CM    ARG,0,10
08380        BNP   DECIML
08390        CM    ARG,4,10
08400        BH    LARGE
```

```
08795 00004
08796 26 00830 08795
08795 00000
08808 33 00829 00000
08820 38 00829 00100
08832 42 00000 00000
08834
08843 00010
08844 33 08834 00000
08843 00000
08856 26 09731 09743
08868 33 09722 00000
08880 26 09721 09753
08892 16 09712 00000
08904 16 09755 00000
08916 44 08952 08841
08928 15 09754 00002
08940 33 08841 00000
08952 14 08843 00099
08964 46 09288 01200
08976 14 08843 00000
08988 47 09334 01100
09000 14 08843 00004
09012 46 09414 01100
```

```
08410          TFM   TRNMT+11,ARG-9
08420          TFM   *+42,OUTPUT-10
08430          S     *+30,ARG
08440          S     *+18,ARG
08450TRNMT     TD    99999,99999
08460          AM    TRNMT+11,1,10
08470          AM    TRNMT+6,2,10
08480          CM    TRNMT+6,OUTPUT-12
08490          BNH   TRNMT
08500          TF    WRITE+23,TRNMT+11
08510          TFM   EXPNT2,5,10
08520          S     EXPNT2,ARG
08530          TFM   *+47,SEVENS
08540          S     *+35,EXPNT2
08550          S     *+23,EXPNT2
08560          A     OUTPUT-12,99999
08570WRITE     TFM   *+18,OUTPUT-8
08580          TD    OUTPUT-8,0
08590          AM    WRITE+23,1,10
08600          AM    WRITE+18,2,10
08610          CM    WRITE+18,OUTPUT
08620          BNH   WRITE+12
08630WRALPH    BD    SETZRO,OUTPUT-18
08640          B     SETSIG
08650          DORG  *-3
08660SETZRO    TDM   OUTPUT,0
```

```
09024 16 09083 ō8834
09036 16 09078 ō9721
09048 22 09078 08843
09060 22 09078 08843
09072 25 99999 99999
09084 11 09083 000ō1
09096 11 09078 000ō2
09108 14 09078 ō9719
09120 47 09072 01100
09132 26 09239 09083
09144 16 09757 000ō5
09156 22 09757 08843
09168 16 09215 ō9743
09180 22 09215 09757
09192 22 09215 09757
09204 21 09719 99999
09216 16 09234 ō9723
09228 25 09723 00000
09240 11 09239 000ō1
09252 11 09234 000ō2
09264 14 09234 ō9731
09276 47 09228 01100
09288 43 09308 09713
09300 49 09620 00000
09308
09308 15 09731 00000
```



```
08670          TF    OUTPUT-20,SIGN
08680          BB
08690          DORG  *-9
08700DECIML    CM    ARG,4,1011
08710          BNH   LARGE
08720          TFM   WRITE+23,ARG-9
08730          TFM   WRITE+18,OUTPUT-8
08740          S     WRITE+18,ARG
08750          S     WRITE+18,ARG
08760          B     WRITE+12
08770          DORG  *-3
08780LARGE     TF    OUTPUT-17,SEVENS-7
08790          BNF   JUMP2,ARG
08800          TFM   OUTPUT-20,20,10
08810          CF    ARG
08820          CF    OUTPUT-19
08830JUMP2     TD    OUTPUT-16,ARG
08840          TD    OUTPUT-18,ARG-1
08850          CF    OUTPUT-18
08860          TF    OUTPUT-12,SIGN
08870          CF    OUTPUT-13
08880          TFM   WR+11,ARG-9
08890          TFM   WR+6,OUTPUT-8
08900WR        TD    99999,99999
08910          AM    WR+11,1,10
08920          AM    WR+6,2,10
```

```
09320 26 09711 09755
09332 42 00000 00000
09334
09334 14 08843 000ō4
09346 47 09414 01100
09358 16 09239 ō8834
09370 16 09234 ō9723
09382 22 09234 08843
09394 22 09234 08843
09406 49 09228 00000
09414
09414 26 09714 09736
09426 44 09474 08843
09438 16 09711 000ō0
09450 33 08843 00000
09462 33 09712 00000
09474 25 09715 08843
09486 25 09713 08842
09498 33 09713 00000
09510 26 09719 09755
09522 33 09718 00000
09534 16 09569 ō8834
09546 16 09564 ō9723
09558 25 99999 99999
09570 11 09569 000ō1
09582 11 09564 000ō2
```

```
08930          CM    WR+6,OUTPUT
08940          BNH   WR
08950          BB
08960          DORG  *-9
08970SETSIG    TFM   SETS+11,OUTPUT-16
08980SETS      BD    SET,OUTPUT-16
08990          AM    SETS+11,2,10
09000          B     SETS
09010          DORG  *-3
09020SET       TF    *+30,SETS+11
09030          SM    *+18,2,10
09040          TF    99999,SIGN
09050          BB
09060          DORG  *-9
09070          DAS   14
09080OUTPUT    DS    2
09090          DAC   1,@
09100SEVENS    DC    10,7070707070
09110DCMAL     DC    10,0000000003
09120SIGN      DS    2
09130EXPNT2    DS    2
09140          DAC   1,0
09150          DEND  STAR4B
```

```
09594 14 09564 09731
09606 47 09558 01100
09618 42 00000 00000
09620
09620 16 09643 09715
09632 43 09664 09715
09644 11 09643 00002
09656 49 09632 00000
09664
09664 26 09694 09643
09676 12 09694 00002
09688 26 99999 09755
09700 42 00000 00000
09702
09703 00014
09731 00002
09733 00001
09743 00010
09753 00010
09755 00002
09757 00002
09759 00001
00908
```

LOAD SUBROUTINES


```
09760 16 10314 T0772
09772 49 09900 0
09780 16 10314 T0816
09792 49 09900 0
09800 16 10314 T1316
09812 49 09900 0
09820 16 10314 T1556
09832 49 09900 0
09840 16 10314 T1892
09852 49 10004 0
09860 16 10314 T2472
09872 49 10004 0
09880 16 10314 T2504
09892 49 10004 0
```

END OF PASS II

00402	CONT	00407	DATE	00409	PROB	00414	NOBS	00417	NFORM
00420	INVAR	00423	NOVAR	00426	N	00429	NDEP	00432	*NOTRAN
00435	NOCON	00437	NCOL	00440	NELIM	00441	CON1	00442	CON2
00443	CON3	00444	CON4	00445	CON5	00446	CON6	00447	CON7
00448	CON8	00449	CON9	00450	CON10	00451	CON11	00452	CON12
00453	CON13	00454	CON14	00455	CON15	00456	CON16	00457	CON17
00458	CON18	00481	OBSER	00486	IND	00491	ID	00496	IDD
00501	*FORMAT	00506	INDEX	00511	CONST	00516	DATA1	00521	DATA2
00526	B	00531	SE	00536	T	00541	SUM1	00546	SIGMA
00551	R	00556	WT	00561	ADKK	00566	ADRNN	00571	ADIJ
00576	ADRIJ	00581	SIGN3	00586	COUNT	00589	CNTR	00592	CTR
00595	I	00598	J	00601	K	00604	L	00607	P
00610	Q	00614	MSZ	00617	IVE	00620	IVP	00630	TEMP1
00640	TEMP2	00650	AO	00660	EY	00670	RSQR	00680	SQR
00690	DF	00700	F	00710	FIN	00720	FOUT	00730	HIGH
00740	VP	00750	VE	00830	OUT	00841	FP001	00851	FHIGH
00861	ZERO	00871	ZEROS	00881	ONE	00885	PNUM	00888	MCNT
00891	NOIN	00894	RCNT	00897	CNTR1	00907	AGG	00908	*STAR4B
00980	DF1	01004	MD0	01040	MD01	01162	STW23	01228	MD1
01248	MD2	01304	MD3	01406	MD4	01514	MD5	01594	MD6
01630	MD7	01654	MD9	01684	MD10	01714	MD11	01774	MDMOD
01822	AG1	01944	TSTH	02062	*FINISH	02110	MDV1	02206	*MDVMOD
02254	CMEX	02322	EX1	02418	EXMOD	02466	CMTRA	02510	CMRE
02578	RE1	02598	RE2	02638	REMOD	02722	FINAL	02742	MT
02778	MT1	02822	DEL	02846	MT2	02870	CKK1	02918	CKK2
02948	CKK3	02978	CKK4	03068	*GENTFM	03104	GTFM1	03212	GTFM2
03284	GTFM3	03308	GTFM4	03338	*GTFM41	03368	GTFM7	03422	GTFM6
03460	GTFM5	03472	GTFM8	03510	KGRJ	03582	*KGRJ11	03602	KGRJ1
03622	KGRJ2	03642	IGRK	03726	*IGRK11	03746	IGRK1	03766	IGRK2
03786	NEXT	03842	N1	03898	*ROWTFM	03934	RTFM1	03996	*COLTFM
04008	CTFM4	04056	CTFM1	04080	CTFM2	04158	CTFM3	04170	CTFM5

04190	CTFM6	04212	CADIJ	04248	AAA	04304	BB	04318	CA98
04354	CA99	04402	SP1	04438	SP2	04468	SP3	04504	RET3
04512	CREGO	04560	CREG	04608	CALCE	04752	CE1	04782	CALCB
04962	CA1	05014	CA2	05050	ILL	05106	IGRL	05154	CA3
05184	CA4	05214	CA5	05300	CA55	05312	CA6	05390	SE1
05420	SE2	05510	SE3	05540	SE4	05594	T1	05624	T2
05654	SETID	05750	BMOD	05880	CA0	05916	CA01	06042	CA02
06062	CA03	06082	CA04	06112	CA05	06184	CAMOD	06256	CSQR
06316	SQR1	06346	SQR2	06376	SQR3	06484	CR1	06514	CR2
06612	CR3	06642	CR35	06702	CR4	06852	RET5	06862	CNOIN
06898	CN1	06930	CN2	06962	CNMOD	07001	HDNG0	07043	HDNG1
07079	HDNG2	07115	HDNG3	07151	HDNG4	07193	HDNG5	07229	HDNG6
07261	HDNG7	07316	PREG	07796	W1	07820	W2	07874	W3
07928	W4	08054	RET6	08062	PST	08316	CD	08412	RET4
08424	PST2	08472	BR	08484	MOVER	08483	MAD	08508	MV1
08552	MV2	08564	MV3	08576	MV4	08706	PNCH	08742	PNCH1
08796	WRNUM	08795	NO	08844	*FLTFIX	08843	ARG	08952	JUMP
09072	TRNNT	09216	WRITE	09288	*WRALPH	09308	*SETZRO	09334	*DECIML
09414	LARGE	09474	JUMP2	09558	WR	09620	*SETSIG	09632	SETS
09664	SET	09731	*OUTPUT	09743	*SEVENS	09753	DCMAL	09755	SIGN
09757	*EXPNT2								

```
00010*  PROGRAM 80-4C, ADV REGRESSION, OCT. 15, 1963.
00020*
00030         DORG 402
00040CONT     DSS  80
00050DATE     DS   6,CONT+5
00060PROB     DS   2,CONT+7
00070NOBS     DS   5,CONT+12
00080NFORM    DS   3,CONT+15
00090INVAR    DS   3,CONT+18
00100NOVAR    DS   3,CONT+21
00110N        DS   3,CONT+24
00120NDEP     DS   3,CONT+27
00130NOTRAN   DS   3,CONT+30
00140NOCON    DS   3,CONT+33
00150NCOL     DS   2,CONT+35
00160NELIM    DS   3,CONT+38
00170CON1     DS   1,CONT+39
00180CON2     DS   1,CONT+40
00190CON3     DS   1,CONT+41
00200CON4     DS   1,CONT+42
00210CON5     DS   1,CONT+43
00220CON6     DS   1,CONT+44
00230CON7     DS   1,CONT+45
00240CON8     DS   1,CONT+46
00250CON9     DS   1,CONT+47
00260CON10    DS   1,CONT+48
00270CON11    DS   1,CONT+49
00280CON12    DS   1,CONT+50
00290CON13    DS   1,CONT+51
00300CON14    DS   1,CONT+52
00310CON15    DS   1,CONT+53
00320CON16    DS   1,CONT+54
00330CON17    DS   1,CONT+55
00340CON18    DS   1,CONT+56
00350OBSER    DS   10,CONT+79
00360IND      DS   5
00370ID       DS   5
00380IDD      DS   5
00390FORMAT   DS   5
00400INDEX    DS   5
00410CONST    DS   5
00420DATA1    DS   5
00430DATA2    DS   5
00440B        DS   5
00450SE       DS   5
00460T        DS   5
00470SUM1     DS   5
00480SIGMA    DS   5
00490R        DS   5
00500WT       DS   5
00510ADKK     DS   5
00520ADRNN    DS   5
00530ADIJ     DS   5
```

```
00402
00402 00080
00407 00006
00409 00002
00414 00005
00417 00003
00420 00003
00423 00003
00426 00003
00429 00003
00432 00003
00435 00003
00437 00002
00440 00003
00441 00001
00442 00001
00443 00001
00444 00001
00445 00001
00446 00001
00447 00001
00448 00001
00449 00001
00450 00001
00451 00001
00452 00001
00453 00001
00454 00001
00455 00001
00456 00001
00457 00001
00458 00001
00481 00010
00486 00005
00491 00005
00496 00005
00501 00005
00506 00005
00511 00005
00516 00005
00521 00005
00526 00005
00531 00005
00536 00005
00541 00005
00546 00005
00551 00005
00556 00005
00561 00005
00566 00005
00571 00005
```

```
00540ADRIJ    DS    5
00550SIGN3    DS    5
00560COUNT    DS    5
00570CNTR     DS    3
00580CTR      DS    3
005901        DS    3
00600J        DS    3
00610K        DS    3
00620L        DS    3
00630P        DS    3
006400        DS    3
00650MSZ      DS    4
00660IVE      DS    3
00670IVP      DS    3
00680TEMP1    DS    10
00690TEMP2    DS    10
00700A0       DS    10
00710EY       DS    10
00720RSOR     DS    10
00730SQR      DS    10
00740DF       DS    10
00750F        DS    10
00760FIN      DS    10
00770FOUT     DS    10
00780HIGH     DS    10
00790VP       DS    10
```

```
00576 00005
00581 00005
00586 00005
00589 00003
00592 00003
00595 00003
00598 00003
00601 00003
00604 00003
00607 00003
00610 00003
00614 00004
00617 00003
00620 00003
00630 00010
00640 00010
00650 00010
00660 00010
00670 00010
00680 00010
00690 00010
00700 00010
00710 00010
00720 00010
00730 00010
00740 00010
```



```
00800VE       DS    10
00810OUT      DS    80
00820         DC    1,
00830         DC    8,10000000
00840FP001    DC    2,-2
00850         DC    8,10000000
00860FHIGH    DC    2,50
00870         DC    8,0
00880ZERO     DC    2,-99
00890ZEROS    DC    10,0
00900         DC    8,10000000
00910ONE      DC    2,1
00920PNUM     DS    4
00930MCNT     DS    3
00940NOIN     DS    3
00950RCNT     DS    3
00960CNTR1    DS    3
00970ERR1     DAC   23,MATRIX ALMOST SINGULAR2
00980*
00990*  COMPUTE ADV REGRESSION STATISTICS.
01000*
01010*
01020*  INITIALIZE DEGREFS OF FREEDOM
01030*
01040STAR4C TFLS DF,OBSER
01050         BD    *+20,CON7
01060         B     MADV
01070         DORG  *-3
01080         FA    DF,ONE
```

```
00750 00010
00830 00080
00831 00001
00839 00008
00841 00002
00849 00008
00851 00002
00859 00008
00861 00002
00871 00010
00879 00008
00881 00002
00885 00004
00888 00003
00891 00003
00894 00003
00897 00003
00899 00023
```

```
00944 16 09651 00967
00956 49 09600 00000
00963 00005    00690
00968 00005    00481
00974 43 00994 00447
00986 49 01024 00000
00994
```

```
01090MADV   BNC4  MADV1
01100       TF    CNTR1,N
01110       TF    *+18,IND
01120MADV0  WNCD  99999
01130       AM    MADV0+6,80,10
01140       SM    CNTR1,80,10
01150       BP    MADV0
01160       TF    PNUM,N
01170       BT    PNCH,SUM1
01180       TF    PNUM,N
01190       BT    PNCH,SIGMA
01200       TF    PNUM,MSZ
01210       BT    PNCH,R
01220       H
01230       DORG  *-9
01250MADV1  TF    CNTR1,N
01260       TFLS  HIGH,ZERO


01270       TFM   1,1,9
01280       TF    PIV2+11,IND
01290       TF    PIV3+28,R
01300PIV2   BD    PIV6,99999
01310       TFLS  TEMP1,HIGH
```

```
00994 16 09651 0̄1017
01006 49 09520 00000
01013 00005    0̄0690
01018 00005    0̄0881

01024 47 01182 00400

01036 26 00897 00426

01048 26 01066 00486

01060 38 99999 00400

01072 11 01066 000̄0

01084 12 00897 000̄0

01096 46 01060 01100

01108 26 00885 00426

01120 27 08446 00541

01132 26 00885 00426

01144 27 08446 00546

01156 26 00885 00614

01168 27 08446 00551

01180 48 00000 00000

01182

01182 26 00897 00426

01194 16 09651 0̄1217
01206 49 09600 00000
01213 00005    0̄0730
01218 00005    0̄0861

01224 16 00595 000̄01

01236 26 01271 00486

01248 26 01330 00551

01260 43 01482 99999

01272 16 09651 0̄1295
01284 49 09600 00000
01291 00005    0̄0630
01296 00005    0̄0730
```

```
01320PIV3   FS    TEMP1,99999


01330       BNN   PIV6
01340       TFLS  TEMP1,FP001


01350       TF    PIV4+28,PIV3+28
01360PIV4   FS    TEMP1,99999


01370       BP    PIV6
01380       TF    PIV5+28,PIV3+28
01390PIV5   TFLS  HIGH,99999


01400       TF    K,1
01410PIV6   AM    1,1,10
01420       AM    PIV2+11,1,10
01430       A     PIV3+27,CNTR1
01440       SM    CNTR1,1,10
01450       BP    PIV2
01460       C     HIGH,ZERO
01470       BE    ADV
01480       TFM   RET3+6,*+20
01490       B     MT
01500       DORG  *-3
01510       FS    DF,ONE
```



```
01322 16 09651 0̄1325
01314 49 09500 00000
01321 00005    0̄0630
01326 00005    9̄9999

01332 46 01482 01300

01344 16 09651 0̄1367
01356 49 09600 00000
01363 00005    0̄0630
01368 00005    0̄0841

01374 26 01414 01330

01386 16 09651 0̄1409
01398 49 09500 00000
01405 00005    0̄0630
01410 00005    9̄9999

01416 46 01482 01100

01428 26 01468 01330

01440 16 09651 0̄1463
01452 49 09600 00000
01459 00005    0̄0730
01464 00005    9̄9999

01470 26 00601 00595

01482 11 00595 000̄01

01494 11 01271 000̄01

01506 21 01329 00897

01518 12 00897 000̄01

01530 46 01260 01100

01542 24 00730 00861

01554 46 01624 01200

01566 16 06598 0̄1586

01578 49 04830 00000

01586

01586 16 09651 0̄1609
01598 49 09500 00000
01605 00005    0̄0690
01610 00005    0̄0881
```

```
01520          B     NADV
01530          DORG  *-3
01540ADV       BTM   CNOIN,0,10
01550          C     NOIN,N
01560          BE    ADV1
01570          WATY  ERR1
01580          H
01590          DORG  *-9
01600ADV1      TF    MCNT,NDEP
01610          SM    NOIN,1,10
01620          TF    ADV2+11,IDD
01630ADV2      TF    L,99999
01640          TF    I,L
01650          SM    I,1,10
01660          TF    CNTR1,N
01670          TF    ADKK,R
01680          CM    I,0,10
01690          BE    CR
01700I1        A     ADKK-1,CNTR1
01710          SM    CNTR1,1,10
01720          SM    I,1,10
01730          BP    I1
01740*
01750*  CALCULATE STANDARD ERROR OF DEPENDENT VARIABLE.
01760*
01770CR        TF    CR1+28,ADKK
01780          TF    CR2+28,SIGMA
01790          SM    CR2+28,10,10
```

```
01616 49 01024 00000
01624
01624 17 06602 00000
01636 24 00891 00426
01648 46 01674 01200
01660 39 00899 00100
01672 48 00000 00000
01674
01674 26 00888 00429
01686 12 00891 00001
01698 26 01721 00496
01710 26 00604 99999
01722 26 00595 00604
01734 12 00595 00001
01746 26 00897 00426
01758 26 00561 00551
01770 14 00595 00000
01782 46 01842 01200
01794 21 00560 00897
01806 12 00897 00001
01818 12 00595 00001
01830 46 01794 01100

01842 26 01978 00561
01854 26 02068 00546
01866 12 02068 00010
```



```
01800          A     CR2+27,L
01810          TFLS  EY,OBSER
01820          TFLS  TEMP1,DF
01830CR1       FM    TEMP1,99999
01840          FD    EY,TEMP1
01850          FSQR  EY,EY
01860CR2       FM    EY,99999
01870*
01880*  CALCULATE REGRESSION COEFFICIENTS.
01890*
01900          TF    CNTR1,N
01910          SM    CNTR1,1,10
01920          TFM   I,1,10
01930          TF    REG2+28,R
01940          SM    REG2+28,10,10
01950          A     REG2+27,L
01960          TF    REG3+28,SIGMA
01970          SM    REG3+28,10,10
01980          A     REG3+27,L
```

```
01878 21 02067 00604

01890 16 09651 01913
01902 49 09600 00000
01909 00005    00660
01914 00005    00481

01920 16 09651 01943
01932 49 09600 00000
01939 00005    00630
01944 00005    00690

01950 16 09651 01973
01962 49 09540 00000
01969 00005    00630
01974 00005    99999

01980 16 09651 02003
01992 49 09560 00000
01999 00005    00660
02004 00005    00630

02010 16 09651 02033
02022 49 09580 00000
02029 00005    00660
02034 00005    00660

02040 16 09651 02063
02052 49 09540 00000
02059 00005    00660
02064 00005    99999

02070 26 00897 00426

02082 12 00897 00001

02094 16 00595 00001

02106 26 02266 00551

02118 12 02266 00010

02130 21 02265 00604

02142 26 02296 00546

02154 12 02296 00010

02166 21 02295 00604
```

```
01990          TF    REG4+28,ADKK
02000          TF    REG5+28,SIGMA
02010          TF    REG7+23,B
02020REG1      C     I,L
02030          BE    IEL
02040REG2      TFLS  TEMP1,99999


02050REG3      FM    TEMP1,99999


02060REG4      FD    TEMP1,99999


02070REG5      FD    TEMP1,99999


02080          BNF   REG6,TEMP1-2
02090          CF    TEMP1-2
02100          B     REG7
02110          DORG  *-3
02120REG6      SF    TEMP1-2
02130REG7      TFLS  99999,TEMP1


02140          C     I,L
02150          BP    IGRL2
02160IEL       A     REG2+27,CNTR1
02170          AM    REG5+28,10,10
```

```
02178 26 02326 00561

02190 26 02356 00546

02202 26 02425 00526

02214 24 00595 00604

02226 46 02544 01200

02238 16 09651 02261
02250 49 09600 00000
02257 00005    00630
02262 00005    99999

02268 16 09651 02291
02280 49 09540 00000
02287 00005    00630
02292 00005    99999

02298 16 09651 02321
02310 49 09560 00000
02317 00005    00630
02322 00005    99999

02328 16 09651 02351
02340 49 09560 00000
02347 00005    00630
02352 00005    99999

02358 44 02390 00628

02370 33 00628 00000

02382 49 02402 00000

02390

02390 32 00628 00000

02402 16 09651 02425
02414 49 09600 00000
02421 00005    99999
02426 00005    00630

02432 24 00595 00604

02444 46 02500 01100

02456 21 02265 00897

02468 11 02356 000T0
```



```
02180          AM    REG7+23,10,10
02190          B     TST
02200          DORG  *-3
02210IGRL2     AM    REG2+28,10,10
02220          AM    REG5+28,10,10
02230          AM    REG7+23,10,10
02240          B     TST
02250          DORG  *-3
02260IEL       AM    REG2+28,10,10
02270          AM    REG5+28,10,10
02280TST       SM    CNTR1,1,10
02290          AM    1,1,10
02300          C     I,N
02310          BNP   REG1
02320*
02330*  CALCULATE STANDARD ERRORS OF COEFFICIENTS.
02340*
02350          TF    CTR,N
02360          TFM   J,1,10
02370          TF    STE4+28,ADKK
02380          TF    STE5+28,R
02390          TF    STE6+28,SIGMA
02400          TF    STE7+23,SE
02410STE1      C     J,L
02420          BN    JLEL
02430          BE    JEL
02440JGRL      TF    P,L
02450          TF    Q,J
```

```
02480 11 02425 000T0

02492 49 02568 00000

02500

02500 11 02266 000T0

02512 11 02356 000T0

02524 11 02425 000T0

02536 49 02568 00000

02544

02544 11 02266 000T0

02556 11 02356 000T0

02568 12 00897 0000D1

02580 11 00595 0000D1

02592 24 00595 00426

02604 47 02214 01100

02616 26 00592 00426

02628 16 00598 0000D1

02640 26 02928 00561

02652 26 02958 00551

02664 26 03108 00546

02676 26 03133 00531

02688 24 00598 00604

02700 47 02780 01300

02712 46 03152 01200

02724 26 00607 00604

02736 26 00610 00598
```

```
02460          BTM   CADIJ,0,10
02470          TF    STE2+28,ADIJ
02480          B     STE2
02490          DORG  *-3
02500JLEL      TF    P,J
02510          TF    Q,L
02520          BTM   CADIJ,0,10
02530          TF    STE2+28,ADIJ
02540STE2      TFLS  TEMP1,99999


02550          TF    STE3+28,STE2+28
02560STE3      FM    TEMP1,99999


02570STE4      FD    TEMP1,99999


02580STE5      TFLS  TEMP2,99999


02590          FS    TEMP2,TENP1


02600          FD    TEMP2,OBSER


02610          FSQR  TEMP2,TEMP2
```

```
02748 17 06300 000ð0

02760 26 02856 00571

02772 49 02828 00000

02780

02780 26 00607 00598

02792 26 00610 00604

02804 17 06300 000ð0

02816 26 02856 00571

02828 16 09651 ð2851
02840 49 09600 00000
02847 00005    ð0630
02852 00005    99999

02858 26 02898 02856

02870 16 09651 ð2893
02882 49 09540 00000
02889 00005    ð0630
02894 00005    99999

02900 16 09651 ð2923
02912 49 09560 00000
02919 00005    ð0630
02924 00005    99999

02930 16 09651 ð2953
02942 49 09600 00000
02949 00005    ð0640
02954 00005    99999

02960 16 09651 ð2983
02972 49 09500 00000
02979 00005    ð0640
02984 00005    ð0630

02990 16 09651 ð3013
03002 49 09560 00000
03009 00005    ð0640
03014 00005    ð0481

03020 16 09651 ð3043
03032 49 09580 00000
03039 00005    ð0640
03044 00005    ð0640
```

```
02620          FM    TEMP2,EY


02630STE6      FD    TEMP2,99999


02640STE7      TFLS  99999,TEMP2


02650          AM    STE7+23,10,10
02660JEL       A     STE5+27,CTR
02670          AM    STE6+28,10,10
02680TST1      AM    J,1,10
02690          SM    CTR,1,10
02700          BP    STE1
02710*
02720*  CALCULATE T.
02730*
02740          TF    CNTR,NOIN
02750          TF    TR1+23,T
02760          TF    TR1+28,B
02770          TF    TR2+23,T
02780          TF    TR2+28,SE
02790TR1       TFLS  99999,99999


02800TR2       FD    99999,99999


02810          AM    TR1+23,10,10
02820          AM    TR1+28,10,10
```



```
03050 16 09651 ð3073
03062 49 09540 00000
03069 00005    ð0640
03074 00005    ð0660

03080 16 09651 ð3103
03092 49 09560 00000
03099 00005    ð0640
03104 00005    99999

03110 16 09651 ð3133
03122 49 09600 00000
03129 00005    99999
03134 00005    ð0640

03140 11 03133 000Ì0

03152 21 02957 00592

03164 11 03108 000Ì0

03176 11 00598 000ð1

03188 12 00592 000ð1

03200 46 02688 01100


03212 26 00589 00891

03224 26 03295 00536

03236 26 03300 00526

03248 26 03325 00536

03260 26 03330 00531

03272 16 09651 ð3295
03284 49 09600 00000
03291 00005    99999
03296 00005    99999

03302 16 09651 ð3325
03314 49 09560 00000
03321 00005    99999
03326 00005    99999

03332 11 03295 000Ì0

03344 11 03300 000Ì0
```

```
02830          AM    TR2+23,10,10
02840          AM    TR2+28,10,10
02850          SM    CNTR,1,10
02860          BP    TR1
02870*
02880*  CALCULATE CONSTANT TERM.
02890*
02900          BD    *+20,CON7
02910          B     CC0
02920          DORG  *-3
02930          TFLS  A0,ZERO


02940          B     CSQR
02950          DORG  *-3
02960CC0       TF    CC1+28,SUM1
02970          SM    CC1+28,10,10
02980          A     CC1+27,L
02990CC1       TFLS  A0,99999


03000          TF    CNTR,N
03010          TFM   1,1,10
03020          TF    CC3+28,B
03030          TF    CC4+28,SUM1
03040CC2       C     1,L
03050          BE    CCMOD
03060CC3       TFLS  TEMP1,99999
```

```
03356 11 03325 00010
03368 11 03330 00010
03380 12 00589 00001
03392 46 03272 01100


03404 43 03424 00447
03416 49 03462 00000
03424

03424 16 09651 03447
03436 49 09600 00000
03443 00005    00650
03448 00005    00861
03454 49 03750 00000
03462

03462 26 03526 00541
03474 12 03526 00010
03486 21 03525 00604
03498 16 09651 03521
03510 49 09600 00000
03517 00005    00650
03522 00005    99999
03528 26 00589 00426
03540 16 00595 00001
03552 26 03628 00526
03564 26 03658 00541
03576 24 00595 00604
03588 46 03714 01200
03600 16 09651 03623
03612 49 09600 00000
03619 00005    00630
03624 00005    99999
```



```
03070CC4       FM    TEMP1,99999
03080          FS    A0,TEMP1


03090          AM    CC3+28,10,10
03100          AM    CC4+28,10,10
03110CCMOD     AM    1,1,10
03120          SM    CNTR,1,10
03130          BP    CC2
03140*
03150*  CALCULATE SUM OF SQUARED RESIDUALS.
03160*
03170CSQR      TF    SS1+28,SIGMA
03180          SM    SS1+28,10,10
03190          A     SS1+27,L
03200          TF    SS2+28,SS1+28
03210          TF    SS3+28,ADKK
03220SS1       TFLS  SQR,99999


03230SS2       FM    SQR,99999


03240SS3       FD    SQR,99999


03250          FM    SQR,OBSER
```

```
03630 16 09651 03653
03642 49 09540 00000
03649 00005    00630
03654 00005    99999
03660 16 09651 03683
03672 49 09500 00000
03679 00005    00650
03684 00005    00630
03690 11 03628 00010
03702 11 03658 00010
03714 11 00595 00001
03726 12 00589 00001
03738 46 03576 01100


03750 26 03838 00546
03762 12 03838 00010
03774 21 03837 00604
03786 26 03868 03838
03798 26 03898 00561
03810 16 09651 03833
03822 49 09600 00000
03829 00005    00680
03834 00005    99999
03840 16 09651 03863
03852 49 09540 00000
03859 00005    00680
03864 00005    99999
03870 16 09651 03893
03882 49 09560 00000
03889 00005    00680
03894 00005    99999
03900 16 09651 03923
03912 49 09540 00000
03919 00005    00680
03924 00005    00481
```

```
03260*
03270*  CALCULATE R SQUARED.
03280*
03290         TF    RR1+28,SIGNA
03300         SM    RR1+28,10,10
03310         A     RR1+27,L
03320         TF    RR2+28,RR1+28
03330RR1      TFLS  TEMP1,99999
03340RR2      FM    TEMP1,99999
03350         BD    *+20,CON7
03360         B     RR4
03370         DORG  *-3
03380         TF    RR3+28,SUM1
03390         SM    RR3+28,10,10
03400         A     RR3+27,L
03410         TF    RR35+28,RR3+28
03420RR3      TFLS  TEMP2,99999
03430RR35     FM    TEMP2,99999
03440         FS    TEMP1,TEMP2
03450RR4      FM    TEMP1,OBSER
```

```
03930 26 04006 00546
03942 12 04006 000T0
03954 21 04005 00604
03966 26 04036 04006
03978 16 09651 Ō4001
03990 49 09600 00000
03997 00005    Ō0630
04002 00005    99999
04008 16 09651 Ō4031
04020 49 09540 00000
04027 00005    Ō0630
04032 00005    99999
04038 43 04058 00447
04050 49 04196 00000
04058
04058 26 04134 00541
04070 12 04134 000T0
04082 21 04133 00604
04094 26 04164 04134
04106 16 09651 Ō4129
04118 49 09600 00000
04125 00005    Ō0640
04130 00005    99999
04136 16 09651 Ō4159
04148 49 09540 00000
04155 00005    Ō0640
04160 00005    99999
04166 16 09651 Ō4189
04178 49 09500 00000
04185 00005    Ō0630
04190 00005    Ō0640
04196 16 09651 Ō4219
04208 49 09540 00000
04215 00005    Ō0630
04220 00005    Ō0481
```



```
03460         TFLS  TEMP2,SQR
                                    04226 16 09651 Ō4249
                                    04238 49 09600 00000
                                    04245 00005    Ō0640
                                    04250 00005    Ō0680
03470         FD    TEMP2,TEMP1
                                    04256 16 09651 Ō4273
                                    04268 49 09560 00000
                                    04275 00005    Ō0640
                                    04280 00005    Ō0630
03480         TFLS  RSQR,ONE
                                    04286 16 09651 Ō4309
                                    04298 49 09600 00000
                                    04305 00005    Ō0670
                                    04310 00005    Ō0881
03490         FS    RSQR,TEMP2
                                    04316 16 09651 Ō4339
                                    04328 49 09500 00000
                                    04335 00005    Ō0670
                                    04340 00005    Ō0640
03500*
03510*  SET INDEXES OF INDEPENDENT VARIABLES.
03520*
03530         TFM   1,1,10          04346 16 00595 000Ō1
03540         TF    CNTR1,N         04358 26 00897 00426
03550         TF    DEX2+6,ID       04370 26 04412 00491
03560DEX1     C     1,L             04382 24 00595 00604
03570         BE    DEX3            04394 46 04430 01200
03580DEX2     TF    99999,1         04406 26 99999 00595
03590         AM    DEX2+6,2,10     04418 11 04412 000Ō2
03600DEX3     AM    1,1,10          04430 11 00595 000Ō1
03610         SM    CNTR1,1,10      04442 12 00897 000Ō1
03620         BP    DEX1            04454 46 04382 01100
03630         TFM   RET4+6,*+20     04466 16 08158 Ō4486
03640         B     PST             04478 49 07802 00000
03650         DORG  *-3             04486
03660         BD    ADVMOD,CON8     04486 43 04518 00448
03670         TFM   RET6+6,*+20     04498 16 07800 Ō4518
```

```
03680          B     PREG
03690          DORG  *-3
03700ADVMOD    AM    ADV2+11,2,10
03710          SM    MCNT,1,10
03720          BP    ADV2
03730*
03740*       IS TRANSFORMED MATRIX PUNCHED.
03750*
03760CHTRA     BD    *+20,CON12
03770          B     CHRE
03780          DORG  *-3
03790          TF    PNUM,MSZ
03800          BT    PNCH,R
03810*
03820*   IS MATRIX REINVERTED.
03830*
03840CHRE      BD    *+20,CON13
03850          B     FINAL
03860          DORG  *-3
03870*
03880*   REINVERT MATRIX AND PUNCH.
03890*
03900          TF    COUNT,N
03910          TFM   K,1,10
03920          TF    RE1+11,IND
03930          TF    RE2+11,IND
03940RE1       BNR   *+20,99999
03950          B     REMOD
03960          DORG  *-3
03970RE2       BD    *+20,99999
03980          B     REMOD
```

```
04510 49 07056 00000
04518
04518 11 01721 0000Ō2
04530 12 00888 0000Ō1
04542 46 01710 01100


04554 43 04574 00452
04566 49 04598 00000
04574
04574 26 00885 00614
04586 27 08446 00551


04598 43 04618 00453
04610 49 04810 00000
04618


04618 26 00586 00426
04630 16 00601 0000Ō1
04642 26 04677 00486
04654 26 04697 00486
04666 45 04686 99999
04678 49 04726 00000
04686
04686 43 04706 99999
04698 49 04726 00000
```



```
03990          DORG  *-3
04000          TFM   RET3+6,*+20
04010          B     MT
04020          DORG  *-3
04030REMOD     AM    K,1,10
04040          AM    RE1+11,1,10
04050          AM    RE2+11,1,10
04060          SM    COUNT,1,10
04070          BP    RE1
04080          TF    PNUM,MSZ
04090          BT    PNCH,R
04100FINAL     RNCD  0
04110          B     0
04120          DORG  *-3
04130*   *   *   *   *   *   *   *   *
04140*  MATRIX TRANSFORMATION SUBROUTINE.  *
04150*   *   *   *   *   *   *   *   *
04160*    TEST IF ADDING OR DELETING VARIABLE
04170*
04180MT        TF    MT1+11,IND
04190          SM    MT1+11,1,10
04200          A     MT1+11,K
04210MT1       BD    DEL,99999
04220          TFM   GTFM1+11,0
04230          TDM   CA99+11,1
04240          B     MT2
04250          DORG  *-3
04260DEL       TFM   GTFM1+11,5
04270          TDM   CA99+11,0
```

```
04706
04706 16 06598 Ō4726
04718 49 04830 00000
04726
04726 11 00601 0000Ō1
04738 11 04677 0000Ō1
04750 11 04697 0000Ō1
04762 12 00586 0000Ō1
04774 46 04666 01100
04786 26 00885 00614
04798 27 08446 00551
04810 36 00000 00500
04822 49 00000 00000
04830

04830 26 04877 00486
04842 12 04877 0000Ō1
04854 21 04877 00601
04866 43 04910 99999
04878 16 05203 Ō0000
04890 15 06453 00001
04902 49 04934 00000
04910
04910 16 05203 Ō0005
04922 15 06453 00000
```

```
04280NIT2    TF    P,K
04290        TF    Q,K
04300CKK1    BTM   CADIJ,0,10
04310        TF    CKK2+28,ADIJ
04320        TF    CKK3+23,ADIJ
04330        TF    CKK4+23,ADIJ
04340*
04350*  COMPUTE INVERSE OF PIVOT ELEMENT.
04360*
04370CKK2    TFLS  TEMP1,99999
04380CKK3    TFLS  99999,ONE
04390CKK4    FD    99999,TEMP1
04400        TF    GTFM7+28,ADIJ
04410        TF    RTFM1+28,ADIJ
04420        TF    RTFM1+23,ADIJ
04430        TF    CTFM2+28,ADIJ
04440        AM    RTFM1+23,10,10
04450*
04460*  GENERAL MATRIX ELEMENT TRANSFORMATION.
04470*
04480GENTFM  TFM   I,1,10
04490        TFM   J,1,10
04500        TF    ADRIJ,K
04510GTFM1   TFM   SIGN3,0
04520        C     K,I
```

```
04934 26 00607 00601
04946 26 00610 00601
04958 17 06300 00000
04970 26 05034 00571
04982 26 05059 00571
04994 26 05089 00571

05006 16 09651 05029
05018 49 09600 00000
05025 00005    00630
05030 00005    99999

05036 16 09651 05059
05048 49 09600 00000
05055 00005    99999
05060 00005    00881

05066 16 09651 05089
05078 49 09560 00000
05085 00005    99999
05090 00005    00630

05096 26 05484 00571
05108 26 06050 00571
05120 26 06045 00571
05132 26 06196 00571
05144 11 06045 00010

05156 16 00595 00001
05168 16 00598 00001
05180 26 00576 00551
05192 16 00581 00000
05204 24 00601 00595
```



```
04530        BE    NEXT
04540        C     K,J
04550        BE    NEXT
04560        BH    KGRJ
04570        A     SIGN3,GTFM1+11
04580        TF    P,K
04590        TF    Q,J
04600GTFM2   BTM   CADIJ,0,10
04610        TF    GTFM4+28,ADIJ
04620        C     I,K
04630        BH    IGRK
04640        TF    P,I
04650        TF    C,K
04660GTFM3   BTM   CADIJ,0,10
04670        TF    GTFM41+28,ADIJ
04680GTFM4   TFLS  TEMP1,99999
04690GTFM41  FM    TEMP1,99999
04700GTFM7   FM    TEMP1,99999
04710        BD    GTFM5,SIGN3
04720        TF    GTFM6+23,ADRIJ
04730GTFM6   FS    99999,TEMP1
```

```
05216 46 05874 01200
05228 24 00601 00598
05240 46 05874 01200
05252 46 05598 01100
05264 21 00581 05203
05276 26 00607 00601
05288 26 00610 00598
05300 17 06300 00000
05312 26 05424 00571
05324 24 00595 00601
05336 46 05730 01100
05348 26 00607 00595
05360 26 00610 00601
05372 17 06300 00000
05384 26 05454 00571

05396 16 09651 05419
05408 49 09600 00000
05415 00005    00630
05420 00005    99999

05426 16 09651 05449
05438 49 09540 00000
05445 00005    00630
05450 00005    99999

05456 16 09651 05479
05468 49 09540 00000
05475 00005    00630
05480 00005    99999

05486 43 05548 00581
05498 26 05533 00576

05510 16 09651 05533
05522 49 09500 00000
05529 00005    99999
05534 00005    00630
```

```
04740        B      NEXT                        05540 49 05874 00000
04750        DORG   *-3                         05548
04760GTFM5   TF     GTFM8+23,ADRIJ              05548 26 05583 00576
04770GTFM8   FA     99999,TEMP1                 05560 16 09651 05583
                                                05572 49 09520 00000
                                                05579 00005    99999
                                                05584 00005    00630
04780        B      NEXT                        05590 49 05874 00000
04790        DORG   *-3                         05598
04800*
04810*  K GREATER THAN J.
04820*
04830KGRJ    TF     P,J                         05598 26 00607 00598
04840        TF     Q,K                         05610 26 00610 00601
04850        TF     KGRJ1+11,IND                05622 26 05701 00486
04860        SM     KGRJ1+11,1,10               05634 12 05701 00001
04870        A      KGRJ1+11,J                  05646 21 05701 00598
04880        TF     KGRJ11+11,KGRJ1+11          05658 26 05681 05701
04890KGRJ11  BNR    KGRJ1,99999                 05670 45 05690 99999
04900        B      GTFM2                       05682 49 05300 00000
04910        DORG   *-3                         05690
04920KGRJ1   BD     KGRJ2,99999                 05690 43 05710 99999
04930        B      GTFM2                       05702 49 05300 00000
04940        DORG   *-3                         05710
04950KGRJ2   AM     SIGN3,5,10                  05710 11 00581 00005
04960        B      GTFM2                       05722 49 05300 00000
04970        DORG   *-3                         05730
04980*
04990*  I GREATER THAN K.
05000*
05010IGRK    TF     P,K                         05730 26 00607 00601
```



```
05020        A      SIGN3,GTFM1+11              05742 21 00581 05203
05030        TF     Q,I                         05754 26 00610 00595
05040        TF     IGRK1+11,IND                05766 26 05845 00486
05050        SM     IGRK1+11,1,10               05778 12 05845 00001
05060        A      IGRK1+11,I                  05790 21 05845 00595
05070        TF     IGRK11+11,IGRK1+11          05802 26 05825 05845
05080IGRK11  BNR    IGRK1,99999                 05814 45 05834 99999
05090        B      GTFM3                       05826 49 05372 00000
05100        DORG   *-3                         05834
05110IGRK1   BD     IGRK2,99999                 05834 43 05854 99999
05120        B      GTFM3                       05846 49 05372 00000
05130        DORG   *-3                         05854
05140IGRK2   AM     SIGN3,5,10                  05854 11 00581 00005
05150        B      GTFM3                       05866 49 05372 00000
05160        DORG   *-3                         05874
05170*
05180*  SET UP NEXT TRANSFORMATION.
05190*
05200NEXT    AM     ADRIJ,10,10                 05874 11 00576 00010
05210        C      N,J                         05886 24 00426 00598
05220        BE     N1                          05898 46 05930 01200
05230        AM     J,1,10                      05910 11 00598 00001
05240        B      GTFM1                       05922 49 05192 00000
05250        DORG   *-3                         05930
05260N1      C      N,I                         05930 24 00426 00595
05270        BE     ROWTFM                      05942 46 05986 01200
05280        AM     I,1,10                      05954 11 00595 00001
05290        TF     J,I                         05966 26 00598 00595
```

```
05300          B     GTFN1
05310          DORG  *-3
05320*
05330*  PIVOT ROW TRANSFORMATION.
05340*
05350ROWTFN    TF    J,K
05360          C     J,N
05370          BE    COLTFM
05380RTFN1     FN    99999,99999



05390          AM    J,1,10
05400          AM    RTFN1+23,10,10
05410          B     ROWTFM+12
05420          DORG  *-3
05430*
05440*  PIVOT COLUMN TRANSFORMATION
05450*
05460COLTFM    TF    I,K
05470CTFN4     SM    I,1,10
05480          BE    CA98
05490          TF    P,I
05500          TF    Q,K
05510CTFN1     BTM   CADIJ,0,10
05520          TF    CTFN2+23,ADIJ
05530CTFN2     FN    99999,99999



05540          TF    CTFM3+11,CTFM2+23
05550          SM    CTFM3+11,2,10
```

```
05978 49 05192 00000
05986

05986 26 00598 00601
05998 24 00598 00426
06010 46 06084 01200
06022 16 09651 06045
06034 49 09540 00000
06041 00005    99999
06046 00005    99999
06052 11 00598 00001
06064 11 06045 00010
06076 49 05998 00000
06084

06084 26 00595 00601
06096 12 00595 00001
06108 46 06406 01200
06120 26 00607 00595
06132 26 00610 00601
06144 17 06300 00000
06156 26 06191 00571
06168 16 09651 06191
06180 49 09540 00000
06187 00005    99999
06192 00005    99999
06198 26 06257 06191
06210 12 06257 00002
```



```
05560          TF    CTFM5+6,CTFM3+11
05570          TF    CTFM6+6,CTFM3+11
05580CTFM3     BNF   CTFM6,99999
05590CTFM5     CF    99999
05600          B     CTFM4
05610          DORG  *-3
05620CTFM6     SF    99999
05630          B     CTFM4
05640          DORG  *-3
05650*
05660*  CALCULATE ELEMENT ADDRESSES.
05670*
05680          DS    2
05690CADIJ     S     Q,P
05700          TF    ADIJ,R
05710          TF    CNTR1,N
05720AAA       SM    P,1,10
05730          BE    BB
05740          A     ADIJ-1,CNTR1
05750          SM    CNTR1,1,10
05760          B     AAA
05770          DORG  *-3
05780BB        A     ADIJ-1,Q
05790          BB
05800          DORG  *-9
05810*
05820*  SET IND.
05830*
05840CA98      TF    CA99+6,IND
```

```
06222 26 06264 06257
06234 26 06284 06257
06246 44 06278 99999
06258 33 99999 00000
06270 49 06096 00000
06278
06278 32 99999 00000
06290 49 06096 00000
06298

06299 00002
06300 22 00610 00607
06312 26 00571 00551
06324 26 00897 00426
06336 12 00607 00001
06348 46 06392 01200
06360 21 00570 00897
06372 12 00897 00001
06384 49 06336 00000
06392
06392 21 00570 00610
06404 42 00000 00000
06406

06406 26 06448 00486
```

```
05850          SM    CA99+6,1,10
05860          A     CA99+6,K
05870CA99      TDM   99999,0
05880*
05890*  SET NEGATIVE DIAGONAL ELEMENTS = ZERO.
05900*
05910          TF    CNTR1,N
05920          TF    SP1+11,R
05930          SM    SP1+11,2,10
05940SP1       BNF   SP3,99999
05950          TF    SP2+23,SP1+11
05960          AM    SP2+23,2,10
05970SP2       TFLS  99999,ZERO


05980SP3       A     SP1+10,CNTR1
05990          SM    CNTR1,1,10
06000          BP    SP1
06010RET3      B     99999
06020          DORG  *-3
06030*    *    *    *    *    *    *    *
06040*  SUBROUTINE TO CALCULATE NOIN.    *
06050*    *    *    *    *    *    *    *
06060          DS    2
06070CNOIN     TFM   NOIN,0,9
06080          TF    CN1+11,IND
06090          TF    CNTR1,N
06100CN1       BD    *+20,99999
06110          B     CNMOD
06120          DORG  *-3
```

```
06418 12 06448 00001
06430 21 06448 00601
06442 15 99999 00000


06454 26 00897 00426
06466 26 06501 00551
06478 12 06501 00002
06490 44 06556 99999
06502 26 06549 06501
06514 11 06549 00002
06526 16 09651 06549
06538 49 09600 00000
06545 00005    99999
06550 00005    00861
06556 21 06500 00897
06568 12 00897 00001
06580 46 06490 01100
06592 49 99999 00000
06600


06601 00002
06602 16 00891 00000
06614 26 06649 00486
06626 26 00897 00426
06638 43 06658 99999
06650 49 06702 00000
06658
```



```
06130          TF    CN2+11,CN1+11
06140CN2       BNR   *+20,99999
06150          B     CNMOD
06160          DORG  *-3
06170          AM    NOIN,1,10
06180CNMOD     AM    CN1+11,1,10
06190          SM    CNTR1,1,10
06200          BP    CN1
06210          BB
06220          DORG  *-9
06230HDNG0     DAC   21,DEP VAR       =     @
06240HDNG1     DAC   18,STD ERR Y.X   =  @
06250HDNG2     DAC   18,R SQUARED     =  @
06260HDNG3     DAC   18,SUM SQR RES   =  @
06270HDNG4     DAC   21,IND VAR USED  =     @
06280HDNG5     DAC   18,CONSTANT TERM =  @
06290HDNG6     DAC   16,VAR        COEFF@
06300HDNG7     DAC   28,        STD ERR      T RATIO@
06310*    *    *    *    *    *    *    *    *    *
06320*  SUBROUTINE TO PRINT REGRESSION STATISTICS.    *
06330*    *    *    *    *    *    *    *    *    *
06340PREG      RCTY
06350          RCTY
06360          WATY  HDNG0
06370          BT    WRNUM,L
06380          RCTY
06390          WATY  HDNG1
06400          BTFS  FLTFIX,EY
```

```
06658 26 06681 06649
06670 45 06690 99999
06682 49 06702 00000
06690
06690 11 00891 00001
06702 11 06649 00001
06714 12 00897 00001
06726 46 06638 01100
06738 42 00000 00000
06740
06741 00021
06783 00018
06819 00018
06855 00018
06891 00021
06933 00018
06969 00016
07001 00028


07056 34 00000 00102
07068 34 00000 00102
07080 39 06741 00100
07092 27 08536 00604
07104 34 00000 00102
07116 39 06783 00100
07128 16 09651 07151
07140 49 09620 00000
07147 00005    08584
07152 00005    00660
```

```
06410          WATY OUTPUT-20
06420          RCTY
06430          WATY HDNG2
06440          BTFS FLTFIX,RSQR

06450          WATY OUTPUT-20
06460          RCTY
06470          WATY HDNG3
06480          BTFS FLTFIX,SQR

06490          WATY OUTPUT-20
06500          RCTY
06510          WATY HDNG4
06520          BT   WRNUM,NOIN
06530          RCTY
06540          RCTY
06550          WATY HDNG5
06560          BTFS FLTFIX,A0

06570          WATY OUTPUT-20
06580          RCTY
06590          RCTY
06600          WATY HDNG6
06610          WATY HDNG7
06620          RCTY
```

```
07158 39 09451 00100
07170 34 00000 00102
07182 39 06819 00100
07194 16 09651 07217
07206 49 09620 00000
07213 00005    08584
07218 00005    00670
07224 39 09451 00100
07236 34 00000 00102
07248 39 06855 00100
07260 16 09651 07283
07272 49 09620 00000
07279 00005    08584
07284 00005    00680
07290 39 09451 00100
07302 34 00000 00102
07314 39 06891 00100
07326 27 08536 00891
07338 34 00000 00102
07350 34 00000 00102
07362 39 06933 00100
07374 16 09651 07397
07386 49 09620 00000
07393 00005    08584
07398 00005    00650
07404 39 09451 00100
07416 34 00000 00102
07428 34 00000 00102
07440 39 06969 00100
07452 39 07001 00100
07464 34 00000 00102
```



```
06630          TF   CNTR1,NOIN
06640          TF   W1+11,ID
06650          TF   W2+28,B
06660          TF   W3+28,SE
06670          TF   W4+28,T
06680W1        BT   WRNUM,99999
06690          TBTY
06700W2        BTFS FLTFIX,99999

06710          WATY OUTPUT-20
06720          TBTY
06730W3        BTFS FLTFIX,99999

06740          WATY OUTPUT-20
06750          TBTY
06760W4        BTFS FLTFIX,99999

06770          WATY OUTPUT-20
06780          RCTY
06790          AM   W1+11,2,10
06800          AM   W2+28,10,10
06810          AM   W3+28,10,10
06820          AM   W4+28,10,10
06830          SM   CNTR1,1,10
06840          BP   W1
```

```
07476 26 00897 00891
07488 26 07547 00491
07500 26 07588 00526
07512 26 07642 00531
07524 26 07696 00536
07536 27 08536 99999
07548 34 00000 00108
07560 16 09651 07583
07572 49 09620 00000
07579 00005    08584
07584 00005    99999
07590 39 09451 00100
07602 34 00000 00108
07614 16 09651 07637
07626 49 09620 00000
07633 00005    08584
07638 00005    99999
07644 39 09451 00100
07656 34 00000 00108
07668 16 09651 07691
07680 49 09620 00000
07687 00005    08584
07692 00005    99999
07698 39 09451 00100
07710 34 00000 00102
07722 11 07547 00002
07734 11 07588 00010
07746 11 07642 00010
07758 11 07696 00010
07770 12 00897 00001
07782 46 07536 01100
```

```
06850RET6   B     99999
06860       DORG  *-3
06870*    *    *    *    *    *    *    *    *
06880*  SUBROUTINE TO PUNCH STEP RESULTS.     *
06890*    *    *    *    *    *    *    *    *
06900PST    AM    PST2+11,1,10
06910       TF    OUT-77,PST2+11
06920       TF    OUT-74,L
06930       TF    OUT-71,NOIN
06940       TF    OUT-68,N
06950       TFLS  OUT-50,AO
06960       TFLS  OUT-40,RSQR
06970       TFLS  OUT-30,EY
06980       TFLS  OUT-20,F
06990       TFLS  OUT-10,SQR
07000       TFM   BR+6,*+20
07010       B     PST2
07020       DORG  *-3
07030       TF    COUNT,N
07040       TF    CD+6,IND
07050CD     WNCD  99999
```

```
07794 49 99999 00000
07802
07802 11 08175 00001
07814 26 00753 08175
07826 26 00756 00604
07838 26 00759 00891
07850 26 00762 00426
07862 16 09651 07885
07874 49 09600 00000
07881 00005    00780
07886 00005    00650
07892 16 09651 07915
07904 49 09600 00000
07911 00005    00790
07916 00005    00670
07922 16 09651 07945
07934 49 09600 00000
07941 00005    00800
07946 00005    00660
07952 16 09651 07975
07964 49 09600 00000
07971 00005    00810
07976 00005    00700
07982 16 09651 08005
07994 49 09600 00000
08001 00005    00820
08006 00005    00680
08012 16 08218 08032
08024 49 08164 00000
08032
08032 26 00586 00426
08044 26 08062 00486
08056 38 99999 00400
```



```
07060       AM    CD+6,80,10
07070       SM    COUNT,80,10
07080       BP    CD
07090       AM    PST2+23,1,10
07100       BT    MOVER,B
07110       BT    MOVER,SE
07120       BT    MOVER,T
07130RET4   B     99999
07140PST2   TFM   OUT-4,0,9
07150       TFM   OUT,1,8
07160       WNCD  OUT-79
07170       AM    PST2+23,1,10
07180BR     B     99999
07190MOVER  TF    MV4+28,MAD
07200MAD    DS    ,MOVER-1
07210       TF    TEMP1,NOIN
07220MV1    CM    TEMP1,7,10
07230       BP    MV2
07240       TF    COUNT,TEMP1
07250       B     MV3
07260       DORG  *-3
07270MV2    TFM   COUNT,7,10
07280MV3    TFM   MV4+23,OUT-70
07290MV4    TFLS  99999,99999
```

```
08068 11 08062 00080
08080 12 00586 00080
08092 46 08056 01100
08104 11 08187 00001
08116 27 08224 00526
08128 27 08224 00531
08140 27 08224 00536
08152 49 99999 00000
08164 16 00826 00000
08176 16 00830 00001
08188 38 00751 00400
08200 11 08187 00001
08212 49 99999 00000
08224 26 08344 08223
08223 00000
08236 26 00630 00891
08248 14 00630 00007
08260 46 08292 01100
08272 26 00586 00630
08284 49 08304 00000
08292
08292 16 00586 00007
08304 16 08339 00760
08316 16 09651 08339
08328 49 09600 00000
08335 00005    99999
08340 00005    99999
```

```
07300          AM    NIV4+23,10,10
07310          AM    NIV4+28,10,10
07320          SM    COUNT,1,10
07330          BP    NIV4
07340          TFM   BR+6,*+20
07350          B     PST2
07360          DORG  *-3
07370          SM    TEMP1,7,10
07380          BP    NIV1
07390          BB
07400          DORG  *-9
07410*    *    *    *    *    *
07420*  PUNCH SUBROUTINE.      *
07430*    *    *    *    *    *
07440          DS    5
07450PNCH      WNCD  402
07460          TF    PNCH1+6,PNCH-1
07470          SM    PNCH1+6,9,10
07480PNCH1     WNCD  99999
07490          AM    PNCH1+6,80,10
07500          SM    PNUM,8,10
07510          BP    PNCH1
07520          BB
07530          DORG  *-9
07540          DS    4
07550WRNUM     TF    OUT,NO
07560NO        DS    ,WRNUM-1
07570          CF    OUT-1
```

```
08346 11 08339 000T0
08358 11 08344 000T0
08370 12 00586 000D1
08382 46 08316 01100
08394 16 08218 D8414
08406 49 08164 00000
08414
08414 12 00630 000D7
08426 46 08248 01100
08438 42 00000 00000
08440


08444 00005
08446 38 00402 00400
08458 26 08488 08445
08470 12 08488 000D9
08482 38 99999 00400
08494 11 08488 00080
08506 12 00885 00008
08518 46 08482 01100
08530 42 00000 00000
08532
08535 00004
08536 26 00830 08535
08535 00000
08548 33 00829 00000
```



```
07580          WNTY  OUT-1
07590          BB
07600          DORG  *-9
07610*    *    *    *    *    *    *    *    *    *    *    *    *    *
07620*  SUBROUTINE FOR PREPARING DATA FOR ALPHAMERICAL PRINTING OR      *
07630*  PUNCHING.  INTERNAL FORMAT IS SPSII.                            *
07640*    *    *    *    *    *    *    *    *    *    *    *    *    *
07650          DS    10
07660FLTFIX    CF    ARG-9
07670ARG       DS    ,FLTFIX-1
07680          TF    OUTPUT,SEVENS
07690          CF    OUTPUT-9
07700          TF    OUTPUT-10,DCMAL
07710          TFM   OUTPUT-19,0,9
07720          TFM   SIGN,0,10
07730          BNF   JUMP,ARG-2
07740          TDM   SIGN-1,2,11
07750          CF    ARG-2
07760JUMP      CM    ARG,99,1011
07770          BE    WRALPH
07780          CM    ARG,0,10
07790          BNP   DECIML
07800          CM    ARG,4,10
07810          BH    LARGE
07820          TFM   TRNMT+11,ARG-9
07830          TFM   *+42,OUTPUT-10
07840          S     *+30,ARG
07850          S     *+18,ARG
```

```
08560 38 00829 00100
08572 42 00000 00000
08574
08583 00010
08584 33 08574 00000
08583 00000
08596 26 09471 09483
08608 33 09462 00000
08620 26 09461 09493
08632 16 09452 00D00
08644 16 09495 00D00
08656 44 08692 08581
08668 15 09494 00002
08680 33 08581 00000
08692 14 08583 00099
08704 46 09028 01200
08716 14 08583 00D00
08728 47 09074 01100
08740 14 08583 00004
08752 46 09154 01100
08764 16 08823 D8574
08776 16 08818 D9461
08788 22 08818 08583
08800 22 08818 08583
```

```
07860TRNMT  TD   99999,99999
07870       AM   TRNMT+11,1,10
07880       AM   TRNMT+6,2,10
07890       CM   TRNMT+6,OUTPUT-12
07900       BNH  TRNMT
07910       TF   WRITE+23,TRNMT+11
07920       TFM  EXPNT2,5,10
07930       S    EXPNT2,ARG
07940       TFM  *+47,SEVENS
07950       S    *+35,EXPNT2
07960       S    *+23,EXPNT2
07970       A    OUTPUT-12,99999
07980WRITE  TFM  *+18,OUTPUT-8
07990       TD   OUTPUT-8,0
08000       AM   WRITE+23,1,10
08010       AM   WRITE+18,2,10
08020       CM   WRITE+18,OUTPUT
08030       BNH  WRITE+12
08040WRALPH BD   SETZRO,OUTPUT-18
08050       B    SETSIG
08060       DORG *-3
08070SETZRO TDM  OUTPUT,0
08080       TF   OUTPUT-20,SIGN
08090       BB
08100       DORG *-9
08110DECIML CM   ARG,4,1011
08120       BNH  LARGE
```

```
08812 25 99999 99999
08824 11 08823 00001
08836 11 08818 00002
08848 14 08818 09459
08860 47 08812 01100
08872 26 08979 08823
08884 16 09497 00005
08896 22 09497 08583
08908 16 08955 09483
08920 22 08955 09497
08932 22 08955 09497
08944 21 09459 99999
08956 16 08974 09463
08968 25 09463 00000
08980 11 08979 00001
08992 11 08974 00002
09004 14 08974 09471
09016 47 08968 01100
09028 43 09048 09453
09040 49 09360 00000
09048
09048 15 09471 00000
09060 26 09451 09495
09072 42 00000 00000
09074
09074 14 08583 00004
09086 47 09154 01100
```



```
08130       TFM  WRITE+23,ARG-9
08140       TFM  WRITE+18,OUTPUT-8
08150       S    WRITE+18,ARG
08160       S    WRITE+18,ARG
08170       B    WRITE+12
08180       DORG *-3
08190LARGE  TF   OUTPUT-17,SEVENS-7
08200       BNF  JUMP2,ARG
08210       TFM  OUTPUT-20,20,10
08220       CF   ARG
08230       CF   OUTPUT-19
08240JUMP2  TD   OUTPUT-16,ARG
08250       TD   OUTPUT-18,ARG-1
08260       CF   OUTPUT-18
08270       TF   OUTPUT-12,SIGN
08280       CF   OUTPUT-13
08290       TFM  WR+11,ARG-9
08300       TFM  WR+6,OUTPUT-8
08310WR     TD   99999,99999
08320       AM   WR+11,1,10
08330       AM   WR+6,2,10
08340       CM   WR+6,OUTPUT
08350       BNH  WR
08360       BB
08370       DORG *-9
08380SETSIG TFM  SETS+11,OUTPUT-16
```

```
09098 16 08979 08574
09110 16 08974 09463
09122 22 08974 08583
09134 22 08974 08583
09146 49 08968 00000
09154
09154 26 09454 09476
09166 44 09214 08583
09178 16 09451 00020
09190 33 08583 00000
09202 33 09452 00000
09214 25 09455 08583
09226 25 09453 08582
09238 33 09453 00000
09250 26 09459 09495
09262 33 09458 00000
09274 16 09309 08574
09286 16 09304 09463
09298 25 99999 99999
09310 11 09309 00001
09322 11 09304 00002
09334 14 09304 09471
09346 47 09298 01100
09358 42 00000 00000
09360
09360 16 09383 09455
```

```
08390SETS    BD    SET,OUTPUT-16
08400        AM    SETS+11,2,10
08410        B     SETS
08420        DORG  *-3
08430SET     TF    *+30,SETS+11
08440        SN    *+18,2,10
08450        TF    99999,SIGN
08460        BB
08470        DORG  *-9
08480        DAS   14
08490OUTPUT  DS    2
08500        DAC   1,@
08510SEVENS  DC    10,7070707070
08520DCMAL   DC    10,0000000003
08530SIGN    DS    2
08540EXPNT2  DS    2
08550        DAC   1,0
08560        DEND  STAR4C
LOAD SUBROUTINES
```

```
09372 43 09404 09455
09384 11 09383 00002
09396 49 09372 00000
09404
09404 26 09434 09383
09416 12 09434 00002
09428 26 99999 09495
09440 42 00000 00000
09442
09443 00014
09471 00002
09473 00001
09483 00010
09493 00010
09495 00002
09497 00002
09499 00001
00944
09500 16 10054 T0512
09512 49 09640 0
09520 16 10054 T0556
09532 49 09640 0
09540 16 10054 T1056
09552 49 09640 0
09560 16 10054 T1296
09572 49 09640 0
09580 16 10054 T1632
09592 49 09744 0
09600 16 10054 T2212
09612 49 09744 0
09620 16 10054 T2244
09632 49 09744 0
```

```
END OF PASSII
00402  CONT     00407  DATE     00409  PROB     00414  NOBS     00417  NFORM
00420  INVAR    00423  NOVAR    00426  N        00429  NDEP     00432 *NOTRAN
00435  NOCON    00437  NCOL     00440  NELIM    00441  CON1     00442  CON2
00443  CON3     00444  CON4     00445  CON5     00446  CON6     00447  CON7
00448  CON8     00449  CON9     00450  CON10    00451  CON11    00452  CON12
00453  CON13    00454  CON14    00455  CON15    00456  CON16    00457  CON17
00458  CON18    00481  OBSER    00486  IND      00491  ID       00496  IDD
00501 *FORMAT   00506  INDEX    00511  CONST    00516  DATA1    00521  DATA2
00526  B        00531  SE       00536  T        00541  SUM1     00546  SIGMA
00551  R        00556  WT       00561  ADKK     00566  ADRNN    00571  ADIJ
00576  ADRIJ    00581  SIGN3    00586  COUNT    00589  CNTR     00592  CTR
00595  I        00598  J        00601  K        00604  L        00607  P
00610  Q        00614  MSZ      00617  IVE      00620  IVP      00630  TEMP1
00640  TEMP2    00650  AO       00660  EY       00670  RSQR     00680  SQR
00690  DF       00700  F        00710  FIN      00720  FOUT     00730  HIGH
00740  VP       00750  VE       00830  OUT      00841  FP001    00851  FHIGH
00861  ZERO     00871  ZEROS    00881  ONE      00885  PNUM     00888  MCNT
00891  NOIN     00894  RCNT     00897  CNTR1    00899  ERR1     00944 *STAR4C
01024  MADV     01060  MADV0    01182  MADV1    01260  PIV2     01302  PIV3
01386  PIV4     01440  PIV5     01482  PIV6     01624  ADV      01674  ADV1
01710  ADV2     01794  I1       01842  CR       01950  CR1      02040  CR2
02214  REG1     02238  REG2     02268  REG3     02298  REG4     02328  REG5
02390  REG6     02402  REG7     02456  ILEL     02500  IGRL2    02544  IEL
02568  TST      02688  STE1     02724  JGRL     02780  JLEL     02828  STE2
02870  STE3     02900  STE4     02930  STE5     03080  STE6     03110  STE7
03152  JEL      03176  TST1     03272  TR1      03302  TR2      03462  CC0
03498  CC1      03576  CC2      03600  CC3      03630  CC4      03714  CCMOD
03750  CSQR     03810  SS1      03840  SS2      03870  SS3      03978  RR1
04008  RR2      04106  RR3      04136  RR35     04196  RR4      04382  DEX1
04406  DEX2     04430  DEX3     04518 *ADVMOD   04554  CMTRA    04598  CMRE
04666  RE1      04686  RE2      04726  REMOD    04810  FINAL    04830  MT
```

```
04866 MT1      04910 DEL      04934  MT2      04958  CKK1     05006  CKK2
05036 CKK3     05066 CKK4     05156 *GENTFM   05192  GTFM1    05300  GTFM2
05372 GTFM3    05396 GTFM4    05426 *GTFM41   05456  GTFM7    05510  GTFM6
05548 GTFM5    05560 GTFM8    05598  KGRJ     05670 *KGRJ11   05690  KGRJ1
05710 KGRJ2    05730 IGRK     05814 *IGRK11   05834  IGRK1    05854  IGRK2
05874 NEXT     05930 N1       05986 *ROWTFM   06022  RTFM1    06084 *COLTFM
06096 CTFM4    06144 CTFM1    06168  CTFM2    06246  CTFM3    06258  CTFM5
06278 CTFM6    06300 CADIJ    06336  AAA      06392  BB       06406  CA98
06442 CA99     06490 SP1      06526  SP2      06556  SP3      06592  RET3
06602 CNOIN    06638 CN1      06670  CN2      06702  CNMOD    06741  HDNG0
06783 HDNG1    06819 HDNG2    06855  HDNG3    06891  HDNG4    06933  HDNG5
06969 HDNG6    07001 HDNG7    07056  PREG     07536  W1       07560  W2
07614 W3       07668 W4       07794  RET6     07802  PST      08056  CD
08152 RET4     08164 PST2     08212  BR       08224  MOVER    08223  MAD
08248 MV1      08292 MV2      08304  MV3      08316  MV4      08446  PNCH
08482 PNCH1    08536 WRNUM    08535  NO       08584 *FLTFIX   08583  ARG
08692 JUMP     08812 TRNMT    08956  WRITE    09028 *WRALPH   09048 *SETZRO
09074 *DECIML  09154 LARGE    09214  JUMP2    09298  WR       09360 *SETSIG
09372 SETS     09404 SET      09471 *OUTPUT   09483 *SEVENS   09493  DCMAL
09495 SIGN     09497 *EXPNT2
```

```
00010*  PROGRAM 80-A, LOAD, DELETE AND/OR CUMULATE SUMS OR MEANS
00020*  SEPT. 6, 1963.
00030*
00040          DORG  402
00050CONT      DSS   80                                  00402
00060DATE      DS    6,CONT+5                            00402 00080
00070PROB      DS    2,CONT+7                            00407 00006
00080NOBS      DS    5,CONT+12                           00409 00002
00090NFORM     DS    3,CONT+15                           00414 00005
00100INVAR     DS    3,CONT+18                           00417 00003
00110NOVAR     DS    3,CONT+21                           00420 00003
00120N         DS    3,CONT+24                           00423 00003
00130NDEP      DS    3,CONT+27                           00426 00003
00140NOTRAN    DS    3,CONT+30                           00429 00003
00150NOCON     DS    3,CONT+33                           00432 00003
00160NCOL      DS    2,CONT+35                           00435 00003
00170NELIM     DS    3,CONT+38                           00437 00002
00180CON1      DS    1,CONT+39                           00440 00003
00190CON2      DS    1,CONT+40                           00441 00001
00200CON3      DS    1,CONT+41                           00442 00001
00210CON4      DS    1,CONT+42                           00443 00001
00220CON5      DS    1,CONT+43                           00444 00001
00230CON6      DS    1,CONT+44                           00445 00001
00240CON7      DS    1,CONT+45                           00446 00001
00250CON8      DS    1,CONT+46                           00447 00001
00260CON9      DS    1,CONT+47                           00448 00001
00270CON10     DS    1,CONT+48                           00449 00001
00280CON11     DS    1,CONT+49                           00450 00001
00290CON12     DS    1,CONT+50                           00451 00001
                                                         00452 00001
```

```
00300CON13   DS    1,CONT+51
00310CON14   DS    1,CONT+52
00320CON15   DS    1,CONT+53
00330CON16   DS    1,CONT+54
00340CON17   DS    1,CONT+55
00350CON18   DS    1,CONT+56
00360OBSER   DS    10,CONT+79
00370IND     DS    5
00380ID      DS    5
00390IDD     DS    5
00400FORMAT  DS    5
00410INDEX   DS    5
00420CONST   DS    5
00430DATA1   DS    5
00440DATA2   DS    5
00450B       DS    5
00460SE      DS    5
00470T       DS    5
00480SUM1    DS    5
00490SIGMA   DS    5
00500R       DS    5
00510WT      DS    5
00520ADKK    DS    5
00530ADRNN   DS    5
00540ADIJ    DS    5
00550ADRIJ   DS    5
00560SIGN3   DS    5
00570COUNT   DS    5
00580CNTR    DS    3
```

```
00453 00001
00454 00001
00455 00001
00456 00001
00457 00001
00458 00001
00481 00010
00486 00005
00491 00005
00496 00005
00501 00005
00506 00005
00511 00005
00516 00005
00521 00005
00526 00005
00531 00005
00536 00005
00541 00005
00546 00005
00551 00005
00556 00005
00561 00005
00566 00005
00571 00005
00576 00005
00581 00005
00586 00005
00589 00003
```

```
00590CTR     DS    3
00600I       DS    3
00610J       DS    3
00620K       DS    3
00630L       DS    3
00640P       DS    3
00650Q       DS    3
00660MSZ     DS    4
00670IVE     DS    3
00680IVP     DS    3
00690TEMP1   DS    10
00700TEMP2   DS    10
00710A0      DS    10
00720EY      DS    10
00730RSQR    DS    10
00740SQR     DS    10
00750DF      DS    10
00760F       DS    10
00770FIN     DS    10
00780FOUT    DS    10
00790HIGH    DS    10
00800VP      DS    10
00810VE      DS    10
00820OUT     DS    80
00830        DC    1,@
00840        DC    8,10000000
00850FP001   DC    2,-2
```



```
00592 00003
00595 00003
00598 00003
00601 00003
00604 00003
00607 00003
00610 00003
00614 00004
00617 00003
00620 00003
00630 00010
00640 00010
00650 00010
00660 00010
00670 00010
00680 00010
00690 00010
00700 00010
00710 00010
00720 00010
00730 00010
00740 00010
00750 00010
00830 00080
00831 00001
00839 00008
00841 00002
```

```
00860          DC    8,10000000
00870FHIGH     DC    2,50
00880          DC    8,0
00890ZERO      DC    2,-99
00900ZEROS     DC    10,0
00910          DC    8,10000000
00920ONE       DC    2,1
00930PNUM      DS    4
00940MCNT      DS    3
00950NOIN      DS    3
00960RCNT      DS    3
00970CNTR1     DS    3
00980ERROR     DAC   17,N DOES NOT AGREE@
00990*
01000*  LOAD AND DELETE AND/OR CUMULATE SUMS OR MEANS.
01010*
01020LOAD      TFM   CNTR,0,10
01030          TD    CNTR,CON16
01040          TDM   NOP+1,1
01050          TFM   NOBS,0
01060LOAD2     RNCD  OUT-79
01070          TF    MOV+23,SUM1
01080          TFM   MOV+28,OUT-70
01090          A     NOBS,OUT-67
01100          C     N,OUT-55
01110          BE    LOAD3
01120          WATY  ERROR
01130          H
01140          DORG  *-9
```

```
00849 00008
00851 00002
00859 00008
00861 00002
00871 00010
00879 00008
00881 00002
00885 00004
00888 00003
00891 00003
00894 00003
00897 00003
00899 00017

00932 16 00589 00000
00944 25 00589 00456
00956 15 01293 00001
00968 16 00414 00000
00980 36 00751 00500
00992 26 01149 00541
01004 16 01154 00760
01016 21 00414 00763
01028 24 00426 00775
01040 46 01066 01200
01052 39 00899 00100
01064 48 00000 00000
01066
```



```
01150LOAD3     RNCD  OUT-79
01160          TF    COMPAR+11,FORMAT
01170          TFM   K,1,10
01180COMPAR    C     K,99999
01190          BE    SKIP1
01200MOV       FA    99999,99999
01210          AM    MOV+23,10,10
01220MOV1      AM    MOV+28,10,10
01230          AM    K,1,10
01240          C     K,N
01250          BP    ENDMOV
01260          CM    MOV+28,OUT+10
01270          BN    COMPAR
01280          RNCD  OUT-79
01290          TFM   MOV+28,OUT-70
01300          B     COMPAR
01310          DORG  *-3
01320ENDMOV    BD    *+20,CON17
01330          B     MOVE2
01340          DORG  *-3
01350NOP       NOP   MOVE2
01360          TDM   NOP+1,9
01370          TF    MOV+23,SIGMA
01380          TFM   MOV+28,OUT-70
01390          RNCD  OUT-79
01400          B     LOAD3
```

```
01066
01066 36 00751 00500
01078 26 01113 00501
01090 16 00601 00001
01102 24 00601 99999
01114 46 01360 01200
01126 16 02843 01149
01138 49 02792 00000
01145 00005    99999
01150 00005    99999
01156 11 01149 00010
01168 11 01154 00010
01180 11 00601 00001
01192 24 00601 00426
01204 46 01272 01100
01216 14 01154 00840
01228 47 01102 01300
01240 36 00751 00500
01252 16 01154 00760
01264 49 01102 00000
01272
01272 43 01292 00457
01284 49 01380 00000
01292
01292 41 01380 00000
01304 15 01293 00009
01316 26 01149 00546
01328 16 01154 00760
01340 36 00751 00500
01352 49 01066 00000
```

```
01410          DORG *-3
01420SKIP1     AM   COMPAR+11,2,10
01430          B    MOV1
01440          DORG *-3
01450MOVE2     TF   MVV+23,R
01460          TFM  L,1,10
01470          TF   MVIND+11,FORMAT
01480          TF   ROWX+11,FORMAT
01490          RNCD OUT-79
01500          RNCD OUT-79
01510          TFM  MVV+28,OUT-70
01520ROWX      C    L,99999
01530          BE   EQROW
01540          TF   K,L
01550MVIND     TFM  COLX+11,99999
01560CPR4      CM   MVV+28,OUT+10
01570          BE   RDNUM
01580COLX      C    K,99999
01590          BE   EOCOL
01600MVV       FA   99999,99999


01610          AM   MVV+23,10,10
01620STEPK     AM   K,1,10
01630          AM   MVV+28,10,10
01640          C    K,N
01650          BNH  CPR4
01660STEPL     AM   L,1,10
01670          C    L,N
```

```
01360
01360 11 01113 00002
01372 49 01168 00000
01380
01380 26 01583 00551
01392 16 00604 00001
01404 26 01511 00501
01416 26 01475 00501
01428 36 00751 00500
01440 36 00751 00500
01452 16 01588 00760
01464 24 00604 99999
01476 46 01770 01200
01488 26 00601 00604
01500 16 01547 99999
01512 14 01588 00840
01524 46 01718 01200
01536 24 00601 99999
01548 46 01750 01200
01560 16 02843 01583
01572 49 02792 00000
01579 00005    99999
01584 00005    99999
01590 11 01583 00070
01602 11 00601 00001
01614 11 01588 00070
01626 24 00601 00426
01638 47 01512 01100
01650 11 00604 00001
```



```
01680          BNH  ROWX
01690          SM   CNTR,1,10
01700          BP   LOAD2
01710          B    SEN
01720          DORG *-3
01730RDNUM     RNCD OUT-79
01740          TFM  MVV+28,OUT-70
01750          B    COLX
01760          DORG *-3
01770EQCOL     AM   COLX+11,2,10
01780          B    STEPK
01790          DORG *-3
01800EQROW     AM   MVIND+11,2,10
01810          AM   ROWX+11,2,10
01820          TF   K,L
01830          TF   NOPER+11,MVV+28
01840          CM   NOPER+11,OUT+10
01850          BL   NOPER+12
01860          RNCD OUT-79
01870          TFM  NOPER+11,OUT-70
01880NOPER     NOP  0,0
01890          AM   NOPER+11,10,10
01900          AM   K,1,10
01910          CM   NOPER+11,OUT+10
01920          BE   RDCARD
01930CMPKN     C    K,N
01940          BNH  NOPER+12
```

```
01662 24 00604 00426
01674 47 01464 01100
01686 12 00589 00001
01698 46 00980 01100
01710 49 02058 00000
01718
01718 36 00751 00500
01730 16 01588 00760
01742 49 01536 00000
01750
01750 11 01547 00002
01762 49 01602 00000
01770
01770 11 01511 00002
01782 11 01475 00002
01794 26 00601 00604
01806 26 01877 01588
01818 14 01877 00840
01830 47 01878 01300
01842 36 00751 00500
01854 16 01877 00760
01866 41 00000 00000
01878 11 01877 00070
01890 11 00601 00001
01902 14 01877 00840
01914 46 01970 01200
01926 24 00601 00426
```

```
01950          TF    MVV+28,NOPER+11
01960          B     STEPL
01970          DORG  *-3
01980RDCARD    C     L,N
01990          BE    TSTCOL
02000          RNCD  OUT-79
02010          TFM   NOPER+11,OUT-70
02020          B     CMPKN
02030          DORG  *-3
02040TSTCOL    C     K,N
02050          BNH   RDCARD+24
02060          B     STEPL
02070          DORG  *-3
02080SEN       TF    SETN+11,FORMAT
02090          SM    SETN+11,4,10
02100SETN      TF    N,99999
02110          BT    CONV,NOBS
02120          MM    N,5,10
02130          TF    TEMP1,99
02140          TF    TEMP2,N
02150          AM    TEMP2,1,10
02160          M     TEMP1,TEMP2
02170          SF    95
02180          TF    MSZ,98
02190*
02200*  ARE MEANS LOADED
02210*
02220          BD    PM,CON17
```

```
01938 47 01878 01100
01950 26 01588 01877
01962 49 01650 00000
01970
01970 24 00604 00426
01982 46 02026 01200
01994 36 00751 00500
02006 16 01877 00760
02018 49 01926 00000
02026
02026 24 00601 00426
02038 47 01994 01100
02050 49 01650 00000
02058
02058 26 02093 00501
02070 12 02093 00004
02082 26 00426 99999
02094 27 02528 00414
02106 13 00426 00005
02118 26 00630 00099
02130 26 00640 00426
02142 11 00640 00001
02154 23 00630 00640
02166 32 00095 00000
02178 26 00614 00098


02190 43 02278 00457
```



```
02230*
02240*  ARE SUMS PUNCHED.
02250*
02260          BD    *+20,CON9
02270          B     CHECK
02280          DORG  *-3
02290*
02300*  PUNCH SUMS.
02310          TF    PNUM,N
02320          BT    PNCH,SUM1
02330          TF    PNUM,MSZ
02340          BT    PNCH,R
02350          B     CHECK
02360          DORG  *-3
02370*
02380*  ARE MEANS PUNCHED.
02390*
02400PM        BD    *+20,CON10
02410          B     END
02420          DORG  *-3
02430*
02440*  PUNCH MEANS.
02450*
02460          TF    PNUM,N
02470          BT    PNCH,SUM1
02480          TF    PNUM,N
02490          BT    PNCH,SIGMA
02500          TF    PNUM,MSZ
02510          BT    PNCH,R
02520END       RNCD  0
02530          B     0
02540          DORG  *-3
02550CHECK     BD    *+20,CON5
```

```
02202 43 02222 00449
02214 49 02390 00000
02222

02222 26 00885 00426
02234 27 02436 00541
02246 26 00885 00614
02258 27 02436 00551
02270 49 02390 00000
02278

02278 43 02298 00450
02290 49 02370 00000
02298

02298 26 00885 00426
02310 27 02436 00541
02322 26 00885 00426
02334 27 02436 00546
02346 26 00885 00614
02358 27 02436 00551
02370 36 00000 00500
02382 49 00000 00000
02390
```

```
02560          B     END
02570          DORG  *-3
02580          BTM   MEANS,0,10
02590          B     END
02600          DORG  *-3
02610*    *    *    *    *    *
02620*  PUNCH SUBROUTINE.      *
02630*    *    *    *    *    *
02640          DS    5
02650PNCH      WNCD  402
02660          TF    PNCH1+6,PNCH-1
02670          SM    PNCH1+6,9,10
02680PNCH1     WNCD  99999
02690          AM    PNCH1+6,80,10
02700          SM    PNUM,8,10
02710          BP    PNCH1
02720          BB
02730          DORG  *-9
02740*    *    *    *    *    *    *    *    *
02750*  SUBROUTINE TO FLOAT NOBS.
02760*    *    *    *    *    *    *    *    *
02770          DS    5
02780CONV      TFM   EXP3,5,10
02790          TFM   TESTD+11,CONV-5
02800          TFM   TESTD+11,CONV-5
02810          TFM   MVWRD+6,OBSER-5
02820          TF    OBSER,ZEROS
02830TESTD     BD    SETM,99999
02840          AM    TESTD+11,1,10
02850          SM    EXP3,1,10
02860          SM    MVWRD+6,1,10
```

```
02390 43 02410 00445
02402 49 02370 00000
02410
02410 17 02698 00000
02422 49 02370 00000
02430

02434 00005
02436 38 00402 00400
02448 26 02478 02435
02460 12 02478 00009
02472 38 99999 00400
02484 11 02478 00080
02496 12 00885 00008
02508 46 02472 01100
02520 42 00000 00000
02522
*
*
*
02526 00005
02528 16 02695 00005
02540 16 02599 02523
02552 16 02599 02523
02564 16 02674 00476
02576 26 00481 00871
02588 43 02644 99999
02600 11 02599 00001
02612 12 02695 00001
```



```
02870          B     TESTD
02880          DORG  *-3
02890SETM      TF    *+18,TESTD+11
02900          SF    99999
02910MVWRD     TF    99999,CONV-1
02920          TF    OBSER,EXP3
02930          BB
02940          DORG  *-9
02950EXP3      DS    2
02960*    *    *    *    *    *    *
02970*  SUBROUTINE TO FORM MEANS.    *
02980*    *    *    *    *    *    *
02990          DS    2
03000MEANS     TF    MCNT,N
03010          TF    DIVS+23,SUM1
03020DIVS      FD    99999,OBSER

03030          AM    DIVS+23,10,10
03040          SM    MCNT,1,10
03050          BP    DIVS
03060          BB
03070          DORG  *-9
03080          DAC   1,0
03090          DEND  LOAD
LOAD SUBROUTINES
```

```
02624 12 02674 00001
02636 49 02588 00000
02644
02644 26 02662 02599
02656 32 99999 00000
02668 26 99999 02527
02680 26 00481 02695
02692 42 00000 00000
02694
02695 00002

02697 00002
02698 26 00888 00426
02710 26 02745 00541
02722 16 02843 02745
02734 49 02812 00000
02741 00005    99999
02746 00005    00481
02752 11 02745 00010
02764 12 00888 00001
02776 46 02722 01100
02788 42 00000 00000
02790
02791 00001
00932
02792 16 03246 03748
02804 49 02832 0
02812 16 03246 04248
02824 49 02832 0
```

```
00010*  PROGRAM 80-B, TYPE FINAL REPORT, MAY 7, 1963.
00020*
00030          DORG 402                                    00402
00040CONT      DSS  80                                     00402 00080
00050I         DS   2,CONT+1                               00403 00002
00060J         DS   2,CONT+3                               00405 00002
00070Y         DS   2,CONT+5                               00407 00002
00080PROB      DS   2,CONT+7                               00409 00002
00090NOBS      DS   5,CONT+12                              00414 00005
00100N         DS   3,CONT+24                              00426 00003
00110INDEX     DSS  80                                     00482 00080
00120HED       DSS  80                                     00562 00080
00130STEPNO    DS   3,HED+2                                00564 00003
00140L         DS   3,HED+5                                00567 00003
00150NOIN      DS   3,HED+8                                00570 00003
00160NN        DS   3,HED+11                               00573 00003
00170A0        DS   10,HED+29                              00591 00010
00180RSQR      DS   10,HED+39                              00601 00010
00190EY        DS   10,HED+49                              00611 00010
00200F         DS   10,HED+59                              00621 00010
00210SQR       DS   10,HED+69                              00631 00010
00220COUNT     DS   5                                      00646 00005
00230OUT       DS   5                                      00651 00005
00240          DC   1,@                                    00652 00001
00250TABNO     DS   2                                      00654 00002
00260K         DS   3                                      00657 00003
00270ALPHA     DAS  80                                     00659 00080
```

00402	CONT	00407	DATE	00409	PROB	00414	NOBS	00417	NFORM
00420	INVAR	00423	NOVAR	00426	N	00429	NDEP	00432	*NOTRAN
00435	NOCON	00437	NCOL	00440	NELIM	00441	CON1	00442	CON2
00443	CON3	00444	CON4	00445	CON5	00446	CON6	00447	CON7
00448	CON8	00449	CON9	00450	CON10	00451	CON11	00452	CON12
00453	CON13	00454	CON14	00455	CON15	00456	CON16	00457	CON17
00458	CON18	00481	OBSER	00486	IND	00491	ID	00496	IDD
00501	*FORMAT	00506	INDEX	00511	CONST	00516	DATA1	00521	DATA2
00526	B	00531	SE	00536	T	00541	SUM1	00546	SIGMA
00551	R	00556	WT	00561	ADKK	00566	ADRNN	00571	ADIJ
00576	ADRIJ	00581	SIGN3	00586	COUNT	00589	CNTR	00592	CTR
00595	I	00598	J	00601	K	00604	L	00607	P
00610	Q	00614	MSZ	00617	IVE	00620	IVP	00630	TEMP1
00640	TEMP2	00650	AO	00660	EY	00670	RSQR	00680	SQR
00690	DF	00700	F	00710	FIN	00720	FOUT	00730	HIGH
00740	VP	00750	VE	00830	OUT	00841	FPOO1	00851	FHIGH
00861	ZERO	00871	ZEROS	00881	ONE	00885	PNUM	00888	MCNT
00891	NOIN	00894	RCNT	00897	CNTR1	00899	ERROR	00932	LOAD
00980	LOAD2	01066	LOAD3	01102	*COMPAR	01126	MOV	01168	MOV1
01272	*ENDMOV	01292	NOP	01360	SKIP1	01380	MOVE2	01464	ROWX
01500	MVIND	01512	CPR4	01536	COLX	01560	MVV	01602	STEPK
01650	STEPL	01718	RDNUM	01750	EQCOL	01770	EQROW	01866	NOPER
01926	CMPKN	01970	*RDCARD	02026	*TSTCOL	02058	SEN	02082	SETN
02278	PM	02370	END	02390	CHECK	02436	PNCH	02472	PNCH1
02528	CONV	02588	TESTD	02644	SETM	02668	MVWRD	02695	EXP3
02698	MEANS	02722	DIVS						

```
00280        DAC   1,@                                          00819 00001
00290CON2    DS    1,ALPHA+3                                    00662 00001
00300CON4    DS    1,ALPHA+5                                    00664 00001
00310CON6    DS    1,ALPHA+7                                    00666 00001
00320CON8    DS    1,ALPHA+9                                    00668 00001
00330CON10   DS    1,ALPHA+11                                   00670 00001
00340ID      DSB   2,80                                         00821 00002 00080
00350B       DSB   10,80                                        00989 00010 00080
00360SE      DSB   10,80                                        01789 00010 00080
00370T       DSB   10,80                                        02589 00010 00080
00380INAREA  DSB   10,8                                         03389 00010 00008
00390HDNG0   DAC   20,DEP VAR       =     @                    03461 00020
00400HDNG1   DAC   18,STD ERR Y.X   =   @                      03501 00018
00410HDNG2   DAC   18,R SQUARED     =   @                      03537 00018
00420HDNG3   DAC   18,SUM SQR RES   =   @                      03573 00018
00430HDNG4   DAC   21,IND VAR USED  =      @                   03609 00021
00440HDNG5   DAC   18,CONSTANT TERM =   @                      03651 00018
00450HDNG6   DAC   15,VAR       COEFF@                         03687 00015
00460HDNG7   DAC   29,          STD ERR       T RATIO@         03717 00029
00470PRBL    DAC   6,PROB @                                     03775 00006
00480VRBL    DAC   6, VAR @                                     03787 00006
00490OBSR    DAC   7, OBSER@                                    03799 00007
00500SUMS    DAC   18,SUMS OF VARIABLES@                        03813 00018
00510SUMSQ   DAC   35,SUMS OF SQUARES AND CROSS-PRODUCTS@       03849 00035
00520AVRG    DAC   9,AVERAGES@                                  03919 00009
00530STDEVS  DAC   20,STANDARD DEVIATIONS@                      03937 00020
00540SMPCOR  DAC   19,CORRELATION MATRIX@                       03977 00019
00550STEP    DAC   6,STEP @                                     04015 00006
```



```
00560MAT1    DAC   31,TRANSFORMED CORRELATION MATRIX@           04027 00031
00570MAT2    DAC   30,REINVERTED CORRELATION MATRIX@            04089 00030
00580*
00590*  SUBROUTINE TO READ B, SE AND T.
00600*
00610        DS    5                                            04152 00005
00620RD      TF    RD1+6,RD-1                                   04154 26 04196 04153
00630        TF    C1+11,RD-1                                   04166 26 04225 04153
00640        A     C1+10,NOIN                                   04178 21 04224 00570
00650RD1     RNCD  99999                                        04190 36 99999 00500
00660        AM    RD1+6,70,10                                  04202 11 04196 00070
00670C1      CM    RD1+6,99999                                  04214 14 04196 99999
00680        BN    RD1                                          04226 47 04190 01300
00690        BB                                                 04238 42 00000 00000
00700        DORG  *-3                                          04246
00710*
00720*  SUBROUTINE TO READ AND PRINT FLOATING POINT NUMBERS.
00730*
00740        DS    4                                            04249 00004
00750PRINT   RNCD  INAREA-9                                     04250 36 03380 00500
00760NMBR    DS    ,PRINT-1                                     04249 00000
00770        TFM   BRTRMT+28,INAREA                             04262 16 04302 03389
00780BRTRMT  BTFS  FLTFIX,99999                                 04274 16 07865 04297
                                                                04286 49 07834 00000
                                                                04293 00005    04916
                                                                04298 00005    99999
00790        WATY  OUTPUT-20                                    04304 39 05783 00100
00800        TBTY                                               04316 34 00000 00108
00810        AM    BRTRMT+28,10,10                              04328 11 04302 00010
00820        SM    NMBR,1,10                                    04340 12 04249 00001
00830        BNP   RTRN2A                                       04352 47 04396 01100
```

```
00840COP     CM   BRTRMT+28,INAREA+70
00850        BNH  BRTRMT
00860        B    PRINT
00870        DORG *-3
00880RTRN2A  RCTY
00890        RCTY
00900RTRN2   B    99999
00910        DORG *-3
00920*
00930*  SUBROUTINE TO PRINT FIXED POINT NUMBERS.
00940*
00950        DS   4
00960WRNUM   TF   OUT,NO
00970NO      DS   ,WRNUM-1
00980        CF   OUT-1
00990        WNTY OUT-1
01000        BB
01010        DORG *-9
01020*
01030*  SUBROUTINE TO PRINT TRIANGULAR MATRIX.
01040*
01050PRTRI   RNCD INAREA-9
01060        TFM  BRTRMT+28,INAREA
01070        TF   K,N
01080        TFM  TABNO,1,10
01090BTAB    BT   TABSUB,TABNO
01100TRMTK   TF   NMBR,K
01110        TFM  RTRN2+6,*+20
01120        B    COP
01130        DORG *-3
```

```
04364 14 04302 03459
04376 47 04274 01100
04388 49 04250 00000
04396
04396 34 00000 00102
04408 34 00000 00102
04420 49 99999 00000
04428

04431 00004
04432 26 00651 04431
04431 00000
04444 33 00650 00000
04456 38 00650 00100
04468 42 00000 00000
04470

04470 36 03380 00500
04482 16 04302 03389
04494 26 00657 00426
04506 16 00654 00001
04518 27 04644 00654
04530 26 04249 00657
04542 16 04426 04562
04554 49 04364 00000
04562
```



```
01140        AM   TABNO,1,10
01150        CM   TABNO,5,10
01160        BNP  *+24
01170        TFM  TABNO,1,10
01180        SM   K,1,10
01190        BNE  BTAB
01200RTRN4   B    99999
01210        DORG *-3
01220        DS   2
01230TABSUB  TBTY
01240NUMB    DS   ,TABSUB-1
01250        SM   NUMB,1,10
01260        BP   TABSUB
01270        BB
01280        DORG *-9
01290*
01300*  SUBROUTINE TO PRINT HEADING.
01310*
01320HEADNG  BT   WRNUM,I
01330        SPTY
01340        BT   WRNUM,J
01350        SPTY
01360        BT   WRNUM,Y
01370        RCTY
01380        WATY PRBL
01390        BT   WRNUM,PROB
01400        TBTY
01410        BT   WRNUM,N
01420        WATY VRBL
```

```
04562 11 00654 00001
04574 14 00654 00005
04586 47 04610 01100
04598 16 00654 00001
04610 12 00657 00001
04622 47 04518 01200
04634 49 99999 00000
04642
04643 00002
04644 34 00000 00108
04643 00000
04656 12 04643 00001
04668 46 04644 01100
04680 42 00000 00000
04682

04682 27 04432 00403
04694 34 00000 00101
04706 27 04432 00405
04718 34 00000 00101
04730 27 04432 00407
04742 34 00000 00102
04754 39 03775 00100
04766 27 04432 00409
04778 34 00000 00108
04790 27 04432 00426
04802 39 03787 00100
```

```
01430          TBTY
01440          TF    OUT,NOBS
01450          CF    OUT-4
01460          WNTY  OUT-4
01470          WATY  OBSR
01480          RCTY
01490          RCTY
01500RTRN3     B     99999
01510          DORG  *-3
01520*    *    *    *    *    *    *    *    *    *    *    *    *    *
01530*  SUBROUTINE FOR PREPARING DATA FOR ALPHAMERICAL PRINTING OR    *
01540*  PUNCHING.  INTERNAL FORMAT IS SPSII.                          *
01550*    *    *    *    *    *    *    *    *    *    *    *    *    *
01560          DS    10
01570FLTFIX    CF    ARG-9
01580ARG       DS    ,FLTFIX-1
01590          TF    OUTPUT,SEVENS
01600          CF    OUTPUT-9
01610          TF    OUTPUT-10,DCMAL
01620          TFM   OUTPUT-19,0,9
01630          TFM   SIGN,0,10
01640          BNF   JUMP,ARG-2
01650          TDM   SIGN-1,2,11
01660          CF    ARG-2
01670JUMP      CM    ARG,99,1011
01680          BE    WRALPH
01690          CM    ARG,0,10
01700          BNP   DECIML
01710          CM    ARG,4,10
01720          BH    LARGE
```

```
04814 34 00000 00108
04826 26 00651 00414
04838 33 00647 00000
04850 38 00647 00100
04862 39 03799 00100
04874 34 00000 00102
04886 34 00000 00102
04898 49 99999 00000
04906
04915 00010
04916 33 04906 00000
04915 00000
04928 26 05803 05815
04940 33 05794 00000
04952 26 05793 05825
04964 16 05784 00000
04976 16 05827 00000
04988 44 05024 04913
05000 15 05826 00002
05012 33 04913 00000
05024 14 04915 00099
05036 46 05360 01200
05048 14 04915 00000
05060 47 05406 01100
05072 14 04915 00004
05084 46 05486 01100
```



```
01730          TFM   TRNMT+11,ARG-9
01740          TFM   *+42,OUTPUT-10
01750          S     *+30,ARG
01760          S     *+18,ARG
01770TRNMT     TD    99999,99999
01780          AM    TRNMT+11,1,10
01790          AM    TRNMT+6,2,10
01800          CM    TRNMT+6,OUTPUT-12
01810          BNH   TRNMT
01820          TF    WRITE+23,TRNMT+11
01830          TFM   EXPNT2,5,10
01840          S     EXPNT2,ARG
01850          TFM   *+47,SEVENS
01860          S     *+35,EXPNT2
01870          S     *+23,EXPNT2
01880          A     OUTPUT-12,99999
01890WRITE     TFM   *+18,OUTPUT-8
01900          TD    OUTPUT-8,0
01910          AM    WRITE+23,1,10
01920          AM    WRITE+18,2,10
01930          CM    WRITE+18,OUTPUT
01940          BNH   WRITE+12
01950WRALPH    BD    SETZRO,OUTPUT-18
01960          B     SETSIG
01970          DORG  *-3
01980SETZRO    TDM   OUTPUT,0
01990          TF    OUTPUT-20,SIGN
```

```
05096 16 05155 05906
05108 16 05150 05793
05120 22 05150 04915
05132 22 05150 04915
05144 25 99999 99999
05156 11 05155 00001
05168 11 05150 00002
05180 14 05150 05791
05192 47 05144 01100
05204 26 05311 05155
05216 16 05829 00005
05228 22 05829 04915
05240 16 05287 05815
05252 22 05287 05829
05264 22 05287 05829
05276 21 05791 99999
05288 16 05306 05795
05300 25 05795 00000
05312 11 05311 00001
05324 11 05306 00002
05336 14 05306 05803
05348 47 05300 01100
05360 43 05380 05785
05372 49 05692 00000
05380
05380 15 05803 00000
05392 26 05783 05827
```

```
02000          BB
02010          DORG  *-9
02020DECIML    CM    ARG,4,1011
02030          BNH   LARGE
02040          TFM   WRITE+23,ARG-9
02050          TFM   WRITE+18,OUTPUT-8
02060          S     WRITE+18,ARG
02070          S     WRITE+18,ARG
02080          B     WRITE+12
02090          DORG  *-3
02100LARGE     TF    OUTPUT-17,SEVENS-7
02110          BNF   JUMP2,ARG
02120          TFM   OUTPUT-20,20,10
02130          CF    ARG
02140          CF    OUTPUT-19
02150JUMP2     TD    OUTPUT-16,ARG
02160          TD    OUTPUT-18,ARG-1
02170          CF    OUTPUT-18
02180          TF    OUTPUT-12,SIGN
02190          CF    OUTPUT-13
02200          TFM   WR+11,ARG-9
02210          TFM   WR+6,OUTPUT-8
02220WR        TD    99999,99999
02230          AM    WR+11,1,10
02240          AM    WR+6,2,10
02250          CM    WR+6,OUTPUT
```

```
05404 42 00000 00000
05406
05406 14 04915 000Ō4
05418 47 05486 01100
05430 16 05311 Ō4906
05442 16 05306 Ō5795
05454 22 05306 04915
05466 22 05306 04915
05478 49 05300 00000
05486
05486 26 05786 05808
05498 44 05546 04915
05510 16 05783 000Ō0
05522 33 04915 00000
05534 33 05784 00000
05546 25 05787 04915
05558 25 05785 04914
05570 33 05785 00000
05582 26 05791 05827
05594 33 05790 00000
05606 16 05641 Ō4906
05618 16 05636 Ō5795
05630 25 99999 99999
05642 11 05641 000Ō1
05654 11 05636 000Ō2
05666 14 05636 Ō5803
```

```
02260          BNH   WR
02270          BB
02280          DORG  *-9
02290SETSIG    TFM   SETS+11,OUTPUT-16
02300SETS      BD    SET,OUTPUT-16
02310          AM    SETS+11,2,10
02320          B     SETS
02330          DORG  *-3
02340SET       TF    *+30,SETS+11
02350          SM    *+18,2,10
02360          TF    99999,SIGN
02370          BB
02380          DORG  *-9
02390          DAS   14
02400OUTPUT    DS    2
02410          DAC   1,@
02420SEVENS    DC    10,7070707070
02430DCMAL     DC    10,000000000 3
02440SIGN      DS    2
02450EXPNT2    DS    2
02460STARTB    RACD  ALPHA
02470          RCTY
02480          WATY  ALPHA
02490          BNR   *+24,ALPHA+158
02500          B     STARTB
02510          RCTY
02520          RCTY
```



```
05678 47 05630 01100
05690 42 00000 00000
05692
05692 16 05715 Ō5787
05704 43 05736 05787
05716 11 05715 000Ō2
05728 49 05704 00000
05736
05736 26 05766 05715
05748 12 05766 000Ō2
05760 26 99999 05827
05772 42 00000 00000
05774
05775 00014
05803 00002
05805 00001
05815 00010
05825 00010
05827 00002
05829 00002
05830 37 00659 00500
05842 34 00000 00102
05854 39 00659 00100
05866 45 05890 00817
05878 49 05830 00000
05890 34 00000 00102
05902 34 00000 00102
```

```
02530          RNCD CON2-1
02540TEST2     BD   RDSUMS,CON2
02550TEST4     BD   RDCORS,CON4
02560TEST6     BD   RDMAT1,CON6
02570TEST8     BD   RDMAT2,CON8
02580TEST10    BD   RDSTEP,CON10
02590          B    END
02600          DORG *-3
02610RDSUMS    RNCD 1-1
02620          TFM  RTRN3+6,*+20
02630          B    HEADNG
02640          DORG *-3
02650          WATY SUMS
02660          RCTY
02670          RCTY
02680          TF   NMBR,N
02690          TFM  RTRN2+6,*+20
02700          B    PRINT
02710          DORG *-3
02720          WATY SUMSQ
02730          RCTY
02740          RCTY
02750          RNCD 1-1
02760          TFM  RTRN4+6,TEST4
02770          B    PRTR1
02780          DORG *-3
02790RDCORS    RNCD 1-1
```

```
05914 36 00661 00500
05926 43 05994 00662
05938 43 06162 00664
05950 43 06422 00666
05962 43 06534 00668
05974 43 06658 00670
05986 49 07808 00000
05994
05994 36 00402 00500
06006 16 04904 ð6026
06018 49 04682 00000
06026
06026 39 03813 00100
06038 34 00000 00102
06050 34 00000 00102
06062 26 04249 00426
06074 16 04426 ð6094
06086 49 04250 00000
06094
06094 39 03849 00100
06106 34 00000 00102
06118 34 00000 00102
06130 36 00402 00500
06142 16 04640 ð5938
06154 49 04470 00000
06162
06162 36 00402 00500
```

```
02800          BD   OVER1,CON2
02810          TFM  RTRN3+6,*+20
02820          B    HEADNG
02830          DORG *-3
02840OVER1     WATY AVRG
02850          RCTY
02860          RCTY
02870          TF   NMBR,N
02880          TFM  RTRN2+6,*+20
02890          B    PRINT
02900          DORG *-3
02910          RNCD 1-1
02920          WATY STDEVS
02930          RCTY
02940          RCTY
02950          TF   NMBR,N
02960          TFM  RTRN2+6,*+20
02970          B    PRINT
02980          DORG *-3
02990          RNCD 1-1
03000          WATY SMPCOR
03010          RCTY
03020          RCTY
03030          TFM  RTRN4+6,TEST6
03040          B    PRTR1
03050          DORG *-3
03060RDMAT1    RNCD 1-1
```



```
06174 43 06206 00662
06186 16 04904 ð6206
06198 49 04682 00000
06206
06206 39 03919 00100
06218 34 00000 00102
06230 34 00000 00102
06242 26 04249 00426
06254 16 04426 ð6274
06266 49 04250 00000
06274
06274 36 00402 00500
06286 39 03937 00100
06298 34 00000 00102
06310 34 00000 00102
06322 26 04249 00426
06334 16 04426 ð6354
06346 49 04250 00000
06354
06354 36 00402 00500
06366 39 03977 00100
06378 34 00000 00102
06390 34 00000 00102
06402 16 04640 ð5950
06414 49 04470 00000
06422
06422 36 00402 00500
```

```
03070          BD    OVER2,CON2
03080          BD    OVER2,CON4
03090          TFM   RTRN3+6,*+20
03100          B     HEADNG
03110          DORG  *-3
03120OVER2     WATY  MAT1
03130          RCTY
03140          RCTY
03150          TFM   RTRN4+6,TEST8
03160          B     PRTRI
03170          DORG  *-3
03180RDMAT2    RNCD  1-1
03190          BD    OVER3,CON2
03200          BD    OVER3,CON4
03210          BD    OVER3,CON6
03220          TFM   RTRN3+6,*+20
03230          B     HEADNG
03240          DORG  *-3
03250OVER3     WATY  MAT2
03260          RCTY
03270          RCTY
03280          TFM   RTRN4+6,TEST10
03290          B     PRTRI
03300          DORG  *-3
```

```
06434 43 06478 00662
06446 43 06478 00664
06458 16 04904 06478
06470 49 04682 00000
06478
06478 39 04027 00100
06490 34 00000 00102
06502 34 00000 00102
06514 16 04640 05962
06526 49 04470 00000
06534
06534 36 00402 00500
06546 43 06602 00662
06558 43 06602 00664
06570 43 06602 00666
06582 16 04904 06602
06594 49 04682 00000
06602
06602 39 04089 00100
06614 34 00000 00102
06626 34 00000 00102
06638 16 04640 05974
06650 49 04470 00000
06658
```



```
03310RDSTEP BNLC *+12
03320          RCTY
03330          RNCD  STEPNO-2
03340          RNCD  INDEX
03350          BTM   RD,B-9
03360          BTM   RD,SE-9
03370          BTM   RD,T-9
03380*
03390*  PRINT STEP RESULTS.
03400*
03410          WATY  STEP
03420          TF    OUT,STEPNO
03430          CF    OUT-2
03440          WNTY  OUT-2
03450          RCTY
03460          RCTY
03470          WATY  HDNGO
03480          BT    WRNUM,L
03490          RCTY
03500          WATY  HDNG1
03510          BTFS  FLTFIX,EY
03520          WATY  OUTPUT-20
03530          RCTY
03540          WATY  HDNG2
03550          BTFS  FLTFIX,RSQR
```

```
06658 47 06670 00900
06670 34 00000 00102
06682 36 00562 00500
06694 36 00482 00500
06706 17 04154 00980
06718 17 04154 01780
06730 17 04154 02580
06742 39 04015 00100
06754 26 00651 00564
06766 33 00649 00000
06778 38 00649 00100
06790 34 00000 00102
06802 34 00000 00102
06814 39 03461 00100
06826 27 04432 00567
06838 34 00000 00102
06850 39 03501 00100
06862 16 07865 06885
06874 49 07834 00000
06881 00005    04916
06886 00005    00611
06892 39 05783 00100
06904 34 00000 00102
06916 39 03537 00100
06928 16 07865 06951
06940 49 07834 00000
06947 00005    04916
06952 00005    00601
```

```
03560          WATY OUTPUT-20
03570          RCTY
03580          WATY HDNG3
03590          BTFS FLTFIX,SQR

03600          WATY OUTPUT-20
03610          RCTY
03620          WATY HDNG4
03630          TF   OUT,NOIN
03640          CF   OUT-1
03650          WNTY OUT-1
03660          RCTY
03670          RCTY
03680          WATY HDNG5
03690          BTFS FLTFIX,AO

03700          WATY OUTPUT-20
03710          RCTY
03720          RCTY
03730          WATY HDNG6
03740          WATY HDNG7
03750          RCTY
03760*
03770*  SET ID OF INDEPENDENT VARIABLES.
03780*
03790          TF   COUNT,NN
```

```
06958 39 05783 00100
06970 34 00000 00102
06982 39 03573 00100
06994 16 07865 07017
07006 49 07834 00000
07013 00005    04916
07018 00005    00631
07024 39 05783 00100
07036 34 00000 00102
07048 39 03609 00100
07060 26 00651 00570
07072 33 00650 00000
07084 38 00650 00100
07096 34 00000 00102
07108 34 00000 00102
07120 39 03651 00100
07132 16 07865 07155
07144 49 07834 00000
07151 00005    04916
07156 00005    00591
07162 39 05783 00100
07174 34 00000 00102
07186 34 00000 00102
07198 39 03687 00100
07210 39 03717 00100
07222 34 00000 00102

07234 26 00646 00573
```



```
03800          TFM  1,1,10
03810          TFM  ID1+11,INDEX
03820          TFM  ID2+6,ID
03830ID1       BD   *+20,99999
03840          B    IDMOD
03850          DORG *-3
03860          TF   *+23,ID1+11
03870          BNR  *+20,99999
03880          B    IDMOD
03890          DORG *-3
03900          C    I,L
03910          BE   IDMOD
03920ID2       TF   99999,I
03930          AM   ID2+6,2,10
03940IDMOD     AM   ID1+11,1,10
03950          AM   1,1,10
03960          SM   COUNT,1,10
03970          BP   ID1
03980*
03990*  PRINT B, SE, AND T.
04000*
04010          TFM  W1+11,ID
04020          TFM  W2+28,B
04030          TFM  W3+28,SE
04040          TFM  W4+28,T
04050          TF   COUNT,NOIN
04060W1        TF   OUT,99999
04070          CF   OUT-1
```

```
07246 16 00403 00001
07258 16 07293 00482
07270 16 07364 00821
07282 43 07302 99999
07294 49 07382 00000
07302
07302 26 07325 07293
07314 45 07334 99999
07326 49 07382 00000
07334
07334 24 00403 00567
07346 46 07382 01200
07358 26 99999 00403
07370 11 07364 00002
07382 11 07293 00001
07394 11 00403 00001
07406 12 00646 00001
07418 46 07282 01100

07430 16 07501 00821
07442 16 07566 00989
07454 16 07620 01789
07466 16 07674 02589
07478 26 00646 00570
07490 26 00651 99999
07502 33 00650 00000
```

```
04080        WNTY OUT-1
04090        TBTY
04100W2      BTFS FLTFIX,B


04110        WATY OUTPUT-20
04120        TBTY
04130W3      BTFS FLTFIX,SE


04140        WATY OUTPUT-20
04150        TBTY
04160W4      BTFS FLTFIX,T


04170        WATY OUTPUT-20
04180        RCTY
04190        AM   W1+11,2,10
04200        AM   W2+28,10,10
04210        AM   W3+28,10,10
04220        AM   W4+28,10,10
04230        SM   COUNT,1,10
04240        BP   W1
04250        RCTY
04260        RCTY
04270        BNLC RDSTEP+12
04280END     H
04290        B    STARTB
04295        DAC  1,0
04300        DEND STARTB
LOAD SUBROUTINES
```

```
07514 38 00650 00100

07526 34 00000 00108

07538 16 07865 07561
07550 49 07834 00000
07557 00005    04916
07562 00005    00989

07568 39 05783 00100

07580 34 00000 00108

07592 16 07865 07615
07604 49 07834 00000
07611 00005    04916
07616 00005    01789

07622 39 05783 00100

07634 34 00000 00108

07646 16 07865 07669
07658 49 07834 00000
07665 00005    04916
07670 00005    02589

07676 39 05783 00100

07688 34 00000 00102

07700 11 07501 00002

07712 11 07566 00010

07724 11 07620 00010

07736 11 07674 00010

07748 12 00646 00001

07760 46 07490 01100

07772 34 00000 00102

07784 34 00000 00102

07796 47 06670 00900

07808 48 00000 00000

07820 49 05830 00000

07833 00001

05830

07834 16 08268 08726
07846 49 07958 0
```

```
END OF PASSII
00402  CONT     00403  I        00405  J        00407  Y        00409  PROB
00414  NOBS     00426  N        00482  INDEX    00562  HED      00564 *STEPNO
00567  L        00570  NOIN     00573  NN       00591  AO       00601  RSQR
00611  EY       00621  F        00631  SCR      00646  COUNT    00651  OUT
00654  TABNO    00657  K        00659  ALPHA    00662  CON2     00664  CON4
00666  CON6     00668  CON8     00670  CON10    00821  ID       00989  B
01789  SE       02589  T        03389 *INAREA   03461  HDNG0    03501  HDNG1
03537  HDNG2    03573  HDNG3    03609  HDNG4    03651  HDNG5    03687  HDNG6
03717  HDNG7    03775  PRBL     03787  VRBL     03799  OBSR     03813  SUMS
03849  SUMSQ    03919  AVRG     03937 *STDEVS   03977 *SMPCOR   04015  STEP
04027  MAT1     04089  MAT2     04154  RD       04190  RD1      04214  C1
04250  PRINT    04249  NMBR     04274 *BRTRMT   04364  COP      04396 *RTRN2A
04420  RTRN2    04432  WRNUM    04431  NO       04470  PRTR1    04518  BTAB
04530  TRMTK    04634  RTRN4    04644 *TABSUB   04643  NUMB     04682 *HEADNG
04898  RTRN3    04916 *FLTFIX   04915  ARG      05024  JUMP     05144  TRNMT
05288  WRITE    05360 *WRALPH   05380 *SETZRO   05406 *DECIML   05486  LARGE
05546  JUMP2    05630  WR       05692 *SETSIG   05704  SETS     05736  SET
05803 *OUTPUT   05815 *SEVENS   05825  DCMAL    05827  SIGN     05829 *EXPNT2
05830 *STARTB   05926  TEST2    05938  TEST4    05950  TEST6    05962  TEST8
05974 *TEST10   05994 *RDSUMS   06162 *RDCORS   06206  OVER1    06422 *RDMAT1
06478  OVER2    06534 *RDMAT2   06602  OVER3    06658 *RDSTEP   07282  ID1
07358  ID2      07382  IDMOD    07490  W1       07538  W2       07592  W3
07646  W4       07808  END
```

```
00010*  PROGRAM 80-C, PUNCH FINAL REPORT,  MAY 7, 1963.
00020*
00030          DORG 402
00040CONT      DSS  80
000501         DS   2,CONT+1
00060J         DS   2,CONT+3
00070Y         DS   2,CONT+5
00080PROB      DS   2,CONT+7
00090NOBS      DS   5,CONT+12
00100N         DS   3,CONT+24
00110INDEX     DSS  80
00120HED       DSS  80
00130STEPNO    DS   3,HED+2
00140L         DS   3,HED+5
00150NN        DS   3,HED+11
00160NOIN      DS   3,HED+8
00170AO        DS   10,HED+29
00180RSQR      DS   10,HED+39
00190EY        DS   10,HED+49
00200F         DS   10,HED+59
00210SQR       DS   10,HED+69
00220COUNT     DS   5
00230WORK2     DS   12
00240OUT       DS   5
00250          DC   1,@
00260TABNO     DS   2
00270K         DS   3
00280ALPHA     DAS  80
```

```
00402
00402 00080
00403 00002
00405 00002
00407 00002
00409 00002
00414 00005
00426 00003
00482 00080
00562 00080
00564 00003
00567 00003
00573 00003
00570 00003
00591 00010
00601 00010
00611 00010
00621 00010
00631 00010
00646 00005
00658 00012
00663 00005
00664 00001
00666 00002
00669 00003
00671 00080
```



```
00290          DAC  1,@
00300BLANKS    DAS  80
00310          DAC  1,@
00320CN        DSS  80
00330CON2      DS   1,CN+1
00340CON4      DS   1,CN+3
00350CON6      DS   1,CN+5
00360CON8      DS   1,CN+7
00370CON10     DS   1,CN+9
00380ID        DSB  2,80
00390B         DSB  10,80
00400SE        DSB  10,80
00410T         DSB  10,80
00420INAREA    DSB  10,8
00430HDNG0     DAC  20,DEP VAR      =    @
00440HDNG1     DAC  18,STD ERR Y.X  =  @
00450HDNG2     DAC  18,R SQUARED    =  @
00460HDNG3     DAC  18,SUM SQR RES  =  @
00470HDNG4     DAC  21,IND VAR USED =     @
00480HDNG5     DAC  18,CONSTANT TERM =  @
00490HDNG6     DAC  15,VAR     COEFF@
00500HDNG7     DAC  29,        STD ERR      T RATIO@
00510PRBL      DAC  6,PROB @
00520VRBL      DAC  6, VAR @
00530BSR       DAC  7, OBSER@
00540SUMS      DAC  18,SUMS OF VARIABLES@
00550SUMSQ     DAC  35,SUMS OF SQUARES AND CROSS-PRODUCTS@
00560AVRG      DAC  9,AVERAGES@
```

```
00831 00001
00833 00080
00993 00001
00994 00080
00995 00001
00997 00001
00999 00001
01001 00001
01003 00001
01075 00002 00080
01243 00010 00080
02043 00010 00080
02843 00010 00080
03643 00010 00008
03715 00020
03755 00018
03791 00018
03827 00018
03863 00021
03905 00018
03941 00015
03971 00029
04029 00006
04041 00006
04053 00007
04067 00018
04103 00035
04173 00009
```

```
00570STDEVS DAC  20,STANDARD DEVIATIONS@                    04191 00020
00580SMPCOR DAC  19,CORRELATION MATRIX@                     04231 00019
00590STEP   DAC  6,STEP @                                   04269 00006
00600MAT1   DAC  31,TRANSFORMED CORRELATION MATRIX@         04281 00031
00610MAT2   DAC  30,REINVERTED CORRELATION MATRIX@          04343 00030
00620*    *    *    *    *    *    *    *    *    *    *    *    *    *
00630*  SUBROUTINE FOR PREPARING DATA FOR ALPHAMERICAL PRINTING OR    *
00640*  PUNCHING.  INTERNAL FORMAT IS SPSII.                          *
00650*    *    *    *    *    *    *    *    *    *    *    *    *    *
00660       DS   10                                         04411 00010
00670FLTFIX CF   ARG-9                                      04412 33 04402 00000
00680ARG    DS   ,FLTFIX-1                                  04411 00000
00690       TF   OUTPUT,SEVENS                              04424 26 05299 05311
00700       CF   OUTPUT-9                                   04436 33 05290 00000
00710       TF   OUTPUT-10,DCMAL                            04448 26 05289 05321
00720       TFM  OUTPUT-19,0,9                              04460 16 05280 00000
00730       TFM  SIGN,0,10                                  04472 16 05323 00000
00740       BNF  JUMP,ARG-2                                 04484 44 04520 04409
00750       TDM  SIGN-1,2,11                                04496 15 05322 00002
00760       CF   ARG-2                                      04508 33 04409 00000
00770JUMP   CM   ARG,99,1011                                04520 14 04411 00099
00780       BE   WRALPH                                     04532 46 04856 01200
00790       CM   ARG,0,10                                   04544 14 04411 00000
00800       BNP  DECIML                                     04556 47 04902 01100
00810       CM   ARG,4,10                                   04568 14 04411 00004
00820       BH   LARGE                                      04580 46 04982 01100
00830       TFM  TRNMT+11,ARG-9                             04592 16 04651 04402
00840       TFM  *+42,OUTPUT-10                             04604 16 04646 05289
00850       S    *+30,ARG                                   04616 22 04646 04411
00860       S    *+18,ARG                                   04628 22 04646 04411
00870TRNMT  TD   99999,99999                                04640 25 99999 99999
```



```
00880       AM   TRNMT+11,1,10                              04652 11 04651 00001
00890       AM   TRNMT+6,2,10                               04664 11 04646 00002
00900       CM   TRNMT+6,OUTPUT-12                          04676 14 04646 05287
00910       BNH  TRNMT                                      04688 47 04640 01100
00920       TF   WRITE+23,TRNMT+11                          04700 26 04807 04651
00930       TFM  EXPNT2,5,10                                04712 16 05325 00005
00940       S    EXPNT2,ARG                                 04724 22 05325 04411
00950       TFM  *+47,SEVENS                                04736 16 04783 05311
00960       S    *+35,EXPNT2                                04748 22 04783 05325
00970       S    *+23,EXPNT2                                04760 22 04783 05325
00980       A    OUTPUT-12,99999                            04772 21 05287 99999
00990WRITE  TFM  *+18,OUTPUT-8                              04784 16 04802 05291
01000       TD   OUTPUT-8,0                                 04796 25 05291 00000
01010       AM   WRITE+23,1,10                              04808 11 04807 00001
01020       AM   WRITE+18,2,10                              04820 11 04802 00002
01030       CM   WRITE+18,OUTPUT                            04832 14 04802 05299
01040       BNH  WRITE+12                                   04844 47 04796 01100
01050WRALPH BD   SETZRO,OUTPUT-18                           04856 43 04876 05281
01060       B    SETSIG                                     04868 49 05188 00000
01070       DORG *-3                                        04876
01080SETZRO TDM  OUTPUT,0                                   04876 15 05299 00000
01090       TF   OUTPUT-20,SIGN                             04888 26 05279 05323
01100       BB                                              04900 42 00000 00000
01110       DORG *-9                                        04902
01120DECIML CM   ARG,4,1011                                 04902 14 04411 00004
01130       BNH  LARGE                                      04914 47 04982 01100
01140       TFM  WRITE+23,ARG-9                             04926 16 04807 04402
```

```
01150          TFM  WRITE+18,OUTPUT-8
01160          S    WRITE+18,ARG
01170          S    WRITE+18,ARG
01180          B    WRITE+12
01190          DORG *-3
01200LARGE     TF   OUTPUT-17,SEVENS-7
01210          BNF  JUMP2,ARG
01220          TFM  OUTPUT-20,20,10
01230          CF   ARG
01240          CF   OUTPUT-19
01250JUMP2     TD   OUTPUT-16,ARG
01260          TD   OUTPUT-18,ARG-1
01270          CF   OUTPUT-18
01280          TF   OUTPUT-12,SIGN
01290          CF   OUTPUT-13
01300          TFM  WR+11,ARG-9
01310          TFM  WR+6,OUTPUT-8
01320WR        TD   99999,99999
01330          AM   WR+11,1,10
01340          AM   WR+6,2,10
01350          CM   WR+6,OUTPUT
01360          BNH  WR
01370          BB
01380          DORG *-9
01390SETSIG    TFM  SETS+11,OUTPUT-16
01400SETS      BD   SET,OUTPUT-16
01410          AM   SETS+11,2,10
01420          B    SETS
01430          DORG *-3
```

```
04938 16 04802 05291
04950 22 04802 04411
04962 22 04802 04411
04974 49 04796 00000
04982
04982 26 05282 05304
04994 44 05042 04411
05006 16 05279 00020
05018 33 04411 00000
05030 33 05280 00000
05042 25 05283 04411
05054 25 05281 04410
05066 33 05281 00000
05078 26 05287 05323
05090 33 05286 00000
05102 16 05137 04402
05114 16 05132 05291
05126 25 99999 99999
05138 11 05137 00001
05150 11 05132 00002
05162 14 05132 05299
05174 47 05126 01100
05186 42 00000 00000
05188
05188 16 05211 05283
05200 43 05232 05283
05212 11 05211 00002
05224 49 05200 00000
05232
```



```
01440SET       TF   *+30,SETS+11
01450          SM   *+18,2,10
01460          TF   99999,SIGN
01470          BB
01480          DORG *-9
01490          DAS  14
01500OUTPUT    DS   2
01510          DAC  1,@
01520SEVENS    DC   10,7070707070
01530DCMAL     DC   10,0000000003
01540SIGN      DS   2
01550EXPNT2    DS   2
01560*
01570*  SUBROUTINE TO READ B,SE, AND T.
01580*
01590          DS   5
01600RD        TF   RD1+6,RD-1
01610          TF   C1+11,RD-1
01620          A    C1+10,NOIN
01630RD1       RNCD 99999
01640          AM   RD1+6,70,10
01650C1        CM   RD1+6,99999
01660          BN   RD1
01670          BB
01680          DORG *-9
01690          DS   6
01700SUBR      TFM  EXCHG+18,WORK2
01710          TFM  EXCHG+23,SUBR-1
```

```
05232 26 05262 05211
05244 12 05262 00002
05256 26 99999 05323
05268 42 00000 00000
05270
05271 00014
05299 00002
05301 00001
05311 00010
05321 00010
05323 00002
05325 00002

05330 00005
05332 26 05374 05331
05344 26 05403 05331
05356 21 05402 00570
05368 36 99999 00500
05380 11 05374 00070
05392 14 05374 99999
05404 47 05368 01300
05416 42 00000 00000
05418
05423 00006
05424 16 05466 00658
05436 16 05471 05423
```

```
01720EXCHG   TF    WORK2,SEVENS
01730        TD    WORK2,99999
01740        TF    BRNF+11,*-6
01750        SM    EXCHG+23,1,10
01760        SM    EXCHG+18,2,10
01770BRNF    BNF   EXCHG+12,WORK2
01780        TF    *+18,BRNF+11
01790        CF    99999
01800        TF    *+30,BRNF+11
01810        SM    *+18,1,10
01820        SF    99999
01830        BB
01840        DORG  *-9
01850        DS    4
01860PRINT   TFM   BRT1+6,ALPHA+20
01870NMBR    DS    ,PRINT-1
01880        TR    ALPHA-1,BLANKS-1
01890        RNCD  INAREA-9
01900        TFM   BRTRMT+28,INAREA
01910BRTRMT  BTFS  FLTFIX,99999


01920BRT1    TF    99999,OUTPUT
01930        AM    BRT1+6,26,10
01940        CM    BRT1+6,ALPHA+160
01950        BH    ENDCRD
01960RTN3    AM    BRTRMT+28,10,10
01970        SM    NMBR,1,10
```

```
05448 26 00658 05311
05460 25 00658 99999
05472 26 05519 05466
05484 12 05471 000ð1
05496 12 05466 000ð2
05508 44 05460 00658
05520 26 05538 05519
05532 33 99999 00000
05544 26 05574 05519
05556 12 05574 000ð1
05568 32 99999 00000
05580 42 00000 00000
05582
05585 00004
05586 16 05670 ð0691
05585 00000
05598 31 00670 00832
05610 36 03634 00500
05622 16 05662 ð3643
05634 16 08579 ð5657
05646 49 08548 00000
05653 00005    ð4412
05658 00005    99999
05664 26 99999 05299
05676 11 05670 00026
05688 14 05670 ð0831
05700 46 05780 01100
05712 11 05662 00010
05724 12 05585 000ð1
```



```
01980        BNP   RTRN2A
01990COP     CM    BRTRMT+28,INAREA+70
02000        BNH   BRTRMT
02010        B     PRINT+24
02020        DORG  *-3
02030ENDCRD  WACD  ALPHA
02040        TFM   BRT1+6,ALPHA+20
02050        TR    ALPHA-1,BLANKS-1
02060        B     RTN3
02070        DORG  *-3
02080RTRN2A  CM    BRT1+6,ALPHA+20
02090        BE    *+24
02100        WACD  ALPHA
02110        WACD  BLANKS
02120RTRN2   B     99999
02130        DORG  *-3
02140PRTRI   RNCD  INAREA-9
02150        TFM   BRTRMT+28,INAREA
02160        TF    K,N
02170        TFM   TABNO,0,10
02180        TFM   BRT1+6,ALPHA+20
02190BTAB    BT    TABSUB,TABNO
02200        TR    ALPHA-1,BLANKS-1
02210TRMTK   TF    NMBR,K
02220        TFM   RTRN2+6,*+20
02230        B     COP
02240        DORG  *-3
02250        AM    TABNO,1,10
```

```
05736 47 05824 01100
05748 14 05662 ð3713
05760 47 05634 01100
05772 49 05610 00000
05780
05780 39 00671 00400
05792 16 05670 ð0691
05804 31 00670 00832
05816 49 05712 00000
05824
05824 14 05670 ð0691
05836 46 05860 01200
05848 39 00671 00400
05860 39 00833 00400
05872 49 99999 00000
05880
05880 36 03634 00500
05892 16 05662 ð3643
05904 26 00669 00426
05916 16 00666 000ð0
05928 16 05670 ð0691
05940 27 06078 00666
05952 31 00670 00832
05964 26 05585 00669
05976 16 05878 ð5996
05988 49 05748 00000
05996
05996 11 00666 000ð1
```

```
02260          CM    TABNO,5,10
02270          BNP   *+24
02280          TFM   TABNO,0,10
02290          SM    K,1,10
02300          BNE   BTAB-12
02310RTRN4     B     99999
02320          DORG  *-3
02330NUMB      DS    2
02340TABSUB    CM    NUMB,0,10
02350          BE    BRB
02360          AM    BRT1+6,26,10
02370          SM    NUMB,1,10
02380          BP    TABSUB+24
02390BRB       BB
02400          DORG  *-9
02410HEADNG    BT    SUBR,I
02420          TR    ALPHA-1,BLANKS-1
02430          TF    ALPHA+6,WORK2
02440          BT    SUBR,J
02450          TF    ALPHA+12,WORK2
02460          BT    SUBR,Y
02470          TF    ALPHA+18,WORK2
02480          TF    ALPHA+34,PRBL+6
02490          BT    SUBR,PROB
02500          TF    ALPHA+40,WORK2
02510          BT    SUBR,N
02520          TF    ALPHA+50,WORK2
```

```
06008 14 00666 00005
06020 47 06044 01100
06032 16 00666 00000
06044 12 00669 00001
06056 47 05928 01200
06068 49 99999 00000
06076
06077 00002
06078 14 06077 00000
06090 46 06138 01200
06102 11 05670 00026
06114 12 06077 00001
06126 46 06102 01100
06138 42 00000 00000
06140
06140 27 05424 00403
06152 31 00670 00832
06164 26 00677 00658
06176 27 05424 00405
06188 26 00683 00658
06200 27 05424 00407
06212 26 00689 00658
06224 26 00705 04035
06236 27 05424 00409
06248 26 00711 00658
06260 27 05424 00426
06272 26 00721 00658
```

```
02530          TF    ALPHA+60,VRBL+6
02540          BT    SUBR,NOBS
02550          TF    ALPHA+74,WORK2
02560          TF    ALPHA+86,OBSR+10
02570          WACD  ALPHA
02580          WACD  BLANKS
02590          WACD  BLANKS
02600RTRN3     B     99999
02610          DORG  *-3
02620STARTC    RACD  ALPHA
02630          WACD  ALPHA
02640          BNR   *+20,ALPHA+158
02650          B     STARTC
02660          DORG  *-3
02670          WACD  BLANKS
02680          WACD  BLANKS
02690          RNCD  CON2-1
02700TEST2     BD    RDSUMS,CON2
02710TEST4     BD    RDCORS,CON4
02720TEST6     BD    RDMAT1,CON6
02730TEST8     BD    RDMAT2,CON8
02740TEST10    BD    RDSTEP,CON10
02750          B     END
02760RDSUMS    RNCD  1-1
02770          TFM   RTRN3+6,*+20
02780          B     HEADNG
02790          DORG  *-3
```



```
06284 26 00731 04047
06296 27 05424 00414
06308 26 00745 00658
06320 26 00757 04063
06332 39 00671 00400
06344 39 00833 00400
06356 39 00833 00400
06368 49 99999 00000
06376
06376 37 00671 00500
06388 39 00671 00400
06400 45 06420 00829
06412 49 06376 00000
06420
06420 39 00833 00400
06432 39 00833 00400
06444 36 00994 00500
06456 43 06528 00995
06468 43 06732 00997
06480 43 07040 00999
06492 43 07176 01001
06504 43 07324 01003
06516 49 08522 00000
06528 36 00402 00500
06540 16 06374 06560
06552 49 06140 00000
06560
```

```
02800          TR    ALPHA-1,BLANKS-1
02810          TF    ALPHA+32,SUMS+32
02820          WACD  ALPHA
02830          WACD  BLANKS
02840          TF    NMBR,N
02850          TFM   RTRN2+6,*+20
02860          B     PRINT
02870          DORG  *-3
02880          WACD  BLANKS
02890          TR    ALPHA-1,BLANKS-1
02900          TF    ALPHA+66,SUMSQ+66
02910          WACD  ALPHA
02920          WACD  BLANKS
02930          RNCD  I-1
02940          TFM   RTRN4+6,TEST4
02950          B     PRTRI
02960          DORG  *-3
02970RDCORS    RNCD  I-1
02980          BD    OVER1,CON2
02990          TFM   RTRN3+6,*+20
03000          B     HEADNG
03010          DORG  *-3
03020OVER1     TR    ALPHA-1,BLANKS-1
03030          TF    ALPHA+14,AVRG+14
03040          WACD  ALPHA
03050          WACD  BLANKS
03060          TF    NMBR,N
```

```
06560 31 00670 00832
06572 26 00703 04099
06584 39 00671 00400
06596 39 00833 00400
06608 26 05585 00426
06620 16 05878 Ø6640
06632 49 05586 00000
06640
06640 39 00833 00400
06652 31 00670 00832
06664 26 00737 04169
06676 39 00671 00400
06688 39 00833 00400
06700 36 00402 00500
06712 16 06074 Ø6468
06724 49 05880 00000
06732
06732 36 00402 00500
06744 43 06776 00995
06756 16 06374 Ø6776
06768 49 06140 00000
06776
06776 31 00670 00832
06788 26 00685 04187
06800 39 00671 00400
06812 39 00833 00400
06824 26 05585 00426
```



```
03070          TFM   RTRN2+6,*+20
03080          B     PRINT
03090          DORG  *-3
03100          RNCD  I-1

03110          WACD  BLANKS
03120          TR    ALPHA-1,BLANKS-1
03130          TF    ALPHA+36,STDEVS+36
03140          WACD  ALPHA
03150          WACD  BLANKS
03160          TF    NMBR,N
03170          TFM   RTRN2+6,*+20
03180          B     PRINT
03190          DORG  *-3
03200          RNCD  I-1
03210          TR    ALPHA-1,BLANKS-1
03220          TF    ALPHA+34,SMPCOR+34
03230          WACD  ALPHA
03240          WACD  BLANKS
03250          TFM   RTRN4+6,TEST6
03260          B     PRTRI
03270          DORG  *-3
03280RDMAT1    RNCD  I-1
03290          BD    OVER2,CON2
03300          BD    OVER2,CON4
03310          TFM   RTRN3+6,*+20
03320          B     HEADNG
03330          DORG  *-3
03340OVER2     TR    ALPHA-1,BLANKS-1
```

```
06836 16 05878 Ø6856
06848 49 05586 00000
06856
06856 36 00402 00500

06868 39 00833 00400
06880 31 00670 00832
06892 26 00707 04227
06904 39 00671 00400
06916 39 00833 00400
06928 26 05585 00426
06940 16 05878 Ø6960
06952 49 05586 00000
06960
06960 36 00402 00500
06972 31 00670 00832
06984 26 00705 04265
06996 39 00671 00400
07008 39 00833 00400
07020 16 06074 Ø6480
07032 49 05880 00000
07040
07040 36 00402 00500
07052 43 07096 00995
07064 43 07096 00997
07076 16 06374 Ø7096
07088 49 06140 00000
07096
07096 31 00670 00832
```

```
03350          TF    ALPHA+58,MAT1+58
03360          WACD  ALPHA
03370          WACD  BLANKS
03380          WACD  BLANKS
03390          TFM   RTRN4+6,TEST8
03400          B     PRTR1
03410          DORG  *-3
03420RDMAT2    RNCD  1-1
03430          BD    OVER3,CON2
03440          BD    OVER3,CON4
03450          BD    OVER3,CON6
03460          TFM   RTRN3+6,*+20
03470          B     HEADNG
03480          DORG  *-3
03490OVER3     TR    ALPHA-1,BLANKS-1
03500          TF    ALPHA+56,MAT2+56
03510          WACD  ALPHA
03520          WACD  BLANKS
03530          WACD  BLANKS
03540          TFM   RTRN4+6,TEST10
03550          B     PRTR1
03560          DORG  *-3
03570RDSTEP    BNLC  *+12
03575          WACD  BLANKS
03580          WACD  BLANKS
03590          RNCD  STEPNO-2
```

```
07108 26 00729 04339
07120 39 00671 00400
07132 39 00833 00400
07144 39 00833 00400
07156 16 06074 0̄6492
07168 49 05880 00000
07176
07176 36 00402 00500
07188 43 07244 00995
07200 43 07244 00997
07212 43 07244 00999
07224 16 06374 0̄7244
07236 49 06140 00000
07244
07244 31 00670 00832
07256 26 00727 04399
07268 39 00671 00400
07280 39 00833 00400
07292 39 00833 00400
07304 16 06074 0̄6504
07316 49 05880 00000
07324
07324 47 07336 00900
07336 39 00833 00400
07348 39 00833 00400
07360 36 00562 00500
```



```
03600          RNCD  INDEX
03610          BTM   RD,B-9
03620          BTM   RD,SE-9
03630          BTM   RD,T-9
03640*
03650* PUNCH STEP RESULTS.
03660*
03670          TR    ALPHA-1,BLANKS-1
03680          TF    ALPHA+8,STEP+8
03690          BT    SUBR,STEPNO
03700          TF    ALPHA+14,WORK2
03710          TF    ALPHA+32,HDNG0+32
03720          BT    SUBR,L
03730          TF    ALPHA+38,WORK2
03740          WACD  ALPHA
03750          WACD  BLANKS
03760          WACD  BLANKS
03770          TR    ALPHA-1,BLANKS-1
03780          TF    ALPHA+32,HDNG1+32
03790          BTFS  FLTFIX,EY
03800          TF    ALPHA+54,OUTPUT
03810          WACD  ALPHA
03820          TR    ALPHA-1,BLANKS-1
03830          TF    ALPHA+32,HDNG2+32
03840          BTFS  FLTFIX,RSQR
03850          TF    ALPHA+54,OUTPUT
```

```
07372 36 00482 00500
07384 17 05332 0̄1234
07396 17 05332 0̄2034
07408 17 05332 0̄2834
07420 31 00670 00832
07432 26 00679 04277
07444 27 05424 00564
07456 26 00685 00658
07468 26 00703 03747
07480 27 05424 00567
07492 26 00709 00658
07504 39 00671 00400
07516 39 00833 00400
07528 39 00833 00400
07540 31 00670 00832
07552 26 00703 03787
07564 16 08591 0̄7587
07576 49 08560 00000
07583 00005    0̄4412
07588 00005    0̄0611
07594 26 00725 05299
07606 39 00671 00400
07618 31 00670 00832
07630 26 00703 03823
07642 16 08591 0̄7665
07654 49 08560 00000
07661 00005    0̄4412
07666 00005    0̄0601
07672 26 00725 05299
```

```
03860          WACD ALPHA
03870          TR   ALPHA-1,BLANKS-1
03880          TF   ALPHA+32,HDNG3+32
03890          BTFS FLTFIX,SQR
03900          TF   ALPHA+54,OUTPUT
03910          WACD ALPHA
03920          TR   ALPHA-1,BLANKS-1
03930          TF   ALPHA+32,HDNG4+32
03940          BT   SUBR,NOIN
03950          TF   ALPHA+40,WORK2
03960          WACD ALPHA
03970          WACD BLANKS
03980          TR   ALPHA-1,BLANKS-1
03990          TF   ALPHA+32,HDNG5+32
04000          BTFS FLTFIX,AO
04010          TF   ALPHA+54,OUTPUT
04020          WACD ALPHA
04030          WACD BLANKS
04040          TR   ALPHA-1,BLANKS-1
04050          TF   ALPHA+28,HDNG6+26
04060          TF   ALPHA+82,HDNG7+54
04070          WACD ALPHA
04080          WACD BLANKS
04090*
04100*  SET ID OF INDEPENDENT VARIABLES.
```

```
07684 39 00671 00400
07696 31 00670 00832
07708 26 00703 03859
07720 16 08591 07743
07732 49 08560 00000
07739 00005    04412
07744 00005    00631
07750 26 00725 05299
07762 39 00671 00400
07774 31 00670 00832
07786 26 00703 03895
07798 27 05424 00570
07810 26 00711 00658
07822 39 00671 00400
07834 39 00833 00400
07846 31 00670 00832
07858 26 00703 03937
07870 16 08591 07893
07882 49 08560 00000
07889 00005    04412
07894 00005    00591
07900 26 00725 05299
07912 39 00671 00400
07924 39 00833 00400
07936 31 00670 00832
07948 26 00699 03967
07960 26 00753 04025
07972 39 00671 00400
07984 39 00833 00400
```



```
04110*
04120          TF   COUNT,NN
04130          TFM  1,1,10
04140          TFM  ID1+11,INDEX
04150          TFM  ID2+6,ID
04160ID1       BD   *+20,99999
04170          B    IDMOD
04180          DORG *-3
04190          TF   *+23,ID1+11
04200          BNR  *+20,99999
04210          B    IDMOD
04220          DORG *-3
04230          C    I,L
04240          BE   IDMOD
04250ID2       TF   99999,I
04260          AM   ID2+6,2,10
04270IDMOD     AM   ID1+11,1,10
04280          AM   I,1,10
04290          SM   COUNT,1,10
04300          BP   ID1
04310          TF   COUNT,NOIN
04320          TFM  W1+11,ID
04330          TFM  W2+28,B
04340          TFM  W3+28,SE
04350          TFM  W4+28,T
04360          TR   ALPHA-1,BLANKS-1
04370W1        BT   SUBR,99999
04380          TF   ALPHA+8,WORK2
```

```
07996 26 00646 00573
08008 16 00403 00001
08020 16 08055 00482
08032 16 08126 01075
08044 43 08064 99999
08056 49 08144 00000
08064
08064 26 08087 08055
08076 45 08096 99999
08088 49 08144 00000
08096
08096 24 00403 00567
08108 46 08144 01200
08120 26 99999 00403
08132 11 08126 00002
08144 11 08055 00001
08156 11 00403 00001
08168 12 00646 00001
08180 46 08044 01100
08192 26 00646 00570
08204 16 08275 01075
08216 16 08316 01243
08228 16 08358 02043
08240 16 08400 02843
08252 31 00670 00832
08264 27 05424 99999
08276 26 00679 00658
```

```
04390W2     BTFS FLTFIX,99999


04400       TF   ALPHA+34,OUTPUT
04410W3     BTFS FLTFIX,99999


04420       TF   ALPHA+60,OUTPUT
04430W4     BTFS FLTFIX,99999


04440       TF   ALPHA+86,OUTPUT
04450       WACD ALPHA
04460       AM   W1+11,2,10
04470       AM   W2+28,10,10
04480       AM   W3+28,10,10
04490       AM   W4+28,10,10
04500       SM   COUNT,1,10
04510       BP   W1-12
04520       WACD BLANKS
04530       WACD BLANKS
04540       BNLC RDSTEP+12
04550END    H
04560       B    STARTC
04565       DAC  1,0
04570       DEND STARTC
LOAD SUBROUTINES
```

```
08288 16 08591 08311
08300 49 08560 00000
08307 00005    04412
08312 00005    99999

08318 26 00705 05299

08330 16 08591 08353
08342 49 08560 00000
08349 00005    04412
08354 00005    99999

08360 26 00731 05299

08372 16 08591 08395
08384 49 08560 00000
08391 00005    04412
08396 00005    99999

08402 26 00757 05299

08414 39 00671 00400

08426 11 08275 00002

08438 11 08316 00010

08450 11 08358 00010

08462 11 08400 00010

08474 12 00646 00001

08486 46 08252 01100

08498 39 00833 00400

08510 39 00833 00400

08522 47 07336 00900

08534 48 00000 00000

08546 49 06376 00000

08559 00001

06376

08560 16 08994 09452
08572 49 08684 0
```

```
END OF PASSII
00402   CONT    00403   I       00405   J       00407   Y       00409   PROB
00414   NOBS    00426   N       00482   INDEX   00562   HED     00564  *STEPNO
00567   L       00573   NN      00570   NOIN    00591   AO      00601   RSCR
00611   EY      00621   F       00631   SCR     00646   COUNT   00658   WORK2
00663   OUT     00666   TABNO   00669   K       00671   ALPHA   00833  *BLANKS
00994   CN      00995   CON2    00997   CON4    00999   CON6    01001   CON8
01003   CON10   01075   ID      01243   B       02043   SE      02843   T
03643  *INAREA  03715   HDNG0   03755   HDNG1   03791   HDNG2   03827   HDNG3
03863   HDNG4   03905   HDNG5   03941   HDNG6   03971   HDNG7   04029   PRBL
04041   VRBL    04053   OBSR    04067   SUMS    04103   SUMSC   04173   AVRG
04191  *STDEVS  04231  *SMPCOR  04269   STEP    04281   MAT1    04343   MAT2
04412  *FLTFIX  04411   ARG     04520   JUMP    04640   TRNMT   04784   WRITE
04856  *WRALPH  04876  *SETZRO  04902  *DECIML  04982   LARGE   05042   JUMP2
05126   WR      05188  *SETSIG  05200   SETS    05232   SET     05299  *OUTPUT
05311  *SEVENS  05321   DCMAL   05323   SIGN    05325  *EXPNT2  05332   RD
05368   RD1     05392   C1      05424   SUBR    05448   EXCHG   05508   BRNF
05586   PRINT   05585   NMBR    05634  *BRTRMT  05664   BRT1    05712   RTN3
05748   COP     05780  *ENDCRD  05824  *RTRN2A  05872   RTRN2   05880   PRTR1
05940   BTAB    05964   TRMTK   06068   RTRN4   06077   NUMB    06078  *TABSUB
06138   BRB     06140  *HEADNG  06368   RTRN3   06376  *STARTC  06456   TEST2
06468   TEST4   06480   TEST6   06492   TEST8   06504  *TEST10  06528  *RDSUMS
06732  *RDCORS  06776   OVER1   07040  *RDMAT1  07096   OVER2   07176  *RDMAT2
07244   OVER3   07324  *RDSTEP  08044   ID1     08120   ID2     08144   IDMOD
08264   W1      08288   W2      08330   W3      08372   W4      08534   END
```

```
00010*  PROGRAM 80-D, RESIDUAL ANALYSIS, OCTOBER 29,1963.
00020*
00030REF     DS    ,17500                    17500 00000
00040        DORG  402                       00402
00050CONT    DSS   80                        00402 00080
00060DATE    DS    6,CONT+5                  00407 00006
00070PROB    DS    2,CONT+7                  00409 00002
00080NOBS    DS    5,CONT+12                 00414 00005
00090NFORM   DS    3,CONT+15                 00417 00003
00100INVAR   DS    3,CONT+18                 00420 00003
00110NOVAR   DS    3,CONT+21                 00423 00003
00120N       DS    3,CONT+24                 00426 00003
00130NDEP    DS    3,CONT+27                 00429 00003
00140NOTRAN  DS    3,CONT+30                 00432 00003
00150NOCON   DS    3,CONT+33                 00435 00003
00160NCOL    DS    2,CONT+35                 00437 00002
00170NELIM   DS    3,CONT+38                 00440 00003
00180CON1    DS    1,CONT+39                 00441 00001
00190CON2    DS    1,CONT+40                 00442 00001
00200CON3    DS    1,CONT+41                 00443 00001
00210CON4    DS    1,CONT+42                 00444 00001
00220CON5    DS    1,CONT+43                 00445 00001
00230CON6    DS    1,CONT+44                 00446 00001
00240CON7    DS    1,CONT+45                 00447 00001
00250CON8    DS    1,CONT+46                 00448 00001
00260CON9    DS    1,CONT+47                 00449 00001
00270CON10   DS    1,CONT+48                 00450 00001
00280CON11   DS    1,CONT+49                 00451 00001
00290CON12   DS    1,CONT+50                 00452 00001
00300CON13   DS    1,CONT+51                 00453 00001
00310CON14   DS    1,CONT+52                 00454 00001
00320CON15   DS    1,CONT+53                 00455 00001
00330CON16   DS    1,CONT+54                 00456 00001
00340CON17   DS    1,CONT+55                 00457 00001
00350CON18   DS    1,CONT+56                 00458 00001
00360OBSER   DS    10,CONT+79                00481 00010
00370IND     DS    5                         00486 00005
00380ID      DS    5                         00491 00005
00390IDD     DS    5                         00496 00005
00400FORMAT  DS    5                         00501 00005
00410INDEX   DS    5                         00506 00005
00420CONST   DS    5                         00511 00005
00430DATA1   DS    5                         00516 00005
00440DATA2   DS    5                         00521 00005
00450B       DS    5                         00526 00005
00460SE      DS    5                         00531 00005
00470T       DS    5                         00536 00005
00480SUM1    DS    5                         00541 00005
00490SIGMA   DS    5                         00546 00005
00500R       DS    5                         00551 00005
00510WT      DS    5                         00556 00005
00520ADKK    DS    5                         00561 00005
00530ADRNN   DS    5                         00566 00005
00540ADIJ    DS    5                         00571 00005
00550ADRIJ   DS    5                         00576 00005
00560SIGN3   DS    5                         00581 00005
00570COUNT   DS    5                         00586 00005
```

```
00580CNTR   DS   3                    00589 00003
00590CTR    DS   3                    00592 00003
00600I      DS   3                    00595 00003
00610J      DS   3                    00598 00003
00620K      DS   3                    00601 00003
00630P      DS   3                    00604 00003
00640Q      DS   3                    00607 00003
00650MSZ    DS   4                    00611 00004
00660IVE    DS   3                    00614 00003
00670IVP    DS   3                    00617 00003
00680TEMP1  DS   10                   00627 00010
00690TEMP2  DS   10                   00637 00010
00700EY     DS   10                   00647 00010
00710RSQR   DS   10                   00657 00010
00720SQR    DS   10                   00667 00010
00730DF     DS   10                   00677 00010
00740F      DS   10                   00687 00010
00750FIN    DS   10                   00697 00010
00760FOUT   DS   10                   00707 00010
00770HIGH   DS   10                   00717 00010
00780VP     DS   10                   00727 00010
00790VE     DS   10                   00737 00010
008000UT    DS   80                   00817 00080
00810       DC   1,@                  00818 00001
00820PRBL   DAC  6,PROB @             00821 00006
00830VRBL   DAC  5, VAR@              00833 00005
008400BSR   DAC  7, OBSER@            00843 00007
```



```
00850       DC   8,10000000           00863 00008
00860FP001  DC   2,-2                 00865 00002
00870       DC   8,10000000           00873 00008
00880FHIGH  DC   2,50                 00875 00002
00890       DC   8,0                  00883 00008
00900ZERO   DC   2,-99                00885 00002
00910ZEROS  DC   10,0                 00895 00010
00920       DC   8,10000000           00903 00008
00930ONE    DC   2,1                  00905 00002
00940CONTR  DSS  80                   00906 00080
00950CONTR1 DS   ,CONTR+1             00907 00000
00960CONTR2 DS   ,CONTR+3             00909 00000
00970CONTR3 DS   ,CONTR+5             00911 00000
00980CONTR4 DS   ,CONTR+7             00913 00000
00990BLANKS DAS  80                   00987 00080
01000       DAC  1,@                  01147 00001
01010ALPHA  DAS  80                   01149 00080
01020       DAC  1,@                  01309 00001
01030WORK2  DS   12                   01321 00012
01040PRED   DS   10                   01331 00010
01050RES    DS   10                   01341 00010
01060SAVE   DS   10                   01351 00010
01070DSQR   DS   10                   01361 00010
01080SUMRES DS   10                   01371 00010
01090SUMAB  DS   10                   01381 00010
01100L      DS   ,OUT-74              00743 00000
01110NOIN   DS   ,OUT-71              00746 00000
01120AO     DS   ,OUT-50              00767 00000
```

```
01130*    *    *    *    *    *    *    *    *    *    *
01140*  SUBROUTINE FOR READING B, SE AND T.              *
01150*    *    *    *    *    *    *    *    *    *    *
01160         DS   5
01170RD       TF   RD1+6,RD-1
01180         SM   RD1+6,9,10
01190         TF   COUNT,NOIN
01200RD1      RNCD 99999
01210         AM   RD1+6,70,10
01220         SM   COUNT,7,10
01230         BP   RD1
01240         BB
01250         DORG *-9
01260*
01270*  SUBROUTINE TO TRANSFORM NUMBERS TO ALPHA.
01280*
01290         DS   6
01300SUBR     TFM  EXCHG+18,WORK2
01310         TFM  EXCHG+23,SUBR-1
01320EXCHG    TF   WORK2,SEVENS
01330         TD   WORK2,99999
01340         TF   BRNF+11,*-6
01350         SM   EXCHG+23,1,10
01360         SM   EXCHG+18,2,10
01370BRNF     BNF  EXCHG+12,99999
01380         TF   *+18,BRNF+11
01390         CF   99999
01400         TF   *+30,BRNF+11
01410         SM   *+18,1,10
01420         SF   99999
```

```
01386 00005
01388 26 01430 01387
01400 12 01430 00009
01412 26 00586 00746
01424 36 99999 00500
01436 11 01430 00070
01448 12 00586 00007
01460 46 01424 01100
01472 42 00000 00000
01474

01479 00006
01480 16 01522 01321
01492 16 01527 01479
01504 26 01321 08435
01516 25 01321 99999
01528 26 01575 01522
01540 12 01527 00001
01552 12 01522 00002
01564 44 01516 99999
01576 26 01594 01575
01588 33 99999 00000
01600 26 01630 01575
01612 12 01630 00001
01624 32 99999 00000
```



```
01430         BB
01440         DORG *-9
01450HDNG8    DAC  16,OBS       ACTUAL@
01460HDNG9    DAC  25,          PRED      RES@
01470HDNG10   DAC  13,SSQR      = @
01480HDNG11   DAC  13,DSQR/SSQR = @
01490HDNG12   DAC  13,SUM RES   = @
01500HDNG13   DAC  13,AVE AB RES= @
01510HDNG14   DAC  13,OBSERVATIONS@
01520STARTD   RNCD CONTR1-1
01525         RCTY
01530ALPH     TR   ALPHA-1,BLANKS-1
01540         RACD ALPHA
01550         WATY ALPHA
01560         RCTY
01570         BD   *+24,CONTR2
01580         WACD ALPHA
01590         BNR  *+20,ALPHA+158
01600         B    ALPH
01610         DORG *-3
01620         BD   *+36,CONTR2
01630         WACD BLANKS
01640         WACD BLANKS
01650         RCTY
01660*
01670*  READ AND FLAG PARAMETERS.
01680*
01690         TFM  RET2+6,*+20
01700         B    START
```

```
01636 42 00000 00000
01638
01639 00016
01671 00025
01721 00013
01747 00013
01773 00013
01799 00013
01825 00013
01850 36 00906 00500
01862 34 00000 00102
01874 31 01148 00986
01886 37 01149 00500
01898 39 01149 00100
01910 34 00000 00102
01922 43 01946 00909
01934 39 01149 00400
01946 45 01966 01307
01958 49 01874 00000
01966
01966 43 02002 00909
01978 39 00987 00400
01990 39 00987 00400
02002 34 00000 00102


02014 16 10500 02034
02026 49 08896 00000
```

```
01710          DORG *-3
01720*
01730*  READ STEP DATA.
01740*
01750          RNCD OUT-79
01760          TF   COUNT,N
01770          TF   *+18,IND
01780RNC       RNCD 99999
01790          AM   RNC+6,80,10
01800          SM   COUNT,80,10
01810          BP   RNC
01820          BT   RD,B
01830          BT   RD,SE
01840          BT   RD,T
01850*
01860*  INITIALIZE.
01870*
01880          TR   ALPHA-1,BLANKS-1
01890          TF   ALPHA+30,HDNG8+30
01900          TF   ALPHA+76,HDNG9+46
01910          BD   *+60,CONTR1
01920          RCTY
01930          WATY ALPHA
01940          RCTY
01950          RCTY
01960          BD   *+36,CONTR2
01970          WACD ALPHA
01980          WACD BLANKS
01990          TFM  PRED7+11,0
02000          TDM  PRED9+1,1
02010          TFLS OBSER,ZERO
```

```
02034

02034 36 00738 00500
02046 26 00586 00426
02058 26 02076 00486
02070 36 99999 00500
02082 11 02076 00080
02094 12 00586 00080
02106 46 02070 01100
02118 27 01388 00526
02130 27 01388 00531
02142 27 01388 00536

02154 31 01148 00986
02166 26 01179 01669
02178 26 01225 01717
02190 43 02250 00907
02202 34 00000 00102
02214 39 01149 00100
02226 34 00000 00102
02238 34 00000 00102
02250 43 02286 00909
02262 39 01149 00400
02274 39 00987 00400
02286 16 03389 00000
02298 15 03925 00001
02310 16 10795 02333
```



```
02020          TFLS SQR,ZERO

02030          TFLS SAVE,ZERO

02040          TFLS DSQR,ZERO

02050          TFLS SUMRES,ZERO

02060          TFLS SUMAB,ZERO

02070          TF   PRED6+28,DATA1
02080          SM   PRED6+28,10,10
02090          A    PRED6+27,L
02100          TF   PRED8+28,PRED6+28
02110*
02120*  READ,FLOAT, AND STORE ONE OBSERVATION.
02130*
02140LOOP      TF   WCTR,INVAR
02150          BT   RFS,DATA1
02160          BNC1 TRD
02170          TF   WORDS,INVAR
02180          TF   PRINT1+28,DATA1
02190          TFM  RET1+6,*+20
02200          B    PRINT
02210          DORG *-3
02220*
```

```
02322 49 10744 00000
02329 00005    00481
02334 00005    00885

02340 16 10795 02363
02352 49 10744 00000
02359 00005    00667
02364 00005    00885

02370 16 10795 02393
02382 49 10744 00000
02389 00005    01351
02394 00005    00885

02400 16 10795 02423
02412 49 10744 00000
02419 00005    01361
02424 00005    00885

02430 16 10795 02453
02442 49 10744 00000
02449 00005    01371
02454 00005    00885

02460 16 10795 02483
02472 49 10744 00000
02479 00005    01381
02484 00005    00885

02490 26 03066 00516

02502 12 03066 00010

02514 21 03065 00743

02526 26 03442 03066

02538 26 04682 00420

02550 27 04688 00516

02562 47 02618 00100

02574 26 05772 00420

02586 26 05814 00516

02598 16 05882 02618

02610 49 05774 00000

02618
```

```
02230*  TRANSFORM DATA.
02240*
02250TRD     CM    NOTRAN,0,10
02260        BE    CALC
02270        BTM   TFS,0,10
02280        BNC2  CALC
02290        TF    WORDS,N
02300        TF    PRINT1+28,DATA1
02310        TFM   RET1+6,*+20
02320        B     PRINT
02330        DORG  *-3
02340*
02350*  CALCULATE RESIDUALS.
02360*
02370CALC    TFM   I,1,10
02380        TF    PRED1+11,IND
02390        TF    PRED3+28,DATA1
02400        TF    PRED4+28,B
02410        TF    COUNT,N
02420        TFLS  PRED,A0


02430PRED1   BNR   *+20,99999
02440        B     PRED5
02450        DORG  *-3
02460        TF    PRED2+11,PRED1+11
02470PRED2   BD    *+20,99999
02480        B     PRED5
02490        DORG  *-3
02500        C     I,L
```

```
02618 14 00432 000Ō0
02630 46 02710 01200
02642 17 05886 000Ō0
02654 47 02710 00200
02666 26 05772 00426
02678 26 05814 00516
02690 16 05882 Ō2710
02702 49 05774 00000
02710

02710 16 00595 000Ō1
02722 26 02811 00486
02734 26 02904 00516
02746 26 02934 00526
02758 26 00586 00426
02770 16 10795 Ō2793
02782 49 10744 00000
02789 00005    Ō1331
02794 00005    Ō0767
02800 45 02820 99999
02812 49 02978 00000
02820

02820 26 02843 02811
02832 43 02852 99999
02844 49 02978 00000
02852

02852 24 00595 00743
```

```
02510        BE    PRED5
02520PRED3   TFLS  TEMP1,99999


02530PRED4   FM    TEMP1,99999


02540        FA    PRED,TEMP1


02550        AM    PRED4+28,10,10
02560PRED5   AM    PRED3+28,10,10
02570        AM    I,1,10
02580        AM    PRED1+11,1,10
02590        SM    COUNT,1,10
02600        BP    PRED1
02610PRED6   TFLS  RES,99999


02620        FS    RES,PRED


02630        BD    *+20,CONTR3
02640        B     PRED7-12
02650        DORG  *-3
02660        BD    EX2,CONTR4
02670        TF    EX1+23,PRED6+28
02680        TF    EX1+28,PRED6+28
02690EX1     FEX   99999,99999
```



```
02864 46 02978 01200
02876 16 10795 Ō2899
02888 49 10744 00000
02895 00005    Ō0627
02900 00005    99999
02906 16 10795 Ō2929
02918 49 10544 00000
02925 00005    Ō0627
02930 00005    99999
02936 16 10795 Ō2959
02948 49 10524 00000
02955 00005    Ō1331
02960 00005    Ō0627
02966 11 02934 000Ī0
02978 11 02904 000Ī0
02990 11 00595 000Ō1
03002 11 02811 000Ō1
03014 12 00586 000Ō1
03026 46 02800 01100
03038 16 10795 Ō3061
03050 49 10744 00000
03057 00005    Ō1341
03062 00005    99999
03068 16 10795 Ō3091
03080 49 10504 00000
03087 00005    Ō1341
03092 00005    Ō1331
03098 43 03118 00911
03110 49 03366 00000
03118

03118 43 03252 00913
03130 26 03177 03066
03142 26 03182 03066
03154 16 10795 Ō3177
03166 49 10684 00000
03173 00005    99999
03178 00005    99999
```

```
02700          FEX   PRED,PRED
02710          FEX   RES,RES
02720          B     PRED7-12
02730          DORG  *-3
02740EX2       TF    EX3+23,PRED6+28
02750          TF    EX3+28,PRED6+28
02760EX3       FEXT  99999,99999
02770          FEXT  PRED,PRED
02780          FEXT  RES,RES
02790          AM    PRED7+11,1,10
02800PRED7     BTM   SUBR,0
02810          TR    ALPHA-1,BLANKS-1
02820          TF    ALPHA+8,WORK2
02830PRED8     BTFS  FLTFIX,99999
02840          TF    ALPHA+34,OUTPUT
02850          BTFS  FLTFIX,PRED
02860          TF    ALPHA+60,OUTPUT
```

```
03184 16 10795 0 3207
03196 49 10684 00000
03203 00005    0 1331
03208 00005    0 1331

03214 16 10795 0 3237
03226 49 10684 00000
03233 00005    0 1341
03238 00005    0 1341

03244 49 03366 00000

03252

03252 26 03299 03066

03264 26 03304 03066

03276 16 10795 0 3299
03288 49 10664 00000
03295 00005    9 9999
03300 00005    9 9999

03306 16 10795 0 3329
03318 49 10664 00000
03325 00005    0 1331
03330 00005    0 1331

03336 16 10795 0 3359
03348 49 10664 00000
03355 00005    0 1341
03360 00005    0 1341

03366 11 03389 0000 1

03378 17 01480 0 0000

03390 31 01148 00986

03402 26 01157 01321

03414 16 10795 0 3437
03426 49 10764 00000
03433 00005    0 7536
03438 00005    9 9999

03444 26 01183 08423

03456 16 10795 0 3479
03468 49 10764 00000
03475 00005    0 7536
03480 00005    0 1331

03486 26 01209 08423
```



```
02870          BTFS  FLTFIX,RES
02880          TF    ALPHA+88,OUTPUT+2
02890          BD    *+36,CONTR1
02900          WATY  ALPHA+2
02910          RCTY
02920          BD    *+24,CONTR2
02930          WACD  ALPHA
02940          TFLS  TEMP1,RES
02950          FM    TEMP1,TEMP1
02960          FA    SQR,TEMP1
02970          FA    SUMRES,RES
02980          FS    SAVE,RES
02990          TFLS  TEMP1,SAVE
03000          FM    TEMP1,TEMP1
03010          FA    DSQR,TEMP1
```

```
03498 16 10795 0 3521
03510 49 10764 00000
03517 00005    0 7536
03522 00005    0 1341

03528 26 01237 08425

03540 43 03576 00907

03552 39 01151 00100

03564 34 00000 00102

03576 43 03600 00909

03588 39 01149 00400

03600 16 10795 0 3623
03612 49 10744 00000
03619 00005    0 0627
03624 00005    0 1341

03630 16 10795 0 3653
03642 49 10544 00000
03649 00005    0 0627
03654 00005    0 0627

03660 16 10795 0 3683
03672 49 10524 00000
03679 00005    0 0667
03684 00005    0 0627

03690 16 10795 0 3713
03702 49 10524 00000
03709 00005    0 1371
03714 00005    0 1341

03720 16 10795 0 3743
03732 49 10504 00000
03739 00005    0 1351
03744 00005    0 1341

03750 16 10795 0 3773
03762 49 10744 00000
03769 00005    0 0627
03774 00005    0 1351

03780 16 10795 0 3803
03792 49 10544 00000
03799 00005    0 0627
03804 00005    0 0627

03810 16 10795 0 3833
03822 49 10524 00000
03829 00005    0 1361
03834 00005    0 0627
```

```
03020          TFLS SAVE,RES

03030          BNF  *+24,RES-2
03040          CF   RES-2
03050          FA   SUMAB,RES

03060PRED9     NOP  PRED10
03070          TDM  PRED9+1,9
03080          TFLS DSQR,ZERO

03090PRED10    FA   OBSER,ONE

03100          BNLC LOOP
03110          RCTY
03120          RCTY
03130          BT   SUBR,PRED7+11
03140          TR   ALPHA-1,BLANKS-1
03150          TF   ALPHA+10,WORK2
03160          TF   ALPHA+36,HDNG14+24
03170          WATY ALPHA
03180          RCTY
03190          TR   ALPHA-1,BLANKS-1
03200          TF   ALPHA+22,HDNG12+22
03210          BTFS FLTFIX,SUMRES
```

```
03840 16 10795 0 3863
03852 49 10744 00000
03859 00005    0 1351
03864 00005    0 1341

03870 44 03894 01339

03882 33 01339 00000

03894 16 10795 0 3917
03906 49 10524 00000
03913 00005    0 1381
03918 00005    0 1341

03924 41 03978 00000

03936 15 03925 00009

03948 16 10795 0 3971
03960 49 10744 00000
03967 00005    0 1361
03972 00005    0 0885

03978 16 10795 0 4001
03990 49 10524 00000
03997 00005    0 0481
04002 00005    0 0905

04008 47 02538 00900

04020 34 00000 00102

04032 34 00000 00102

04044 27 01480 03389

04056 31 01148 00986

04068 26 01159 01321

04080 26 01185 01849

04092 39 01149 00100

04104 34 00000 00102

04116 31 01148 00986

04128 26 01171 01795

04140 16 10795 0 4163
04152 49 10764 00000
04159 00005    0 7536
04164 00005    0 1371
```



```
03220          TF   ALPHA+50,OUTPUT+2
03230          WATY ALPHA
03240          RCTY
03250          BD   *+48,CONTR2
03260          WACD BLANKS
03270          WACD BLANKS
03280          WACD ALPHA
03290          TR   ALPHA-1,BLANKS-1
03300          TF   ALPHA+22,HDNG13+22
03310          FD   SUMAB,OBSER

03320          BTFS FLTFIX,SUMAB

03330          TF   ALPHA+50,OUTPUT+2
03340          WATY ALPHA
03350          RCTY
03360          BD   *+24,CONTR2
03370          WACD ALPHA
03380          TR   ALPHA-1,BLANKS-1
03390          TF   ALPHA+22,HDNG10+22
03400          BTFS FLTFIX,SQR

03410          TF   ALPHA+50,OUTPUT+2
03420          WATY ALPHA
03430          RCTY
03440          BD   *+24,CONTR2
```

```
04170 26 01199 08425

04182 39 01149 00100

04194 34 00000 00102

04206 43 04254 00909

04218 39 00987 00400

04230 39 00987 00400

04242 39 01149 00400

04254 31 01148 00986

04266 26 01171 01821

04278 16 10795 0 4301
04290 49 10564 00000
04297 00005    0 1381
04302 00005    0 0481

04308 16 10795 0 4331
04320 49 10764 00000
04327 00005    0 7536
04332 00005    0 1381

04338 26 01199 08425

04350 39 01149 00100

04362 34 00000 00102

04374 43 04398 00909

04386 39 01149 00400

04398 31 01148 00986

04410 26 01171 01743

04422 16 10795 0 4445
04434 49 10764 00000
04441 00005    0 7536
04446 00005    0 0667

04452 26 01199 08425

04464 39 01149 00100

04476 34 00000 00102

04488 43 04512 00909
```

```
03450          WACD ALPHA
03460          TR   ALPHA-1,BLANKS-1
03470          TF   ALPHA+22,HDNG11+22,
03480          FD   DSQR,SQR

03490          BTFS FLTFIX,DSQR

03500          TF   ALPHA+50,OUTPUT+2
03510          WATY ALPHA
03520          RCTY
03530          BD   *+24,CONTR2
03540          WACD ALPHA
03550          H
03560          B    STARTD
03570*    *    *    *    *    *    *    *    *    *    *    *    *
03580*      SUBROUTINE TO READ, FLOAT, AND STORE NUMBERS UNDER      *
03590*        FORMAT CONTROL.  NEEDS NUMBER OF WORDS AND INITIAL    *
03600*        ADDRESS WHERE STORED.                                 *
03610*    *    *    *    *    *    *    *    *    *    *    *    *
03620WCTR      DS   3
03630          DS   5
03640RFS       TF   TRSMT+23,RFS-1,,SET UP STORE ADDRESS.
03650          TFM  READN-2,READN
03660          TF   FRMT+11,FORMAT
03670FRMT      TF   SPEC,99999
03680          SF   SPEC-1
03690          SF   SPEC-3
03700          B    99999,,,READN OR LOOP1
03710          DORG *-3
```

```
04500 39 01149 00400
04512 31 01148 00986
04524 26 01171 01769
04536 16 10795 04559
04548 49 10564 00000
04555 00005    01361
04560 00005    00667
04566 16 10795 04589
04578 49 10764 00000
04585 00005    07536
04590 00005    01361
04596 26 01199 08425
04608 39 01149 00100
04620 34 00000 00102
04632 43 04656 00909
04644 39 01149 00400
04656 48 00000 00000
04668 49 01850 00000
04682 00003
04687 00005
04688 26 05611 04687
04700 16 04766 04768
04712 26 04735 00501
04724 26 05727 99999
04736 32 05726 00000
04748 32 05724 00000
04760 49 99999 00000
04768
```



```
03720READN     RACD ALPHA
03730          TFM  READN-2,LOOP1
03740          TFM  ADDR,ALPHA-2
03750LOOP1     A    ADDR,SPEC-2
03760          A    ADDR,SPEC-2
03770          TF   INPUT,ZEROS
03780          TF   INPUT-3,ZEROS-5
03790CHCOL     CM   ADDR,ALPHA+154
03800          BNL  READN
03805          CM   SPEC-4,0,10
03807          BE   STEP1
03810          TDM  SIGN2,0
03820          TF   D1+6,ADDR
03830          TF   D2+11,D1+6
03840          TF   PER+6,D1+6
03850          TF   D4+6,D1+6
03860          TF   RET+6,D1+6
03870          SM   RET+6,1,10
03880          TFM  D2+6,INPUT
03890          TFM  D5+6,INPUT
03900          TFM  SETFL+6,INPUT+1
03910          S    SETFL+6,SPEC-2
03920RET       SF   99999,,,ADDR-1
03930D1        CM   99999,70,10
03940          BL   PER
03950D2        TD   99999,99999,,INPUT,ADDR
```

```
04768 37 01149 00500
04780 16 04766 04804
04792 16 05732 01147
04804 21 05732 05725
04816 21 05732 05725
04828 26 05746 00895
04840 26 05737 00890
04852 14 05732 01303
04864 46 04768 01300
04876 14 05723 00000
04888 46 05678 01200
04900 15 05762 00000
04912 26 05050 05732
04924 26 05079 05050
04936 26 05094 05050
04948 26 05118 05050
04960 26 05038 05050
04972 12 05038 00001
04984 16 05074 05746
04996 16 05142 05746
05008 16 05310 05747
05020 22 05310 05725
05032 32 99999 00000
05044 14 99999 00070
05056 47 05088 01300
05068 25 99999 99999
```

```
03960          B     CHG+20
03970          DORG  *-3
03980PER       CM    99999,03,10,ADDR
03990          BE    CHG
04000D4        CM    99999,20,10
04010          BE    MIN
04020D5        TDM   99999,0,,INPUT
04030          B     CHG+20
04040          DORG  *-3
04050MIN       SF    SIGN2
04060          B     PER+48
04070          DORG  *-3
04080CHG       AM    SETFL+6,1,10
04090          B     *+32
04100          DORG  *-3
04110          SM    D2+6,1,10
04120          SM    D5+6,1,10
04130          SM    D1+6,2,10
04140          SM    D2+11,2,10
04150          SM    PER+6,2,10
04160          SM    D4+6,2,10
04170          SM    RET+6,2,10
04180          C     D2+6,SETFL+6
04190          BNL   RET
04200SETFL     SF    99999,,,(INPUT+1)-(SPEC-2)
04210MOVE      CM    INPUT,0,10
04220          BE    ZEROX
04230          TF    COMN,ZEROS
04240          CF    COMN-9
```

```
05080 49 05136 00000
05088
05088 14 99999 0000Ō3
05100 46 05176 01200
05112 14 99999 000Ō0
05124 46 05156 01200
05136 15 99999 00000
05148 49 05196 00000
05156
05156 32 05762 00000
05168 49 05136 00000
05176
05176 11 05310 0000Ō1
05188 49 05220 00000
05196
05196 12 05074 0000Ō1
05208 12 05142 0000Ō1
05220 12 05050 0000Ō2
05232 12 05079 0000Ō2
05244 12 05094 0000Ō2
05256 12 05118 0000Ō2
05268 12 05038 0000Ō2
05280 24 05074 05310
05292 46 05032 01300
05304 32 99999 00000
05316 14 05746 0000Ō0
05328 46 05700 01200
05340 26 05756 00895
05352 33 05747 00000
```



```
04250          TFM   EXPNT,INPUT+1
04260          S     EXPNT,SETFL+6
04270          TF    BRNCH+11,SETFL+6
04280          SF    EXPNT-1
04290          S     EXPNT,SPEC
04300BRNCH     BD    DIGIT,99999
04310          SM    EXPNT,1,10
04320          AM    BRNCH+11,1,10
04330          B     BRNCH
04340          DORG  *-3
04350DIGIT     TF    *+30,BRNCH+11
04360          AM    *+18,9,10
04370EX        TF    99999,EXPNT
04380          TF    *+18,BRNCH+11
04390          SF    99999
04400          TF    TRSMT+28,EX+6
04410          BNF   *+48,SIGN2
04420          TF    *+30,TRSMT+28
04430          SM    *+18,2,10
04440          SF    99999
04450TRSMT     TFLS  99999,99999
04460          AM    TRSMT+23,10,10
04470          SM    WCTR,1,10
04480          BNP   OVR2
04490          SM    SPEC-4,1,10
```

```
05364 16 05761 Ō5747
05376 22 05761 05310
05388 26 05435 05310
05400 32 05760 00000
05412 22 05761 05727
05424 43 05468 99999
05436 12 05761 0000Ō1
05448 11 05435 0000Ō1
05460 49 05424 00000
05468
05468 26 05498 05435
05480 11 05498 0000Ō9
05492 26 99999 05761
05504 26 05522 05435
05516 32 99999 00000
05528 26 05616 05498
05540 44 05588 05762
05552 26 05582 05616
05564 12 05582 0000Ō2
05576 32 99999 00000
05588 16 10795 Ō5611
05600 49 10744 00000
05607 00005    99999
05612 00005    99999
05618 11 05611 000Ō0
05630 12 04682 0000Ō1
05642 47 05698 01100
05654 12 05723 0000Ō1
```

```
04500          BP    LOOP1
04510STEP1     AM    FRMT+11,6,10
04520          B     FRMT
04530          DORG  *-3
04540OVR2      BB
04550          DORG  *-9
04560ZEROX     TFM   TRSMT+28,ZERO
04570          B     TRSMT
04580          DORG  *-3
04590SPEC      DS    8
04600ADDR      DS    5
04610INPUT     DS    14
04620COMN      DS    10
04630EXPNT     DS    5
04640SIGN2     DS    1
04650PNUM      DS    4
04660MCNT      DS    3
04670*    *    *    *    *    *    *    *    *
04680*      SUBROUTINE FOR PRINTING N WORDS.   *
04690*    *    *    *    *    *    *    *    *
04700WORDS     DS    3
04710PRINT     RCTY
04720PRINT1    BTFS  FLTFIX,99999
04730          WATY  OUTPUT-20
04740          TBTY
04750          AM    PRINT1+28,10,10
04760          SM    WORDS,1,10
04770          BP    PRINT1
```

```
05666 46 04804 01100
05678 11 04735 00006
05690 49 04724 00000
05698
05698 42 00000 00000
05700
05700 16 05616 00885
05712 49 05588 00000
05720
05727 00008
05732 00005
05746 00014
05756 00010
05761 00005
05762 00001
05766 00004
05769 00003

05772 00003
05774 34 00000 00102
05786 16 10795 05809
05798 49 10764 00000
05805 00005    07536
05810 00005    99999
05816 39 08403 00100
05828 34 00000 00108
05840 11 05814 00010
05852 12 05772 00001
05864 46 05786 01100
```



```
04780RET1      B     99999
04790          DORG  *-3
04800*    *    *    *    *    *    *    *    *
04810*      SUBROUTINE TO TRANSFORM DATA       *
04820*    *    *    *    *    *    *    *    *
04830          DS    2
04840TFS       TF    CNT,INVAR
04850          TF    MV+23,DATA2
04860          TF    MV+28,DATA1
04870MV        TFLS  99999,99999

04880          AM    MV+23,10,10
04890          AM    MV+28,10,10
04900          SM    CNT,1,10
04910          BP    MV
04920          TF    CNT,NOTRAN
04930TRNF      TF    *+23,INDEX
04940          TF    SPEC,99999
04950          SF    SPEC-1
04960          SF    SPEC-3
04970          SF    SPEC-5
04980          TF    TRF+28,DATA1
04990          SM    TRF+28,10,10
05000          A     TRF+27,SPEC-2
05010TRF       TFLS  WORK,99999

05020          TF    MVE+23,DATA1
05030          SM    MVE+23,10,10
```

```
05876 49 99999 00000
05884
05885 00002
05886 26 07414 00420
05898 26 05945 00521
05910 26 05950 00516
05922 16 10795 05945
05934 49 10744 00000
05941 00005    99999
05946 00005    99999
05952 11 05945 00010
05964 11 05950 00010
05976 12 07414 00001
05988 46 05922 01100
06000 26 07414 00432
06012 26 06035 00506
06024 26 05727 99999
06036 32 05726 00000
06048 32 05724 00000
06060 32 05722 00000
06072 26 06136 00516
06084 12 06136 00010
06096 21 06135 05725
06108 16 10795 06131
06120 49 10744 00000
06127 00005    07424
06132 00005    99999
06138 26 07367 00516
06150 12 07367 00010
```

```
05040          A     MVE+22,SPEC-4
05050          MM    SPEC-6,5,10
05060          TFM   *+35,TRCON-5
05070          A     *+23,99
05080          TF    *+18,99999
05090BRCH      B     99999
05100          DORG  *-3
05110*
05120*      HERE ARE THE TRANSFORMATION SUBROUTINES.
05130*
05140RETURN    TF    TRNF1+28,DATA2
05150          SM    TRNF1+28,10,10
05160          A     TRNF1+27,SPEC-2
05170TRNF1     TFLS  WORK,99999



05180          B     MVE
05190          DORG  *-3
05200CHSIGN    BNF   OVR1,WORK-2
05210          CF    WORK-2
05220          B     MVE
05230          DORG  *-3
05240OVR1      SF    WORK-2
05250          B     MVE
05260          DORG  *-3
05270SCALE     TF    FADD+28,CONST
05280          SM    FADD+28,10,10
05290          A     FADD+27,SPEC
05300FADD      FA    WORK,99999
```

```
06162 21 07366 05723
06174 13 05721 00005
06186 16 06221 07424
06198 21 06221 00099
06210 26 06228 99999
06222 49 99999 00000
06230

06230 26 06294 00521
06242 12 06294 00010
06254 21 06293 05725
06266 16 10795 06289
06278 49 10744 00000
06285 00005    07424
06290 00005    99999
06296 49 07344 00000
06304

06304 44 06336 07422
06316 33 07422 00000
06328 49 07344 00000
06336

06336 32 07422 00000
06348 49 07344 00000
06356

06356 26 06420 00511
06368 12 06420 00010
06380 21 06419 05727
06392 16 10795 06415
06404 49 10524 00000
06411 00005    07424
06416 00005    99999
```

```
05310          B     MVE
05320          DORG  *-3
05330MAGN      TF    FMUL+28,CONST
05340          SM    FMUL+28,10,10
05350          A     FMUL+27,SPEC
05360FMUL      FM    WORK,99999



05370          B     MVE
05380          DORG  *-3
05390SUM       TF    FADD1+28,DATA1
05400          SM    FADD1+28,10,10
05410          A     FADD1+27,SPEC
05420FADD1     FA    WORK,99999



05430          B     MVE
05440          DORG  *-3
05450SUB       TF    FSUB+28,DATA1
05460          SM    FSUB+28,10,10
05470          A     FSUB+27,SPEC
05480FSUB      FS    WORK,99999



05490          B     MVE
05500          DORG  *-3
05510MPY       TF    FMUL1+28,DATA1
05520          SM    FMUL1+28,10,10
05530          A     FMUL1+27,SPEC
```



```
06422 49 07344 00000
06430

06430 26 06494 00511
06442 12 06494 00010
06454 21 06493 05727
06466 16 10795 06489
06478 49 10544 00000
06485 00005    07424
06490 00005    99999
06496 49 07344 00000
06504

06504 26 06568 00516
06516 12 06568 00010
06528 21 06567 05727
06540 16 10795 06563
06552 49 10524 00000
06559 00005    07424
06564 00005    99999
06570 49 07344 00000
06578

06578 26 06642 00516
06590 12 06642 00010
06602 21 06641 05727
06614 16 10795 06637
06626 49 10504 00000
06633 00005    07424
06638 00005    99999
06644 49 07344 00000
06652

06652 26 06716 00516
06664 12 06716 00010
06676 21 06715 05727
```

```
05540FMUL1  FM    WORK,99999


05550       B     MVE
05560       DORG  *-3
05570DVDE   TF    FDIV+28,DATA1
05580       SM    FDIV+28,10,10
05590       A     FDIV+27,SPEC
05600FDIV   FD    WORK,99999


05610       B     MVE
05620       DORG  *-3
05630RCPR   TFLS  TEMP1,ONE


05640       FD    TEMP1,WORK


05650       TFLS  WORK,TEMP1


05660       B     MVE
05670       DORG  *-3
05680POWER  TF    AA+28,CONST
05690       SM    AA+28,10,10
05700       A     AA+27,SPEC
05710       FLN   WORK,WORK
```

```
06688 16 10795 06711
06700 49 10544 00000
06707 00005    07424
06712 00005    99999

06718 49 07344 00000

06726

06726 26 06790 00516

06738 12 06790 00010

06750 21 06789 05727

06762 16 10795 06785
06774 49 10564 00000
06781 00005    07424
06786 00005    99999

06792 49 07344 00000

06800

06800 16 10795 06823
06812 49 10744 00000
06819 00005    00627
06824 00005    00905

06830 16 10795 06853
06842 49 10564 00000
06849 00005    00627
06854 00005    07424

06860 16 10795 06883
06872 49 10744 00000
06879 00005    07424
06884 00005    00627

06890 49 07344 00000

06898

06898 26 06992 00511

06910 12 06992 00010

06922 21 06991 05727

06934 16 10795 06957
06946 49 10724 00000
06953 00005    07424
06958 00005    07424
```



```
05720AA     FM    WORK,99999


05730       FEX   WORK,WORK


05740       B     MVE
05750       DORG  *-3
05760LN     FLN   WORK,WORK


05770       B     MVE
05780       DORG  *-3
05790LOG    FLOG  WORK,WORK


05800       B     MVE
05810       DORG  *-3
05820EXN    FEX   WORK,WORK


05830       B     MVE
05840       DORG  *-3
05850EXT    FEXT  WORK,WORK


05860       B     MVE
```

```
06964 16 10795 06987
06976 49 10544 00000
06983 00005    07424
06988 00005    99999

06994 16 10795 07017
07006 49 10684 00000
07013 00005    07424
07018 00005    07424

07024 49 07344 00000

07032

07032 16 10795 07055
07044 49 10724 00000
07051 00005    07424
07056 00005    07424

07062 49 07344 00000

07070

07070 16 10795 07093
07082 49 10704 00000
07089 00005    07424
07094 00005    07424

07100 49 07344 00000

07108

07108 16 10795 07131
07120 49 10684 00000
07127 00005    07424
07132 00005    07424

07138 49 07344 00000

07146

07146 16 10795 07169
07158 49 10664 00000
07165 00005    07424
07170 00005    07424

07176 49 07344 000000
```

```
05870          DORG *-3
05880SIN       FSIN WORK,WORK


05890          B    MVE

05900          DORG *-3
05910COS       FCOS WORK,WORK


05920          B    MVE
05930          DORG *-3
05940ARCTAN    FATN WORK,WORK


05950          B    MVE
05960          DORG *-3
05970SQRT      FSQR WORK,WORK


05980          B    MVE
05990          DORG *-3
06000DUMMY     B    99999
06010          DORG *-3
06020MVE       TFLS 99999,WORK


06030          AM   TRNF+23,8,10
06040          SM   CNT,1,10
06050          BP   TRNF+12
06060          BB
```

```
07184

07184 16 10795 0̄7207
07196 49 10624 00000
07203 00005    0̄7424
07208 00005    0̄7424

07214 49 07344 00000


07222

07222 16 10795 0̄7245
07234 49 10604 00000
07241 00005    0̄7424
07246 00005    0̄7424

07252 49 07344 00000

07260

07260 16 10795 0̄7283
07272 49 10644 00000
07279 00005    0̄7424
07284 00005    0̄7424

07290 49 07344 00000

07298

07298 16 10795 0̄7321
07310 49 10584 00000
07317 00005    0̄7424
07322 00005    0̄7424

07328 49 07344 00000

07336

07336 49 99999 00000

07344

07344 16 10795 0̄7367
07356 49 10744 00000
07363 00005    9̄9999
07368 00005    0̄7424

07374 11 06035 0000̄8

07386 12 07414 0000̄1

07398 46 06024 01100

07410 42 00000 00000
```



```
06070          DORG *-9

06080CNT       DS   3

06090WORK      DS   10

06100TRCON     DSA  MVE,RETURN,CHSIGN,SCALE,MAGN,SUM,SUB,MPY,DVDE,RCPR


06110          DSA  POWER,LN,LOG,EXN,EXT,SIN,COS,ARCTAN,SQRT,DUMMY

06120*    *    *    *    *    *    *    *    *    *    *    *    *    *
06130*  SUBROUTINE FOR PREPARING DATA FOR ALPHAMERICAL PRINTING OR    *
06140*  PUNCHING.  INTERNAL FORMAT IS SPSII.                          *
06150*    *    *    *    *    *    *    *    *    *    *    *    *    *
06160          DS   10

06170FLTFIX    CF   ARG-9

06180ARG       DS   ,FLTFIX-1

06190          TF   OUTPUT,SEVENS

06200          CF   OUTPUT-9

06210          TF   OUTPUT-10,DCMAL

06220          TFM  OUTPUT-19,0,9

06230          TFM  SIGN,0,10

06240          BNF  JUMP,ARG-2

06250          TDM  SIGN-1,2,11

06260          CF   ARG-2

06270JUMP      CM   ARG,99,1011

06280          BE   WRALPH
```

```
07412

07414 00003

07424 00010

07429 00005    0̄7344
07434 00005    0̄6230
07439 00005    0̄6304
07444 00005    0̄6356
07449 00005    0̄6430
07454 00005    0̄6504
07459 00005    0̄6578
07464 00005    0̄6652
07469 00005    0̄6726
07474 00005    0̄6800

07479 00005    0̄6898
07484 00005    0̄7032
07489 00005    0̄7070
07494 00005    0̄7108
07499 00005    0̄7146
07504 00005    0̄7184
07509 00005    0̄7222
07514 00005    0̄7260
07519 00005    0̄7298
07524 00005    0̄7336

07534 00010

07536 33 07526 00000

07535 00000

07548 26 08423 08435

07560 33 08414 00000

07572 26 08413 08445

07584 16 08404 00000

07596 16 08447 00000

07608 44 07644 07533

07620 15 08446 0000̄2

07632 33 07533 00000

07644 14 07535 00099

07656 46 07980 01200
```

```
06290          CM    ARG,0,10
06300          BNP   DECIML
06310          CM    ARG,4,10
06320          BH    LARGE
06330          TFM   TRNMT+11,ARG-9
06340          TFM   *+42,OUTPUT-10
06350          S     *+30,ARG
06360          S     *+18,ARG
06370TRNMT     TD    99999,99999
06380          AM    TRNMT+11,1,10
06390          AM    TRNMT+6,2,10
06400          CM    TRNMT+6,OUTPUT-12
06410          BNH   TRNMT
06420          TF    WRITE+23,TRNMT+11
06430          TFM   EXPNT2,5,10
06440          S     EXPNT2,ARG
06450          TFM   *+47,SEVENS
06460          S     *+35,EXPNT2
06470          S     *+23,EXPNT2
06480          A     OUTPUT-12,99999
06490WRITE     TFM   *+18,OUTPUT-8
06500          TD    OUTPUT-8,0
06510          AM    WRITE+23,1,10
06520          AM    WRITE+18,2,10
06530          CM    WRITE+18,OUTPUT
06540          BNH   WRITE+12
06550WRALPH    BD    SETZRO,OUTPUT-18
06560          B     SETSIG
06570          DORG  *-3
06580SETZRO    TDM   OUTPUT,0
```



```
07668 14 07535 00000
07680 47 08026 01100
07692 14 07535 00004
07704 46 08106 01100
07716 16 07775 07526
07728 16 07770 08413
07740 22 07770 07535
07752 22 07770 07535
07764 25 99999 99999
07776 11 07775 00001
07788 11 07770 00002
07800 14 07770 08411
07812 47 07764 01100
07824 26 07931 07775
07836 16 08449 00005
07848 22 08449 07535
07860 16 07907 08435
07872 22 07907 08449
07884 22 07907 08449
07896 21 08411 99999
07908 16 07926 08415
07920 25 08415 00000
07932 11 07931 00001
07944 11 07926 00002
07956 14 07926 08423
07968 47 07920 01100
07980 43 08000 08405
07992 49 08312 00000
08000
08000 15 08423 00000
```

```
06590          TF    OUTPUT-20,SIGN
06600          BB
06610          DORG  *-9
06620DECIML    CM    ARG,4,1011
06630          BNH   LARGE
06640          TFM   WRITE+23,ARG-9
06650          TFM   WRITE+18,OUTPUT-8
06660          S     WRITE+18,ARG
06670          S     WRITE+18,ARG
06680          B     WRITE+12
06690          DORG  *-3
06700LARGE     TF    OUTPUT-17,SEVENS-7
06710          BNF   JUMP2,ARG
06720          TFM   OUTPUT-20,20,10
06730          CF    ARG
06740          CF    OUTPUT-19
06750JUMP2     TD    OUTPUT-16,ARG
06760          TD    OUTPUT-18,ARG-1
06770          CF    OUTPUT-18
06780          TF    OUTPUT-12,SIGN
06790          CF    OUTPUT-13
06800          TFM   WR+11,ARG-9
06810          TFM   WR+6,OUTPUT-8
06820WR        TD    99999,99999
06830          AM    WR+11,1,10
06840          AM    WR+6,2,10
06850          CM    WR+6,OUTPUT
06860          BNH   WR
06870          BB
```



```
08012 26 08403 08447
08024 42 00000 00000
08026
08026 14 07535 00004
08038 47 08106 01100
08050 16 07931 07526
08062 16 07926 08415
08074 22 07926 07535
08086 22 07926 07535
08098 49 07920 00000
08106
08106 26 08406 08428
08118 44 08166 07535
08130 16 08403 00020
08142 33 07535 00000
08154 33 08404 00000
08166 25 08407 07535
08178 25 08405 07534
08190 33 08405 00000
08202 26 08411 08447
08214 33 08410 00000
08226 16 08261 07526
08238 16 08256 08415
08250 25 99999 99999
08262 11 08261 00001
08274 11 08256 00002
08286 14 08256 08423
08298 47 08250 01100
08310 42 00000 00000
```

```
06880          DORG *-9
06890SETSIG    TFM  SETS+11,OUTPUT-16
06900SETS      BD   SET,OUTPUT-16
06910          AM   SETS+11,2,10
06920          B    SETS
06930          DORG *-3
06940SET       TF   *+30,SETS+11
06950          SM   *+18,2,10
06960          TF   99999,SIGN
06970          BB
06980          DORG *-9
06990          DAS  14
07000OUTPUT    DS   2
07010          DAC  1,^
07020SEVENS    DC   10,7070707070
7030DCMAL      DC   10,0000000003
07040SIGN      DS   2
07050EXPNT2    DS   2
07060*    *    *    *    *    *    *    *    *    *
07070*  SUBROUTINE FOR READING FIN AND FOUT.    *
07080*    *    *    *    *    *    *    *    *    *
07090FF        TF   RF1+6,FORMAT
07100          SM   RF1+6,5,10
07110          TFM  RF2+11,78,10
07120          TFM  RF3+11,13,10
07130          TFM  RF5+11,6,10
07140          BTM  RF,2,10
07150*
07160*      READ,FLOAT AND STORE FIN AND FOUT.
07170          TFM  WCTR,2,10
07180          BTM  RFS,FIN
```

```
08312
08312 16 08335 08407
08324 43 08356 08407
08336 11 08335 00002
08348 49 08324 00000
08356
08356 26 08386 08335
08368 12 08386 00002
08380 26 99999 08447
08392 42 00000 00000
08394
08395 00014
08423 00002
08425 00001
08435 00010
08445 00010
08447 00002
08449 00002
08450 26 08588 00501
08462 12 08588 00005
08474 16 08605 00078
08486 16 08617 00073
08498 16 08665 00006
08510 17 08558 00002

08522 16 04682 00002
08534 17 04688 00697
```



```
07190RET7      B    99999
07200          DORG *-3
07210*    *    *    *    *    *    *    *    *    *    *    *    *    *
07220*      SUBROUTINE TO READ AND FLAG FORMATS , TRANSFORMATION INDEXES,
07230*        AND IDD, INDEXES OF DEPENDENT VARIABLES FOR ADV.
07240*    *    *    *    *    *    *    *    *    *    *    *    *    *
07250          DS   3
07260RF        TF   CNTR,RF-1
07270          TF   RF4+6,RF1+6
07280RF1       RNCD 99999
07290RF2       AM   RF1+6,99999
07300RF3       SM   CNTR,99999
07310          BP   RF1
07320          TF   CNTR,RF-1
07330RF4       SF   99999
07340RF5       AM   RF4+6,99999
07350          SM   CNTR,1,10
07360          BP   RF4
07370          BB
07380          DORG *-9
07390*    *    *    *    *    *    *    *
07400*      SUBROUTINE TO FLOAT NOBS.     *
07410*    *    *    *    *    *    *    *
07420          DS   5
07430CONV      TFM  EXP3,5,10
07440          TFM  TESTD+11,CONV-5
07450          TFM  MVWRD+6,OBSER-5
07460          TF   OBSER,ZEROS
07470TESTD     BD   SETM,99999
07480          AM   TESTD+11,1,10
07490          SM   EXP3,1,10
```

```
08546 49 99999 00000
08554
08556 00003
08558 26 00589 08557
08570 26 08648 08588
08582 36 99999 00500
08594 11 08588 99999
08606 12 00589 99999
08618 46 08582 01100
08630 26 00589 08557
08642 32 99999 00000
08654 11 08648 99999
08666 12 00589 00001
08678 46 08642 01100
08690 42 00000 00000
08692

08696 00005
08698 16 08853 00005
08710 16 08757 08693
08722 16 08832 00476
08734 26 00481 00895
08746 43 08802 99999
08758 11 08757 00001
08770 12 08853 00001
```

```
07500          SM    MVWRD+6,1,10
07510          B     TESTD
07520          DORG  *-3
07530SETM      TF    *+18,TESTD+11
07540          SF    99999
07550MVWRD     TF    99999,CONV-1
07560          TF    OBSER,EXP3
07570          BB
07580          DORG  *-9
07590EXP3      DS    2
07600          DS    4
07610WRNUM     TF    OUT,NO
07620NO        DS    ,WRNUM-1
07630          CF    OUT-1
07640          WNTY  OUT-1
07650          BB
07660          DORG  *-9
07670START     RNCD  CONT
07680          SF    DATE-5
07690          SF    DATE-3
07700          SF    DATE-1
07710          SF    PROB-1
07720          SF    NOBS-4
07730          SF    NFORM-2
07740          SF    INVAR-2
07750          SF    NOVAR-2
07760          SF    N-2
```

```
08782 12 08832 00001
08794 49 08746 00000
08802
08802 26 08820 08757
08814 32 99999 00000
08826 26 99999 08697
08838 26 00481 08853
08850 42 00000 00000
08852
08853 00002
08857 00004
08858 26 00817 08857
08857 00000
08870 33 00816 00000
08882 38 00816 00100
08894 42 00000 00000
08896
08896 36 00402 00500
08908 32 00402 00000
08920 32 00404 00000
08932 32 00406 00000
08944 32 00408 00000
08956 32 00410 00000
08968 32 00415 00000
08980 32 00418 00000
08992 32 00421 00000
09004 32 00424 00000
```



```
07770          SF    NDEP-2
07780          SF    NOTRAN-2
07790          SF    NOCON-2
07800          SF    NCOL-1
07810          SF    NELIM-2
07820          TFM   CMCOL+11,ALPHA+152
07830*
07840*         COMPUTE ADDRESSES FOR DATA FIELDS.
07850*
07860CADD      TFM   IND,REF
07870          TF    TEMP1,IND
07880          AM    TEMP1,80,10
07890          CM    N,80,10
07900          BNP   *+24
07910          AM    TEMP1,80,10
07920          AM    TEMP1,1,10
07930          TF    ID,TEMP1
07970          A     TEMP1,N
07980          A     TEMP1,N
07990          TF    IDD,TEMP1
08000CADD1     A     TEMP1,N
08010          A     TEMP1,N
08020          AM    TEMP1,4,10
08030          TF    FORMAT,TEMP1
08040          TF    TEMP2,NFORM
08050          TFM   CTR,0,10
08060INC       AM    CTR,1,10
08070          SM    TEMP2,13,10
08080          BP    INC
```

```
09016 32 00427 00000
09028 32 00430 00000
09040 32 00433 00000
09052 32 00436 00000
09064 32 00438 00000
09076 16 04887 01301
09088 16 00486 17500
09100 26 00627 00486
09112 11 00627 00080
09124 14 00426 00080
09136 47 09160 01100
09148 11 00627 00080
09160 11 00627 00001
09172 26 00491 00627
09184 21 00627 00426
09196 21 00627 00426
09208 26 00496 00627
09220 21 00627 00426
09232 21 00627 00426
09244 11 00627 00004
09256 26 00501 00627
09268 26 00637 00417
09280 16 00592 00000
09292 11 00592 00001
09304 12 00637 00013
09316 46 09292 01100
```

```
08090          MM    CTR,78,10
08100          A     TEMP1,99
08110          AM    TEMP1,4,10
08120          TF    INDEX,TEMP1
08130          TF    TEMP2,NOTRAN
08140          TFM   CTR,0,10
08150INC2      AM    CTR,1,10
08160          SM    TEMP2,10,10
08170          BP    INC2
08180          MM    CTR,80,10
08190          A     TEMP1,99
08200          AM    TEMP1,2,10
08210          TF    CONST,TEMP1
08220          A     TEMP1-1,NOCON
08230          TF    DATA1,TEMP1
08240          A     TEMP1-1,NOVAR
08250          TF    DATA2,TEMP1
08260CADD2     A     TEMP1-1,INVAR
08270          TF    B,TEMP1
08280          A     TEMP1-1,N
08290          TF    SE,TEMP1
08300          A     TEMP1-1,N
08310          TF    T,TEMP1
08450          TFLS  FIN,ZERO


08460          TFLS  FOUT,ZERO
```

```
09328 13 00592 00078
09340 21 00627 00099
09352 11 00627 00004
09364 26 00506 00627
09376 26 00637 00432
09388 16 00592 00000
09400 11 00592 00001
09412 12 00637 00010
09424 46 09400 01100
09436 13 00592 00080
09448 21 00627 00099
09460 11 00627 00002
09472 26 00511 00627
09484 21 00626 00435
09496 26 00516 00627
09508 21 00626 00423
09520 26 00521 00627
09532 21 00626 00420
09544 26 00526 00627
09556 21 00626 00426
09568 26 00531 00627
09580 21 00626 00426
09592 26 00536 00627
09604 16 10795 09627
09616 49 10744 00000
09623 00005    00697
09628 00005    00885
09634 16 10795 09657
```



```
                                                    09646 49 10744 00000
                                                    09653 00005    00707
                                                    09658 00005    00885
08470          TFLS  F,ZERO
                                                    09664 16 10795 09687
                                                    09676 49 10744 00000
                                                    09683 00005    00687
                                                    09688 00005    00885
08480*
08490*     IS ADV USED.
08500*
08510          BD    RIDD,CON3
                                                    09694 43 09774 00443
08520*
08530*     READ IND CARD(S).
08540*
08550          TF    COUNT,N
                                                    09706 26 00586 00426
08560          TF    *+18,IND
                                                    09718 26 09736 00486
08570RIND      RNCD  99999
                                                    09730 36 99999 00500
08580          SM    COUNT,80,10
                                                    09742 12 00586 00080
08590          BP    RIND
                                                    09754 46 09730 01100
08600          B     CMPR
                                                    09766 49 09846 00000
08610          DORG  *-3
                                                    09774
08620RIDD      TF    RF1+6,IDD
                                                    09774 26 08588 00496
08630          SM    RF1+6,1,10
                                                    09786 12 08588 00001
08640          TFM   RF2+11,80,10
                                                    09798 16 08605 00080
08650          TFM   RF3+11,40,10
                                                    09810 16 08617 00040
08660          TFM   RF5+11,2,10
                                                    09822 16 08665 00002
08670          BT    RF,NDEP
                                                    09834 27 08558 00429
08680*
08690*     IS THE NUMBER OF TRANSFORMATION CONSTANTS = ZERO.
08700*
08710CMPR      CM    NOCON,0,10
                                                    09846 14 00435 00000
08720          BP    RDCON
                                                    09858 46 09902 01100
08730*
08740*     IS THE NUMBER OF TRANSFORMATIONS= ZERO.
08750*
08760          CM    NOTRAN,0,10
                                                    09870 14 00432 00000
```

```
08770          BP    RDTRAN                                  09882 46 09998 01100
08780          B     CMPF                                    09894 49 10070 00000
08790          DORG  *-3                                     09902
08800*
08810*     READ FORMATS FOR TRANSFORMATION CONSTANTS, ONE CARD.
08820*
08830RDCON     TF    RF1+6,FORMAT                            09902 26 08588 00501
08840          SM    RF1+6,5,10                              09914 12 08588 00005
08850          TFM   RF2+11,78,10                            09926 16 08605 00078
08860          TFM   RF3+11,13,10                            09938 16 08617 00013
08870          TFM   RF5+11,6,10                             09950 16 08665 00006
08880          BTM   RF,13,10                                09962 17 08558 00013
08890*
08900*     READ, FLOAT AND STORE TRANSFORMATION CONSTANTS.
08910*
08920          TF    WCTR,NOCON                              09974 26 04682 00435
08930          BT    RFS,CONST                               09986 27 04688 00511
08940*
08950*     READ TRANSFORMATION INDEXES.
08960*
08970RDTRAN    TF    RF1+6,INDEX                             09998 26 08588 00506
08980          SM    RF1+6,7,10                              10010 12 08588 00007
08990          TFM   RF2+11,80,10                            10022 16 08605 00080
09000          TFM   RF3+11,10,10                            10034 16 08617 00010
09010          TFM   RF5+11,8,10                             10046 16 08665 00008
09020          BT    RF,NOTRAN                               10058 27 08558 00432
09030*
09040*
09050*  ARE FIN AND FOUT READ.
09060*
09070CMPF      BD    *+20,CON4                               10070 43 10090 00444
09080          B     RDFORM                                  10082 49 10110 00000
09090          DORG  *-3                                     10090
09100          TFM   RET7+6,RDFORM                           10090 16 08552 10110
```



```
09110          B     FF                                      10102 49 08450 00000
09120          DORG  *-3                                     10110
09130*
09140*     READ FORMATS FOR DATA.
09150*
09160RDFORM    TF    RF1+6,FORMAT                            10110 26 08588 00501
09170          SM    RF1+6,5,10                              10122 12 08588 00005
09180          TFM   RF2+11,78,10                            10134 16 08605 00078
09190          TFM   RF3+11,13,10                            10146 16 08617 00013
09200          TFM   RF5+11,6,10                             10158 16 08665 00006
09210          BT    RF,NFORM                                10170 27 08558 00417
09220*
09230*     SET UP ADDRESS OF WEIGHTS.
09240*
09250WGTS      TF    WT,DATA1                                10182 26 00556 00516
09260          A     WT-1,N                                  10194 21 00555 00426
09270*
09280*  SET UP NUMBER OF CARD COLUMNS TO READ.
09290*
09300          CM    NCOL,0,10                               10206 14 00437 00000
09310          BE    FLT                                     10218 46 10266 01200
09320          TFM   CMCOL+11,ALPHA                          10230 16 04887 01149
09330          A     CMCOL+11,NCOL                           10242 21 04887 00437
09340          A     CMCOL+11,NCOL                           10254 21 04887 00437
09350*
09360*     FLOAT NUMBER OF OBSERVATIONS.
09370*
09380FLT       BT    CONV,NOBS                               10266 27 08698 00414
09690PRH       RCTY                                          10278 34 00000 00102
09700          BT    WRNUM,DATE-4                            10290 27 08858 00403
09710          SPTY                                          10302 34 00000 00101
09720          BT    WRNUM,DATE-2                            10314 27 08858 00405
09730          SPTY                                          10326 34 00000 00101
09740          BT    WRNUM,DATE                              10338 27 08858 00407
09750          RCTY                                          10350 34 00000 00102
```

```
09760          WATY PRBL
09770          BT   WRNUM,PROB
09780          TBTY
09790          BT   WRNUM,N
09800          WATY VRBL
09810          TBTY
09820          TF   OUT,NOBS
09830          CF   OUT-4
09840          WNTY OUT-4
09850          WATY OBSR
09860          RCTY
09870RET2      B    99999
09880          DORG *-3
09885          DAC  1,0
09890          DEND STARTD
LOAD SUBROUTINES
```

```
10362 39 00821 00100

10374 27 08858 00409

10386 34 00000 00108

10398 27 08858 00426

10410 39 00833 00100

10422 34 00000 00108

10434 26 00817 00414

10446 33 00813 00000

10458 38 00813 00100

10470 39 00843 00100

10482 34 00000 00102

10494 49 99999 00000

10502

10503 00001

01850

10504 16 11198 T1844
10516 49 10784 0
10524 16 11198 T1888
10536 49 10784 0
10544 16 11198 T2388
10556 49 10784 0
10564 16 11198 T2628
10576 49 10784 0
10584 16 11198 T2964
10596 49 10888 0
10604 16 11198 T3544
10616 49 10888 0
10624 16 11198 T3576
10636 49 10888 0
10644 16 11198 T4388
10656 49 10888 0
10664 16 11198 T5378
10676 49 10888 0
10684 16 11198 T5398
10696 49 10888 0
10704 16 11198 T6118
10716 49 10888 0
10724 16 11198 T6138
10736 49 10888 0
10744 16 11198 T6960
10756 49 10888 0
10764 16 11198 T6992
10776 49 10888 0
```

```
LOAD SUBROUTINES
END OF PASSII
17500   REF      00402   CONT     00407   DATE     00409   PROB     00414   NOBS
00417   NFORM    00420   INVAR    00423   NOVAR    00426   N        00429   NDEP
00432  *NOTRAN   00435   NOCON    00437   NCOL     00440   NELIM    00441   CON1
00442   CON2     00443   CON3     00444   CON4     00445   CON5     00446   CON6
00447   CON7     00448   CON8     00449   CON9     00450   CON10    00451   CON11
00452   CON12    00453   CON13    00454   CON14    00455   CON15    00456   CON16
00457   CON17    00458   CON18    00481   OBSER    00486   IND      00491   ID
00496   IDD      00501  *FORMAT   00506   INDEX    00511   CONST    00516   DATA1
00521   DATA2    00526   B        00531   SE       00536   T        00541   SUM1
00546   SIGMA    00551   R        00556   WT       00561   ADKK     00566   ADRNN
00571   ADIJ     00576   ADRIJ    00581   SIGN3    00586   COUNT    00589   CNTR
00592   CTR      00595   I        00598   J        00601   K        00604   P
00607   Q        00611   MSZ      00614   IVE      00617   IVP      00627   TEMP1
00637   TEMP2    00647   EY       00657   RSQR     00667   SQR      00677   DF
00687   F        00697   FIN      00707   FOUT     00717   HIGH     00727   VP
00737   VE       00817   OUT      00821   PRBL     00833   VRBL     00843   OBSR
00865   FP001    00875   FHIGH    00885   ZERO     00895   ZEROS    00905   ONE
00906   CONTR    00907  *CONTR1   00909  *CONTR2   00911  *CONTR3   00913  *CONTR4
00987  *BLANKS   01149   ALPHA    01321   WORK2    01331   PRED     01341   RES
01351   SAVE     01361   DSQR     01371  *SUMRES   01381   SUMAB    00743   L
00746   NOIN     00767   AO       01388   RD       01424   RD1      01480   SUBR
01504   EXCHG    01564   BRNF     01639   HDNG8    01671   HDNG9    01721  *HDNG10
01747  *HDNG11   01773  *HDNG12   01799  *HDNG13   01825  *HDNG14   01850  *STARTD
01874   ALPH     02070   RNC      02538   LOOP     02618   TRD      02710   CALC
02800   PRED1    02832   PRED2    02876   PRED3    02906   PRED4    02978   PRED5
03038   PRED6    03154   EX1      03252   EX2      03276   EX3      03378   PRED7
03414   PRED8    03924   PRED9    03978  *PRED10   04682   WCTR     04688   RFS
04724   FRMT     04768   READN    04804   LOOP1    04876   CMCOL    05032   RET
05044   D1       05068   D2       05088   PER      05112   D4       05136   D5
05156   MIN      05176   CHG      05304   SETFL    05316   MOVE     05424   BRNCH
05468   DIGIT    05492   EX       05588   TRSMT    05678   STEP1    05698   OVR2
05700   ZEROX    05727   SPEC     05732   ADDR     05746   INPUT    05756   COMN
05761   EXPNT    05762   SIGN2    05766   PNUM     05769   MCNT     05772   WORDS
05774   PRINT    05786  *PRINT1   05876   RET1     05886   TFS      05922   MV
06012   TRNF     06108   TRF      06222   BRCH     06230  *RETURN   06266   TRNF
06304  *CHSIGN   06336   OVR1     06356   SCALE    06392   FADD     06430   MAGN
```

```
06466   FMUL     06504   SUM      06540   FADD1    06578   SUB      06614   FSUB
06652   MPY      06688   FMUL1    06726   DVDE     06762   FDIV     06800   RCPR
06898   POWER    06964   AA       07032   LN       07070   LOG      07108   EXN
07146   EXT      07184   SIN      07222   COS      07260  *ARCTAN   07298   SQRT
07336   DUMMY    07344   MVE      07414   CNT      07424   WORK     07429   TRCON
07536  *FLTFIX   07535   ARG      07644   JUMP     07764   TRNMT    07908   WRITE
07980  *WRALPH   08000  *SETZRO   08026  *DECIML   08106   LARGE    08166   JUMP2
08250   WR       08312  *SETSIG   08324   SETS     08356   SET      08423  *OUTPUT
08435  *SEVENS   08445   DCMAL    08447   SIGN     08449  *EXPNT2   08450   FF
08546   RET7     08558   RF       08582   RF1      08594   RF2      08606   RF3
08642   RF4      08654   RF5      08698   CONV     08746   TESTD    08802   SETM
08826   MVWRD    08853   EXP3     08858   WRNUM    08857   NO       08896   START
09088   CADD     09220   CADD1    09292   INC      09400   INC2     09532   CADD2
09730   RIND     09774   RIDD     09846   CMPR     09902   RDCON    09998  *RDTRAN
10070   CMPF     10110  *RDFORM   10182   WGTS     10266   FLT      10278   PRH
10494   RET2
```

```
00010*  PROGRAM 80-E, SUM CHECK PROGRAM, NOV. 1, 1963
00020*
00030*
00040REF    DS    ,15000                          15000 00000
00050       DORG  402                             00402
00060CONT   DSS   80                              00402 00080
00070DATE   DS    6,CONT+5                        00407 00006
00080PROB   DS    2,CONT+7                        00409 00002
00090NOBS   DS    5,CONT+12                       00414 00005
00100NFORM  DS    3,CONT+15                       00417 00003
00110INVAR  DS    3,CONT+18                       00420 00003
00120NOVAR  DS    3,CONT+21                       00423 00003
00130N      DS    3,CONT+24                       00426 00003
00140NDEP   DS    3,CONT+27                       00429 00003
00150NOTRAN DS    3,CONT+30                       00432 00003
00160NOCON  DS    3,CONT+33                       00435 00003
00170NCOL   DS    2,CONT+35                       00437 00002
00180NELIM  DS    3,CONT+38                       00440 00003
00190CON1   DS    1,CONT+39                       00441 00001
00200CON2   DS    1,CONT+40                       00442 00001
00210CON3   DS    1,CONT+41                       00443 00001
00220CON4   DS    1,CONT+42                       00444 00001
00230CON5   DS    1,CONT+43                       00445 00001
00240CON6   DS    1,CONT+44                       00446 00001
00250CON7   DS    1,CONT+45                       00447 00001
00260CON8   DS    1,CONT+46                       00448 00001
00270CON9   DS    1,CONT+47                       00449 00001
00280CON10  DS    1,CONT+48                       00450 00001
```

```
00290CON11   DS    1,CONT+49
00300CON12   DS    1,CONT+50
00310CON13   DS    1,CONT+51
00320CON14   DS    1,CONT+52
00330CON15   DS    1,CONT+53
00340CON16   DS    1,CONT+54
00350CON17   DS    1,CONT+55
00360CON18   DS    1,CONT+56
00370OBSER   DS    10,CONT+79
00380IND     DS    5
00390ID      DS    5
00400IDD     DS    5
00410FORMAT  DS    5
00420INDEX   DS    5
00430CONST   DS    5
00440DATA1   DS    5
00450DATA2   DS    5
00460B       DS    5
00470SE      DS    5
00480T       DS    5
00490SUM1    DS    5
00500SIGMA   DS    5
00510R       DS    5
00520WT      DS    5
00530ADKK    DS    5
00540ADRNN   DS    5
00550ADIJ    DS    5
00560ADRIJ   DS    5
```

```
00451 00001
00452 00001
00453 00001
00454 00001
00455 00001
00456 00001
00457 00001
00458 00001
00481 00010
00486 00005
00491 00005
00496 00005
00501 00005
00506 00005
00511 00005
00516 00005
00521 00005
00526 00005
00531 00005
00536 00005
00541 00005
00546 00005
00551 00005
00556 00005
00561 00005
00566 00005
00571 00005
00576 00005
```

```
00570SIGN3   DS    5
00580COUNT   DS    5
00590CNTR    DS    3
00600CTR     DS    3
00610I       DS    3
00620J       DS    3
00630K       DS    3
00640P       DS    3
00650Q       DS    3
00660MSZ     DS    4
00670IVE     DS    3
00680IVP     DS    3
00690TEMP1   DS    10
00700TEMP2   DS    10
00710EY      DS    10
00720RSQR    DS    10
00730SQR     DS    10
00740DF      DS    10
00750F       DS    10
00760FIN     DS    10
00770FOUT    DS    10
00780HIGH    DS    10
00790VP      DS    10
00800VE      DS    10
00810OUT     DS    80
00820        DC    1,@
00830PRBL    DAC   6,PROB @
```



```
00581 00005
00586 00005
00589 00003
00592 00003
00595 00003
00598 00003
00601 00003
00604 00003
00607 00003
00611 00004
00614 00003
00617 00003
00627 00010
00637 00010
00647 00010
00657 00010
00667 00010
00677 00010
00687 00010
00697 00010
00707 00010
00717 00010
00727 00010
00737 00010
00817 00080
00818 00001
00821 00006
```

```
00840VRBL   DAC  5, VAR@                                 00833 00005
00850OBSR   DAC  7, OBSER@                               00843 00007
00860COM2   DAC  31,SUMS OF TRANSFORMED VARIABLES.@      00857 00031
00870COM1   DAC  25,SUMS OF INPUT VARIABLES.@            00919 00025
00880       DC   8,10000000                              00975 00008
00890FP001  DC   2,-2                                    00977 00002
00900       DC   8,10000000                              00985 00008
00910FHIGH  DC   2,50                                    00987 00002
00920       DC   8,0                                     00995 00008
00930ZERO   DC   2,-99                                   00997 00002
00940ZEROS  DC   10,0                                    01007 00010
00950       DC   8,10000000                              01015 00008
00960ONE    DC   2,1                                     01017 00002
00970ALPHA  DAS  80                                      01019 00080
00980       DAC  1,@                                     01179 00001
00990PNUM   DS   4                                       01183 00004
01000MCNT   DS   3                                       01186 00003
01010STARTE RCTY                                         01188 34 00000 00102
01020ALPH   RACD ALPHA                                   01200 37 01019 00500
01030       WATY ALPHA                                   01212 39 01019 00100
01040       RCTY                                         01224 34 00000 00102
01050       BNR  *+20,ALPHA+158                          01236 45 01256 01177
01060       B    ALPH                                    01248 49 01200 00000
01070       DORG *-3                                     01256
01080*
01090*  READ AND FLAG PARAMETERS.
01100*
01110       TFM  RET2+6,*+20                             01256 16 03738 01276
01120       B    START                                   01268 49 01764 00000
```



```
01130       DORG *-3                                     01276
01140*
01150*  SET COUNTER.
01160*
01170       TF   COUNT,NOBS                              01276 26 00586 00414
01180*
01190*  READ,FLOAT, AND STORE ONE OBSERVATION.
01200*
01210LOOP   TF   WCTR,INVAR                              01288 26 06866 00420
01220       BT   RFS,DATA1                               01300 27 06872 00516
01230*
01240*  CUMULATE SUMS OF INPUT VARIABLES.
01250*
01260       TF   S1+23,SUM1                              01312 26 07985 00541
01270       BT   SUMS,INVAR                              01324 27 07950 00420
01280*
01290*  IS INPUT DATA PRINTED.
01300       BNC1 TRD                                     01336 47 01392 00100
01310       TF   WORDS,INVAR                             01348 26 06753 00420
01320       TF   PRINT1+28,DATA1                         01360 26 06794 00516
01330       TFM  RET1+6,*+20                             01372 16 06862 01392
01340       B    PRINT                                   01384 49 06754 00000
01350       DORG *-3                                     01392
01360*
01370*  TRANSFORM DATA.
01380*
01390TRD    CM   NOTRAN,0,10                             01392 14 00432 00000
01400       BE   END                                     01404 46 01508 01200
01410       BTM  TFS,0,10                                01416 17 05112 00000
01420*
01430*  CUMULATE SUMS OF TRANSFORMED VARIABLES
01440*
01450       TF   S1+23,R                                 01428 26 07985 00551
01460       BT   SUMS,N                                  01440 27 07950 00426
01470*
01480*  ARE TRANSFORMED DATA PRINTED.
01490*
```

```
01500        BNC2 END
01510        TF   WORDS,N
01520        TF   PRINT1+28,DATA1
01530        TFM  RET1+6,*+20
01540        B    PRINT
01550        DORG *-3
01560END     SM   COUNT,1,10
01570        BP   LOOP
01580*
01590*  PRINT SUMS OF INPUT DATA.
01600*
01610        RCTY
01620        RCTY
01630        WATY COM1
01640        RCTY
01650        RCTY
01660        TF   WORDS,INVAR
01670        TF   PRINT1+28,SUM1
01680        TFM  RET1+6,*+20
01690        B    PRINT
01700        DORG *-3
01710*
01720*  ARE SUMS OF TRANSFORMED DATA PRINTED.
01730*
01740        CM   NOTRAN,0,10
01750        BE   FINISH
01760        RCTY
01770        RCTY
01780        WATY COM2
01790        TF   WORDS,N
```

```
01452 47 01508 00200
01464 26 06753 00426
01476 26 06794 00516
01488 16 06862 01508
01500 49 06754 00000
01508
01508 12 00586 00001
01520 46 01288 01100

01532 34 00000 00102
01544 34 00000 00102
01556 39 00919 00100
01568 34 00000 00102
01580 34 00000 00102
01592 26 06753 00420
01604 26 06794 00541
01616 16 06862 01636
01628 49 06754 00000
01636

01636 14 00432 00000
01648 46 01740 01200
01660 34 00000 00102
01672 34 00000 00102
01684 39 00857 00100
01696 26 06753 00426
```



```
01800        TF   PRINT1+28,R
01810        TFM  RET1+6,*+20
01820        B    PRINT
01830        DORG *-3
01840FINISH  H
01850        B    STARTE
01860*    *    *    *    *    *    *    *
01870*  SUBROUTINE TO INITIALIZE.        *
01880*    *    *    *    *    *    *    *
01890START   RNCD CONT
01900        SF   DATE-5
01910        SF   DATE-3
01920        SF   DATE-1
01930        SF   PROB-1
01940        SF   NOBS-4
01950        SF   NFORM-2
01960        SF   INVAR-2
01970        SF   NOVAR-2
01980        SF   N-2
01990        SF   NDEP-2
02000        SF   NOTRAN-2
02010        SF   NOCON-2
02020        SF   NCOL-1
02030        SF   NELIM-2
02040        TFM  CMCOL+11,ALPHA+152
02050*
02060*     COMPUTE ADDRESSES FOR DATA FIELDS.
02070*
02080CADD    TFM  IND,REF
02090        TF   TEMP1,IND
```

```
01708 26 06794 00551
01720 16 06862 01740
01732 49 06754 00000
01740
01740 48 00000 00000
01752 49 01188 00000

01764 36 00402 00500
01776 32 00402 00000
01788 32 00404 00000
01800 32 00406 00000
01812 32 00408 00000
01824 32 00410 00000
01836 32 00415 00000
01848 32 00418 00000
01860 32 00421 00000
01872 32 00424 00000
01884 32 00427 00000
01896 32 00430 00000
01908 32 00433 00000
01920 32 00436 00000
01932 32 00438 00000
01944 16 07071 01171

01956 16 00486 15000
01968 26 00627 00486
```

```
02100       AM   TEMP1,80,10
02110       CM   N,80,10
02120       BNP  *+24
02130       AM   TEMP1,80,10
02140       AM   TEMP1,1,10
02150       TF   ID,TEMP1
02160       BD   *+20,CON3
02170       B    CADD1
02180       DORG *-3
02190       A    TEMP1,N
02200       A    TEMP1,N
02210       TF   IDD,TEMP1
02220CADD1  A    TEMP1,N
02230       A    TEMP1,N
02240       AM   TEMP1,4,10
02250       TF   FORMAT,TEMP1
02260       TF   TEMP2,NFORM
02270       TFM  CTR,0,10
02280INC    AM   CTR,1,10
02290       SM   TEMP2,13,10
02300       BP   INC
02310       MM   CTR,78,10
02320       A    TEMP1,99
02330       AM   TEMP1,4,10
02340       TF   INDEX,TEMP1
02350       TF   TEMP2,NOTRAN
02360       TFM  CTR,0,10
```

```
01980 11 00627 00080
01992 14 00426 00080
02004 47 02028 01100
02016 11 00627 00080
02028 11 00627 00001
02040 26 00491 00627
02052 43 02072 00443
02064 49 02108 00000
02072
02072 21 00627 00426
02084 21 00627 00426
02096 26 00496 00627
02108 21 00627 00426
02120 21 00627 00426
02132 11 00627 00004
02144 26 00501 00627
02156 26 00637 00417
02168 16 00592 00000
02180 11 00592 00001
02192 12 00637 00013
02204 46 02180 01100
02216 13 00592 00078
02228 21 00627 00099
02240 11 00627 00004
02252 26 00506 00627
02264 26 00637 00432
02276 16 00592 00000
```



```
02370INC2   AM   CTR,1,10
02380       SM   TEMP2,10,10
02390       BP   INC2
02400       MM   CTR,80,10
02410       A    TEMP1,99
02420       AM   TEMP1,2,10
02430       TF   CONST,TEMP1
02440       A    TEMP1-1,NOCON
02450       TF   DATA1,TEMP1
02460       A    TEMP1-1,NOVAR
02470       TF   DATA2,TEMP1
02480CADD2  A    TEMP1-1,INVAR
02490       TF   B,TEMP1
02500       A    TEMP1-1,N
02510       TF   SE,TEMP1
02520       A    TEMP1-1,N
02530       TF   T,TEMP1
02540       A    TEMP1-1,N
02550       TF   SUM1,TEMP1
02560       A    TEMP1-1,INVAR
02570       TF   SIGMA,TEMP1
02580       A    TEMP1-1,N
02590       TF   R,TEMP1
02670       TFLS FIN,ZERO


02680       TFLS FOUT,ZERO
```

```
02288 11 00592 00001
02300 12 00637 00010
02312 46 02288 01100
02324 13 00592 00080
02336 21 00627 00099
02348 11 00627 00002
02360 26 00511 00627
02372 21 00626 00435
02384 26 00516 00627
02396 21 00626 00423
02408 26 00521 00627
02420 21 00626 00420
02432 26 00526 00627
02444 21 00626 00426
02456 26 00531 00627
02468 21 00626 00426
02480 26 00536 00627
02492 21 00626 00426
02504 26 00541 00627
02516 21 00626 00420
02528 26 00546 00627
02540 21 00626 00426
02552 26 00551 00627

02564 16 08335 02587
02576 49 08284 00000
02583 00005    00697
02588 00005    00997

02594 16 08335 02617
02606 49 08284 00000
02613 00005    00707
02618 00005    00997
```

```
02690        TFLS F,ZERO
                                                    02624 16 08335 02647
                                                    02636 49 08284 00000
                                                    02643 00005    00687
                                                    02648 00005    00997
02700*
02710*      IS ADV USED.
02720*
02730        BD   RIDD,CON3
                                                    02654 43 02734 00443
02740*
02750*      READ IND CARD(S).
02760*
02770        TF   COUNT,N
                                                    02666 26 00586 00426
02780        TF   *+18,IND
                                                    02678 26 02696 00486
02790RIND    RNCD 99999
                                                    02690 36 99999 00500
02800        SM   COUNT,80,10
                                                    02702 12 00586 00080
02810        BP   RIND
                                                    02714 46 02690 01100
02820        B    CMPR
                                                    02726 49 02806 00000
02830        DORG *-3
                                                    02734
02840RIDD    TF   RF1+6,IDD
                                                    02734 26 03978 00496
02850        SM   RF1+6,1,10
                                                    02746 12 03978 00001
02860        TFM  RF2+11,80,10
                                                    02758 16 03995 00080
02870        TFM  RF3+11,40,10
                                                    02770 16 04007 00040
02880        TFM  RF5+11,2,10
                                                    02782 16 04055 00002
02890        BT   RF,NDEP
                                                    02794 27 03948 00429
02900*
02910*      IS THE NUMBER OF TRANSFORMATION CONSTANTS = ZERO.
02920*
02930CMPR    CM   NOCON,0,10
                                                    02806 14 00435 00000
02940        BP   RDCON
                                                    02818 46 02862 01100
02950*
02960*   IS THE NUMBER OF TRANSFORMATIONS= ZERO.
02970*
02980        CM   NOTRAN,0,10
                                                    02830 14 00432 00000
02990        BP   RDTRAN
                                                    02842 46 02958 01100
03000        B    CMPF
                                                    02854 49 03030 00000
03010        DORG *-3
                                                    02862
03020*
03030*      READ FORMATS FOR TRANSFORMATION CONSTANTS, ONE CARD.
```



```
03040*
03050RDCON   TF   RF1+6,FORMAT
                                                    02862 26 03978 00501
03060        SM   RF1+6,5,10
                                                    02874 12 03978 00005
03070        TFM  RF2+11,78,10
                                                    02886 16 03995 00078
03080        TFM  RF3+11,13,10
                                                    02898 16 04007 00013
03090        TFM  RF5+11,6,10
                                                    02910 16 04055 00006
03100        BTM  RF,13,10
                                                    02922 17 03948 00013
03110*
03120*      READ, FLOAT AND STORE TRANSFORMATION CONSTANTS.
03130*
03140        TF   WCTR,NOCON
                                                    02934 26 06866 00435
03150        BT   RFS,CONST
                                                    02946 27 06872 00511
03160*
03170*      READ TRANSFORMATION INDEXES.
03180*
03190RDTRAN  TF   RF1+6,INDEX
                                                    02958 26 03978 00506
03200        SM   RF1+6,7,10
                                                    02970 12 03978 00007
03210        TFM  RF2+11,80,10
                                                    02982 16 03995 00080
03220        TFM  RF3+11,10,10
                                                    02994 16 04007 00010
03230        TFM  RF5+11,8,10
                                                    03006 16 04055 00008
03240        BT   RF,NOTRAN
                                                    03018 27 03948 00432
03250*
03260*
03270*   ARE FIN AND FOUT READ.
03280*
03290CMPF    BD   *+20,CON4
                                                    03030 43 03050 00444
03300        B    RDFORM
                                                    03042 49 03070 00000
03310        DORG *-3
                                                    03050
03320        TFM  RET7+6,RDFORM
                                                    03050 16 04184 03070
03330        B    FF
                                                    03062 49 04082 00000
03340        DORG *-3
                                                    03070
03350*
03360*      READ FORMATS FOR DATA.
03370*
```

```
03380RDFORM TF   RF1+6,FORMAT
03390       SM   RF1+6,5,10
03400       TFM  RF2+11,78,10
03410       TFM  RF3+11,13,10
03420       TFM  RF5+11,6,10
03430       BT   RF,NFORM
03440*
03450*     SET UP ADDRESS OF WEIGHTS.
03460*
03470WGTS   TF   WT,DATA1
03480       A    WT-1,N
03490*
03500*  SET UP NUMBER OF CARD COLUMNS TO READ.
03510*
03520       CM   NCOL,0,10
03530       BE   FLT
03540       TFM  CMCOL+11,ALPHA
03550       A    CMCOL+11,NCOL
03560       A    CMCOL+11,NCOL
03570*
03580*     FLOAT NUMBER OF OBSERVATIONS.
03590*
03600FLT    BT   CONV,NOBS
03610*
03620*
03630*  CLEAR ID,SUM1,SIGMA, AND R
03640*
03650CLR    TF   CLR2+6,ID
03660       TF   CNTR,N
03670CLR2   TFM   99999,0,10
03680       AM   CLR2+6,2,10
03690       SM   CNTR,1,10
03700       BP   CLR2
```

```
03070 26 03978 00501
03082 12 03978 00005
03094 16 03995 00078
03106 16 04007 00013
03118 16 04055 00006
03130 27 03948 00417

03142 26 00556 00516
03154 21 00555 00426

03166 14 00437 00000
03178 46 03226 01200
03190 16 07071 01019
03202 21 07071 00437
03214 21 07071 00437

03226 27 03746 00414

03238 26 03268 00491
03250 26 00589 00426
03262 16 99999 00000
03274 11 03268 00002
03286 12 00589 00001
03298 46 03262 01100
```

```
03710       TF   COUNT,INVAR
03720       A    COUNT,N
03730       A    COUNT,N
03740       TF   CLR3+23,SUM1
03750CLR3   TFLS 99999,ZERO

03760       AM   CLR3+23,10,10
03770       SM   COUNT,1,10
03780       BP   CLR3
03790*
03800*     IS IT ADV.
03810*
03820       BD   *+20,CON3
03830       B    PRH
03840       DORG *-3
03850       TF   CLR1+6,IND
03860       TF   CNTR,N
03870CLR1   TDM  99999
03880       AM   CLR1+6,1,10
03890       SM   CNTR,1,10
03900       BP   CLR1
03910PRH    RCTY
03920       BT   WRNUM,DATE-4
03930       SPTY
03940       BT   WRNUM,DATE-2
03950       SPTY
03960       BT   WRNUM,DATE
03970       RCTY
```



```
03310 26 00586 00420
03322 21 00586 00426
03334 21 00586 00426
03346 26 03381 00541
03358 16 08335 03381
03370 49 08284 00000
03377 00005    99999
03382 00005    00997
03388 11 03381 00010
03400 12 00586 00001
03412 46 03358 01100

03424 43 03444 00443
03436 49 03516 00000
03444
03444 26 03474 00486
03456 26 00589 00426
03468 15 99999 00000
03480 11 03474 00001
03492 12 00589 00001
03504 46 03468 01100
03516 34 00000 00102
03528 27 03906 00403
03540 34 00000 00101
03552 27 03906 00405
03564 34 00000 00101
03576 27 03906 00407
03588 34 00000 00102
```

```
03980        WATY PRBL
03990        BT   WRNUM,PROB
04000        TBTY
04010        BT   WRNUM,N
04020        WATY VRBL
04030        TBTY
04040        TF   OUT,NOBS
04050        CF   OUT-4
04060        WNTY OUT-4
04070        WATY OBSR
04080        RCTY
04090RET2    B    99999
04100        DORG *-3
04110*    *    *    *    *    *    *    *
04120*     SUBROUTINE TO FLOAT NOBS.     *
04130*    *    *    *    *    *    *    *
04140        DS   5
04150CONV    TFM  EXP3,5,10
04160        TFM  TESTD+11,CONV-5
04170        TFM  MVWRD+6,OBSER-5
04180        TF   OBSER,ZEROS
04190TESTD   BD   SETM,99999
04200        AM   TESTD+11,1,10
04210        SM   EXP3,1,10
04220        SM   MVWRD+6,1,10
04230        B    TESTD
04240        DORG *-3
04250SETM    TF   *+18,TESTD+11
04260        SF   99999
04270MVWRD   TF   99999,CONV-1
```

```
03600 39 00821 00100
03612 27 03906 00409
03624 34 00000 00108
03636 27 03906 00426
03648 39 00833 00100
03660 34 00000 00108
03672 26 00817 00414
03684 33 00813 00000
03696 38 00813 00100
03708 39 00843 00100
03720 34 00000 00102
03732 49 99999 00000
03740


03744 00005
03746 16 03901 00005
03758 16 03805 03741
03770 16 03880 00476
03782 26 00481 01007
03794 43 03850 99999
03806 11 03805 00001
03818 12 03901 00001
03830 12 03880 00001
03842 49 03794 00000
03850
03850 26 03868 03805
03862 32 99999 00000
03874 26 99999 03745
```



```
04280        TF   OBSER,EXP3
04290        BB
04300        DORG *-9
04310EXP3    DS   2
04320        DS   4
04330WRNUM   TF   OUT,NO
04340NO      DS   ,WRNUM-1
04350        CF   OUT-1
04360        WNTY OUT-1
04370        BB
04380        DORG *-9
04390*    *    *    *    *    *    *    *    *    *    *    *    *
04400*     SUBROUTINE TO READ AND FLAG FORMATS , TRANSFORMATION INDEXES,
04410*       AND IDD, INDEXES OF DEPENDENT VARIABLES FOR ADV.
04420*    *    *    *    *    *    *    *    *    *    *    *    *
04430        DS   3
04440RF      TF   CNTR,RF-1
04450        TF   RF4+6,RF1+6
04460RF1     RNCD 99999
04470RF2     AM   RF1+6,99999
04480RF3     SM   CNTR,99999
04490        BP   RF1
04500        TF   CNTR,RF-1
04510RF4     SF   99999
04520RF5     AM   RF4+6,99999
04530        SM   CNTR,1,10
04540        BP   RF4
04550        BB
04560        DORG *-9
04570*    *    *    *    *    *    *    *    *    *
```

```
03886 26 00481 03901
03898 42 00000 00000
03900
03901 00002
03905 00004
03906 26 00817 03905
03905 00000
03918 33 00816 00000
03930 38 00816 00100
03942 42 00000 00000
03944
03946 00003
03948 26 00589 03947
03960 26 04038 03978
03972 36 99999 00500
03984 11 03978 99999
03996 12 00589 99999
04008 46 03972 01100
04020 26 00589 03947
04032 32 99999 00000
04044 11 04038 99999
04056 12 00589 00001
04068 46 04032 01100
04080 42 00000 00000
04082
```

```
04580*  SUBROUTINE FOR READING FIN AND FOUT.
04590*    *    *    *    *    *    *    *    *    *
04600FF       TF    RF1+6,FORMAT
04610         SM    RF1+6,5,10
04620         TFM   RF2+11,78,10
04630         TFM   RF3+11,13,10
04640         TFM   RF5+11,6,10
04650         BTM   RF,2,10
04660*
04670*       READ,FLOAT AND STORE FIN AND FOUT.
04680         TFM   WCTR,2,10
04690         BTM   RFS,FIN
04700RET7     B     99999
04710         DORG  *-3
04720*    *    *    *    *    *    *    *    *    *    *    *    *
04730*  SUBROUTINE FOR PREPARING DATA FOR ALPHAMERICAL PRINTING OR    *
04740*  PUNCHING.  INTERNAL FORMAT IS SPSII.                          *
04750*    *    *    *    *    *    *    *    *    *    *    *    *
04760         DS    10
04770FLTFIX   CF    ARG-9
04780ARG      DS    ,FLTFIX-1
04790         TF    OUTPUT,SEVENS
04800         CF    OUTPUT-9
04810         TF    OUTPUT-10,DCMAL
04820         TFM   OUTPUT-19,0,9
04830         TFM   SIGN,0,10
04840         BNF   JUMP,ARG-2
04850         TDM   SIGN-1,2,11
04860         CF    ARG-2
04870JUMP     CM    ARG,99,1011
04880         BE    WRALPH
```

```
04082 26 03978 00501
04094 12 03978 00005
04106 16 03995 00078
04118 16 04007 00013
04130 16 04055 00006
04142 17 03948 00002
04154 16 06866 00002
04166 17 06872 00697
04178 49 99999 00000
04186
04195 00010
04196 33 04186 00000
04195 00000
04208 26 05083 05095
04220 33 05074 00000
04232 26 05073 05105
04244 16 05064 00000
04256 16 05107 00000
04268 44 04304 04193
04280 15 05106 00002
04292 33 04193 00000
04304 14 04195 00099
04316 46 04640 01200
```

```
04890         CM    ARG,0,10
04900         BNP   DECIML
04910         CM    ARG,4,10
04920         BH    LARGE
04930         TFM   TRNMT+11,ARG-9
04940         TFM   *+42,OUTPUT-10
04950         S     *+30,ARG
04960         S     *+18,ARG
04970TRNMT    TD    99999,99999
04980         AM    TRNMT+11,1,10
04990         AM    TRNMT+6,2,10
05000         CM    TRNMT+6,OUTPUT-12
05010         BNH   TRNMT
05020         TF    WRITE+23,TRNMT+11
05030         TFM   EXPNT2,5,10
05040         S     EXPNT2,ARG
05050         TFM   *+47,SEVENS
05060         S     *+35,EXPNT2
05070         S     *+23,EXPNT2
05080         A     OUTPUT-12,99999
05090WRITE    TFM   *+18,OUTPUT-8
05100         TD    OUTPUT-8,0
05110         AM    WRITE+23,1,10
05120         AM    WRITE+18,2,10
05130         CM    WRITE+18,OUTPUT
05140         BNH   WRITE+12
05150WRALPH   BD    SETZRO,OUTPUT-18
05160         B     SETSIG
```



```
04328 14 04195 00000
04340 47 04686 01100
04352 14 04195 00004
04364 46 04766 01100
04376 16 04435 04186
04388 16 04430 05073
04400 22 04430 04195
04412 22 04430 04195
04424 25 99999 99999
04436 11 04435 00001
04448 11 04430 00002
04460 14 04430 05071
04472 47 04424 01100
04484 26 04591 04435
04496 16 05109 00005
04508 22 05109 04195
04520 16 04567 05095
04532 22 04567 05109
04544 22 04567 05109
04556 21 05071 99999
04568 16 04586 05075
04580 25 05075 00000
04592 11 04591 00001
04604 11 04586 00002
04616 14 04586 05083
04628 47 04580 01100
04640 43 04660 05065
04652 49 04972 00000
```

```
05170          DORG *-3
05180SETZRO    TDM  OUTPUT,0
05190          TF   OUTPUT-20,SIGN
05200          BB
05210          DORG *-9
05220DECIML    CM   ARG,4,1011
05230          BNH  LARGE
05240          TFM  WRITE+23,ARG-9
05250          TFM  WRITE+18,OUTPUT-8
05260          S    WRITE+18,ARG
05270          S    WRITE+18,ARG
05280          B    WRITE+12
05290          DORG *-3
05300LARGE     TF   OUTPUT-17,SEVENS-7
05310          BNF  JUMP2,ARG
05320          TFM  OUTPUT-20,20,10
05330          CF   ARG
05340          CF   OUTPUT-19
05350JUMP2     TD   OUTPUT-16,ARG
05360          TD   OUTPUT-18,ARG-1
05370          CF   OUTPUT-18
05380          TF   OUTPUT-12,SIGN
05390          CF   OUTPUT-13
05400          TFM  WR+11,ARG-9
05410          TFM  WR+6,OUTPUT-8
05420WR        TD   99999,99999
05430          AM   WR+11,1,10
05440          AM   WR+6,2,10
```

```
04660
04660 15 05083 00000
04672 26 05063 05107
04684 42 00000 00000
04686
04686 14 04195 00004
04698 47 04766 01100
04710 16 04591 04186
04722 16 04586 05075
04734 22 04586 04195
04746 22 04586 04195
04758 49 04580 00000
04766
04766 26 05066 05088
04778 44 04826 04195
04790 16 05063 00020
04802 33 04195 00000
04814 33 05064 00000
04826 25 05067 04195
04838 25 05065 04194
04850 33 05065 00000
04862 26 05071 05107
04874 33 05070 00000
04886 16 04921 04186
04898 16 04916 05075
04910 25 99999 99999
04922 11 04921 00001
04934 11 04916 00002
```

```
05450          CM   WR+6,OUTPUT
05460          BNH  WR
05470          BB
05480          DORG *-9
05490SETSIG    TFM  SETS+11,OUTPUT-16
05500SETS      BD   SET,OUTPUT-16
05510          AM   SETS+11,2,10
05520          B    SETS
05530          DORG *-3
05540SET       TF   *+30,SETS+11
05550          SM   *+18,2,10
05560          TF   99999,SIGN
05570          BB
05580          DORG *-9
05590          DAS  14
05600OUTPUT    DS   2
05610          DAC  1,@
05620SEVENS    DC   10,7070707070
05630DCMAL     DC   10,0000000003
05640SIGN      DS   2
05650EXPNT2    DS   2
05660*     *    *    *    *    *    *    *    *
05670*      SUBROUTINE TO TRANSFORM DATA
05680*     *    *    *    *    *    *    *    *
05690          DS   2
05700TFS       TF   CNT,INVAR
05710          TF   INV+23,DATA2
05720          TF   INV+28,DATA1
05730INV       TFLS 99999,99999
```



```
04946 14 04916 05083
04958 47 04910 01100
04970 42 00000 00000
04972
04972 16 04995 05067
04984 43 05016 05067
04996 11 04995 00002
05008 49 04984 00000
05016
05016 26 05046 04995
05028 12 05046 00002
05040 26 99999 05107
05052 42 00000 00000
05054
05055 00014
05083 00002
05085 00001
05095 00010
05105 00010
05107 00002
05109 00002
*
*
*
05111 00002
05112 26 06640 00420
05124 26 05171 00521
05136 26 05176 00516
05148 16 08335 05171
```

```
05740          AM    MV+23,10,10
05750          AM    MV+28,10,10
05760          SM    CNT,1,10
05770          BP    MV
05780          TF    CNT,NOTRAN
05790TRNF      TF    *+23,INDEX
05800          TF    SPEC,99999
05810          SF    SPEC-1
05820          SF    SPEC-3
05830          SF    SPEC-5
05840          TF    TRF+28,DATA1
05850          SM    TRF+28,10,10
05860          A     TRF+27,SPEC-2
05870TRF       TFLS  WORK,99999


05880          TF    MVE+23,DATA1
05890          SM    MVE+23,10,10
05900          A     MVE+22,SPEC-4
05910          MM    SPEC-6,5,10
05920          TFM   *+35,TRCON-5
05930          A     *+23,99
05940          TF    *+18,99999
05950BRCH      B     99999
05960          DORG  *-3
05970*
05980*     HERE ARE THE TRANSFORMATION SUBROUTINES.
05990*
06000RETURN    TF    TRNF1+28,DATA2
```

```
05160 49 08284 00000
05167 00005    99999
05172 00005    99999

05178 11 05171 000T0

05190 11 05176 000T0

05202 12 06640 00001

05214 46 05148 01100

05226 26 06640 00432

05238 26 05261 00506

05250 26 07911 99999

05262 32 07910 00000

05274 32 07908 00000

05286 32 07906 00000

05298 26 05362 00516

05310 12 05362 000T0

05322 21 05361 07909

05334 16 08335 05357
05346 49 08284 00000
05353 00005    06650
05358 00005    99999

05364 26 06593 00516

05376 12 06593 000T0

05388 21 06592 07907

05400 13 07905 00005

05412 16 05447 06650

05424 21 05447 00099

05436 26 05454 99999

05448 49 99999 00000

05456

05456 26 05520 00521
```

```
06010          SM    TRNF1+28,10,10

06020          A     TRNF1+27,SPEC-2

06030TRNF1     TFLS  WORK,99999



06040          B     MVE

06050          DORG  *-3

06060CHSIGN    BNF   OVR1,WORK-2

06070          CF    WORK-2

06080          B     MVE

06090          DORG  *-3

06100OVR1      SF    WORK-2

06110          B     MVE

06120          DORG  *-3

06130SCALE     TF    FADD+28,CONST

06140          SM    FADD+28,10,10

06150          A     FADD+27,SPEC

06160FADD      FA    WORK,99999



06170          B     MVE

06180          DORG  *-3

06190MAGN      TF    FMUL+28,CONST

06200          SM    FMUL+28,10,10

06210          A     FMUL+27,SPEC

06220FMUL      FM    WORK,99999
```



```
05468 12 05520 000T0

05480 21 05519 07909

05492 16 08335 05515
05504 49 08284 00000
05511 00005    06650
05516 00005    99999

05522 49 06570 00000

05530

05530 44 05562 06648

05542 33 06648 00000

05554 49 06570 00000

05562

05562 32 06648 00000

05574 49 06570 00000

05582

05582 26 05646 00511

05594 12 05646 000T0

05606 21 05645 07911

05618 16 08335 05641
05630 49 08064 00000
05637 00005    06650
05642 00005    99999

05648 49 06570 00000

05656

05656 26 05720 00511

05668 12 05720 000T0

05680 21 05719 07911

05692 16 08335 05715
05704 49 08084 00000
05711 00005    06650
05716 00005    99999
```

```
06230          B     MVE
06240          DORG  *-3
06250SUM       TF    FADD1+28,DATA1
06260          SM    FADD1+28,10,10
06270          A     FADD1+27,SPEC
06280FADD1     FA    WORK,99999


06290          B     MVE
06300          DORG  *-3
06310SUB       TF    FSUB+28,DATA1
06320          SM    FSUB+28,10,10
06330          A     FSUB+27,SPEC
06340FSUB      FS    WORK,99999


06350          B     MVE
06360          DORG  *-3
06370MPY       TF    FMUL1+28,DATA1
06380          SM    FMUL1+28,10,10
06390          A     FMUL1+27,SPEC
06400FMUL1     FM    WORK,99999


06410          B     MVE
06420          DORG  *-3
06430DVDE      TF    FDIV+28,DATA1
06440          SM    FDIV+28,10,10
06450          A     FDIV+27,SPEC
```



```
05722 49 06570 00000

05730

05730 26 05794 00516

05742 12 05794 000T0

05754 21 05793 07911

05766 16 08335 05789
05778 49 08064 00000
05785 00005    06650
05790 00005    99999

05796 49 06570 00000

05804

05804 26 05868 00516

05816 12 05868 000T0

05828 21 05867 07911

05840 16 08335 05863
05852 49 08044 00000
05859 00005    06650
05864 00005    99999

05870 49 06570 00000

05878

05878 26 05942 00516

05890 12 05942 000T0

05902 21 05941 07911

05914 16 08335 05937
05926 49 08084 00000
05933 00005    06650
05938 00005    99999

05944 49 06570 00000

05952

05952 26 06016 00516

05964 12 06016 000T0

05976 21 06015 07911
```

```
06460FDIV      FD    WORK,99999


06470          B     MVE
06480          DORG  *-3
06490RCPR      TFLS  TEMP1,ONE


06500          FD    TEMP1,WORK


06510          TFLS  WORK,TEMP1


06520          B     MVE
06530          DORG  *-3
06540POWER     TF    AA+28,CONST
06550          SM    AA+28,10,10
06560          A     AA+27,SPEC
06570          FLN   WORK,WORK


06580AA        FM    WORK,99999


06590          FEX   WORK,WORK


06600          B     MVE
06610          DORG  *-3
06620LN        FLN   WORK,WORK
```



```
05988 16 08335 06011
06000 49 08104 00000
06007 00005    06650
06012 00005    99999

06018 49 06570 00000

06026

06026 16 08335 06049
06038 49 08284 00000
06045 00005    00627
06050 00005    01017

06056 16 08335 06079
06068 49 08104 00000
06075 00005    00627
06080 00005    06650

06086 16 08335 06109
06098 49 08284 00000
06105 00005    06650
06110 00005    00627

06116 49 06570 00000

06124

06124 26 06218 00511

06136 12 06218 000T0

06148 21 06217 07911

06160 16 08335 06183
06172 49 08264 00000
06179 00005    06650
06184 00005    06650

06190 16 08335 06213
06202 49 08084 00000
06209 00005    06650
06214 00005    99999

06220 16 08335 06243
06232 49 08224 00000
06239 00005    06650
06244 00005    06650

06250 49 06570 00000

06258

06258 16 08335 06281
```

```
                B       MVE
                DORG    *-3
LOG             FLOG    WORK,WORK


                B       MVE
                DORG    *-3
EXN             FEX     WORK,WORK


                B       MVE
                DORG    *-3
EXT             FEXT    WORK,WORK


                B       MVE
                DORG    *-3
SIN             FSIN    WORK,WORK


                B       MVE
                DORG    *-3
COS             FCOS    WORK,WORK


                B       MVE
                DORG    *-3
ARCTAN          FATN    WORK,WORK
```

```
06270 49 08264 00000
06277 00005    06650
06282 00005    06650

06288 49 06570 00000

06296

06296 16 08335 06319
06308 49 08244 00000
06315 00005    06650
06320 00005    06650

06326 49 06570 00000

06334

06334 16 08335 06357
06346 49 08224 00000
06353 00005    06650
06358 00005    06650

06364 49 06570 00000

06372

06372 16 08335 06395
06384 49 08204 00000
06391 00005    06650
06396 00005    06650

06402 49 06570 00000

06410

06410 16 08335 06433
06422 49 08164 00000
06429 00005    06650
06434 00005    06650

06440 49 06570 00000

06448

06448 16 08335 06471
06460 49 08144 00000
06467 00005    06650
06472 00005    06650

06478 49 06570 00000

06486

06486 16 08335 06509
```



```
06498 49 08184 00000
06505 00005    06650
06510 00005    06650

06516 49 06570 00000

06524

06524 16 08335 06547
06536 49 08124 00000
06543 00005    06650
06548 00005    06650

06554 49 06570 00000

06562

06562 49 99999 00000

06570

06570 16 08335 06593
06582 49 08284 00000
06589 00005    99999
06594 00005    06650

06600 11 05261 00008

06612 12 06640 00001

06624 46 05250 01100

06636 42 00000 00000

06638

06640 00003

06650 00010
```

```
                B       MVE
                DORG    *-3
SQRT            FSQR    WORK,WORK


                B       MVE
                DORG    *-3
DUMMY           B       99999

                DORG    *-3
MVE             TFLS    99999,WORK


                AM      TRNF+23,8,10

                SM      CNT,1,10

                BP      TRNF+12

                BB

                DORG    *-9

CNT             DS      3

WORK            DS      10

TRCON           DSA     MVE,RETURN,CHSIGN,SCALE,MAGN,SUM,SUB,MPY,DVDE,RCPR
```

```
06655 00005    06570
06660 00005    05456
06665 00005    05530
06670 00005    05582
06675 00005    05656
06680 00005    05730
06685 00005    05804
06690 00005    05878
06695 00005    05952
06700 00005    06026
```

```
                DSA     POWER,LN,LOG,EXN,EXT,SIN,COS,ARCTAN,SQRT,DUMMY
```

```
06705 00005    06124
06710 00005    06258
```

```
                                                    06715 00005    06296
                                                    06720 00005    06334
                                                    06725 00005    06372
                                                    06730 00005    06410
                                                    06735 00005    06448
                                                    06740 00005    06486
                                                    06745 00005    06524
                                                    06750 00005    06562
06980*    *    *    *    *    *    *    *    *     *
06990*     SUBROUTINE FOR PRINTING N WORDS.       *
07000*    *    *    *    *    *    *    *    *     *
07010WORDS  DS   3
                                                    06753 00003
07020PRINT  RCTY
                                                    06754 34 00000 00102
07030PRINT1 BTFS FLTFIX,99999
                                                    06766 16 08335 06789
                                                    06778 49 08304 00000
                                                    06785 00005    04196
                                                    06790 00005    99999
07040       WATY OUTPUT-20
                                                    06796 39 05063 00100
07050       TBTY
                                                    06808 34 00000 00108
07060       AM   PRINT1+28,10,10
                                                    06820 11 06794 00010
07070       SM   WORDS,1,10
                                                    06832 12 06753 00001
07080       BP   PRINT1
                                                    06844 46 06766 01100
07090RET1   B    99999
                                                    06856 49 99999 00000
07100       DORG *-3
                                                    06864
07110*    *    *    *    *    *    *    *    *    *    *    *    *    *
07120*     SUBROUTINE TO READ, FLOAT, AND STORE NUMBERS UNDER    *
07130*       FORMAT CONTROL.  NEEDS NUMBER OF WORDS AND INITIAL  *
07140*       ADDRESS WHERE STORED.                               *
07150*    *    *    *    *    *    *    *    *    *    *    *    *
07160WCTR   DS   3
                                                    06866 00003
07170       DS   5
                                                    06871 00005
07180RFS    TF   TRSMT+23,RFS-1,,SET UP STORE ADDRESS.
                                                    06872 26 07795 06871
07190       TFM  READN-2,READN
                                                    06884 16 06950 06952
07200       TF   FRMT+11,FORMAT
                                                    06896 26 06919 00501
07210FRMT   TF   SPEC,99999
                                                    06908 26 07911 99999
07220       SF   SPEC-1
                                                    06920 32 07910 00000
07230       SF   SPEC-3
                                                    06932 32 07908 00000
```



```
07240       B    99999,,,READN OR LOOP1          06944 49 99999 00000
07250       DORG *-3                             06952
07260READN  RACD ALPHA                           06952 37 01019 00500
07270       TFM  READN-2,LOOP1                   06964 16 06950 06988
07280       TFM  ADDR,ALPHA-2                    06976 16 07916 01017
07290LOOP1  A    ADDR,SPEC-2                     06988 21 07916 07909
07300       A    ADDR,SPEC-2                     07000 21 07916 07909
07330       TF   INPUT,ZEROS                     07012 26 07930 01007
07340       TF   INPUT-9,ZEROS-5                 07024 26 07921 01002
07350CHCOL  CM   ADDR,ALPHA+154                  07036 14 07916 01173
07360       BNL  READN                           07048 46 06952 01300
07362       CM   SPEC-4,0,10                     07060 14 07907 00000
07364       BE   STEP1                           07072 46 07862 01200
07370       TDM  SIGN2,0                         07084 15 07946 00000
07380       TF   D1+6,ADDR                       07096 26 07234 07916
07390       TF   D2+11,D1+6                      07108 26 07263 07234
07400       TF   PER+6,D1+6                      07120 26 07278 07234
07410       TF   D4+6,D1+6                       07132 26 07302 07234
07420       TF   RET+6,D1+6                      07144 26 07222 07234
07430       SM   RET+6,1,10                      07156 12 07222 00001
07440       TFM  D2+6,INPUT                      07168 16 07258 07930
07450       TFM  D5+6,INPUT                      07180 16 07326 07930
07460       TFM  SETFL+6,INPUT+1                 07192 16 07494 07931
07470       S    SETFL+6,SPEC-2                  07204 22 07494 07909
07480RET    SF   99999,,,ADDR-1                  07216 32 99999 00000
07490D1     CM   99999,70,10                     07228 14 99999 00070
07500       BL   PER                             07240 47 07272 01300
07510D2     TD   99999,99999,,INPUT,ADDR         07252 25 99999 99999
07520       B    CHG+20                          07264 49 07380 00000
```

```
07530          DORG *-3
07540PER       CM   99999,03,10,ADDR
07550          BE   CHG
07560D4        CM   99999,20,10
07570          BE   MIN
07580D5        TDM  99999,0,,INPUT
07590          B    CHG+20
07600          DORG *-3
07610MIN       SF   SIGN2
07620          B    PER+48
07630          DORG *-3
07640CHG       AM   SETFL+6,1,10
07650          B    *+32
07660          DORG *-3
07670          SM   D2+6,1,10
07680          SM   D5+6,1,10
07690          SM   D1+6,2,10
07700          SM   D2+11,2,10
07710          SM   PER+6,2,10
07720          SM   D4+6,2,10
07730          SM   RET+6,2,10
07740          C    D2+6,SETFL+6
07750          BNL  RET
07760SETFL     SF   99999,,,(INPUT+1)-(SPEC-2)
07770MOVE      CM   INPUT,0,10
07780          BE   ZEROX
07790          TF   COMN,ZEROS
```

```
07272
07272 14 99999 0000̄3
07284 46 07360 01200
07296 14 99999 0002̄0
07308 46 07340 01200
07320 15 99999 00000
07332 49 07380 00000
07340
07340 32 07946 00000
07352 49 07320 00000
07360
07360 11 07494 0000̄1
07372 49 07404 00000
07380
07380 12 07258 0000̄1
07392 12 07326 0000̄1
07404 12 07234 0000̄2
07416 12 07263 0000̄2
07428 12 07278 0000̄2
07440 12 07302 0000̄2
07452 12 07222 0000̄2
07464 24 07258 07494
07476 46 07216 01300
07488 32 99999 00000
07500 14 07930 0000̄0
07512 46 07884 01200
07524 26 07940 01007
```



```
07800          CF   COMN-9
07810          TFM  EXPNT,INPUT+1
07820          S    EXPNT,SETFL+6
07830          TF   BRNCH+11,SETFL+6
07840          SF   EXPNT-1
07850          S    EXPNT,SPEC
07860BRNCH     BD   DIGIT,99999
07870          SM   EXPNT,1,10
07880          AM   BRNCH+11,1,10
07890          B    BRNCH
07900          DORG *-3
07910DIGIT     TF   *+30,BRNCH+11
07920          AM   *+18,9,10
07930EX        TF   99999,EXPNT
07940          TF   *+18,BRNCH+11
07950          SF   99999
07960          TF   TRSMT+28,EX+6
07970          BNF  *+48,SIGN2
07980          TF   *+30,TRSMT+28
07990          SM   *+18,2,10
08000          SF   99999
08010TRSMT     TFLS 99999,99999
08020          AM   TRSMT+23,10,10
08030          SM   WCTR,1,10
08040          BNP  OVR2
08050          SM   SPEC-4,1,10
```

```
07536 33 07931 00000
07548 16 07945 0̄7931
07560 22 07945 07494
07572 26 07619 07494
07584 32 07944 00000
07596 22 07945 07911
07608 43 07652 99999
07620 12 07945 0000̄1
07632 11 07619 0000̄1
07644 49 07608 00000
07652
07652 26 07682 07619
07664 11 07682 0000̄9
07676 26 99999 07945
07688 26 07706 07619
07700 32 99999 00000
07712 26 07800 07682
07724 44 07772 07946
07736 26 07766 07800
07748 12 07766 0000̄2
07760 32 99999 00000
07772 16 08335 0̄7795
07784 49 08284 00000
07791 00005    99999
07796 00005    99999
07802 11 07795 0001̄0
07814 12 06866 0000̄1
07826 47 07882 01100
07838 12 07907 0000̄1
```

```
08060          BP    LOOP1
08070STEP1     AM    FRMT+11,6,10
08080          B     FRMT
08090          DORG  *-3
08100OVR2      BB
08110          DORG  *-9
08120ZEROX     TFM   TRSMT+28,ZERO
08130          B     TRSMT
08140          DORG  *-3
08150SPEC      DS    8
08160ADDR      DS    5
08170INPUT     DS    14
08180COMN      DS    10
08190EXPNT     DS    5
08200SIGN2     DS    1
08210*    *    *    *    *    *    *    *    *    *    *    *
08220*  SUBROUTINE TO COMPUTE SUMS OF INPUT AND TRANSFORMED  *
08230*      VARIABLES.                                        *
08240*    *    *    *    *    *    *    *    *    *    *    *
08250          DS    3
08260SUMS      TF    S1+28,DATA1
08270S1        FA    99999,99999


08280          AM    S1+23,10,10
08290          AM    S1+28,10,10
08300          SM    SUMS-1,1,10
08310          BP    S1
08320          BB
```

```
07850 46 06988 01100
07862 11 06919 000ð6
07874 49 06908 00000
07882
07882 42 00000 00000
07884
07884 16 07800 ð0997
07896 49 07772 00000
07904
07911 00008
07916 00005
07930 00014
07940 00010
07945 00005
07946 00001
07949 00003
07950 26 07990 00516
07962 16 08335 ð7985
07974 49 08064 00000
07981 00005    99999
07986 00005    99999
07992 11 07985 000T0
08004 11 07990 000T0
08016 12 07949 000ð1
08028 46 07962 01100
08040 42 00000 00000
```



```
08330          DORG  *-9
08340          DAC   1,0
08350          DEND  STARTE
LOAD SUBROUTINES
```

```
08042
08043 00001
01188
08044 16 08738 ð9384
08056 49 08324 0
08064 16 08738 ð9428
08076 49 08324 0
08084 16 08738 ð9928
08096 49 08324 0
08104 16 08738 T0168
08116 49 08324 0
08124 16 08738 T0504
08136 49 08428 0
08144 16 08738 T1084
08156 49 08428 0
08164 16 08738 T1116
08176 49 08428 0
08184 16 08738 T1928
08196 49 08428 0
08204 16 08738 T2918
08216 49 08428 0
08224 16 08738 T2938
08236 49 08428 0
08244 16 08738 T3658
08256 49 08428 0
08264 16 08738 T3678
08276 49 08428 0
08284 16 08738 T4500
08296 49 08428 0
08304 16 08738 T4532
08316 49 08428 0
```

END OF PASS II

15000	REF	00402	CONT	00407	DATE	00409	PROB	00414	NOBS
00417	NFORM	00420	INVAR	00423	NOVAR	00426	N	00429	NDEP
00432	*NOTRAN	00435	NOCON	00437	NCOL	00440	NELIM	00441	CONT
00442	CON2	00443	CON3	00444	CON4	00445	CON5	00446	CON6
00447	CON7	00448	CON8	00449	CON9	00450	CON10	00451	CON11
00452	CON12	00453	CON13	00454	CON14	00455	CON15	00456	CON16
00457	CON17	00458	CON18	00481	OBSER	00486	IND	00491	ID
00496	IDD	00501	*FORMAT	00506	INDEX	00511	CONST	00516	DATA1
00521	DATA2	00526	B	00531	SE	00536	T	00541	SUMT
00546	SIGMA	00551	R	00556	WT	00561	ADKK	00566	ADRNN
00571	ADIJ	00576	ADRIJ	00581	SIGN3	00586	COUNT	00589	CNTR
00592	CTR	00595	I	00598	J	00601	K	00604	P
00607	Q	00611	MSZ	00614	IVE	00617	IVP	00627	TEMP1
00637	TEMP2	00647	EY	00657	RSQR	00667	SQR	00677	DF
00687	F	00697	FIN	00707	FOUT	00717	HIGH	00727	VP
00737	VE	00817	OUT	00821	PRBL	00833	VRBL	00843	OBSR
00857	COM2	00919	COM1	00977	FP001	00987	FHIGH	00997	ZERO
01007	ZEROS	01017	ONE	01019	ALPHA	01183	PNUM	01186	MCNT
01188	*STARTE	01200	ALPH	01288	LOOP	01392	TRD	01508	END
01740	*FINISH	01764	START	01956	CADD	02108	CADD1	02180	INC
02288	INC2	02420	CADD2	02690	RIND	02734	RIDD	02806	CMPR
02862	RDCON	02958	*RDTRAN	03030	CMPF	03070	*RDFORM	03142	WGTS
03226	FLT	03238	CLR	03262	CLR2	03358	CLR3	03468	CLR1
03516	PRH	03732	RET2	03746	CONV	03794	TESTD	03850	SETM
03874	MVWRD	03901	EXP3	03906	WRNUM	03905	NO	03948	RF
03972	RF1	03984	RF2	03996	RF3	04032	RF4	04044	RF5
04082	FF	04178	RET7	04196	*FLTF1X	04195	ARG	04304	JUMP
04424	TRNMT	04568	WRITE	04640	*WRALPH	04660	*SETZRO	04686	*DECIML
04766	LARGE	04826	JUMP2	04910	WR	04972	*SETSIG	04984	SETS
05016	SET	05083	*OUTPUT	05095	*SEVENS	05105	DCMAL	05107	SIGN
05109	*EXPNT2	05112	TFS	05148	MV	05238	TRNF	05334	TRF
05448	BRCH	05456	*RETURN	05492	TRNF1	05530	*CHSIGN	05562	OVR1

05582	SCALE	05618	FADD	05656	MAGN	05692	FMUL	05730	SUM
05766	FADD1	05804	SUB	05840	FSUB	05878	MPY	05914	FMUL1
05952	DVDE	05988	FDIV	06026	RCPR	06124	POWER	06190	AA
06258	LN	06296	LOG	06334	EXN	06372	EXT	06410	SIN
06448	COS	06486	*ARCTAN	06524	SQRT	06562	DUMMY	06570	MVE
06640	CNT	06650	WORK	06655	TRCON	06753	WORDS	06754	PRINT
06766	*PRINT1	06856	RET1	06866	WCTR	06872	RFS	06908	FRMT
06952	READN	06988	LOOP1	07036	CMCOL	07216	RET	07228	D1
07252	D2	07272	PER	07296	D4	07320	D5	07340	MIN
07360	CHG	07488	SETFL	07500	MOVE	07608	BRNCH	07652	DIGIT
07676	EX	07772	TRSMT	07862	STEP1	07882	OVR2	07884	ZEROX
07911	SPEC	07916	ADDR	07930	INPUT	07940	COMN	07945	EXPNT
07946	SIGN2	07950	SUMS	07962	S1				

PROGRAM 80-1, CONDENSED DECK LISTING.

```
3100080000604900072000000000004619062606406934826300000000000005004900000‡36000000
36002400050‡26000470005416000540000111000540000031001390001045000120024049002420
00160003500100260009000299170006000140039360000000500490000001234567891234567890
41000000000036002100050049002100000000000000000000000000000000000000000000000000
36000000050036000800050036003000050036003220050049001280000000000000000000000000
36001000050036001800050036002600050049021 80‡16000790016626000740016325004020 0166
11001630000111000790000112001650000147000560120036001590050045000440016049000000
01234567891234567890234567890134567890124567890123567890123467890123457890123456
45678901345678901245678901235678901234678901234578901234568901234567901234567 8‡0
0083173‡1000000002100000005000000000990000000000100000000010000000000000000002601
00904738230089916009780098026009470050126019399999932019380000032019360000049999
00977739903701983005001600978010161601944019812101944019372101944019372601958008
01050737126019490086614019440213746009800130014019350000046018900120015019740000
01124732601262019442601291012622601306012622601330012622601250012621201250000011
01197736012860195816013540195816015220195922015220193732999990000014999990007047
01271731300013002599999999999490140801499999000034601388012001499999000204601368 0
```



```
01344731200159999900000490140803201974000004901348011015220000149014320120128600
01418730112013540000112012620000212012910000212013060000212013300000212012500000
01491732240128601522460124401300329999900000140195800000460191201200260196800871
01564733301959000001601973019592201973015222601647015223201972000002201973019394
01637733016809999912019730000111016470000149016360260171001647110171000009269999
01710739019732601734016473299999000002601828017104401800019742601794018281201794
01786730232999990000016050230182349049929999999999011018230001012008940000147019
01859731001100120193500001460101601100110094700006490093604216018280086149018000
0214273 0‡57595642000‡00654159 0‡005642624559 0‡340000000102370198300500390198300 10
02216734502236021414902180036004020050032004020000032004040000032004060000032004
02290738000003200410000003200415000003200418000003200421000003200424000003200427
02368733200430000003200433000003200436000003200438000001601075021352600601004264
02441733024600045649024720220060100440160048613400260063000486210063000601110063
02518730126004910063043025520044349025880210063000601210063000601260049600630210
02592736300060121006300060111006300000426005010063026006400041716005920000011005
02665739200001120064000013460266001100130059200078210063000099110063000004260050
02738736006302600640004321600592000001100592000011200640000104602768011001300592
02814738021006300009911006300000226005110063021006290043526005160063021006290042
02887733260052100630210062900420260052600630210062900601260053100630210062900601
02960732600536006302100629006012600541006302100629006012600546006302100629006012
```

03033736005510063013006010000526006300009926006400060111006400000123006300064032
03109739500000260061400098160502303151490499200710008610160502303181490499200720
03182730086101605023032114904992007000086104303310004432600586006012603260004863
03255736999990050011032600008012005860008046032540110049033820260468200496120468
03328732000011604699000801604711000401604759000022704652004294304340004561400435
03404730046034500110014004320000046035460110049036180260468200501120468200005160
03477734699000781604711000131604759000061704652000132600894004352700900005112604
03550736820050612046820000716046990008016047110001016047590000827046520043243036
03623733800444490365801604646036584904544026046820050112046820000516046990007816
03697734711000131604759000062704652004172600556005162100555006011400437000004603
03770738140120016010750198321010750043721010750043727047920041426038560049126005
03843738900601169999900000110385600002120058900001460385001100260058600614210058
03916736006012100586006012603969005411605023039694904992999990086101103969000101
03989732005860000146039460110043040320044349041040260406200486260058900601159999
04062739000001104062000011200589000014604056011003400000001022704952004033400000
04137731012704952004053400000001012704952004073400000001023902145001002704952004
04211739340000000108270495200601390215700100340000000108260083000414330082600000
042847338008260010039021670010034000000010236000000005004900000043043600044449043
04357738001604646043804904544026044100050112044100000536999990050026044340441032
04430739999900000140044000000460382601200260468200501120468200001160469900080160

04503734711000401604759000022704652004404903826026046820050112046820000516046990
04578737816047110001316047590000617046520000216008940000217009000071049999990000
04652732600589046512604742046823699999005001104682999991200589999994604676011002
04725736005890465132999990000011047429999912005890000146047360110042000000160494
04798737000051604851047871604926004762600481008714304896999991104851000011204947
04874730112049260000149048400260491404851329999900000269999047912600481049474 20
04952732600830049513300829000003800829001004270160542605884490511602605079000004
05025734050680507933050790000026050790507949050240260572300000260511505079120511
05098735000022605721000001505371000022605151050232605470000001105023000052605187
05172735023260524300000440523205243330524300000260524305243490518802605755000002
05245736052790524312052790000226057530000026054940502344053360547033054700000026
05319735470054704905292026054820547012054820000211054940000012053710000147054080
05392731200150537100002460542001400490000004405452000993205721000001105721000002
05465736000000572326000000572149000000000‡34000000010238054900010043055480040148
05538730575305754260572105786260572305788490565203400000001023805490001004405628
05613734014810000100002605721057752605723057774900000034000000010238054900010048
056877350000000049056520000000000000000000000‡000000000000000000000000000000000‡100
057657301‡00000000099‡9999999999‡10000000000000434294481907692307690909090911111
05838731111114285714282000000000333333333300000000000260572305755260572105753490
05911735464000000000000000000000000000000000000000000000000000000000000000000000

0‡0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000

0000000000001020304000204060800030609021004080216100500151020060218142007041128 2

0080614223009081726300000000050607080900121416181518112427202428223635203530454

0363248445532494653604846546275445362718012345678912345678902345678901T3456789012

409

PROGRAM 80-2, CONDENSED DECK LISTING.

3100080000604900072000000000734614924265678348140000000000050049000004‡36000000

4100000000003600210005004900210000000000000000000000000000000000000000000000000000

3600000005003600080005003600300005003600322005004900128000000000000000000000000000

3600100005003600180005003600260005004902144‡1600079001662600074001632500402001661

1100163000011100079000011200165000014700056012003600159005004500044001604900000 0

0123456789123456789023456789013456789012456789012356789012346789012345789012345 6

4567890134567890124567890123567890123467890123457890123456890123455790123456781‡0

0076773000000000000000000000000000000000000000000000000000000000000000000000000‡10000000

0084073021100000005000000009900000000010000000010000000000000000002601823008991

0171673260173401647329999900000260182801710440180001974260179401828120179400002 3

0178973299999000000160674101823490669099999999901101823000101200894000014701910 0

0186273110012019350000146010160110011009470000649009360421601828008614901800000 0

0208173000000000000000000000000000000000000000000000000000000000000000000001502301000

0215473001606741021794906690008910086102605894005562606016005562600586004142600 8

0222773940042027009000051647023020010026029140042026029560051616030240230249029 1

0230073601400432000004602394012001703214000004702394002002602914004262602956005 1

0237373616030240239449029160430241400445490242604302608023011705780000004302458 0

410

ð24467304454902722012005860000146022220110043025020044649025320160674101252549066
ð25197390ð0481ð089104302552004449402576026019780042627030320054117031200000ð01502
ð25927330100001490221002601981004262602667005162602672005411606741ð26674906450ð99
ð26657399909999011026670001011026720001012019810000ð1460264401100170602200ð01200
ð27387358600001460222201100430277800446490280801606741ð280149066900ð0481ð089104 30
ð28117328280044949028880430286400445260197800426270303200541260197800614270303 20
ð28847305513600000005004900000000000000340000000102160674101295149067100486499999
ð29577303905731001003400000001081102956000101202914000ð1460292801100499999900000
ð30307300380040200400260307403031120307400ð9389999900400110307400080120197800ð
ð31037384603068011004200260198100426260316700541160674101ð3167490651099999ð0481011
ð31767303167000101201981000ð1460314401100420026047420042026032730052126032780051
ð32497361606741ð32734906690999999999901103273000101103278000101204742000ð1460325
ð33227300110026047420043226033630050626019399999932019380000032019360000032019 34
ð33957300000260346400516120346400010210346301937160674101ð34594906690ð47529999026
ð34687304695005161204695000102104694019351301933000ð5160354ð4752210354900099260
ð35417335569999949999990260362200521120362200010210362101937160674101ð3617490669 0ð
ð36147347529999049046720440366404750330475000000490467203204750000004904672026 0
ð36877337480051112037480001021037470193916067410ð3743490647ð4752999990490467202 6
ð37607303822005111203822000102103821019391606741ð3817490649ð4752999990490467202
ð38337360389600516120389600010210389501939160674101ð3891490647ð4752999990490467 20
ð39067326039700051612039700001021039690193916067410ð3965490645ð4752999990490467 2

ð39797302604044005161204044000102104043019391606741ð4039490649ð4752999990490467
ð40527320260411800516120411800010210411701939160674101ð4113490651ð4752999990490 46
ð41257372016067410ð4151490669ð0630ð0881016067410ð4181490651ð0ð0630ð4752016067410ð42
ð41987311490669ð0ð4752ð0630049046720260432000051112043200001021043190193916067410ð4
ð42717328549066700ð4752ð4752016067410ð4315490649ð0ð4752999990160674101ð434549066 30ð47
ð43447352ð4752049046720160674101ð4383490667ð0ð4752ð4752049046720160674101ð44214906650
ð44177303ð4752ð4752049046720160674101ð4459490663ð0ð4752ð4752049046720160674101ð44974906
ð44907361ð0ð4752ð4752049046720160674101ð4535490657ð0ð4752ð4752049046720160674101ð45734
ð45637390655ð0ð4752ð4752049046720160674101ð4611490659ð0ð4752ð4752049046720160674101ð46
ð46367349490653ð0ð4752ð4752049046720499999901606741ð4695490669ð99999ð4752011033 63
ð47097300ð0ð8120474200ð0ð1460335201100420000000000000ð4672ð3558ð3632ð3684ð3758ð383
ð47827320ð3906ð3980ð4054ð4128ð4226ð4360ð4398ð4436ð4474ð4512ð4550ð4588ð4626ð466400
ð48557300000000033048540000026057510576333057420000026057410577316057320 0ð001605
ð49287377500ð0ð4404972048611505774000023304861000001404863000999460530801200140 48
ð50017363000ð0ð4705354011001404863000ð4460543401100160510 3ð4854160509 8ð5741220509
ð50747380486322050980486325999999999991105103000ð111050980 00ð2140509 8ð57394705092
ð51477301100260525905103160577700ð5220577704863160523 5ð5763220523505777220523 50
ð52207357772105739999991605254ð5743250574300000110525900 0ð1110525400 0ð2140525 4ð5
ð52937375147052480110043053280573349056400150575100000260573105775421404863000ð4
ð53667347054340110016052590485416052540574322052540486322052540486349052480260 57
ð54397334057564405494048631605731000203304863000003305732000002505735048632505 73

0̅55127̅330486233057330000026057390577533057380000016055890̅48541605584 0̅57432599999
0̅55857̅3999991105589000 0̅11105584000 0̅2140558 4 0̅57514705578011004216056630̅5735430568
0̅56587̅34057351105663000 0̅24905652026057140566312057140000̅226999990577542000000000
0̅57317̅3000000000000000000000000̅‡7̅0707070700̅00000000030000002604742004262605844005 16
0̅58047̅32605919005411606741 0̅58394906690̅06309̅9999043058660044649058960160674 1 0̅588
0̅58777̅394906490̅06309̅999901606741 0̅591949064709̅99990̅0630011058440001̅011059190001̅0
0̅59507̅31204742000 0̅1460581601100430598800446421606741 0̅60114906470 0̅08919̅9999042002
0̅60237̅360611000516260618400556260631700551260644400426260644706444160674 1 0̅610549
0̅60967̅30669 0̅47529̅99990240475200861460642201200430615600446490618601606741 0̅61794
0̅61697̅39064 9 0̅47529̅99990260621606110260626206110249999900861460632401200160674 1 0̅
0̅62427̅36257490669 0̅6309̅999901606741 0̅6287490649 0̅630 0̅4752016067 4 1 0̅631749064 7 09̅9
0̅63157̅3999 0̅0630011062160001̅01106262000 1̅01106317000 1̅0120644 7000 0̅14606210011001106
0̅63887̅311000 0 1̅0120644400 0 0̅146060700110042210631606444490638400000007̅0160714 4 0̅779
0̅64617̅30490673001607144 0̅78344906730016071440̅8334490673001607144 0̅857449067 3001607
0̅65347̅3144 0̅8910490683401607144 0̅9490490683401607144 0̅952249068340160714 4 1̅033449068
0̅66077̅33401607144 1̅1324490683401607144 1̅1344490683401607144 1̅2064490683401607144 1̅20
0̅66807̅3844906834016071441̅29064906834016071441̅2938490683402606797000004406786 0679
0̅67537̅3733067970000026067970679 7̅490674202607441000002606833067971206833000 0̅22607
0̅68267̅343900000150708900002260686906741260718800000110674 1000 0̅5260690506741 26069
0̅68997̅361000004406950069613306961000002606961069 6 1̅4906906026074730000026069 97069

0̅69727̅36112069970000̅226074710000026072120674144070540718833071880000026071880718
0̅70457̅3849070100260720007188120720000000̅2110721200000̅1207089000 0̅147071260120 01507
0̅71187̅30890000246071380140049000000440717000099320743900000110743900000̅2600000 07
0̅71917̅344126000000743949000000000̅‡3400000001023807208001004307266004014 8 0̅7471074
0̅72647̅37226074390750426074410750649073700340000000102380720800100440734600401481̅
0̅73377̅3000010000260743907493260744107495490000003400000001023807208001004 8 5̅0000
0̅74107̅300004907370000000000000000000000000‡0000000000000000000000000000000000‡1̅0000000
0̅74837̅30̅1‡0̅00000009̅9̅‡9̅99999999̅9̅‡1̅00000000000004̅342944819 0̅769230769 0̅90909090 9 1̅1111
0̅75567̅31111 1̅42857142 8 2̅000000000 3̅333333333 0̅0000000000026077690000011076130000̅5260
0̅76297̅376490761326077810000011076130000̅52607685076132607764000001107613000 0̅52607
0̅77027̅372107613260777600000110761300 0 0̅22607788076133100075074872800000000000 29000
0̅77757̅3000000049000000440782207471330747100000490783403207471000001508051000 0116
0̅78487̅308061 0̅74712407441074734608050012004607930011003107443074643107464074 32310
0̅79217̅374320744322074730744146071700140021080610747344079900747115080510000 21407
0̅79947̅3473000 0̅746080500110047071700120015074630000 0̅3307464000002107439000 0025000
0̅80677̅3990743916073760̅71464708186014001107441000 0̅14708142014001607216000 0̅1490721
0̅81407̅380260743907438150743200001̅3307433000004907146046073460120033074 3900000260
0̅82137̅3747307441430830207432310743207433250743 9 0̅67291207473000 0̅1470822201400 1607
0̅82867̅32160000̅249072980320743200000260744107473490714601607376 0̅71462307439074714
0̅83597̅36073460120043084260008416074520000̅1̅320008500000260743900092490845001 60745

0̄84327̄320000̄02607439000912107441074734608498014002107441074524707146014004408530

0̄85057̄30744116072160000̄44907298021074410745247072780130016072160000̄3490721804308

0̄85787̄36180746416073760̄74021607216000̄749073780160737 60̄71462800091074392900091 07

0̄86517̄347125000990009143087340008346073460120032000840000026074390009116074520 00

0̄87247̄30̄049087580260743900090160745200000̄122074410747346088260140021074410745247 0

0̄87977̄371460140016072160000̄549072180440880607441210744107452440888207441150721 60

0̄88707̄3000̄64907298043089020744149088620490735804308942074641607376 0̄718249073460 4

0̄89437̄34089980747116073760̄89861607216000̄84907378033074710000026074410751626074 3

0̄90167̄330747113074730005̄04409114000991400097000 0̄4609082012003200097000004309138

0̄90897̄30009816092400̄742749091740110009800 0̄54309094000983307426000001507425000 0̄

0̄91627̄31609240̄74261609360̄7426260938907265160920700000̄816074730000̄1̄110747300000̄22

0̄92357̄32000000747346092220130012092070000̄1460943401200260930009240210000007473 47

0̄93087̄30934201200260933609300330000000000011092400000̄2320000000000011093600000̄1310

0̄93817̄30000000002209389073411507473000011207472000̄14909234026074410009713074730

0̄94547̄3000̄5320009100000260743900098490718201509811000091509570000034909546015098

0̄95277̄311000011509570000041407473000 0̄34609602011003107464074753107432074644907 18

0̄96007̄32014074730000̄8470965801100160721 60000̄91607376 0̄7402490737801407473000 0̄2470

0̄96737̄39714011001607216000 1̄01607376 0̄97144907378023102730747133000830000011074730

0̄97467̄3009̄1260980907473120747300000̄82609792074733200000000000260744000000490984600

0̄98197̄30004410246000992107440102823207440000002107440074133307440000000220744010 2

415.

0̄98927̄382460990601400240743907493160737 60̄718246073580120016099510000̄42307440074 4

0̄99657̄3026074520009026074311029216100491̄030223074520743144100380009932000900000 0

1̄00387̄32100090000002607431000901110049000 1̄01209951000 0̄1471000201200320742300000 2

1̄01117̄33074400743125000920744231074320008216074630000̄1431021407432310743207433 12

1̄01847̄3074630000̄12507441 0̄6729491015803207432000002607441074634907146032074400000

1̄02577̄30490983 4 1̄5915494 3̄250000000 3̄971067150 7̄6574975 0̄9̄81602231584̄1341677 50̄0628318

1̄03307̄352704310366074643107432074864907182014074730000̄3̄31074320746447071820130 01

1̄04037̄361043 70̄0000251043507471330747100000140747300000̄0461106601100461055801200 16

1̄04767̄31053 30̄7471211053307473160746300000̄0330746400000260747100000150746400010̄330

1̄05497̄374650000014074650002̄94710690013001307471000 0̄615000900000 1̄220747111322260 7

1̄06227̄3452000982800091074712900092074522510893000992607471000903210437000002307 4

1̄06957̄37107471260745200091161076 10̄755916107350000̄42307549074522607441000002207 44

1̄07687̄31000912307441074521110761000 1̄01210735000 0̄14710750012002607441075172207441

1̄08417̄30009123074410747144109061043744108941089332000910000021000911129344109421

1̄09147̄30436320009100000210009111303160744100000̄125000920040043110220008212074410 0

1̄09877̄3000̄131000820008325000910̄67294910966032000820000026074390008944071821043549

1̄10607̄307158026000910760014074730000̄8461093001100260743907598161114 40̄743121111 44

1̄11337̄307473150000000001320743200000280009007439290009007471431126600082140747 30

1̄12067̄3000̄4461091801100260747100090321043600000320746400000491055803107432113044

1̄12797̄39110465̄40419500 1̄5707963277̄85398160̄0‡6̄000000001611418 0̄751849113560161141 80̄

11352737530431138807464310743207475490718201407473000084711368011002307530074711
11425734074730000347114720130047119320120043119320008233000820000026000810759911
11498730747300080261152607473320000000000011074730000126115620747311000000001461
11571731932014001107473000092611615074732607450000003207442000001611675119972607
11644734390760116116610000721074390000023074390745026074390009011116750001112116
11717736100001471166401201110743000010230743807438320008100000260743900088250744
11790732004004407182074712400088075154711852012001207441000014911900026074520008
11863739280009207517290009207452260743900090320744100000110744100001490718201607
11936732160001116073760718244072180747115072160000249072980000932642700025549180
12009730017421119900729517367025439357480662730884311512927760151209300001491209
12082736016120930000033074640000043121520746416073760740216072160001349073780441
12155732208074713307471000001607376122081607216000144907298016125511286115074630
12228730001140746400015461228801300210747107471111255100011491222002607439074712
12301732074390757928000890743929000890747126074710009032074710000032074620000023
12374730747107471260745200089210747107471260744107600161245507540161244100006210
12447737441000002307441074522607441000891112455000101212441000014712444012002307
12520734410747122000890747126074710000022074710008943127841209323129050747321000
12593739907471240009707601310743207486460718201200160744100003251209100099250009
12666739004004312728000873100087000881207441000012500098067294912672032000870000
12739730441276412091320009400000260743900094490718201500079000002307530074712607

12812734710008932074710000023075180747349125880000000000006931471805113862943611 2
12885730794415416230258509292607441074732607439074714907182026130040718826129801
12958733004121298000003260000007471261301607212270000007473490000000000000000000
0‡000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000102030400020406080003060902100408021610050015102006021814200704111282
00806142230090817263000000000506070809001214161815181124272024282236352035304544
036324844553249465360484654627544536271801234567891234567890234567890134567890112

PROGRAM 80-3, CONDENSED DECK LISTING.

```
3100080000604900072000000000894124729621246274770000000000050049000004360000041000000000360021000500490021000000000000000000000000000000000000000000000000000000000000000000360000000500360008000500360030000500360032200500490012800000000000000000000000000360010000500360018000500360026000500490090214600079001662600074001632500402001661100163000011100079000011200165000014700056012003600159005004500044001604900000001234567891234567890234567890134567890124567890123567890123467890123457890123456456789013456789012456789012356789012346789012345789012345689012345679012345678+0007677300000000000000000000000000000000000000000000000000000000000000000000000000000+10000000084073021000000050000000099000000000010000000010000000000000000007043012140044009137354301202004472601099005512601014005412601044005412601340004262601337013400986731602491010094902460063099999016024910103949024000630999990160249101069401059739024200630048101602491010994902380999990630011010440001011010990001012113273013370000146009860110011010140001026010440101412013400000146009740110017012057320320000260133700426260128000551260132100546260137000551260136500546249901278739990090046013420130016024910132149024600999900881049013720000000160249101013517336549024409999999999021012790133721013690133711013210001011013650001012011423733370000146012740110026015390055126015690055126015440054626015740054626013014977337004262601340013371602491015394902420999999999901602491015694902420999999015707399999011015740001011015390001011015690001012013400000146015160110011015441643730001026015740154412013370000146015040110026013370042626017310055116024910017167317314902460999990881021017300133712013370000146017080110026013370042626017897318510054616024910182149024400630048101602491018514902420999990630011011862738510001012013370000146018280110049019020430192200450490199402600898004262019357370213000541260089800426270213000546260089800614270213000551270222200414362008737000000500490000000000026008940042626020790054116024910207949024209999900817304810110207900010120089400001460205601100420000003800402004002602172021291547312021720000938999990040011021720008012008980000846021660110042000000160232227737700005160228102217160235600476260048100871430232699999110228100001120237023007370000112023560000149022700260234402281329999900000269999902221260048102370237373742007016028940335249024800160289403896490248001602894041364902480016028902446734044724902584016028940505249025840260254700000440253602547330254700000260251973254702547490249202603191000002602583025471202583000022603189000001502839002592730002260261902491260293800000110249100005260265502491260271100000440270002026657371133027110000026027110271149026560260322300000260274702711120274700002262738730322100000260296202491440280402938330293800000026029380293849027600260295028117302938120295000002110296200000120283900001470287601200150283900002460288800
```

0288473140049000000440292000099320318900000110318900002600000031912600000031894
02957739000000000‡340000000102380295800100430301600401480322103222260318903254 26
03030730319103256490312003400000001023802958001004403096004014873000010000260318 9
03103730324326031910324549000000340000000102380295800100480500000000490312000000
03176730000000000000000‡000000000000000000000000000000000‡7000000001‡0000000099‡99
03249739999999‡7000000000000434294481907692307690909090909717111111111742857142857
03322730000000003333333333000000000004403384032213303221000004903396032032210000
03395730150361300001160362303221240319103223460361201200460349201100310319303214
03468733103214031823103182031932203223031914602920014002103623032234403552032211
03541735036130000214032230000746036120110047029200120015032130000033032140000021
03614730318900000250009903189160312602896470374801400110319100001470370401400160
03687732966000014902968026031890318815031820000733031830000049028960460309601200
03760733303189000002603223031914303864031823103182031832503189024791203223000014
03833737037840140016029660000249030480320318200000260319103223490289601603126028
03906739623031890322146030960120043039880008416032020000732000850000026031890009
03979732490401201603202000026031890009121031910322346040600140021031910320247 02
04052738960140044040920319116029660000449030480210319103202470302801300160296600
04125730034902968043041800321416031260315216029660000749031280160316026028960800 9
04198731031892900091032212500099000914304296000834603096012003200084000002603189
04271730009116032020000040904320026031890009016032020000122031910322346043880 1400

04344732103191032024702896014001602966000054902968044043680319121031910320244044
04417734403191150296600006490304804304464031914904424049031080430450403214160312
04490736029324903096044045600322116031260454816029660000849031280330322100000260
04563733191032662603183032211303223000504404676000991400097000046046440120032 00
04636730970000043047000009816048020317749047360110009800005430465600098330317600
04709730001503175000001604802031761604922031762604951030151604769000081603223000
04782730111032230000222000000322346047840130012047690000146049960120026048620480
04855732210000003223470490401200260489804862330000000001104802000023200000000000
04928731104922000013100000000002204951030911503223000011203222000014904796026031
05001739100097130322300005320009100000260318900098490293202603191032232603189032
05074732149029320000000000000000000000000000000000000000000000000000000000000000
0‡0000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000010203040002040608000306090210040802161005001510200602181420070411282
00806142230090817263000000000050607080900121416181518112427202428223635203530454
03632484455324946536048465462754453627180123456789123456789023456789013456789012

```
3100080000604900072000000000004408253451025925445000000000000500490000043600000
4100000000003600210005004900210000000000000000000000000000000000000000000000000
3600000005003600080005003600300005003600322005004900128000000000000000000000000
3600100005003600180005003600260005004900898‡160007900166260007400163250040200166
1100163000011100079000011200165000014700056012003600159005004500044001604900000
0123456789123456789023456789013456789012456789012356789012346789012345789012345
456789013456789012456789012356789012346789012345789012345689012345679012345678‡0
0076773000000000000000000000000000000000000000000000000000000000000000000‡0000000
0084073021000000050000000990000000001000000001000000000000000001610647092149 1
0091373059600690048104300970004471610647096349104960690088101609171000001609
0098673183000012600586004262601041004861600595000014501062999992600604005954901 1
0105973120110104100001110059500001120058600001460103001100482600607006042600610 0
0113273060417049480000026005660057147013180040026005860042626012020048638999990 0
0120573400110120200080120058600080460119601100260088500426270944200541260088500 4
0127873262709442005462600885006142709442005514826005860042616005950000116106470 1
0135173365491059600740008510161064701395491059600750008610260149600551260173800 5
```



```
0142473512601763004861610647014614910596006300841016106470149149104960063099999
0149773046020000110024005950060447015900130046020000120026006070060426006100059 5
0157073170494800000490162602600607005952600610006041704948000002601678005712601 7
0164373080057116106470167349105960063099999016106470170349105360063099999016106 4
0171673701733491055600630999990330062800000430188699999161064701787491059600640 0
0178973075001610647018174910496006400630046020000130016106470185949105960075000
0186273630026006170059549020000161064701909491059600640007400161064701939491049 6
0193573006400630047020000110016106470198149105960074000630026006200059521014950
0200873058621017370058611017630000111005950000112005860000146014380110024007100 0
0208173861470222401200240075000861460282801200260213800566249999900861460282801 2
0215473001610647021794910596007000861016106470220949104960069000881049026620161
0222773064702247491059600700007400260230600566260246800566161064702301491055600 7
0230073009999901610647023314910536007000690016106470236149105960063000720016106
0237373470239149104960630007000460269401100161064702433491049600690088101610 64
0244673702463491059600630999990161064702493491049600630075001610647025234910596
0251973007000750016106470255349105560070006300161064702583491053600700006900 16
0259273106470261349105960630007100161064702643491049600630070004602828013002 60
0266573060100617160524602756490347802600601006201610647027294910516006900881016
0273873052460275649034780430277600451490116001707598000001607594028084905296016 0
0281173915401160490879804302958004511707598000002400710008614602906012001610647
```

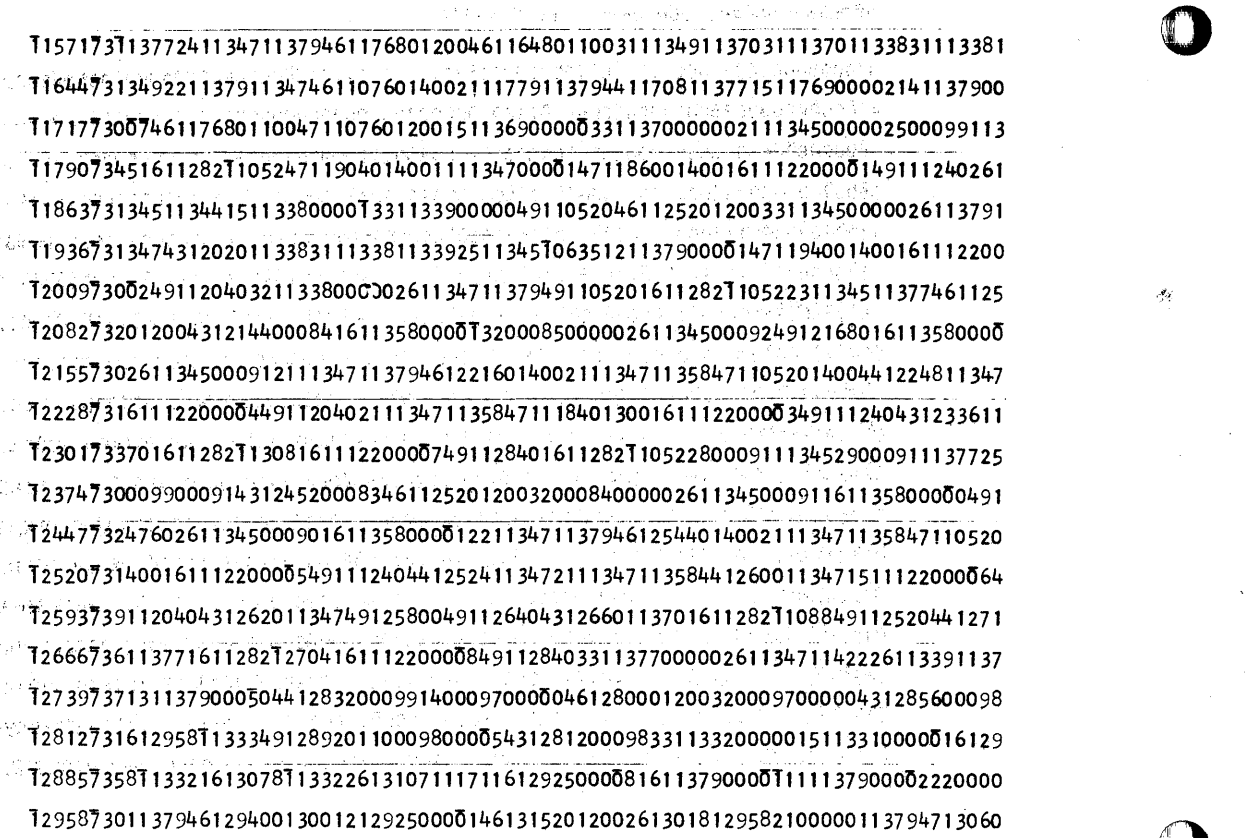
02884732899491051600690008810160917100998160759402938490529601609154029584908798
02957730430299000448160879602990490805204303010004584903202017075980000026008880
03030730426160061700001260306900486430315499999260060400617160759403102490524801
03103736091540312249087980430315400448160879603154490805201100617000011103069000
03176730112008880000146030580110043032220045249032460260088500614270944200551430
03249733266004534903458026005860042616006010000126033250048626033450048645033349
03322739999490337404303354999994903374016052460337449034780110060100001110332500
03395730011103345000011200586000014603314011002600885006142709442005513600000005
03468730049000000260352500486120352500001210352500601430355899999160385100000150
03541735101000014903582016038510000515051010000026006070060126006100060117049480
03614730000260368200571260370700571260373700571161064703677491059600630999990161
03687730647037074910596999990088101610647037374910556999990063002604132005712604
03760736980057126046930057126048440057111046930001016005950000116005980000126005
03833737600551160058100000240060100595460452201200240060100598460452201200460424
03906736011002100581038512600607006012600610005981704948000002604072005712400595
03979730060146043780110026006070059526006100060117049480000026041020057116106470
04052734067491059600630999990161064704097491053600630999990161064704127491053600
04125736309999904304196005812604181005761610647041814910496999990063004904522026
04198730423100576161064704231491051699999006300490452202600607005982600610006012
04271736043490048612043490000121043490059826043290434945043389999949039480430435

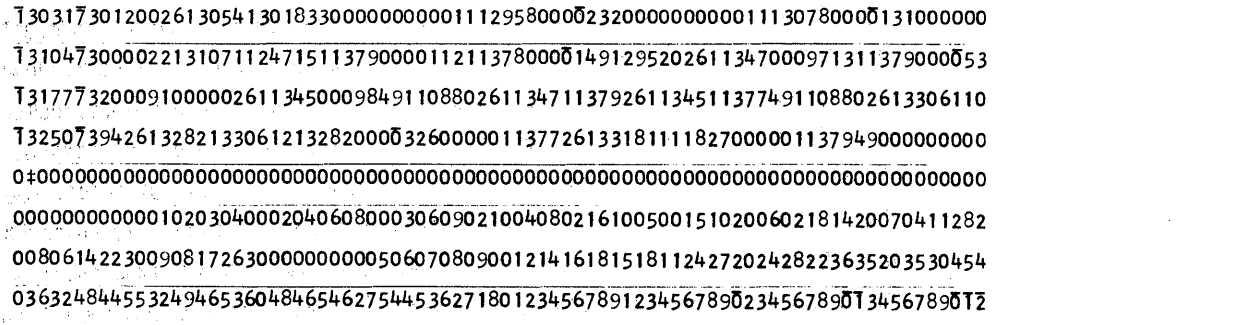
04344738999994903948011005810000549039480260060700601210058103851260061000595260
044177344930048612044930000121044930059526044730449345044829999994904020043045029
04490739999490402001100581000054904020011005760001024004260059846045780120011005
04563739800001490384002400426005954604634012001100595000012600598005954903840026
04636730059800601240059800426460473201200161064704693491053699999999990110059800
04709730011104693000104904646026005950060112005950000146050540120026006070059526
04782730061000601170494800000260483900571161064704839491053699999999990260490504
04855738391204905000022604912049052604932049054404926999993399999000004904744032
04928739999900000490474400022006100060726005710055126008970042612006070000146050
05001734001200210057000897120089700001490498402100570006104226050960048612050960
05074730001210509600601159999900000260089700426260514900551120514900002440520499
05147739992605197051491105197000021610647051974910596999990086102105148008971200
05220738970000146051380110049999990260060700604260061000604170494800000260056600
05293735712605372005662605516005461205516000102105515006041610647053674910596006
05366736099999024006900086146055180120016106470542149105560066000690016106470545
05439731491053600660000481016106470548149105760066000660016106470551149105360660
05512739999901600595000012600894004262605709004862605948005461205948000102105947
05585730060426059780054626060710052626062740054626062990053126063530053626063580
05658730526260638300536260638800531260639600491430571899999490648602605741057094
05731735057509999949064860240059500604460648601200460584201100260060700595260061

0̄58047̄300060417049480000̄02605918005714905890026006070060426006100059517049480000̄
0̄58777̄3026059180057116106470̄591349105960̄06309̄9999016106470̄594349105360̄06309̄99990
0̄59507̄316106470̄597349105560̄06309̄999902400595006044706048013004406036006283300628
0̄60237̄3000004906048032006280000016106470̄607149105969̄99990̄06300260060700595260061
0̄60967̄300059517049480000̄026061540057116106470̄6149491059 60̄06309̄9999016106470̄61794
0̄61697̄39105560̄06300̄0481016106470̄620949105760̄06300̄0630016106470̄623949105360̄06300̄0
0̄62427̄3660016106470̄626949105560̄06309̄9999016106470̄629949105969̄99990̄06300240066000
0̄63157̄386146063900120016106470̄635349105969̄99999̄9999016106470̄638349105569̄99999̄999
0̄63887̄39026999990059511060710001̄011062990001̄011063530001̄011063580001̄011063830001̄
0̄64617̄3011063880001̄011063960000̄211057090000̄111059780001̄011062740001̄011005950000̄1
0̄65347̄312008940000̄14605698011004306578004474906616016106470̄660149105960̄06500̄0861
0̄66077̄304906992026066800054112066800001̄0210667900604161064 70̄667549105960̄06509̄999
0̄66807̄39026008940042616005950000̄126067890048626068090048626068460052626068760054
0̄67537̄3124006040059546069200120043067989999949069200450681899999490692001610647 0̄
0̄68267̄3684149105960̄06309̄9999016106470̄687149105360̄06309̄9999016106470̄690149104960̄0
0̄68997̄36500̄063001106846000 1̄011067890000̄111068090000̄111068760001̄011005950000̄11200
0̄69727̄38940000̄146067780110026070800056626071100054612071100001̄0210710900604 26071
0̄70457̄3400711016106470̄707549105960̄06809̄9999016106470̄710549105360̄06809̄99990161064
0̄71187̄370̄7135491053 60̄06809̄9999016106470̄716549105360̄06800̄48102607248005461207248

0̄71917̄30001̄021072470060426072780724816106470̄724349105960̄06309̄9999016106470̄727349
0̄72647̄3105360̄06309̄99990430730000447490743802607376005411207376000 1̄02107375006042
0̄73377̄36074060737616106470̄737149105960̄06409̄9999016106470̄740149105360̄06409̄9999016
0̄74107̄3106470̄743149104960̄06300̄0640016106470̄746149105360̄06300̄0481016106470̄7491491
0̄74837̄305960̄06400̄068001610647 0̄752149105560̄06400̄063001610647 0̄755149105960̄06700̄088
0̄75567̄31016106470̄758149104960̄06700̄0640049999990001600891000̄002607645004862600897
0̄76297̄300426430765499999490769802607677076454507686999994907698011008910000̄11107
0̄77027̄36450000̄112008970000̄14607634011004 24̄4455700654159000000000000000330000000000
0̄77757̄300‡6̄2634400455959006803670000003300000‡5̄90062586441594544000000000000330000
0̄78487̄30‡6̄2645400625859005945620000003300000‡4̄95544006541590064624544000033000 00
0̄79217̄3000000‡4̄3565562634155630063455954003300000‡6̄541590000000000000004356454646
0̄79947̄30‡0̄0000000000000626344004559590000000000000630059416349560‡340000000102340
0̄80677̄300000010239077370010027095320060434000000010239077790010016106470̄81474910
0̄81407̄36160̄95800̄0660039104470010034000000010239078150010016106470̄821349106160̄958
0̄82137̄300̄067003910447001003400000001023907851001001610647 0̄827949106160̄95800̄06800
0̄82867̄33910447001003400000001023907887001002709532008913400000001023400000001023
0̄83597̄39079290010016106470̄839349106160̄95800̄06500391044700100340000000102340000 00
0̄84327̄301023907965001003907997001003400000001022600897008912608543004912608584 00
0̄85057̄35262608638005312608692005362709532999993400000001081610647 0̄857949106160̄95
0̄85787̄3809̄99990391044700100340000000108161064 70̄863349106160̄95809̄9999039104470010

0865173034000000010816106470868749106160958099990391044700100340000000102110854
0872473300002110858400010110863800010110869200010120089700001460853201100499999
0879773011091710000126007530917126007560060426007590089126007620042616106470888
0887073491059600780006500161064708911491059600790006700161064708941491059600800
0894373066001610647089714910596008100070001610647090014910596008200680016092140
0901673902849091600260058600426260905800486389999900400110905800080120058600080
0908973609052011001109183000012709220005262709220005312709220005364999999000016
0916273008260000160083000013800751004001109183000014999999000002609340092192600
0923573063000891140063000007460928801100260058600630490930001600586000071609335
0930873076016106470933549105960999999999011093350001011093400001012005860000146
0938173931201100160921400941049091600120063000007460924401100420000003800402004
0945473260948409441120948400009389999900400110948400008012008850000846094780110
0952773200002600830095313300829000003800829001004200000000003309570000002610467
0960073047933104580000026104571048916104480000160491000004409688095771510490000
0967373002330957700000140957900099461002401200140957900004710070011001409579000
0974673044610150011001609819095701609814104572209814095792209814095792599999999
0981973911098190000111098140000214098141045547098080110026099750981916104930005
0989273221049309579160995110479220995110493220995110493211045599999160997010459
0996573510459000001109975000011109970000021409970104674709964011004310044104494
1003873103560151046700000261044710491421409579000044710150011001609975095701609





1̄15717̄31̄13772411347113794611768012004611648011003111349113703111370113383111 3381
1̄16447̄3134922113791134746110760140021117791137944117081137715117690000214113790 0
1̄17177̄300̄746117680110047110760120015113690000̄33113700000021113450000025000991 13
1̄17907̄3451611282̄1̄105247119040140011113470000̄14711860014001611122000̄149111240261
1̄18637̄31345113441511338000̄1̄3311339000004911052046112520120033113450000026113791
1̄19367̄313474312020113383111338113392511345̄1̄06351211379000̄14711940014001611 12200
1̄20097̄300̄2491120403211338000026113471137949110520161128̄2̄1̄105223113451137746 1125
1̄20827̄3201200431214400084161135800̄00̄1̄3200085000002611345000924912168016113580000̄
1̄21557̄302611345000912111347113794612216014002111347113584711052014004412248113 47
1̄22287̄3161112200̄04491120402111347113584711184013001611122000̄3491112404312336 11
1̄23017̄33701611282̄1̄13081611122000̄7491128401611282̄1̄105228000911134529000911137725
1̄23747̄3000990009143124520008346112520120032000840000026113450009116113580000̄491
1̄24477̄32476026113450009016113580000̄12211347113794612544014002111347113584711052 0
1̄25207̄31400161112200̄0̄5491112404412524113472111347113584412600113471511122000̄64
1̄25937̄3911204043126201134749125800491126404312660113701611282̄1̄1088491125204412 71
1̄26667̄3611377161128̄2̄1̄27041611122000̄849112840331137700000261134711422261133911 37
1̄27397̄371311379000̄504412832000991400097000̄0461280001200320009700000431285600098
1̄28127̄31612958̄1̄1333491289201100098000̄0̄54312812000983311332000001511331000̄0̄16129
1̄28857̄358̄1̄13321613078̄1̄13322613107111711612925000̄81611379000̄0̄1̄111137900̄0̄2220000
1̄29587̄301137946129400130012129250000̄1461315201200261301812958210000011379471 3060

1̄30317̄3012002613054130183300000000000111295800̄0̄2320000000000011130780000̄131000000
1̄31047̄30000221310711247151137900001121137800̄00̄1491295202611347000971311379000̄53
1̄31777̄320009100000261134500098491108802611347113792611345113774911088026133061 10
1̄32507̄39426132821330612132820000̄32600000113772613318111182700000113794900000000 0
0‡0000000000000000000000000000000000000000000000000000000000000000000000000000
000000000000102030400020406080003060902100408021610050015102006021814200704112 82
00806142230090817263000000000050607080900121416181518112427202428223635203530454
036324844553249465360484654627544536271801234567891234567890̄234567890̄1̄34567890̄1̄2̄

PROGRAM 80-4B, CONDENSED DECK LISTING.

```
3100080000604900072000000000098018157852322292134000000000000005004900000‡36000000
4100000000003600210005004900210000000000000000000000000000000000000000000000000000
3600000005003600080005003600300005003600322005004900128000000000000000000000000000
36001000050036001800050036002600050049009 08‡160007900166260007400163250040200166
1100163000011100079000011200165000014700056012003600159005004500044001604900000 0
0123456789123456789023456789013456789012456789012356789012346789012345789012345 6
4567890134567890124567890123567890123467890123457890123456890123456790123456 78‡0
0076773000000000000000000000000000000000000000000000000000000000000000000‡10000000
0084073021000000050000000009900000000000100000000100000000000000000000000000016099
0091373110093149098600069004810430098000447160991100973490976000690008810160843
0098673500000160844700001470116200400260058600426260104600486389999900400110104 6
0105973000801200586000804601040011002600885004262708706005412600885004262708706 0
0113273054626008850061427087060055148260058600426160059800001160991101209490986 0
0120573007300086102601239004864301248999994901304011012390000111005980000112005 8
0127873600001460122801100490194402600607005982600610005981704212000002600561005 7
0135173126014340056126017420056116099110139949098600063000841016099110142949097 6
0142473000630999990460124801100160060400001260058900426160991101495490986000907 0
0149773086102601525004864501774999992400598006044601594011002600607005982600610 0
```

433.

```
0157073060417042120000049016300260060700604260061000598170421200000260168200571 2
0164373601712005711609911016774909860006309999901609911017074909800006309999901 6
0171673099110173749098200063099999016099110176749097800090700630011006040000111 0
0178973152500001120058900001460151401100160991101845490986000630007300160991101 8
0186273754909760006300090704601248011001609911019174909860007300090702600601005 9
0193573849012480240073000861460206201200160451001988490274203400000001022600830 0
0200873060138008290010016099110204749097600069000881049010040170686200000260088 8
0208173004261600617000012602121004864502206999992600604006171606858021544904512 0
0215473160841802174490806204302206004481608060022064907316011006170000111021210 0
0222773001120088800001460211001100430227400458490246601706862000002600888004261 6
0230073006170000126023330048643024189999926006040061716068580236649045120160841 8
0237373023864908062043024180044816080600241849073160110061700001110233300001120 0
0244673888000014602322011004302486004524902510026008850061427087060055143025300 0
0251973453490272202600586004261600601000012602589004862602609004864502598999994 9
0259273026380430261899999490263801604510026384902742011006010000111025890000111 0
0266573260900001120058600001460257801100260088500614270870600551360000000500490 0
0273873000026027890048612027890000121027890060143028229999916031150000015043650 0
0281173001490284601603115000051504365000002600607006012600610006011704212000002 6
0288473029460057126029710057126030010057116099110294149098600063099999016099110 2
0295773971490986099999008810160991103001490982099999006300260339600571260396200 5
```

434.

ð30307371260395700571260410800571110395700010160059500001160059800001260057600 55
ð31037311600581ð0000240060100595460378601200240060100598460378601200460351001100
ð31767321005810311526006070060126006100059817042120000ð026033360057124005950060 14
ð32497360364201100260060700595260061000601170421200000260336600571160991 1ð333149
ð33227309860ð0630999990160991 1ð3361490980ð0630999990160991 1ð3391490980ð0ð0630999
ð33957399043034600058126034450057616099 11ð34454909760999990ð0630049037860260349 50
ð34687305761609911ð34954909780999990ð0630049037860260060700598260061000601260361 3
ð35417300486120361300ð121036130059826035930361345036029999949032120430362299999
ð36147349032120110058100ð5490321202600607006012100581031152600610005952603757 00
ð36877348612037570000ð1210375700595260373703757450374699999490328404303766999994 9.
ð37607303284011005810000549032840110057600010240042600598460384201200110059800 0ð
ð38337314903104024004260059546038980120011005950000ð126005980059549031040260059 80
ð39067306012400598004264603996012001609911ð39574909800999999999901110059800 0ð1110
ð39797339570001049039100260059500601120059500 0ð146043180120026006070059526006 100
ð40527306011704212000ð026041030057116099 11ð4103490980099999999990260416904103 120
ð41257341690000226041760416926041960416944041909999933999990000049040080329999 90
ð41987300004904008000220061000607260057100551260089700426120060700 0ð146043040 120
ð42717302100570008971200897000ð1490424802100570006104226043600048612043600 00ð121
ð43447304360006011599999000002600897004262604413005511204413000ð2440446899999 260
ð44177344610441311044610000ð2160991 1ð4461490986099999ð0861021044120089712008970 00

ð44907301460440201100499999902600607006042600610006041704212000ð026005660057 1260
ð45637346360056626047800054612047800001021047790060416099 11ð4631490986ð0660999 9
ð46367390240069000861460478201200160991 1ð4685490982ð0660ð0690016099 11ð4715490 98
ð47097300ð0660ð04810160991 1ð4745490984ð0ð0660ð0660016099 11ð4775490980ð0ð0660999990
ð47827316005950000ð1260089400426260497300486260521200546120521200010210521 1006042
ð48557360524200546260533500526260553800546260556300531260561700536260562200526 26
ð49287305647005362605652005312605660004914304982999994905750026050050497345050 14
ð50017399999490575002400595006446057500120046051060110026006070059526006100060 4
ð50747317042120000ð026051820057149051540260060700604260061000595170421200 0ð026051
ð51477382005711609911ð5177490986ð0630999990160991 1ð5207490980ð0630999990160991
ð52207310523749098200630999990240059500604470531201300440530000628330062800000 4
ð52937390531203200628000001609911ð5335490986099999ð0630026006070059526006100059 5
ð53667317042120000ð026054180057116099 11ð5413490986ð0630999990160991 1ð5443490982 0
ð54397300630ð04810160991 1ð5473490984ð0ð0630ð0630016099 11ð5503490980ð0ð0630ð0660016
ð55127309911ð5533490982ð0630999990160991 1ð5563490986099999ð0630024006600086146 0
ð55857356540120016099 11ð5617490986099999999990160991 1ð5647490982099999999902699
ð56587399900595105335000ð1011055630001011056170001011056220001011056470001011056
ð57317352000ð1011056600000ð2110497300ð1110524200ð1011055380001011005950000ð1120089
ð58047340000ð1460496201100430584200447490588001609911ð5865490986ð0650ð0861049062
ð58777356026059440054112059440001021059430060416099 11ð5939490986ð0650999902600

0595073894004261600595000012606053004862606073004862606110005262606140005412400
60602373040059546061840120043060629999949061840450608299999490618401609911061054
9
0609673098600063099999016099110613549098000063099999016099110616549097600065000
6
0616973300110611000010111060530000111060730000111061400001011005950000112008940
00
0624273014606042011002606344005662606374005461206374000102106373006042606404063
7
0631573416099110633949098600068099999016099110636949098000068099999016099110639
9
0638873490980000680999990160991106429490980000680004810260651200546120651200010
2
0646173106511006042606542065121609911065074909860006309999901609911065374909800
0
0653473063099999043065640044749067020260664000541120664000010210663900604260667
0
0660773066401609911066354909860006409999901609911066654909800006409999901609911
0
0668073669549097600063000640016099110672549098000063000481016099110675549098600
0
0675373640006800160991106785490982000640006300160991106815490986000670008810160
9
0682673911068454909760006700064004999999000160089100000260690900486260089700426
4
0689973306918999994906962026069410690945069509999949069620110089100001110690900
0
069727301120089700001460689801100424445570065415900000000000000003300000000000‡626
070457334400455959006803670000003300000‡5900625864415945440000000000003300000‡6264
071187354006258590059456200000033000000‡4955440065415900646245440000330000000000
071917‡‡43565562634155630063455954003300000‡6541590000000000000004356454646‡0000
0726473000000000006263440045595900000000000006300594163495‌60‡3400000001023400000000
073377310239070010010027087960060434000000010239070430010016099110741149098800088

074107344006600390971100100340000000102390707900100160991107477490988008844006700
0748373039097110010034000000010239071150010016099110754349098800884400680039097
1
0755673100100340000000102390715100100270879600891340000000102340000000102390719
3
0762973001001609911076574909880088440065003909711001003400000001023400000001023
9
0770273072290010039072610010034000000010226008970089126078070049126078480052626
0
0777573790200531260795600536270879699999340000000108160991107843490988008844999
9
0784873903909711001003400000001081609911078974909880088449999903909711001003400
0
079217300001081609911079514909880088449999903909711001003400000001021107807000
2
0799473110784800010111079020001011107956000101200897000014607796011004999999011084
0806773350000126007530843526007560060426007590089126007620042616099110814549098
6
0814073000780006500160991108175490986000790006700160991108205490986000800006600
1
0821373609911082354909860008100007000160991108265490986000820006800160847808292
49
0828673084240260058600426260832200486389999900400110832200080120058600080460831
6
0835973011001108447000012708484005262708484005312708484005364999999000001600826
0
0843273000016008300000138007510040011084470000149999990000026086040848326006300
0
0850573891140063000007460855201100260058600630490856401600586000071608599007601
6
0857873099110859949098609999999999011085990001011086040001012005860000146085760
1
0865173100160847808674490842401200630000074608508011004200000038004020040026087
4
0872473808705120874800009389999900400110874800080120088500008460874201100420000
2
0879773600830087953300829000003800829001004200000000000330883400000260973109743
33

0̄88707̄30972200000260972109753160971200̄00160975500̄004408952088411509754000002̄330
0̄89437̄38841000001408843000994609288012001408843000̄0047093340110014088430000̄44609
0̄90167̄34140110016090830̄883416090780̄97212209078088432209078088432599999999999911090
0̄90897̄3830000̄11109078000̄02140907 80̄97194709072011002609239090831609757000̄05220975
0̄91627̄37088431609215 0̄974322092150975722092150975721097199999916092340̄97232509723
0̄92357̄30000011092390000̄111092340000̄2140923 40̄973147092280110043093080971349096200
0̄93087̄315097310000026097110975542140884300 0̄0447094140110016092390̄88341609234 0̄972
0̄93817̄332209234088432209234088434909228026097140973644094740884316097110002̄03308
0̄94547̄384300000330971200000250971508843250971308842330971300000260971909755330 97
0̄95277̄31800000160956 90̄88341609564 0̄97232599999999999110956900 0̄1110956400 0̄2140956
0̄96007̄340̄97314709558011004216096430̄9715430966409715110964300 0̄2490963202609694 09
0̄96737̄364312096940000̄2269999909755420000000000000000000000000000000̄‡7̄07070707000̄0
0̄97467̄30000000300007̄016103141̄07724909900016103141̄08164909900016103141̄13164909900
0̄98197̄3016103141̄15564909900016103141̄18924910004016103141̄24724910004016103141̄2504
0̄98927̄349100040260996700000440995609967330996700000260996709967̄4909912026106 1100
0̄99657̄30002610003099671210003000 0̄2261060900000151025900002261003909911261035 8000
1̄00387̄30011099110000̄52610075099 1126101310000044101201013133101310000026101311013
1̄01117̄31̄491007602610643000002610167101311210167000̄22610641000002610382099114410
1̄01847̄3224103583310358000002610358103584̄91018002610370103581210370000̄21110 38200
1̄02577̄3000̄12102590000̄1471029601200151025900002461030801400490000004410340000 9932

1̄03307̄31060900000111060900 0̄02600000106112600000106094900000000 0̄0‡340000000102381
1̄04037̄30378001004310436004014 81̄0641106422610609106742610611106764910540034000000
1̄04767̄30102381037800100441051600401481̄00001000026106091066326106111066549000000 3
1̄05497̄3400000000102381037800100480 5̄00000000491054000000000000000000000000‡000000000
1̄06227̄3000000000000000000000000‡1̄000000000̄1‡0̄0000000099̄‡9̄999999999̄‡1̄0000000000004̄342
1̄06957̄3944819 0̄769230769 0̄909090909 1̄111111111 1̄42857142 8 2̄000000000 3̄333333333 0̄000000
1̄07687̄30000441080410641331064100000491081603210641000001511033000011611043 1̄06412
1̄08417̄34106111064346110320120046109120110031106131063431106341060231106021061322
1̄09147̄310643106114610340014002111043106434410972106411511033000021410643000 0̄7̄461
1̄09877̄3103201100471034001200151063300000̄3310634000002110609000002500099106091610
1̄10607̄35461̄03164711168014001110611000 0̄1471112401400161038600 0̄14910388026106 0910
1̄11337̄360815106020000 1̄33106030000049103160461051601200331060900000261064310611 43
1̄12067̄311284106023110602106032510609 0̄9899121064300 0̄1471120401400161038600 0̄2491
1̄12797̄30468032106020000026106111064349103160161054 61̄031623106091064146105160120 0
1̄13527̄34311408000841610622000 0̄1̄32000850000026106090000924911432016106220000̄026106
1̄14257̄30900091211061110643461148001400211061110622471031601400441151210611161038
1̄14987̄3600 0̄4491046802110611106224710448013001610386000 0̄349103880431160010634161
1̄15717̄30546 1̄057216103860000̄74910548016105461̄031628000911060929000911064125000990
1̄16447̄30091431171600083461051601200320008400000261060900091161062200 0̄0491174002
1̄17177̄3610609000901610622000 0̄12210611106434611808014002110611106224710316014001 6

```
11790731038600005491038804411788106112110611106224411864106111510386000064910468
11863730431188410611491184404910528043119241063416105461035249105160441198010641
11936731610546119681610386000084910548033106410000026106111068626106031064113106
12009734300050441209600099140009700004612064012003200097000004312120000098161222
12082732105974912156011000980000543120760009833105960000015105950000016122221059
12155736161234210596261237110435161218900008161064300001110643000022200000010643
12228734612204013001212189000014612416012002612282122222100000106434712324012002
12301736123181228233000000000011122220000232000000000001112342000013100000000022
12374731237110511151064300001121064200001491221602610611000971310643000053200091
12447730000026106090009849103520261061110643261060910641491035202612570103582612
12520735461257012125460000326000001064126125821038227000001064349000000000000000
0‡000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000010203040002040608000306090210040802161005001510200602181420070411282
00806142230090817263000000000050607080900121416181518112427202428223635203530454
03632484455324946536048465462754453627180123456789123456789023456789013456789012
```


PROGRAM 80- 4C, CONDENSED DECK LISTING.

```
31000800006049000720000000000851812039007918766820000000000005004900000‡36000000
41000000000036002100050049002100000000000000000000000000000000000000000000000000
36000000050036000800050036003000050036003220050049001280000000000000000000000000
3600100005003600180005003600260005004900944‡16000790016626000740016325004020166
11001630000111000790000112001650000147000560120036001590050045000440016049000000
01234567891234567890234567890134567890124567890123567890123467890123457890123456
4567890134567890124567890123567890123467890123457890123456890123456790123456780‡0
00767730000000000000000000000000000000000000000000000000000000000000000‡10000000
00840730210000000500000000099000000000010000000001000000000000000000544163594967004
00913731535456626300624955476453415 90‡16096510096749096000069000481043009940044 7
00986734901024016096510101749095200069000881047011820040026008970042626010660048
01059736389999900400110106600080120089700080460106001100260088500426270844600541
01132732600885004262708446005462600885006142708446005514826008970042616096510121
01205737490960000730008610160059500001260127100486260133000551430148299999160965
01278731012954909600006300073001609651013254909500006309999904601482013001609651
01351730136749096000063000841026014140133016096510140949095000063099999046014820
```

0̄14247̄311002601468013301609651 0̄146349096000̄07309̄99990260060100595110059500 0̄1110
0̄14977̄312710000̄12101329008971200897000̄14601260011002400730008614601624012001606
0̄15707̄35980̄158649048300160965 10̄160949095000̄06900̄088104901024017066020000̄02400891
0̄16437̄3004264601674012003900899001004826008880042912008910000̄1260172100496260060
0̄17167̄349999926005950060412005950000̄12600897004262600561005511400595000 0̄04601842
0̄17897̄30120021005600089712008970000̄11200595000 0̄146017940110026019780056126020680
0̄18627̄305461202068000 1̄021020670060416096510̄191349096000̄06600̄0481016096510̄1943490
0̄19357̄396000̄06300̄069001609651 0̄1973490954000̄06309̄9999016096510̄200349095600̄06600̄063
0̄20087̄3001609651 0̄20334909580̄06600̄0660016096510̄20634909540 0̄06609̄9999026008970042
0̄20817̄3612008970000̄116005950000̄12602266005511202266000 1̄0210226500604260229600546
0̄21547̄3120229600 0 1̄02102295006042602326005612602356005462602425005262400595006044
0̄22277̄36025440120016096510̄226149096000̄06309̄9999016096510̄229149095400̄06309̄9999016
0̄23007̄3096510̄232149095600̄06309̄9999016096510̄235149095600̄06309̄99990440239000628330
0̄23737̄3062800000490240203200628000001609651 0̄242549096009̄99990̄0630024005950060446
0̄24467̄30250001100210226500897110235600 0 1̄011024250001̄04902568011022660001̄01102356
0̄25197̄30001̄011024250001̄04902568011022660001̄011023560001̄012008970000̄111005950000̄1
0̄25927̄32400595004264702214011002600592004261600598000 0̄12602928005612602958005512
0̄26657̄36031080054626031330053124005980060447027800130046031520120026006070060426
0̄27387̄30061000598170630000 0̄0260285600571490282802600607005982600610006041706300
0̄28117̄30000̄02602856005711609651 0̄285149096000̄06309̄9999026028980285616096510̄289349

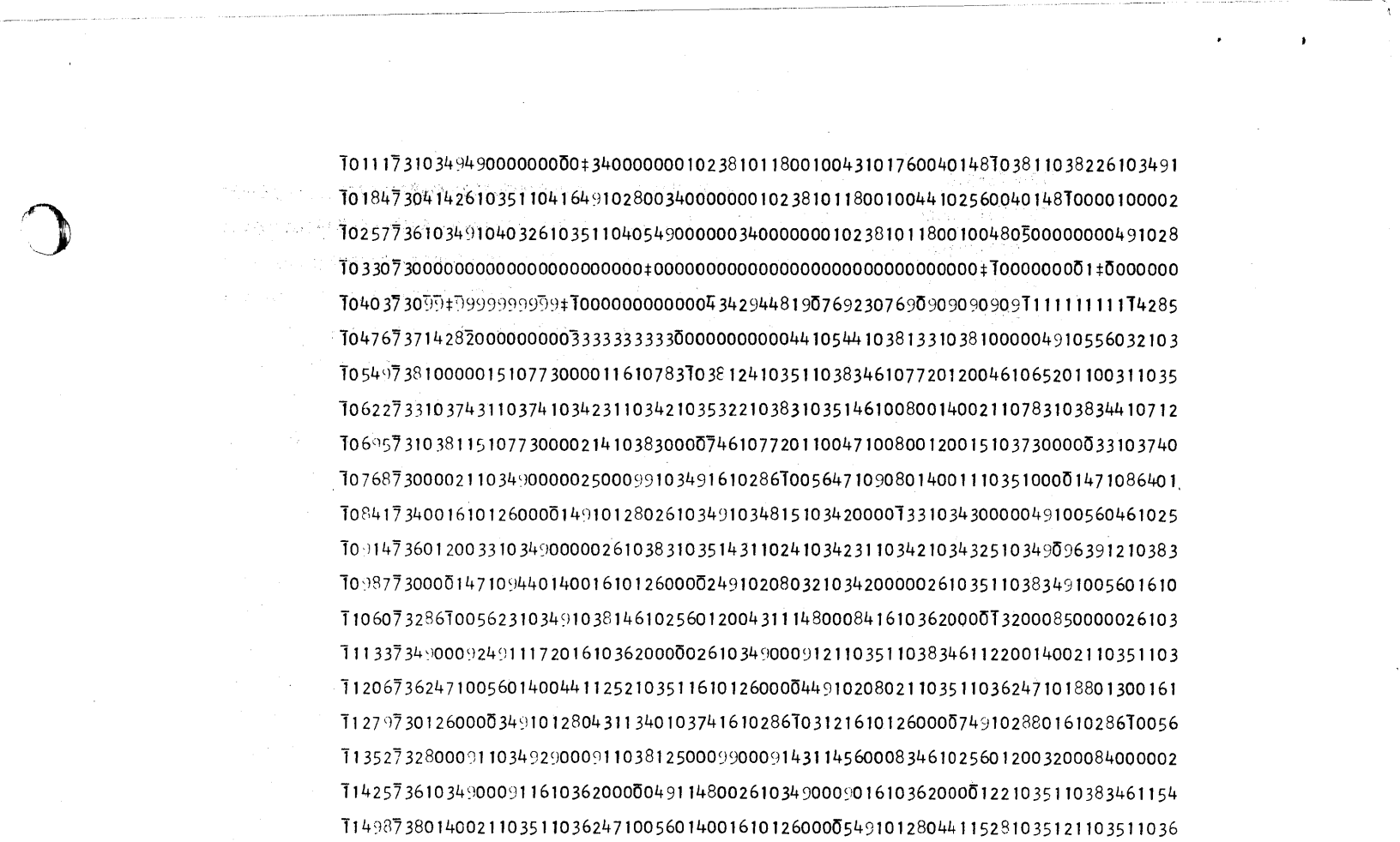
0̄28847̄309540 0̄06309̄999901609651 0̄292349095600̄06309̄9999016096510̄295349096000̄06409̄99
0̄29577̄39901609651 0̄298349095000̄06400̄06300160965 10̄301349095600̄06400̄0481016096510̄30
0̄30307̄34349095800̄06400̄064001609651 0̄307349095400̄06400̄06600160965 10̄310349095600̄064
0̄31037̄309̄9999016096510̄313349096009̄99990̄06400110313300001̄0210295700592110310800001̄0
0̄31767̄31100598000 0̄112005920000̄14602688011002600589008912603295005362603300005262
0̄32497̄36033250053626033300053116096510̄329549096009̄99999̄9999016096510̄33254909560 9̄
0̄33227̄399999̄999901103295000 1̄011033000001̄011033250001̄011033300001̄0120058900 00̄1460
0̄33957̄3327201100430342400447490346201609651 0̄344749096000̄06500̄0861049037500260352
0̄34687̄36005411203526000 1̄02103525006041609651 0̄352149096000̄06509̄99990260058900 4261
0̄35417̄36005950000̄126036280052626036580054124005950060446037140120016096510̄362349
0̄36147̄3096000̄06309̄9999016096510̄365349095400̄06309̄9999016096510̄368349095000̄06500̄06
0̄36877̄33001103628000 1̄011036580001̄011005950000̄112005890000̄14603576011002603838005
0̄37607̄34612038380001̄021038370060426038680383826038980056116096510̄383349096000̄068
0̄38337̄309̄9999016096510̄386349095400̄06809̄9999016096510̄389349095600̄06809̄99990160965
0̄39067̄310̄392349095400̄06800̄0481026040060054612040060001̄021040050060426040360400 61
0̄39797̄36096510̄400149096000̄06309̄9999016096510̄403149095400̄06309̄9999043040580044749
0̄40527̄304196026041340054112041340001̄02104133006042604164041341609651 0̄41294909600
0̄41257̄30̄06409̄99990160965 10̄415949095400̄06409̄9999016096510̄418949095000̄06300̄0640016
0̄41987̄3096510̄421949095400̄06300̄0481016096510̄424949096000̄06400̄0680016096510̄4279490
0̄42717̄395600̄06400̄063001609651 0̄430949096000̄06700̄0881016096510̄433949095000̄06700̄064

0̄43447̄30016005950000̄126008970042626044120049124005950060446044300120026999990059
0̄44177̄3511044120000̄21100595000̄11200897000̄146043820110016081580̄44864907802043 04
0̄44907̄3518004481607800̄0̄4518490705601101721000̄21200888000̄14601710011004304574 00
0̄45637̄3452490459802600885006142708446005514304618004534904810026005860042616006 0
0̄46367̄310000̄12604677004862604697004864504686999994904726043047069999949047260160
0̄47097̄36598̄0̄4726490483001100601000̄111046770000̄111046970000̄112005860000̄14604666 0
0̄47827̄31100260088500614270844600551360000000500490000002604877004861204877000̄12
0̄48557̄310487700601430491099999160520 3̄0̄0000150645300001490493401605203̄0̄0005150645
0̄49287̄33000002600607006012600610006011706300000̄0̄2605034005712605059005712605089
0̄50017̄3005711609651̄0̄502949096000̄0̄6309̄99990160965 1̄0̄505949096009̄99990̄0881016096510̄
0̄50747̄35089490956 09̄99990̄063002605484005712606050005712606045005712606196005711 10
0̄51477̄36045000̄1̄0160059500 0̄0̄1160059800 0̄0̄12600576005511600581̄0̄0000240060100595460 5
0̄52207̄38740120024006010059846058740120046055980110021005810520326006070060126006
0̄52937̄31000598170630000 0̄0̄0260542400571240059500601460573001100260060700595260061
0̄53667̄3000601170630000 0̄0̄02605454005711609651̄0̄54194909600 0̄0̄6309̄9999016096510̄54494
0̄54397̄3909540̄0̄6309̄99990160965 1̄0̄547949095400̄0̄6309̄99990430554800581260553300576 16
0̄55127̄3096 51̄0̄553349095009̄99990̄0630049058740260558300576160965 1̄0̄558349095209̄99990̄
0̄55857̄306300490587402600607005982600610006012605701004861205701000̄1210570100598
0̄56587̄3260568105701450569099999490530004305710999994905300011005810̄0̄0̄5490530002
0̄57317̄360060700601210058105203260061000595260584500486120584500 0̄0̄12105845005952 6

0̄58047̄30582505845450583499999490537204305854999994905372011005810000̄549053720110
0̄58777̄305760001̄02400426005984605930012001100598000 0̄0̄14905192024004260059546059860
0̄59507̄3120011005950000̄1260059800595490519202600598006012400598004264606084012001
0̄60237̄360965 1̄0̄6045490954 0̄9̄99999̄99990110059800 0̄0̄1110604500 0̄1̄04905998026005950060 1
0̄60967̄3120059500 0̄0̄146064060120026006070059526006100060117063000000̄2606191005711
0̄61697̄3609651̄0̄619149095409̄99999̄99990260625706191120625700 0̄0̄22606264062572606284 0
0̄62427̄3625744062789999933999990000049060960329999900000490609600022006100060726 0
0̄63157̄305710055126008970042612006070000̄14606392012002100570008971200897000 0̄0̄14906
0̄63887̄3336021005700061042260644800486120644800 0̄0̄12106448006011599999000002600897
0̄64617̄30042626065010055112065010000̄24406556999992606549065011106549000 0̄0̄2160965 1̄0̄
0̄65347̄36549490960 0̄9̄99990̄0861021065000089712008970000̄1460649001100499999900016008
0̄66077̄391000̄0̄0260664900486260089700426430665899999490670202606681066494506690999
0̄66807̄39949067020110089100000̄1110664900000̄112008970000̄146066380110042 4̄4455700654 15
0̄67537̄39000000000000000033000000000000‡6̄263440045595900680367000000 3300000‡5̄9006258
0̄68267̄36441594544000000000003300000‡6̄26454006258590059456200000033000 00‡4̄95544006
0̄68997̄35415900646245440000330000000000 0‡4̄35655626341556300634559540033000 00‡6̄541
0̄69727̄359000000000000000435645464 60‡0̄0000000000000062634400455959000000000000063005
0̄70457̄39416349560‡34000000010234000000010239067410010027085 3600604340000000010239
0̄71187̄306783001001609651̄0̄715149096200̄85840̄0̄66003909451001003400000001023906819 00
0̄71917̄3100160965 1̄0̄72174909620 0̄8584 0̄0̄670039094510010034000000010239068550010016 09

07264736510728349096200858400680039094510010034000000010239068910010027085360089
07337731340000000102340000000102390693300100160965107397490962008584006500390945
07410731001003400000001023400000001023906969001003907001001003400000001022600897
07483730089126075470049126075880052626076420053126076960053627085369999934000000
07556730108160965107583490962008584999990390945100100340000000108160965107637490
07629739620085849999903909451001003400000001081609651076914909620085849999903909
07702734510010034000000010211075470002110758800010110764200010110769600010012008
07775739700001460753601100499999901108175000012600753081752600756006042600759008
07848739126007620042616096510788549096000078000650016096510791549096000079000670
07921730160965107945490960000800006600160965107975490960000810007000160965108005
07994734909600008200068001608218080324908164026005860042626080620048638999990040
08067730110806200080120058600080460805601100110818700001270822400526270822400531
08140732708224005364999999000001600826000001600830000013800751004001108187000014
08213739999990000026083440822326006300089114006300000746082920110026005860063049
08286730830401600586000071608339007601609651083394909600999999999901108339000101
08359731083440001012005860000146083160110016082180841449081640120063000007460824
08432738011004200000038004020040026084880844512084880000938999990040011084880008
08505730120088500008460848201100420000260083008535330082900000380082900100420000
08578730000003308574000002609471094833309462000002609461094931609452000001609495
08651730000044086920858115094940000233085810000014085830009946090280120014085830

08724730000470907401100140858300004460915401100160882308574160881809461220881808
08797735832208818085832599999999999110882300001110881800002140881809459470881201 1
08870730026089790882316094970000522094970858316089550948322089550949722089550949
08943737210945999999160897409463250946300000110897900001110897400002140897409471
09016734708968011004309048094534909360015094710000026094510949542140858300004470
09089739154011001608979085741608974094632208974085832208974085834908968026094540
09162739476440921408583160945100020330858300000330945200000250945508583250945308
09235735823309453000002609459094953309458000001609309085741609304094632599999999
09308739911093090000111093040000214093040947147092980110042160938309455430940409
09381734551109383000024909372026094340938312094340000226999990949542000000000000
0945473000000000000000000±7070707070000000000300007016100541051249096400161005 4
09527731055649096400161005411056490964001610054112964909640016100541163249097440
09600731610054122124909744016100541224449097440260970700000440969609707330970700
09673730002609707097074909652026103510000026097430970712097430000226103490000015
09746730999900002260977909651261009800000110965100005260981509651260987100000440
09819739860098713309871000002609871098714909816026103830000026099070987112099070
09892730002261038100000261012209651440996410098331009800000261009810098490992002
09965736101101009812101100000211101220000012099990000147100360120015099990000246
10038731004801400490000004410080000993210349000001110349000002600000103512600000



1̄01117̄31034949000000000̄0‡34000000010238101180010043101760040148 1̄03811038226103491
1̄01847̄30414261035110416491028003400000001023810118001004410256004014 81̄0000100002
1̄02577̄36103491040326103511040549000000340000000102381011800100480 5̄00000000491028
1̄03307̄3000000000000000000000‡00000000000000000000000000000000‡1̄00000000̄1‡0̄000000
1̄04037̄3099‡9999999999‡1̄0000000000004̄3429448190̄7692307690̄9090909091̄111111111 1̄4285
1̄04767̄3714282̄0000000003̄3333333330̄0000000000044105441038133103810000049105560321 03
1̄05497̄3810000015107730000116107831̄0381241035110383461077201200461065201100311035
1̄06227̄3310374311037410342311034210353221038310351461008001400211078310383441071 2
1̄06957̄31038115107730000214103830000̄7461077201100471008001200151037300000̄33103740
1̄07687̄3000021103490000025000991034916102861̄005647109080140011103510000̄1471086401
1̄08417̄34001610126000 0̄14910128026103491034815103420000 1̄33103430000049100560461025
1̄09147̄36012003310349000002610383103514311024103423110342103432510349 0̄96391210383
1̄09877̄30000̄1471094401400161012600 0̄2491020803210342000002610351103834910056016 10
1̄10607̄32861̄005623103491038146102560120043111480008416103620000̄1̄32000850000026103
1̄11337̄349000924911172016103620000̄02610349000912110351103834611220014002110351103
1̄12067̄36247100560140044112521035116101260000̄44910208021103511036247101880130016 1
1̄12797̄301260000̄349101280431134010374161028 61̄031216101260000̄749102880161028 61̄0056
1̄13527̄32800091103492900091103812500099000914311456000834610256012003200084000002
1̄14257̄36103490009116103620000̄04911480026103490009016103620000̄1221035110383461154
1̄14987̄38014002110351103624710056014001610126000 0̄549101280441152810351211035110 36

449.

1̄15717̄324411604103511510126000 0̄6491020804311624103514911584049102680431166410374
1̄16447̄316102861̄0092491025604411720103811610286 1̄1708161012600 0̄84910288033103810 0
1̄17177̄30002610351104262610343103811310383000 5̄044118360009914000970000̄04611804012
1̄17907̄3003200097000004311860000981611962 1̄0337491189601100098000 0̄5431181600098331
1̄18637̄303360000015103350000 0̄1611962 1̄0336161208 2̄1̄033626121111017516119200 0̄81610
1̄19367̄33830000̄1̄11103830000̄222000001038346119440130012119290000̄14612156012002612 0
1̄20097̄3221196221000001038347120640120026120581202233000000000011119620000̄2320000
1̄20827̄30000001112082000 0̄1310000000000221211110251151038300001121038200 0̄14911956
1̄21557̄302610351000971310383000 0̄5320009100000261034900098491009202610351103832610
1̄22287̄3349103814910092026123101009826122861231012122860000̄3260000010381261232210
1̄23017̄312227000001038349000000000000000000000000000000000000000000000000000000
0‡0000000000000000000000000000000000000000000000000000000000000000000000000
000000000000102030400020406080003060902100408021610050015102006021814200704112 82
00806142230090817263000000000050607080900121416181518112427202428223635203530454
0363248445532494653604846546275445362718012345678912345678 90̄2345678 90̄1̄345678 90̄1̄2̄

PROGRAM 80 - A, CONDENSED DECK LISTING.

```
310008000006049000720000000000027176051790018804230̄000000000000005004900000‡36000000
41000000000036002100050049002100000000000000000000000000000000000000000000000000
36000000050036000800050036003000050036003220050049001280000000000000000000000000
360010000500360018000500360026000500490093 2‡1600079̄001662600074001632500̄4020̄0166
11001630000̄11100079000̄1120016500 0̄14700056012003600159005004500044001604900000 0
012345678912345678 90̄234567890̄1̄34567890̄1̄2̄4567890̄1̄2̄3̄567890̄1̄2̄3̄4̄67890̄1̄2̄3̄4̄5̄7890̄1̄2̄3̄4̄5̄6̄
4567890̄1̄34567890̄1̄2̄4567890̄1̄2̄3̄567890̄1̄2̄3̄4̄67890̄1̄2̄3̄4̄5̄7890̄1̄2̄3̄4̄5̄6̄890̄1̄2̄3̄4̄5̄6̄7̄90̄1̄2̄3̄4̄5̄6̄7̄8̄‡0
0̄07677̄30000000000000000000000000000000000000000000000000000000000000000‡1̄0000000
0̄08407̄30̄2̄100000005̄0̄000000009̄9̄0̄0000000001̄00000000̄1000000000000000005̄50044564562005
0̄09137̄35566300414759454 50‡1600589000 0̄025005890045615012930000116004140̄000 0360075
0̄09867̄31005002601149005411601154 0̄076021004140076324004260077546010660120039008 99
0̄10597̄300100483600751005002601113005011600601000 0̄1240060199999460136001200160284
0̄11327̄330̄1149490279 29̄99999̄9999011011490001̄01101154000 1̄011006010000̄12400601004264
0̄12057̄36012720110014011540̄0840470110201300360075100500160115 40̄076049011020430129
0̄12787̄3200457490138004101380000001501293000092601149005461601154 0̄0760360075 10050
0̄13517̄30490106601101113000 0̄249011680260158300551160060400 0̄0126015110050126014750
```

```
0̄14247̄3050136007510050036007510050016015880̄07602400604999994601770012002600 60100
0̄14977̄36041601547 9̄99991401588 0̄084046017180120024006019999946017500120016028430̄15
0̄15707̄383490279 29̄99999̄99990110158300 01̄0110060100000̄11101588000 1̄0240060 10042647015
0̄16437̄3120110011006040000̄12400604004264701464011001200589000 0̄146009800110049 0205
0̄17167̄38036007510050016015880̄07604901536011015470000̄2490160201101511000 0̄21101475
0̄17897̄30000̄2260060100604260187701588140187 70̄0840470187801300360075 10050016018770̄
0̄18627̄3076041000000000011018770001̄01100601000 0̄1140187 70̄08404601970012002400 60100
0̄19357̄342647018780110026015880187749016500240060400426460202601200360075 10050016
0̄20087̄3018770̄076049019260240060100426470199401100490165002602093005011202093000 0̄
0̄20817̄34260042699999270252800414130042600 0̄5260063000099260064000426110064000 0̄1
0̄21547̄3230063000640320009500000260061400098430227800457430222200449490239002600 8
0̄22277̄385004262702436005412600885006142702436005514902390043022980045049023700 26
0̄23007̄30088500426270243600541260088500426270243600546260088500614270243600551360
0̄23737̄3000000500490000004302410004454902370017026980000̄0490237000000000 3800402004
0̄24467̄300260247802435120247800 0̄93899999004001102478000 8̄01200885000 0̄846024720110
0̄25197̄3042000000160269500 0̄05160259 90̄25231602599 0̄252316026740̄04762600481008714302
0̄25927̄3644999991102599000 0̄1120269500 0̄1120267400 0̄149025880260266202599329999900
0̄26657̄300026999990252726004810269542000026008880042626027450054116028430̄27454902
0̄27387̄38129̄99990̄04810110274500 01̄0120088800 0̄146027220110042̄70160324603̄7484902832
0̄28117̄30160324 60̄424849028320260289900000440288802899330289900000260289902899̄4902
```

0̄28847̄384402603543000002602935028991202935000̄2260354100000150319100002260297102
0̄29577̄3843260329000000011028430000̄526030070284326030630000044030520306333030630 00
0̄30307̄300260306303063̄490300802603575000002603099030631203099000̄2260357300000260
0̄31037̄33314028434403156032903303290000002603290032 90̄4903112026033020329012033020
0̄31767̄3000̄211033140000̄01203191000̄0147032280120015031910000246032400140049000000 4
0̄32497̄34032720009932035410000011035410000̄026000000354326000000354149000000000̄‡34
0̄33227̄30000000102380331000100430336800401480̄357303574260354103606260354303608490
0̄33957̄3347203400000001023803310001004403448004014 81̄000010000260354103595260354 30
0̄34687̄335974900000034000000010238033100010048 05̄0000000049034720000000000000000000
0̄35417̄3000‡0000000000000000000000000000000‡1̄00000000̄1‡0̄00000009̄9̄‡9̄99999999̄9‡1̄000
0̄36147̄30000000004̄342944819 0̄7692307690̄9090909091̄1111111111̄42857142 8̄000000000̄3333
0̄36877̄3333330̄000000000044037360357333035730000049037480320357300000150396500001
0̄37607̄31603975 0̄357324035430357546039640120046038440110031035450356631035660353 43
0̄38337̄31035340354522035750354346032720140021039750357544039040357315039650000214
0̄39067̄303575000 0̄746039640110047032720120015035650000 0̄330356600000210354100000250
0̄39797̄30099035411603478 0̄324847041000140011035430000̄147040560140016033180000̄14903
0̄40527̄3320026035410354015035340000 1̄33035350000049032480460344801200330354100000 2
0̄41257̄360357503543430421603534310353403535250354 10̄283112035750000̄147041360140016
0̄41987̄3033180000̄2490340003203534000002603543035754903248043042920356616034780̄350
0̄42717̄3416033180000̄7490348001603478 0̄3248280009103541290000910357325000990000914304

0̄43447̄34080008346034480120032000840000026035410009116035540000̄0490443202603541 00
0̄44177̄309016035540000̄12203543035754604500014002103543035544703248014001603318000
0̄44907̄30̄549033200440448003543210354303554440455603543150331800 0̄6490340004304576
0̄45637̄303543490453604903460000000000000000000000000000000000000000000000000000000000000
0‡000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000001020304000204060800030609021004080216100500151020060218142007041128 2
008061422300908172630000000000506070809001214161815181124272024282236352035304 54
036324844553249465360484654627544536271801234567891234567890̄23456789 0̄1345678 90̄12̄

```
3100080000604900072000000000056431578808636899592000000000000050049000004360000000
360024000050426000470005416000540000111000540000031000139000104500012002404900242000
0016000350010026000900029917000600014000393600000005004900000012345678912345678900
4100000000003600210005004900210000000000000000000000000000000000000000000000000000
3600000005003600080005003600300005003600322005004900128000000000000000000000000000
3600100005003600180005003600260005004905830416000790016626000740016325004020016611
1001630000111000790000112001650000147000560120036001590050045000440016049000000
0123456789123456789023456789013456789012456789012356789012346789012345789012345678
4567890134567890124567890123567890123467890123457890123456789012345678904
0062173000000000000000000000000000000000400000000000000000000000000000000000000000
0081873040000000000000000000000000000000000000000000000000000000000000000000000000
0346073444557006541590000000000000033000000004263440045595900680367000000330000
0353573459006258644159454400000000033000004263454006258590059456200000033000004
0360873495544006541590064624544000033000000000043565562634155630063455954003304
0368573465415900000000000435645464604000000000000000626344004559590000000000000
0375873630059416349560457595642000400654159000400564262455904262454620056460065400
```



```
0383173159494142534562042626454620056460062586441594562004155440043595662622057594
0390473564464436362042165455941474562042634155444159440044456549416349565562042
0397773356595945534163495650054416359496704263455700042359415562465659544544004
0405073435659594553416349565500544163594967042634557000423594155624656595445440034
0412373163495655005441635949670400000260419604153260422504153210422400570369999
0419673900500110419600070140419639999947041900130042000000000360338000500160430204
0426973033891607865042974907834049163999903905783001003400000001081104302000701204
0434373424900001470439601100140430203459470427401100490425003400000001023400000004
0441773102499999900000260065104431330065000000380065000100423603380005001604302004
0449073338926006570042616006540000127046440065426042490065716044260456249043640104
0456373100654000011400654000054704610011001600654000011200657000014704518012004904
0463673999990003400000001081204643000014604644011004227044320040334000000010127004
0470973443200405340000000101270443200407340000000102390377500100270443200409340004
0478773108270443200426390378700100340000000108260065100414330064700000380064700104
0486273390379900100340000000102340000000102499999900000000003304906000002605803004
0493673581533057940000026057930582516057840000016058270000440502404913150582600004
0501173233049130000014049150009946053600120014049150000470540601100140491500004004
0508473460548601100160515504906160515005793220515004915220515004915259999999999104
0515773105155000011105150000021405150057914705144011002605311051551605829000052204
0523173582904915160528705815220528705829220528705829210579199999160530600579525050
```

0̄53047̄3795000001105311000̄0̄11105306000̄021405306̄0̄5803470530001100430538005785490 56
0̄53777̄392015058030000026057830582742140491500̄0̄44705486011001605311̄0̄490616053060̄
0̄54507̄35795220530604915220530604915490530002605786058084405546049151605783000̄203
0̄55237̄33049150000033057840000025057870491525057850491433057850000026057910582733
0̄55977̄3579000000160564 1̄0̄49061605636 0̄57952599999999999110564100 0̄1110563600 0̄21405
0̄56707̄3636 0̄58034705630011004216057150̄5787430573605787110571500̄0̄2490570402605766
0̄57447̄3571512057660000̄226999990582742000000000000000000000000000000̄‡70707070700̄
0̄58257̄330000370065900500340000000102390065900100450589000817490583000000340000 00
0̄58997̄31023400000001023600661005004305994006624306162006644306422006664306534006
0̄59727̄3684306658006704907808036004020050016049040̄60264904682039038130010034000 00
0̄60477̄31023400000001022604249004261604426 0̄60944904250039038490010034000000010234
0̄61277̄31023600402005001604640̄5938490447003600402005004306206006621604904 0̄620649
0̄62017̄34682039039190010034000000010234000000010226042490042616044260̄62744904250 0
0̄62747̄33600402005003903937001003400000001023400000001022604249004261604426 0̄63544
0̄63477̄39042500360040200500390397700100340000000102340000000102160464 0̄59504904 47
0̄64227̄33600402005004306478006624306478006641604904 0̄647849046820390402700100340 00
0̄64997̄31023400000001021604640̄59624904470036004020050043066020066243066020066443
0̄65737̄36602006661604904 0̄660249046820390408900100340000000102340000000102160464 0̄0̄
0̄66467̄35974490447004706670009003400000001023600562005003600482005001704154 0̄09801
0̄67197̄370415401̄7801704154 0̄25803904015001002600651005643300649000003800649001 0034

0̄67997̄310234000000010239034610010027044320056734000000010239035010010016078650̄68
0̄68727̄385490783404̄91600̄611039057830010034000000010239035370010016078650̄695149078
0̄69457̄33404̄9160̄06010390578300100340000000102390357300100160786507̄0174907834 0̄4916
0̄70187̄30̄06310390578300100340000000102390360900100260065100570330065000000380 0650
0̄70937̄310034000000010234000000010239036510010016078650̄7155490783404̄91600̄59103905
0̄71667̄378300100340000000102340000000102390368700100390371700100340000000102260 06
0̄72397̄34600573160040300 0̄1160729300̄48216073640̄082143073029999949073820260732507 2
0̄73127̄39345073349999949073820240040300567460738201200269999004031107364000̄21 10
0̄73857̄3729300 0̄111004030000̄1120064600 0̄146072820110016075010̄082116075660̄09891607
0̄74587̄36200̄1789160767400̄25892600646005702600651999993300650000003800650001 0034000
0̄75357̄310816078650̄75614907834 0̄49160̄0989039057830010034000000010816078650̄76154907
0̄76087̄383404̄9160̄1789039057830010034000000010816078650̄7669490783404̄9160̄2589039057
0̄76817̄383001003400000001021107501000̄2110756600 0̄1̄0110762000 0̄1̄01107674000 1̄0120064
0̄77547̄360000̄146074900110034000000010234000000010247066700090048000000000004905830
0̄78327̄3701608268 0̄8726490795802607921000004407910079213307921000002607921079 2̄1490
0̄79057̄37866026085650000026079570792112079570000̄22608563000001508213000022607993 0
0̄79787̄37865260831200000110786500 0̄52608029078652608085000004408074080853308085 00
0̄80547̄32608085080855̄4908030026085970000026081210808512081210000̄2260859500000260 83
0̄81277̄33607865440817808312330831200000260831208312̄49081340260832408312120832400 0
0̄82007̄30̄21108336000 0̄012082130000̄14708250012001508213000024608262014004900000440

0827373829400099320856300000110856300002600000085652600000085634900000000+3400

0835173102380833200100430839000401480859508596260856308628260856508630490849403 4

0843173102380833200100440847000401481000010000260856308617260856508619490000003 4

0851173102380833200100480500000000490849400000000000000000000+0000000000000000

0859873+1000000001+0000000099+9999999999+1000000000000434294481907692307690909

0867273909111111111142857142820000000033333333330000000000260879208312260876 8

0874673879212087680000326000000859526088040833627000000859749000000000000000000

0+0000000000000000000000000000000000000000000000000000000000000000000000000000

0000000000001020304000204060800030609021004080216100500151020060218142007041128 2

0080614223009081726300000000005060708090012141618151811242720242822363520353045 4

0363248445532494653604846546275445362718012345678912345678902345678901345678901 2

459.

PROGRAM 80 - C, CONDENSED DECK LISTING.

3100080000604900072000000000837469426998481829210000000000005004900000+36000000

3600240005 0+2600047000541600054000011100054000003100139000104500012002404900242 0

0016000350010026000900029917000600014003936000000050049000000123456789123456789 0

4100000000003600210005004900210000000000000000000000000000000000000000000000000 0

3600000005003600080005003600300005003600322005004900128000000000000000000000000 0

3600100005003600180005003600260005004906376+1600079001662600074001632500402001 66

1100163000011100079000011200165000014700056012003600159005004500044001604900000 0

0123456789123456789023456789013456789012456789012356789012346789012345789012345 6

4567890134567890124567890123567890123467890123457890123456890123456790123456780+0

0062173000000000000000000000000000000000000000000000+0000000000000000000000000000 0

0083073 0+0000000000000000000000000000000000000000000000000000000000000000000000000 0

0099273 0+0000000000000000000000000000000000000000000000000000000000000000000000000 0

0371473445570065415900000000000000330000000+0263440045595900680367000000330 00

0378973+5900625864415945440000000003300000+0264540062585900594562000000330 0000+

0386273495544006541590064624544000033000000000+4356556263415563006345595400330

0393973+0541590000000000043564546460+0000000000000006263440045595900000000000

460.

0̅40127̅3630059416349560‡5̅7595642000‡0̅0654159000‡0̅056426245590‡6̅264546200564600654
0̅40857̅31594941425345620‡6̅2645462005646006258644159456200415544004359566262205759
0̅41587̅35644644363620‡4̅16545594147456 20‡6̅26341554441594400444565494163495655620‡4̅
0̅42317̅3356595945534163495655005441635949670‡6̅2634557000‡6̅3594155624656595445440 0
0̅43047̅34356595945534163495655005441635949670‡5̅9454955654559634544004356595945534
0̅43777̅3163495655005441635949670‡000000000033044020000026052990531133052900000026
0̅44517̅35289053211605280000̅0016053230000̅04404520044091505322000 02̅3304409000001404
0̅45247̅34110009̅946048560120014044110000̅47049020110014044110000̅446049820110016046
0̅45977̅3510̅440216046460̅5289220464604411220464604411259999999999911046510000̅1110464
0̅46707̅360000̅214046460̅528747046400110026048070465116053250000̅52205325044111604783
0̅47437̅30̅531122047830532522047830532521052879999916048020̅529125052910000011048070
0̅48187̅30̅111048020000̅214048020̅529947047960110043048760528149051880150529900000260
0̅48917̅35279053234214044110000̅44704982011001604807 0̅44021604802 0̅5291220480204411 22
0̅49657̅3480204411490479602605282053044405042044111605279000 2̅033044110000033052800
0̅50427̅32505283044112505281044103305281000002605287053233305286000001605137 0̅44021
0̅51157̅36051320̅529125999999999991105137000 0̅111051320000̅214051320̅529947051260110042
0̅51887̅3160521 1 0̅52834305232052831105211000 0̅249052000260526205211120526200 0̅226999
0̅52617̅3990532342000000000000000000000000000000 0̅‡7̅07070707 0̅0000000003000000000026
0̅53357̅3537405331260540305331210540200570369999900500110537400 7̅0 1405374 9̅99994705
0̅54087̅33680130042000000160546 6 0̅0658160547 1 0̅5423260065805311250065899999260551905

0̅54817̅346612054710000̅112054660000̅24405460006582605538055193399999000002605574055
0̅55547̅31912055740000̅13299999000004200001605670̅0691310067000832360363400500 16056
0̅56277̅3620̅36431608591 0̅56574908560̅44129̅999902699999052991105670000 2̅6140567 0̅0831
0̅57007̅34605780011001105662000 1̅0120558500 0̅14705824011001405662 0̅37134705634011004
0̅57737̅39056100390067100400160567 0̅0691310067000832490571201405670̅06914605860012
0̅58487̅33900671004003900833004004999990360363400500160566 2̅0364326006690042616006
0̅59217̅366000 0̅0160567 0̅06912706078006663100670008322605585006691605878 0̅5996490574
0̅59947̅380110066600 0̅1140066600 0̅5470604401100160066600 0̅012006690000̅147059280120
0̅60687̅34999999000140607700 0̅4606138012001105670000 2̅61206077000̅1460610201100422
0̅61417̅37054240040331006700083226006770065827054240040526006830065827054240040726
0̅62167̅36890065826007050403527054240040926007110065827054240042626007210065826007
0̅62897̅33104047270542400414260074500658260075704063390067100400390083300400390083
0̅63627̅33004004999999037006710050039006710040045064200082949063760390083300400390
0̅64367̅38330040036009940050043065280099543067320099743070400099943071760100143073
0̅65097̅32401003490853400000360040200500160637 4̅0656049061400310067000832260070304 0
0̅65827̅399390067100400390083300400260558500426160587 8̅0664049055860390083300400310
0̅66567̅367000832260073704169390067100400390083300400360040200500160607 4̅0646849058
0̅67297̅380036004020050043067760099516063744̅0677649061400310067000832260068504187 39
0̅68047̅3671004003900833004002605585004261605878̅0685649055860360040200500390083300
0̅68777̅3400310067000832260070704227390067100400390083300400260558500426160587 8̅069

0̄69507̄36049055860360040200500310067000832260070504265390067100400390083300400160

0̄70237̄36074 0̄648049058800360040200500430709600995430709600997160637 40̄709649061400

0̄70967̄3310067000832260072904339390067100400390083300400390083300400160607 40̄64924

0̄71697̄3905880036004020050043072440099543072440099743072440099916063740̄7244490614

0̄72447̄331006700083226007270439939006710040039008330040039008330040016060740̄65044

0̄73177̄39058800470733600900390083300400390083300400360056200500360048200500170533

0̄73907̄320̄12341705332 0̄20341705332 0̄28343100670008322600679042772705424005642600685

0̄74657̄36582600703037472705424005672600709006583900671004003900833004003900833004

0̄75407̄331006700083226007030378716085910̄758749085600̄44120̄061102600725052993900671

0̄76157̄340031006700083226007030382316085910̄766549085600̄44120̄0601026007250529 93900

0̄76887̄36710040031006700083226007030385916085910̄774349085600̄44120̄063102600725052 9

0̄77617̄39390067100400310067000832260070303895270542400570260071100658390067100400

0̄78347̄339008330040031006700083226007030393716085910̄789349085600̄44120̄0591026007 25

0̄79087̄35299390067100400390083300400310067000832260069903967260075304025390067100

0̄79817̄340039008330040026006460057316004030000̄11608055 0̄04821608126 0̄10754308064999

0̄80547̄39949081440260808708055450809699999490814402400403005674608144012002699999

0̄81297̄34031108126000 0̄21108055000 0̄1110040300 0̄11200646000 0̄14608044011002600646005

0̄82027̄370160827 50̄1075160831 60̄1243160835 80̄2043160840 00̄284331006700083227054249999

0̄82757̄392600679006581608591 0̄83114908560 0̄4412 9̄99990260070505299160859 10̄83534 90856

0̄83497̄30̄44129̄99990260073105299160859 10̄83954908560̄44129̄99990260075705299390067 10

0̄84237̄340011082750000̄211083160001̄011083580001̄011084000001̄012006460000̄14608252011

0̄84987̄33900833004003900833004004707336009004800000000000490637600000 7̄016089940̄945

0̄85717̄32490868402608647000004408636086473308647000002608647086474̄908592026092910

0̄86487̄32608683086471208683000̄2260928900000150893900002260871908591260903800000 1

0̄87217̄31085910000̄52608755085912608811000004408800088113308811000002608811088 11̄49

0̄87957̄38756026093230000026088470881112088470000̄22609321000002609062085914408904 0

0̄88687̄39038330903800000260903809038̄49088600260905009038120905000 0̄211090620000̄01

0̄89417̄3208939000 0̄14708976012001508939000024608988014004900000044090200009932 0928

0̄90147̄3900000110928900000̄260000009291260000009289490000000000̄‡3400000001023809058

0̄90897̄310043091160040148 0̄9321093222609289093542609291093564909220034000000010238

0̄91637̄3905800100440919600401481̄0000100002609289093432609291093454900000034000000

0̄92377̄3102380905800100480 5̄0000000049092200000000000000000000000‡00000000000000000

0̄93247̄3‡1̄00000000̄1‡0̄00000009̄9̄‡9̄99999999̄9‡1̄000000000000 4̄342944819 0̄769230769 0̄90909

0̄93987̄39091̄1111111111̄4285714282̄00000000003̄33333333330̄0000000000026095180903826094 94

0̄94727̄3951812094940000̄3260000009321260953009062270000009323490000000000000000000

0‡00000000000000000000000000000000000000000000000000000000000000000000000000000000

00000000000010203040002040608000306090210040802161005001510200602181420070411282

00806142230090817263000000000005060708090012141618151811242720242822363520353045 4

0363248445532494653604846546275445362718012345678912345678 90̄234567890̄1̄34567890̄1̄2̄

PROGRAM 80 – D, CONDENSED DECK LISTING.

```
31000800006049000720000000000828352842850534391844̄0000000000005004900000‡36000000
36002400050‡26000470005416000540̄000111000540̄00003 10̄01390̄0010450001200̄2̄4049002420
00160003550̄0100260009000299170006000 1̄400̄393600000000500490000001234567891234567890̄
41000000000036002100050049002100000000000000000000000000000000000000000000000000
36000000050036000800050036003000050036003220050049001280000000000000000000000000
360010000500360018000500360026000500490185 0‡16000790̄01662600074001632 50̄04020̄0166
11001630000̄11100079000 0̄11200165000 0̄147000560120036001590050045000440016049000000
01234567891234567890̄23456789 0̄1̄3456789 0̄1̄2̄456789 0̄1̄2̄3̄56789 0̄1̄2̄3̄4̄6789 0̄1̄2̄3̄4̄5̄789 0̄1̄2̄3̄4̄5̄6̄
4567890̄1̄3456789 0̄1̄2̄456789 0̄1̄2̄3̄56789 0̄1̄2̄3̄4̄6789 0̄1̄2̄3̄4̄5̄789 0̄1̄2̄3̄4̄5̄6̄89 0̄1̄2̄3̄4̄5̄6̄7̄9 0̄1̄2̄3̄4̄5̄6̄7̄8̄‡0
0̄08187̄3‡05̄7595642000‡0̄06541590‡0̄056426245590‡1̄00000000̄2̄1̄000000005 0̄000000009̄9 0̄0000
0̄08967̄31̄00000000̄100000000000000000000000000000000000000000000000000000000000000
0̄11467̄30̄‡000000000000000000000000000000000000000000000000000000000000000000000000
0̄13087̄30̄‡000000000000000000000000000000000000000000000000000000000000000000000000
0̄13887̄32601430013871201430000̄926005860074636999990050011014300007̄01200586000̄74
0̄14617̄36014240110042000000160152 20̄1321160152 70̄1479260132108435250132199999260157
0̄15347̄350152212015270000̄1120152200000̄244015169999926015940157533999990000026 01630
```

```
0̄16087̄3157512016300000̄13299999000004 25̄642620000000000004143636441530‡0̄0000000000
0̄16867̄3575945440000000000000000005945620‡6̄262585900000000000000 33000‡4̄462585921626
0̄17597̄3258590033000‡6̄264540059456200000033000‡4̄165450041420059456233000‡5̄6426245
0̄18327̄359654163495655620‡3600906005003400000001023101148009863701149005003901149
0̄19077̄310034000000010243019460090939011490040045019660130749018740430200200909 39
0̄19827̄3987004003900987004003400000001021610500̄2034490889603600738005002600586 00
0̄20557̄3426260207600486369999900500110207600 08̄012005860008̄046020700110027013880 05
0̄21287̄32627013880053127013880053631011480098626011790166926012250171743022500090
0̄22017̄37340000000102390114900100340000000102340000000102430228600909390114900400
0̄22747̄339009870040016033890̄000015039250000116107950̄23334910744 0̄04810̄0885016107 95
0̄23477̄30̄23634910744 0̄0667 0̄0885016107950̄23934910744 0̄1351 0̄0885016107950̄242349107440̄
0̄24207̄31361 0̄0885016107950̄24534910744 0̄1371 0̄0885016107950̄24834910744 0̄1381 0̄08850260
0̄24937̄33066005161203066000 1̄021030650074326034420306626046820042027046880051647 02
0̄25667̄36180010026057720042026058140051616058820̄2618490577401400432000 0̄046027 1001
0̄26397̄3200170588600 0̄0470271000200260577200426260581400516160588 20̄27104905774016
0̄27147̄3595000 0̄126028110048626029040051626029340052626005860042616107950̄279349107
0̄27877̄3440̄1331 0̄076704502820999994902978026028430281143028529999949029780240059 50
0̄28617̄37434602978012001610795 0̄28994910744 0̄06279̄99990161079 50̄2929491054 40̄06279̄999
0̄29347̄39016107950̄2959491052 40̄1331 0̄0627011029340001̄01102904000 1̄01100595000 0̄11028
0̄30077̄311000 0̄112005860000̄146028000110016107950̄30614910744 0̄1341 9̄99990161079 50̄3091
```

0̄30807̄349105040̄13410̄133104303118009114903366043032520091326031770306626031820306
0̄31537̄3616107950̄317749106849̄99999̄9999016107950̄320749106840̄13310̄13310161079503237
0̄32267̄349106840̄13410̄13410490336602603299030662603304030661610795 0̄32994910664 9̄999
0̄32997̄39̄999901610795 0̄332949106640̄13310̄133101610795 0̄335949106640̄13410̄134101 10338
0̄33727̄390000̄11701480̄0000310114800986260115701321161079 50̄343749107640̄75369̄999902
0̄34457̄3601183084231610795 0̄347949107640̄75360̄133102601209084231610795 0̄352149107640̄
0̄35187̄375360̄13410260123708425430357600907390115100100340000000102430360000909390
0̄35917̄31149004001610795 0̄362349107440̄06270̄134101610795 0̄365349105440̄06270̄062701610
0̄36647̄37950̄368349105240̄06670̄062701610795 0̄371349105240̄1370̄134101610795 0̄374349105
0̄37387̄340̄1350̄134101610795 0̄377349107440̄06270̄13510161079 50̄380349105440̄06270̄062701
0̄38117̄36107950̄383349105240̄13610̄06270161079 50̄386349107440̄1350̄1341044038940133933
0̄38857̄3133900000161079 50̄391749105240̄1380̄1341041039780000015039250000916107950̄39
0̄39587̄37149107440̄13610̄08850161079 50̄400149105240̄04810̄090504702538009003400000000 10
0̄40317̄323400000000102270148003389310114800986260115901321260118501849390114900100
0̄41047̄33400000000102310114800986260117101795161079 50̄416349107640̄75360̄137102601199
0̄41787̄384253901149001003400000000102430425400909390098700400390098700400390114900
0̄42517̄34003101148009862601171018211610795 0̄430149105640̄13810̄04810161079 50̄4331491 0
0̄43247̄37640̄75360̄1381026011990842539011490010034000000001024304398009093901149 0040
0̄43987̄3310114800986260117101743161079 50̄444549107640̄75360̄0667026011990842539011 49
0̄44737̄3100340000000010243045120090939011490040031011480098626011710176916107950̄45

0̄45467̄35949105640̄13610̄06670161079 50̄458949107640̄75360̄136102601199084253901149 0010
0̄46207̄3340000000010243046560090939011490040048000000000004901850000000000000000 26056
0̄46937̄3110468716047660̄4768260473500501260572799999320572600000320572400000 499999
0̄47667̄3903701149005001604766 0̄480416057320̄1147210573205725210573205725260574600 89
0̄48397̄35260573700890140573 20̄1303460476801300140572300000̄046056780120015057620 0000
0̄49127̄3260505005732260507905050260509405050260511805050260503805050120503800 00̄11
0̄49857̄36050740̄57461605142 0̄57461605310 0̄57472205310057253299999000001499999 0007̄047
0̄50597̄3508801300259999999999994905196014999990000̄346051760120014999990002̄046051560
0̄51327̄31200159999900000490519603205762000004905136011053100000̄149052200120507400
0̄52067̄30̄112051420000̄11205050000̄212050790000̄212050940000̄212051180000̄212050380000̄
0̄52797̄32240507405310460503201300329999900000140574600000̄0460570001200260575600895
0̄53527̄333057470000016057610̄5747220576105310260543505310320576000000220576105727 4
0̄54257̄330546899999120576100000̄11105435000 0̄1490542402605498054351105498000 0̄9269999
0̄54987̄3905761260552205435329999900000260561605498440558805762260558205616120558 2
0̄55747̄30̄232999990000016107950̄561149107449̄99999̄9999011056110001̄01204682000̄147056
0̄56477̄398011001205723000 0̄146048040110011047350000̄64904724042160561 60̄088549055880
0̄57747̄3340000000010216107950̄580949107640̄75369̄9999039084030010034000000001081105814
0̄58507̄31̄012057720000̄14605786011004999999000260741400420260594500521260595000 5161
0̄59237̄36107950̄594549107449̄99999̄9999011059450001̄01105950000 1̄012074140000̄146059220
0̄59967̄311002607414004322606035005062605727999993205726000003205724000003205722 00

0̄60727̄32606136005161206136000 1̄021061350572516107950̄613149107440̄74249̄999902607367

0̄61477̄35161207367000 1̄0210736605723130572100000̄51606221 0̄742421062210009926062 28999

0̄62207̄39949999990260629400521120629400 01̄021062930572516107950̄628949107440̄74249̄99

0̄62937̄3990490734404406336074223307422000004907344032074220000049073440260642 0005

0̄63667̄31112064200001̄0210641905727161079 50̄6415491052 40̄74249̄99990490734402606 49400

0̄64397̄35111206494000 1̄0210649305727161079 50̄64894910544 0̄74249̄99990490734402606 5680

0̄65137̄351612065680001̄021065670572716107950̄656349105240̄74249̄999904907344026066420

0̄65877̄351612066420001̄021066410572716107950̄663749105040̄74249̄999904907344026067160

0̄66617̄351612067160001̄021067150572716107950̄671149105440̄74249̄999904907344026067900

0̄67357̄351612067900001̄021067890572716107950̄678549105640̄74249̄99990490734401610795 0̄

0̄68087̄368234910744 0̄06270̄0905016107950̄6853491056 40̄06270̄742401610795 0̄6883491074 40̄7

0̄68817̄34240̄0627049073440260699200511120699200 01̄02106991057271610795 0̄695749107240̄

0̄69547̄374240̄742401610795 0̄698749105440̄74249̄999901610795 0̄701749106840̄74240̄74240490

0̄70277̄3734401610795 0̄705549107240̄74240̄742404907344016107950̄709349107040̄74240̄74240

0̄71007̄34907344016107950̄713149106840̄74240̄742404907344016107950̄716949106640̄74240̄74

0̄71737̄32404907344016107950̄720749106240̄74240̄742404907344016107950̄724549106040̄7424

0̄72467̄30̄742404907344016107950̄728349106440̄74240̄742404907344016107950̄73214910584 0̄7

0̄73197̄34240̄742404907344049999990161079 50̄736749107449̄99990̄74240110603500 0̄8120741

0̄73927̄340000̄14606024011004200000000000000 0̄73440̄62300̄63040̄63560̄64300̄65040̄65780̄6652

0̄74657̄30̄67260̄68000̄68980̄70320̄70700̄71080̄71460̄71840̄72220̄72600̄72980̄73360000000000033

0̄75397̄37526000002608423084353308414000002608413084451608404000̄0016084470000̄04407

0̄76127̄364407533150844600002̄33075330000014075350009̄9460798001200140753500 0̄047080

0̄76857̄32601100140753500 0̄44608106011001607775 0̄752616077700̄841322077700753522 0777

0̄77607̄3753525999999999911077750000̄11107770000 0̄214077700̄841147077640110026079 3107

0̄78337̄37751608449000 0̄5220844907535160790 70̄84352207907084492207907084492108411999

0̄79067̄3991607926 0̄84152508415000001107931000 0̄11107926000̄214079260̄842347079200110

0̄79807̄3430800008405490831201508423000002608403084474214075350000̄44708106011 00160

0̄80537̄37931 0̄752616079260̄84152207926075352207926075354907920026084060842844081660

0̄81267̄37535160840 30002̄0330753500000330840400000250840707535250840507534330840500

0̄82027̄32608411084473308410000001608261 0̄7526160825 60̄84152599999999991108261000 0̄11

0̄82757̄310825600 0̄214082560̄842347082500110042160833 50̄840743083560840711083350000̄2

0̄83487̄3490832402608386083351208386000̄22699999084474200000000000000000000000000

0̄84247̄30‡7̄07070707070̄000000000300002608588005011208588000̄5160860500 07̄816086170001̄

0̄84977̄3316086650000̄617085580000̄21604682000̄21704688 0̄0697499999900000260058908557

0̄85707̄3260864808588369999900500110858 89̄99991200589̄9999460858201100260058 9085573

0̄86437̄32999990000011086489̄9999120058900 0̄1460864201100420000001608853000̄5160875

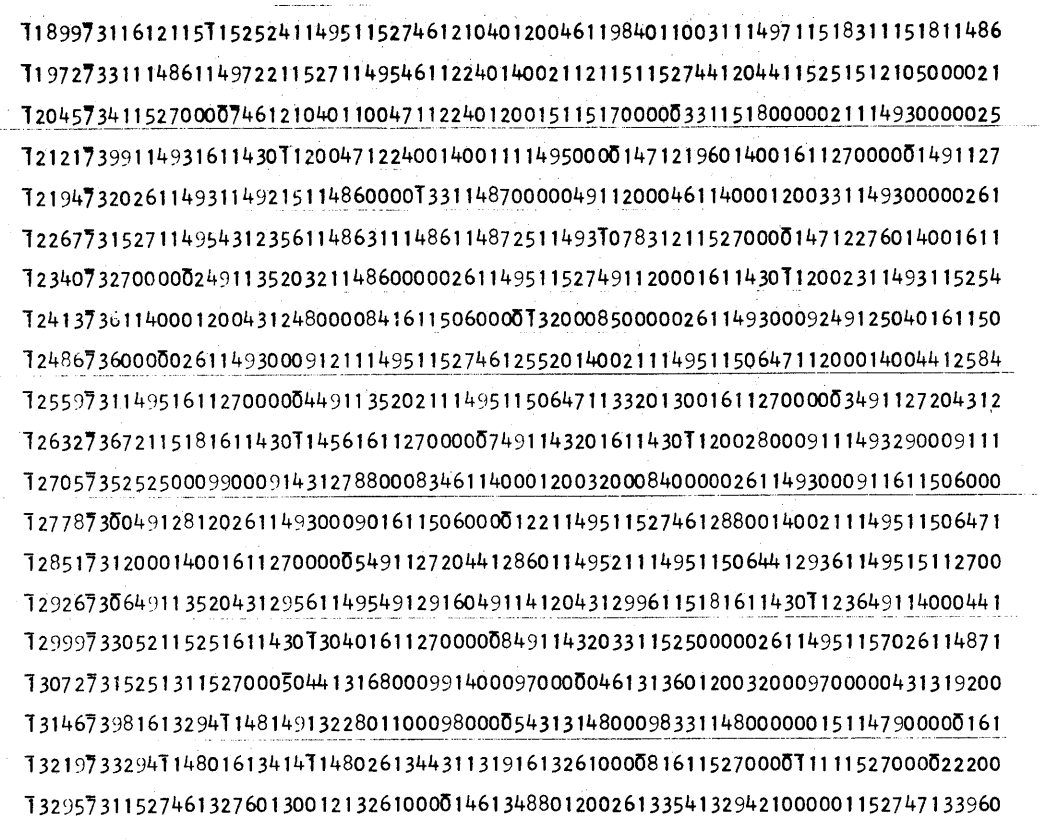
0̄87167̄37 0̄86931608832 0̄04762600481008954308802999991108757000 0̄1120885300 0̄1120883 2

0̄87927̄3 0̄149087460260882008757329999900000269999908697260048108853420000002600817

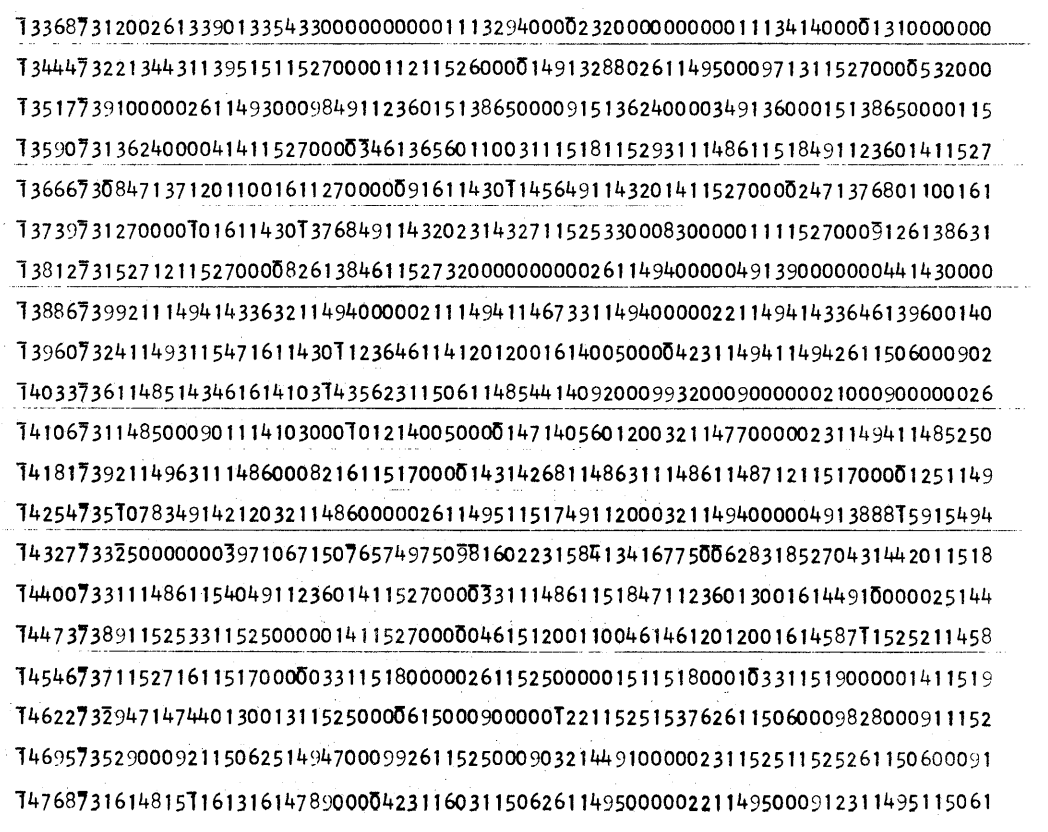
0̄88667̄3885733008160000038008160010042360040200500320040200000320040400000 3200406

0̄89447̄33200408000003200410000003200415000003200418000003200421000003200424000003
0̄90177̄32004270000032004300000032004330000032004360000032004380000016048630̄130116
0̄90927̄34861̄750026006270048611006270008̄01400426000 8̄047091600110011006270008̄011006
0̄91657̄3270000̄126004910062721006270042621006270042626004960062721006270042621 0062
0̄92387̄37004261100627000 0̄426005010062726006370041716005920000̄11005920000̄11200637
0̄93147̄31̄346092920110013005920007̄8210062700099110062700 00̄426005060062726006370043
0̄93877̄32160059200000̄110059200000̄1120063700 01̄046094000110013005920008̄0210062700099
0̄94607̄311006270000̄2260051100627210062600435260051600627210062600423260052 1006272
0̄95337̄31006260042026005260062721006260042626005310062721006260042626005360062716
0̄96067̄3107950̄962749107440̄06970̄088501610795 0̄965749107440̄07070̄088501610795 0̄9687491
0̄96807̄37440̄06870̄08850430977400443260058600426260973600486369999900500120058600 08̄
0̄97547̄34609730011004909846026085880049612085880000̄116086050008̄016086170004̄016086
0̄98277̄36500 00̄22708558004291400435000 0̄46099020110014004320000̄460999801100491007
0̄99027̄326085880050112085880000̄516086050007̄816086170001̄31608665000̄6170855800 01̄32
0̄99757̄36046820043527046880051126085880050612085880000̄716086050008̄016086170001̄016
1̄00497̄386650000̄82708558004324310090004444910110016085521̄011049084500260858800501
1̄01227̄3120858800000̄516086050007̄816086170001̄316086650000̄62708558004172600556005162
1̄01957̄31005550042614004370000̄46102660120016048630̄114921048630043721048630043727
1̄02697̄38698004143400000000102270885800403340000000010127088580040534000000001012708
1̄03427̄3858004073400000000102390082100100270885800409340000000010827088580042639008

1̄04157̄333001003400000000108260081700414330081300000380081300100390084300100340000
1̄04917̄310249999907̄016111981̄18444910784016111981̄18884910784016111981̄238849107840
1̄05647̄316111981̄26284910784016111981̄29644910888016111981̄35444910888016111981̄35764
1̄06377̄3910888016111981̄43884910888016111981̄53784910888016111981̄539849108880161119
1̄07107̄381̄61184910888016111981̄61384910888016111981̄69604910888016111981̄69924910888
1̄07847̄3261085100000441084010851331085100000261085110851̄4910796026114950000026108
1̄08577̄3871085112108870000̄2261149300000151114300002261092310795261124200000111079
1̄09307̄350000̄526109591079526110150000441100411015331101500000261101511015̄4910960
1̄10047̄32611527000002611051110151211051000̄22611525000002611266107954411108112423
1̄10777̄331124200000261124211242̄4911064026112541124212112540000̄2111126600000̄121114
1̄11507̄330000̄14711180012001511143000024611192014004900000044112240009932114930000
1̄12247̄311114930000̄2600000114952600000114934900000000 0̄‡3400000001023811262001004
1̄12977̄331132000401481̄1525115262611493115582611495115604911424034000000010238 1126
1̄13707̄3200100441140000401481̄0000100002611493115472611495115494900000034000000010
1̄14437̄323811262001004805̄00000000491142400000000000000000000000‡000000000000000000
1̄15287̄3‡1̄00000000̄1‡0̄000000099̄‡9̄999999999̄‡1̄0000000000004̄3429448190̄7692307690̄90909
1̄16027̄39091̄111111111̄4285714282̄000000003̄3333333330̄0000000000261182300001111667
1̄16787̄30̄526117031166726118350000011116670000̄52611739116672611818000001111667000̄0
1̄17517̄3526117751166726118300000011116670000̄2261184211667310007511541280000000000
1̄18247̄329000000000004900000044118761152533115250000049118880321152500000151210500



473.



474.

1̄48417̄3114815000 1̄0121478900 0̄147148040120026114951157122114950009123114951152544

1̄49147̄3149601449144149481494732000910000021000911534744149961449032000910000210

1̄49897̄3911535716114950000̄12500092004004315076000821211495000 0̄131000820008325000 9

1̄50627̄311̄0783491502003200082000002611493000894411236144894911212026000911654141

1̄51357̄31527000̄8461498401100261149311652161519 8 1̄14852115198115271500000000013211

1̄52087̄34860000028000901149329000901152543153200008214115270000̄446149720110026115

1̄52817̄32500090321449000000321151800000491461203111486153584915100 5̄40419500 1̄57079

1̄53547̄363277̄853981600̄‡6̄000000001615472 1̄1572491541001615472 1̄158443154421151831114

1̄54277̄38611529491123601411527000 0̄847154220110023115841152514115270000̄34715526013

1̄55027̄347159860120043159860008233000820000026000811165311115270008̄02615580115273

1̄55757̄3200000000000011115270000̄1261561611527110000000000̄14615986014001111527000 0̄926

1̄56487̄315669115272611504000003211496000001615729 1̄605126114931165516157150000 7̄211

1̄57217̄314930000023114931150426114930009011157290001̄1121571500000̄14715718012011111

1̄57947̄3484000 1̄023114921149232000810000026114930008825114960040044112361152524000

1̄58677̄3881156947159060120012114950000̄1491595402611506000892800092115712900092115

1̄59417̄3626114930009032114950000011114950000̄1491123601611270000 1̄11611430 1̄12364411

1̄60147̄32721152515112700000249113520̄00093264270̄00255491800̄01742111990̄0729517367 0̄2

1̄60877̄3543935748 0̄6627308843 1̄1512927760151614700001491615001616147000 0̄3311518000

1̄61627̄343162061151816114301̄145616112700001̄34911432044162621152533115250000016114

1̄62357̄3301̄626216112700001̄44911352016166051̄6915151151700001̄41115180001̄54616342013

1̄63107̄321115251152511166050̄0011491627402611493115252211493116332800089114932900 0

1̄63837̄38911525261152500090321152500000321151600000231152511525261150600089211152

1̄64567̄351152526114951165416165091̄15941616495000 0̄62111495000002311495115062611495

1̄65327̄38911165090̄0010121649500 0̄147164980120023114951152522000891152526115250000

1̄66067̄322115250008943168381614723169591152721000991152524000971165531114861154 04

1̄66797̄36112360120016114950000̄325161450009925000990040043167820008731000870008812

1̄67527̄3114950000̄125000981̄07834916726032000870000044168181614532000940000026114 93

1̄68287̄39449112360150007900000231158411525261152500089321152500000231157211527491

1̄69017̄36642 0̄0000000000 0̄6931471805̄1̄3862943611̄2079441541 6̄2̄3025850929261149511527 26

1̄69747̄311493115254911236026170581124226170341705812170340000̄32600000115252617070

1̄70477̄31126627000091152749000000000000000000000000000000000000000000000000000000000

0‡000000000000000000000000000000000000000000000000000000000000000000000000000000000

0000000000001020304000204060800030609021004080216100500151020060218142007041128 2

00806142230090817263000000000050607080900121416181518112427202428223635203530454

036324844553249465360484654627544536271801234567891234567890̄234567890̄1̄34567890̄1̄2̄

PROGRAM 80 - E, CONDENSED DECK LISTING.

31000800006049000720000000000036239883628047047641̄000000000000500490000 0‡36000000
360024000050‡2600047000541600054̄0̄0000111000540̄000031̄001390̄0010450001200 2̄40490024 20
00160003550̄0̄100260009000299170006000T40̄0̄393600000000500490000001234567891234567890̄
4100000000003600210005004900210000000000000000000000000000000000000000000000
36000000050036000800050036003000050036003220050049001280000000000000000000000000
36001000050036001800050036002600050049011 88‡160007 90̄016626000740016325 0̄0402 0̄0166
1100163000 0̄111000790000 0̄112001650000̄1470005601200360015900500450004400160 49000000
0123456789123456789 0̄2345678 90̄1̄34567890̄1̄2̄4567890̄1̄2̄3̄567890̄1̄2̄3̄4̄67890̄1̄2̄3̄4̄5̄7890̄1̄2̄3̄4̄5̄6̄
456789 0̄1̄345678 90̄1̄2̄4567890̄1̄2̄3̄567890̄1̄2̄3̄4̄67890̄1̄2̄3̄4̄5̄7890̄1̄2̄3̄4̄5̄6̄890̄1̄2̄3̄4̄5̄6̄7̄90̄1̄2̄3̄4̄5̄6̄7̄8̄‡0
0̄08187̄3‡05̄7595642000‡0̄06541590‡0̄05642624559 0‡6̄264546200564600635941556246565954 4
0̄08917̄35440065415949414253456203 0‡6̄2645462005646004955576463006541594941425 34562
0̄09657̄330‡1̄0000000 0̄2̄1̄000000 05̄0̄0000000 09̄9̄0̄000000000 01̄0000000 0̄100000000000000000000
0̄11787̄30̄‡00000000340000000102370101900500390101900100340000000102450125601177490
0̄12517̄31200016037380̄127649017640260058600414260686600420270687200516260798500541
0̄13247̄327079500042047013920010026067530042026067940051616068620̄13924906754014004
0̄13977̄33200 0̄0̄04601508012001705112000 0̄0260798500551270795000426470150800200260675

0̄14707̄3300426260679400516160686 20̄15084906754012005860000̄14601288011003 4000000010
0̄15437̄32340000000102390091900100340000000102340000000102260675300420260679400541
0̄16167̄316068620̄1636490675401400432000 0̄046017400120034000000010234000000010239008
0̄16897̄357001002606753004262606794005511606862 0̄1740490675404800000000004901188000
0̄17647̄33600402005003200402000003200404000003200406000003200408000003200410000003
0̄18377̄3200415000003200418000003200421000003200424000003200427000003200430000032
0̄19127̄34330000032004360000032004380000160704 70̄11711600486 1̄500026006270048611006
0̄19857̄327000 8̄014004260008̄04702028011001100627000 8̄0110062700 0̄0̄12600491006274 30207
0̄20587̄32004434902108021006270042621006270042626004960062721006270042621006270042
0̄21317̄3611006270000̄42600501006272600637004171600592000 0̄0̄11005920000̄112006370001̄3
0̄22047̄3460218001100130059200 07̄821006270009911006270000̄4260050600627260063700 4321
0̄22777̄3600592000 0̄0̄1100592000 0̄11200637000 1̄046022880110013005920008̄021006270009911
0̄23527̄362700 0̄0̄2260051100627210062600435260051600627210062600423260052100627 21006
0̄24257̄32600420260052600627210062600426260053100627210062600426260053600627210062
0̄24987̄3600426260054100627210062600420260054600627210062600426260055100627160 8335
0̄25717̄30̄258749082840̄06970̄099701608335 0̄26174908284 0̄0707 0̄09970160833 50̄2647490828 40̄
0̄26457̄36870̄0997043027340044326005860042626026960048636999990050012005860008̄04602
0̄27187̄3690011004902806026039780049612039780000̄1160399500 8̄0160400700040̄160405500
0̄27927̄30̄2270394800429140043̄5000 0̄046028620110014004320000̄04602958011004903030 0260
0̄28657̄33978005011203978000 0̄51603995000 7̄8160400 7000 1̄31604055000 0̄617039480001̄32606

0̄29387̄38660043527068720051126039780050612039780000̄716039950008̄016040070001̄016040
0̄30117̄3550000̄82703948004324303050004444903070016041840̄30704904082026039780050112
0̄30857̄339780000̄516039950007̄816040070001̄316040550000̄62703948004172600556005162100
0̄31587̄355500426140043700000̄46032260120016070470̄101921070470043721070470043727037
0̄32317̄3460041426032680049126005890042616999990000̄011032680000̄212005890000̄1460326
0̄33047̄320110026005860042021005860042621005860042626033810054116083350̄33814908284
0̄33777̄39̄99990̄0997011033810001̄012005860000̄146033580110043034440044349035160260347
0̄34507̄340048626005890042615999990000011034740000̄112005890000̄14603468011003400000
0̄35257̄31022703906004033400000001012703906004053400000001012703906004073400000001
0̄35997̄32390082100100270390600409340000000108270390600426390083300100340000000108
0̄36727̄32600817004143300813000003800813001003900843001003400000001024999999000000
0̄37467̄316039010000̄516038050̄374116038800̄0476260048101007430385099999110380500000̄11
0̄38197̄32039010000̄112038800000̄149037940260386803805329999900000269999903745260048
0̄38927̄31039014200000026008170390533008160000038008160010042000026005890394726040
0̄39657̄3380397836999990050011039789̄999912005899̄99946039720110026005890394732 9999
0̄40387̄390000011040389̄99991200589 0000̄14604032011004226039780050112039780000̄516039
0̄41117̄3950007̄816040070001̄316040550000̄617039480000̄216068660000̄217068720̄0697499999
0̄41847̄3900000000000330418600000260508305095330507400000260507305105160506 4000̄001
0̄42577̄36051070000̄0440430404193150510600002̄33041930000014041950009̄946046400120014
0̄43317̄341950000̄047046860110014041950000̄446047660110016044350̄418616044300̄50732204

0̄44047̄343004195220443004195259999999999911044350000̄111044300000̄214044300̄507147044
0̄44777̄3240110026045910443516051090000̄522051090419516045670̄5095220456705109220456
0̄45507̄370510921050719999916045860̄507525050750000011045910000̄111045860000̄21404586
0̄46237̄30̄508347045800110043046600506549049720150508300000260506305107421404195000
0̄46967̄30̄4̄47047660110016045910̄418616045860̄507522045860419522045860419549045800260
0̄47697̄350660508844048260419516050630002̄03304195000003305064000002505067041952505
0̄48437̄3650419433050650000026050710510733050700000016049210̄418616049160̄5075259999
0̄49167̄399999911049210000̄111049160000̄214049160̄50834704910011004216049950̄506743050
0̄49897̄3160506711049950000̄24904984026050460499512050460000̄22699999051074200000000
0̄50847̄30̄‡7̄0707070700̄0000000003000000260664000420260517100521260517600516160833 50̄5
0̄51577̄317149082849̄99999̄9999011051710001̄011051760001̄012066400000̄14605148011002606
0̄52307̄36400043226052610050626079119999932079100000032079080000032079060000026053
0̄53037̄3620051612053620001̄021053610790916083350̄535749082840̄66509̄99990260659300516
0̄53767̄312065930001̄021065920790713079050000̄516054470̄66502105447000992605454999994
0̄54497̄399999902605520005211205520000 1̄021055190790916083350̄55154908284 0̄66509̄99990
0̄55227̄3490657004405562066483306648000004906570032066480000049065700260564600 5111
0̄55957̄32056460001̄021056450791116083350̄564149080640̄66509̄999049065700260572000511
0̄56687̄312057200001̄021057190791116083350̄571549080840̄66509̄99904906570026057940051
0̄57417̄36120579400 01̄021057930791116083350̄578949080640̄66509̄99904906570026058680 05
0̄58147̄31612058680001̄021058670791116083350̄586349080440̄66509̄9990490657002605942 00

0588773516120594200010210594107911160833505937490808406650999904906570026060160

0596173516120601600010210601507911160833506011490810406650999904906570016083350

0603473604949082840062701017016083350607949081040062706650016083350610949082840 6

0610773650006270490657002606218005111206218000102106217079111608335061834908264 0

0618073665006650016083350621349080840665099999016083350624349082240665006650049 0

0625373657001608335062814908264066500665004906570016083350631949082440665006650 0

0632673490657001608335063574908224066500665004906570016083350639549082040665006 6

0639973500490657001608335064334908164066500665004906570016083350647149081440665 0

0647273066500490657001608335065094908184066500665004906570016083350654749081240 6

0654573650066500490657004999999016083350659349082849999906650011052610000812066 4

0662273014605250011004200000000000000065700545605530055820565605730058040587805 95

0669573206026061240625806296063340637206410064480648606524065620003400000001021 6

0676973833506789490830404196999990390506300100340000000108110679400010120675300 0

0684273014606766011004999999000000000260779506871160695006952260691900501260791 1

0691573999999320791000000320790800000499999903701019005001606950069881607916010 17

0698873210791607909210791607909260793001007260792101002140791601173460695201300 1

0706173407907000046078620120015079460000026072340791626072630723426072780723426

0713573730207234260722207234120722200011607258079301607326079301607494079312207

0720873494079093299999000001499999000704707272013002599999999999949073800149999 00

0728273034607360012001499999000204607340012001599999000004907380032079460000049 0

0735573732001107494000014907404012072580000112073260000112072340000212072630000 2

0742873120727800002120730200002120722200002240725807494460721601300329999900000 1

0750173407930000004607884012002607940010073307931000001607945079312207945074942 6

0757573761907494320794400000220794507911430765299999120794500001110761900001490 7

0764873608026076820761911076820000926999990794526077060761932999990000026078000 7

0772173682440777207946260776607800120776600023299999000001608335077954908284999

0779473999999990110779500010120686600001470788201100120790700001460698801100110 69

0786773190000649069080421607800009974907772000000000000000000000000000000000000 0

0795073260799000516160833507985490806499999999990110798500010110799000010120794 9

0802673014607962011004270160873809384490832401608738094284908324016087380992849 0

0809973832401608738101684908324016087381050449084280160873811084490842801608738 1

0817273111649084280160873811928490842801608738129184908428016087381293849084280 1

0824573608738136584908428016087381367849084280160873814500490842801608738145324 9

0831973842802608391000004408380083913308391000002608391083914908336026090350000 0

0839273260842708391120842700022609033000001508683000022608463083352608782000001

0846573108335000052608499083352608555000004408544085553308555000002608555085554 9

0853973850002609067000002608591085551208591000022609065000002608806083354408648 0

0861273878233087820000026087820878249086040260879408782120879400002110880600000 1

0868573208683000014708720012001508683000024608732014004900000044087640009932090 3

087587330000011090330000026000000903526000000903349000000000‡34000000010238088 02

0883373100430886000401480906509066260903309098260903509100490896403400000001023 8

08907738802001004408940004014810000100002609033090872609035090894900000034000000
08981731023808802001004805000000004908964000000000000000000000000‡0000000000000000
0906873‡1000000001‡0000000099‡9999999999‡100000000000043429448190769230769090909
09142739091111111111142857142820000000003333333333000000000002609363000001109207
09218730526092430920726093750000011092070000526092790920726093580000011092070000
09291735260931509207260937000000110920700002260938209207310007509081280000000000
09364732900000000000490000004409416090653309065000004909428032090650000015096450 0
09439731160965509065240903509067460964401200460952401100310903709058310905809026
09512733109026090372209067090354608764014002109655090674409584090651509645000021
09585734090670000746096440110047087640120015090570000033090580000021090330000025
09661739909033160897008740470978001400110903500001470973601400160881000001490881
09734732026090330903215090260000133090270000049087400460894001200330903300000260
09807739067090354309896090263109026090272509033083231209067000014709816014001608
09880738100000249088920320902600000260903509067490874001608970087402309033090654
09953736089400120043100200008416090460000132000850000026090330009249100440160904
10026736000002609033000912109035090674610092014002109035090464708740014004410124
10100739035160881000004490889202109035090464708872013001608810000034908812043102
10173731209058160897008996160881000007490897201608970087402800091090332900091090
10246736525000990009143103280008346089400120032000840000026090330009116090460000
10320734910352026090330009016090460000122090350906746104200140021090350904647087
10393734001400160881000005490881204410400090352109035090464410476090351508810000

10466730649088920431049609035491045604908952043105360905816089700877649089400441
10540735920906516089701058016088100000849089720330906500000260903509110260902709
10614736513090670005044107080009914000970000046106760120032000970000043107320009
10687738161083409021491076801100098000054310688000983309020000001509019000001610
10760738340902016109540902026109830885916108010000816090670000111090670000222000
10836739067461081601300121080100001461102801200261089410834210000090674710936 01
10909732002610930108943300000000001110834000023200000000000111095400001310000000
10984732210983089351509067000011209066000014910828026090350009713090670000532000
11057739100000260903300098490877601511405000091511164000034911140015114050000115
11130731116400004140906700003461119601100310905809069310902609058490877601409067
11206730847112520110016088100000916089700899649089720140906700002471130801100160
11279738810000101608970113084908972023118670906533000830000011090670009126114030
11352739067120906700008261138609067320000000000026090340000049114400000441184000
11426739921090341187632090340000021090340900733090340000022090341187646115000140
11500732409033090871608970087764608952012001611545000042309034090342609046000902
11573736090251188616116431189623090460902544116320009932000900000021000900000026
11647739025000901111643000101211545000014711596012003209017000002309034090252500
11721739209036310902600082160905700001431180809026310902609027120905700001250903
11794735083234911752032090260000026090350905749087400320903400000491142815915494
11867733250000000397106715076574975098160223158413416775006283185270431196009058
11940733109026090804908776014090670000331090260905847087760130016120310000025120

ALPHAMERIC LISTING OF SAMPLE PROBLEM DECK.

```
3100080000604900072          5332560741668060950M          05004900000
PROGRAM 80, TEST PROBLEM, FERBER DATA. STEPWISE REGRESSION.
SENSE SWITCHES ONE AND TWO ON TO PRINT INPUT AND TRANSFORMED DATA.
0515630100031002005005005     4          1  1   11111

0101020001020300010304001 2040100
010700040703


PROGRAM 80, TEST PROBLEM, FERBER DATA.  MDV REGRESSION.
VARIABLES 3 AND 5 DESIGNATED THE DEPENDENT VARIABLES.
0515630100031002005005005     4          1  1   11111

0101020001020300010304001 2040100
010700040703


PROGRAM 80, TEST PROBLEM, FERBER DATA. ADV REGRESSION.
0515630100031002005005005  5  4          1  1   11111
0102030405
0101020001020300010304001 2040100
010700040703
```

1	33480	3440	6110	2980
2	15370	3730	2560	7510
3	27900	3790	3700	0220
4	28770	3680	1550	3150
5	32560	3580	4020	0980
6	28270	3660	3640	7500
7	26740	3330	4320	8030
8	25600	3630	3470	2620
9	17550	3070	1350	2740
10	19400	3440	5250	7510
11	32750	3760	1880	5360
12	18790	3810	3360	10130

13	24550	3270	8300	0800
14	30370	3050	6830	10930
15	16310	3610	2600	7210
16	31990	3450	3260	2540
17	18360	3600	3070	3910
18	38100	3640	7680	4960
19	22770	3440	7860	5190
20	34050	3450	2560	2620
21	24120	2990	6140	5780
22	22640	3790	2900	3190
23	22950	3470	6650	1630
24	16790	3860	5720	10960
25	24490	3940	1930	0130
26	27050	3630	2210	2940
27	30520	3610	4350	0440
28	27770	3560	3950	2130
29	24310	3730	4370	0170
30	32790	3840	2780	2040
31	30380	4070	1620	1620
1	33480	3440	6110	2980
2	15370	3730	2560	7510
3	27900	3790	3700	0220
4	28770	3680	1550	3150
5	32560	3580	4020	0980
6	28270	3660	3640	7500
7	26740	3330	4320	8030
8	25600	3630	3470	2620
9	17550	3870	1350	2740
10	19400	3440	5250	7510
11	32750	3760	1880	5360
12	18790	3810	3360	10130
13	24550	3270	8300	0800
14	30370	3050	6830	10930
15	16310	3610	2600	7210
16	31990	3450	3260	2540
17	18360	3600	3070	3910
18	38100	3640	7680	4960
19	22770	3440	7860	5190
20	34050	3450	2560	2620
21	24120	2990	6140	5780

22	22640	3790	2900	3190
23	22950	3470	6650	1630
24	16790	3860	5720	10960
25	24490	3940	1930	0130
26	27050	3630	2210	2940
27	30520	3610	4350	0440
28	27770	3560	3950	2130
29	24310	3730	4370	0170
30	32790	3840	2780	2040
31	30380	4070	1620	1620

```
TEST PROBLEM, FERBER DATA, LOAD OPTION WITH PROGRAM 80-A,
VARIABLE FIVE ELIMINATED WHILE LOADING MEANS, STANDARD DEVIATIONS,
AND CORRELATION MATRIX.
0515630200031           5             11   1          11

04
05
-5J503-1-0031-02-05-05-05-05-04-00-0-00001010001111100000000000000000000L1000000-2
K6048064-2L6038709-1M0641935-1L2323380-1M1264516-1N8931154-1K3558676-0J9473216-1
-5J503-1-0031-02-05-05-05-05-04-00-0-00001010001111100000000000000000000L1000000-2
N8931154-1K3558676-0J9473216-1K4010772-0L1623043-1J0000000-1J283516M--Q3884167-J
-5J503-1-0031-02-05-05-05-05-04-00-0-00001010001111100000000000000000000L1000000-2
J0000000-1J283516M--Q3884167-JR9262183-0L592418L--J0000000-10299407N--J520013P--
K340158L--J0000000-1R0786828-JJ8753168--J0000000-1L963400N--J0000000-10000000000


TEST PROBLEM FOR 80-B OR C, OUTPUT FROM ADV SAMPLE PROBLEM.
 1 1 1 1 1
-5J503-1-0031-02-05-05-05-05-04-00-0-00001010001111100000000000000000000L1000000-2
Q0749000-3J1172000-3J2599000-3J0020248-3J2792000-3-0000000RR-0000000RR-0000000RR
-5J503-1-0031-02-05-05-05-05-04-00-0-00001010001111100000000000000000000L1000000-2
J0765931-4N5240670-1K9841753-2M3540820-2K075378--3J7205349-1Q958802R-1K665423P--
N404574L-1J1755392-3J3159166-1L5799561-2J7872033-1R329093K-1L1000524-30000000000
-5J503-1-0031-02-05-05-05-05-04-00-0-00001010001111100000000000000000000L1000000-2
K6048064-2L6038709-1M0641935-1L2323380-1M1264516-1N8931154-1K3558676-0J9473216-1
-5J503-1-0031-02-05-05-05-05-04-00-0-00001010001111100000000000000000000L1000000-2
N8931154-1K3558676-0J9473216-1K4010772-0L1623043-1J0000000-1J283516M--Q3884167-J
-5J503-1-0031-02-05-05-05-05-04-00-0-00001010001111100000000000000000000L1000000-2
J0000000-1J283516M--Q3884167-JR9262183-0L592418L--J0000000-10299407N--J520013P--
```



```
K340158L--J0000000-1R0786828-JJ8753168--J0000000-1L963400N--J0000000-10000000000
-5J503-1-0031-02-05-05-05-05-04-00-0-00001010001111100000000000000000000L1000000-2
Q4033698-2L821526L-1Q269759L--Q571162K-2M5217410-1J9479683-1J0614359-1M2124367-1
N5350775-0J6713588-1Q1497267--L911794L-JQ8706343-2N1996196-1J5732840-10000000000
-5J503-1-0031-02-05-05-05-05-04-00-0-00001010001111100000000000000000000L1000000-2
R9999997-0J283516N-0Q3884150-JR9262179-0L592417M-0R9999976-002994040-0J520013Q-0
K340156Q-0R9999983-0R0786790-JJ8753157-0J0000000-1L963399N-0R9999990-00000000000
-010-1-04-0500000000J057566L-3R8810001-0P0195997-0-0000000RRJ2811444-2000-01-001
11111-2-3-4-5-0-1-2-3-4-5-10700-407030000000000000000000000000000000000000000000
J1375681-1K9781505-JK5033700-2J0027520--P0195997-0-0000000RRJ2811444-2000-01-003
P1281930-0Q3496588-JN9482393-0M5977943-JP0195997-0-0000000RRJ2811444-2000-01-004
J5958716-1L5667930--M2085899-2K1809414-1P0195997-0-0000000RRJ2811444-2000-01-005
-025-2-04-05667930--J0490258-2M8664462--J8431221-0-0000000RRQ8324573-0000-02-006
11111-1-3-4-5-0-1-2-3-4-5-10700-407030000000000000000000000000000000000000000000
P8426149-J0592119J-JK121759R-1K116844P-JJ8431221-0-0000000RRQ8324573-0000-02-008
M9143142-JJ7772292-JJ2300296-1J2456679-JJ8431221-0-0000000RRQ8324573-0000-02-009
J5958716-1L709211N-1J724966N-1J699365K-1J8431221-0-0000000RRQ8324573-0000-02-010
-035-3-04-0509211N-1L4749324-2M0168442--J6447390-1-0000000RRP0334328-2000-03-011
11111-1-2-4-5-0-1-2-3-4-5-10700-407030000000000000000000000000000000000000000000
J6349929--N249414K-1L954621J-1J4412533-JJ6447390-1-0000000RRP0334328-2000-03-013
M5839300-0J4152371-1J1561451-2J1713579--J6447390-1-0000000RRP0334328-2000-03-014
L5667929--L7092110-1L420523J--J2304124--J6447390-1-0000000RRP0334328-2000-03-015
-046-4-04-0509211Q-1K4002835-1R8872684-0K7837032-J-0000000RRK0147411-J000-04-016
11111-1-2-3-5-0-1-2-3-4-5-10700-407030000000000000000000000000000000000000000000
L9368258-JM839872J-JJ132809K-KM450608--KK7837032-J-0000000RRK0147411-J000-04-018
R3542639-LK8057777-JL3118012-KJ7806727-KK7837032-J-0000000RRK0147411-J000-04-019
M2085896-2J724966L-1L420522R--K499396R-1K7837032-J-0000000RRK0147411-J000-04-020
-058-5-04-0524966L-1J2150368-3L6438684--K7529242-1-0000000RRJ9704338-3000-05-021
11111-1-2-3-4-0-1-2-3-4-5-10700-407030000000000000000000000000000000000000000000
J5422589-1M722471K-1M0377072-JM352732J-2K7529242-1-0000000RRJ9704338-3000-05-023
P0715294-0K7789618-1L2815887--J7415129-2K7529242-1-0000000RRJ9704338-3000-05-024
K1809410-1J699365K-1J2304123--K499396R-1K7529242-1-0000000RRJ9704338-3000-05-025
```

```
   1
PROGRAM 80, TEST PROBLEM, FERBER DATA, RESIDUALS, LAST STEP OF ADV.
0515630100031002005005005  5  4          1 1   11111
0102030405
0101020001020300010304001204010 0
010700040703
-058-5-04-0524966L-1J2150368-3L6438684--K7529242-1-0000000RRJ9704338-3000-05-021
11111-1-2-3-4-0-1-2-3-4-5-10700-407030000000000000000000000000000000000000000000
J5422589-1M722471K-1M0377072-JM352732J-2K7529242-1-0000000RRJ9704338-3000-05-023
P0715294-0K7789618-1L2815887--J7415129-2K7529242-1-0000000RRJ9704338-3000-05-024
K1809410-1J699365K-1J2304123--K499396R-1K7529242-1-0000000RRJ9704338-3000-05-025
```