

AN IBM 650 PROGRAM FOR THE ANALYSIS OF
ATTRIBUTE-CLUSTER-BLOCS

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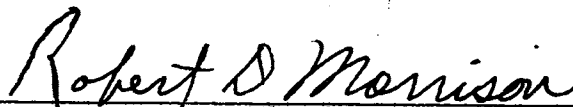
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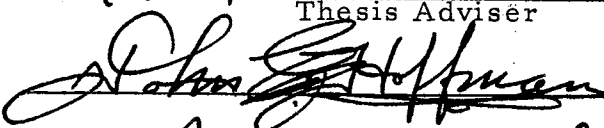
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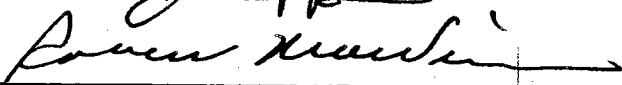
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PREFACE

The inspiration for this thesis came from a problem brought to me by Mr. H. James Henderson of the Oklahoma State University History Department. The need for the program was impressed upon me by my work with him in his bloc analysis of the Continental Congresses.

The scope of this thesis, while being essentially limited to an explanation of the program and its use in the analysis of attribute-cluster-blocs, includes some discussion of the statistics used.

I would like to thank Mr. Henderson for his inspiration of the study and especially Dr. Robert D. Morrison, Professor of Mathematics, who served as my adviser in preparing this paper.

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CHAPTER I

INTRODUCTION

Although this paper is written with the interwoven example of application to the analysis of attribute-cluster-blocs in legislative bodies, the IBM 650 program given herein may be used for the analysis of attribute-cluster-blocs in any size two-way contingency table.

In the analysis of attribute-cluster-blocs in legislative bodies, there is at present little set methodology or procedure. Various and sundry methods and procedures have been used in the past, most of which involve some form of arbitrary standard-setting or ranking. There is usually attached to such procedures some uncertainty and even open disagreement. For example, Hayes (1938) discussed Beyle's "index of cohesion" and questioned its validity, giving his own methods. Too, there is usually no way provided for the attachment of any sort of confidence, in a probability sense, to many of the statements made by the researcher.

Among the procedures used in the past are the arbitrary designation by scaling of "liberal" or "conservative" votes or voters (Brimhall and Otis, 1948) or the use of an "index of cohesion" (Rice, 1928). These techniques involve a certain amount of arbitrariness, some of which is unavoidable, the realization of which fact causes some shadow of doubt to be thrown on the interpretation of the results of a study.

The purpose of this paper is to describe to the person interested in

the analysis of attribute-cluster-blocs an IBM 650 computer program which may help him make tests of the significance and degree of association or relationship between the voting patterns of two legislators over a legislative period. These tests in no way rely on the possibility of the measurement of attributes on a variate-scale, or even on the possibility of arranging them in order. No attempt has been made to justify the validity of the tests, nor to choose the "best" among them. However, the attributes of the tests are discussed in order that the researcher may have some basis for reaching his own decisions as to which tests to use.

The actual tests made and statistics computed are as follows:

1. A test is made to determine whether or not two legislators voted simultaneously often enough to merit further consideration.
2. A chi-square statistic is computed to give an idea as to whether or not two legislators are significantly independent in their voting.
3. The Boas-Yulean ϕ statistic (Kendall's V) is calculated to indicate the "direction" of agreement and to measure the intensity of agreement.
4. Pearson's C, the coefficient of contingency, is calculated as another statistic to give an idea as to the intensity of agreement.

The program facilitates the many tiresome and time-consuming calculations involved in the comparison of all possible pairs of legislators.

An attempt has been made throughout this paper to write so that a layman in the use of statistical methodology and high-speed computing techniques will be able to use the tests and do the computing work with little aid from a trained computer operator.

CHAPTER II

THE TESTS

This chapter is concerned with relating the necessity, appropriateness and interpretation of each of the tests available in the program. The explanation of the actual procedures involved in specifying which tests are to be used will be given in Chapter III.

It will be assumed in the remainder of the paper that "votes" refer to roll-call votes, since the roll-call vote is the only type which directly links vote to voter and is usually completely and publicly recorded. These attributes have been discussed by Rice (1925).

The following system of notation will be used.

a = total number of votes in which A voted yes and B voted yes.

b = total number of votes in which A voted yes and B voted no.

c = total number of votes in which A voted no and B voted yes.

d = total number of votes in which A voted no and B voted no.

n = a + b + c + d = total number of votes in which both A and B voted.

N = total number of votes in the group of votes under consideration.

(N will always be greater than or equal to n because of abstentions by A or B.)

This notation may be tabulated as shown in Table I.

Test 1: Have two legislators voted simultaneously often enough in order that necessary assumptions for the statistical tests can be met?

According to Cochran (1954) the researcher should use methods different from those discussed in this paper if:

- (i) the total n is less than 20;
- (ii) the total n lies between 20 and 40 and the smallest expectation for any one of the cells in Table I is less than 5.

These other methods are discussed by Mainland (1948). Hence, if desired, the program will investigate these requirements and, if they are not met, will not continue with the remainder of the testing for that particular pair of legislators. The researcher may, however, by-pass this part of the program.

Table I

FREQUENCY COUNTS OF AGREEMENT
BETWEEN TWO LEGISLATORS

| | | Legislator B | | |
|--------------|-----|--------------|-------|-------|
| | | yes | no | |
| Legislator A | yes | a | b | a + b |
| | no | c | d | c + d |
| | | a + c | b + d | n |

Test 2: Are two legislators independent in their voting and, if not, what is the strength of their dependency?

The researcher may wish to determine, as an aid to blocing a group of legislators, which pairs of legislators are independent of each other in their voting. For a given pair of legislators, consider the population of votes in which both participated. Each member (vote) of this population

may be classified according to the two attributes

A: the event that the first legislator votes yes,

Not-A: the event that the first legislator votes no,

B: the event that the second legislator votes yes,

Not-B: the event that the second legislator votes no.

Using this notation the data for two legislators could be summarized as in Table II below in which a, b, c, and d are cell frequency counts of the above events and n is the number of times the two legislators voted simultaneously.

Table II

FREQUENCY COUNTS OF TWO EVENTS

| Events | B | Not-B | Totals |
|--------|-------|-------|--------|
| A | a | b | a + b |
| Not-A | c | d | c + d |
| Totals | a + c | b + d | n |

We now define, according to Kendall (1945), the two attributes A and B to be independent if

$$(1) \quad \frac{a}{a + c} = \frac{b}{b + d} = \frac{a + b}{n}.$$

This may be thought of as an algebraic statement of the fact that if there is no relationship between A and B, then there must be the same proportion of A's among the B's as among the Not-B's.

By (1) we see that if A and B are independent, that is, not associated, we expect the relationship

$$a = \frac{(a + b)(a + c)}{n}$$

to hold. If then, for any given pair of legislators,

$$a > \frac{(a+b)(a+c)}{n},$$

we shall say that A and B are positively associated; if

$$a < \frac{(a+b)(a+c)}{n},$$

we shall say that A and B are negatively associated.

Let us examine the difference, δ , between observed and expected frequencies in the first cell defined by

$$\delta = a - \frac{(a+b)(a+c)}{n} = \frac{ad - bc}{n}$$

in which $\frac{(a+b)(a+c)}{n}$ is the expected frequency in the first cell if A is independent of B. Kendall's V (1945) or the Boas-Yulean ϕ is defined as

$$\phi = \frac{n\delta}{\sqrt{(a+b)(a+c)(b+d)(c+d)}} = \frac{ad - bc}{\sqrt{(a+b)(a+c)(b+d)(c+d)}}.$$

If there are no zero border totals in Table II, it is seen that $\phi = 0$ when $\delta = 0$. Since the marginal totals in Table II are constant for a given pair of legislators, $|\phi|$ increases as $|\delta|$ increases. Now $\delta = 0$ implies that there is no difference between observed and expected frequencies in any cell. Thus δ determines uniquely the departure from independence.

We see also that if $b = 0$ and $c = 0$ then $\phi = 1$, signifying positive agreement or association; if $a = 0$ and $d = 0$ then $\phi = -1$, signifying negative agreement or association. When any of the border totals are zero then ϕ has an indeterminate form and an examination of the two-way contingency table (Table II) is necessary to determine association, thus limiting the usefulness of ϕ as a measure of association. However, ϕ can give a definite indication of the direction of association.

It might also be pointed out that ϕ is unity if and only if each yes-vote by the first legislator corresponds to a yes-vote by the second legislator, and each yes-vote by the second legislator corresponds to a yes-vote by the first legislator, a condition described as absolute (positive) association by Kendall. Likewise, ϕ is equal to -1 if and only if each yes-vote by the first legislator corresponds to a no-vote by the second legislator and each yes-vote by the second legislator corresponds to a no-vote by the first legislator, a condition described as absolute negative association.

If we assume that A and B have the point-binomial distribution (i. e. that $\frac{a+b}{n}$ and $\frac{a+c}{n}$ are equal to k_1 and k_2 , respectively, where k_1 and k_2 are constants) then ϕ becomes the product-moment correlation between the means of the two variates A and B. This is not true if we think of A and B as continuous variates, even though they are recorded in a two-category manner (Kelly, 1923).

If the two legislators have voted simultaneously often enough to satisfy the requirements in test 1 then the chi-square (χ^2) test of independence for a two-way contingency table may be used. In a two-way table,

$$\chi^2 = \chi_u^2 = n\phi^2$$

with one degree of freedom associated with the χ^2 . However, we will use a χ^2 corrected for continuity (Kendall, 1945 or Snedecor, 1956) as given by

$$\chi_c^2 = \frac{n(|ad - bc| - n/2)^2}{(a+b)(a+c)(b+d)(c+d)}$$

For either χ_c^2 or χ_u^2 (with one degree of freedom), values greater than

3.84 or 6.63 will indicate rejection of the hypothesis of independence at the 5% and 1% probability levels, respectively.

As another measure of the strength of independence besides either ϕ , which is uncorrected for continuity, or χ^2 , which may increase without bound, we calculate Pearson's C (1904), the coefficient of contingency, defined by

$$C = \sqrt{\frac{\chi_u^2}{n + \chi_u^2}}.$$

This coefficient is zero when there is independence, but cannot become 1 if we use the uncorrected χ_u^2 with at most two cells equal to zero.

According to Kendall (1945) the upper limit is .7071.

CHAPTER III

THE PROGRAM

This program is designed to construct two-way contingency tables for all possible pairs of up to eighty legislators (variables), as well as calculate, for each such table, the statistics n/N (or n), ϕ , C , χ_u^2 (uncorrected χ^2), and χ_c^2 (corrected χ^2). Any or all of these statistics, as well as the contingency tables, may be deleted. A test may be made as to the applicability of these statistics and, if it fails, the statistics will not be computed for that particular table.

The IBM 650-653 with the following hardware is necessary:

Three index registers (A, B and C);

Floating point device.

(Core storage is not needed.)

Preparation of data

Each data card represents one question voted upon by roll-call in a particular legislative grouping of votes. There is, practically speaking, no limit to the number of questions from any given grouping which may be processed.

Each column of a card, starting with column 1, represents a member of the legislative grouping. Each legislator must be assigned the same column of each card for the entire group of cards to be processed. If a legislator votes "yes" on a particular question (card), assign a "0"

to the column of the card corresponding to that legislator; if he votes "no" assign a "1" to the column; if he does not vote, assign a "2" to the column.

A maximum of eighty legislators may be processed from any one legislative grouping in any one analysis. However, if card (vote) identification is desired, the number of legislators is reduced by the number of columns of identification required. Card identification is placed at any place on the card after the last column assigned to a legislator. Such identification must be numeric if the standard 80-80 board is used in the 533 read-punch unit. Any portion of the card not used for recording votes of legislators and vote identification must be filled in with numeric code of any type. An example of a data card for thirty-three legislators is shown below.

```
Col:  (1-10)  (11-20)  (21-30)  (31-40)  (41-80)
      0101222212 2021111222 2221122222 122zzzzzzz zzz...z
```

The z's in columns 34-80 are numerical digits which may be used as identification or to display other information which is desired. There is no necessity for any particular order of assembly of the data cards.

Transfer card (load card)

This card is made up as follows:

```
Col:  (1-10)  (11-20)  (21-80)
      †0000LL1000̄ xxxxxxxxxxxx † blank
```

The LL in the first word is the number of legislators under analysis, e.g., LL = 33 in the example above. Note that column 10 has a "-" punch. The second word, xxxxxxxxxxxx, is an analysis identification number, left to the discretion of the researcher. It may be used to

identify the legislative session or grouping or type of vote, etc., under analysis. It will constitute the first card of the output.

Trailer card (load card)

The trailer card initiates the calculations and punchout. It is made up as follows:

Col: (1-10) (11-80)
[†]000000100[†] blank

The same trailer card is used for every analysis; the transfer card must be changed to agree with each set of data cards.

Starting the program

Step 1. Set the console reading as shown in Table III below.

Table III

CONSOLE SETTINGS FOR STARTING PROGRAM

| | |
|-------------------------------------|--|
| Console switches (8000). | 701951 [†] xxxxx (see Table IV) |
| Program stop switch. | STOP |
| Half-cycle switch | RUN |
| Address Selection switches | Anything |
| Control switch | RUN |
| Display switch | PROGRAM REGISTER |
| Overflow switch. | STOP |
| Error switch. | STOP |
| Standard 80-80 control panel in 533 | |

A "-" console switch setting will cause the machine to

skip test 1, described in Chapter II. If a "+" is used, and the test 1 result is negative, none of the statistics in Table IV will be punched for that pair of legislators. The xxxx values for the console setting must be selected from one of the available choices shown in Table IV below.

Table IV

POSSIBLE RESULTS OBTAINABLE WITH
VARIOUS CONSOLE SWITCH SETTINGS

| Console switches | 2 X 2 table | n/ N | ϕ | C | χ_u^2 | χ_c^2 | No. cards |
|------------------|----------------|------------|--------|-----|------------|------------|-----------|
| .70 1951 8888 | yes | yes | yes | yes | yes | yes | 3 |
| " 8898 | yes | yes | | yes | yes | yes | 3 |
| " 8988 | yes | yes | yes | | yes | yes | 3 |
| " 8998 | yes | yes | | | yes | yes | 3 |
| " 9888 | yes | yes | yes | yes | | yes | 3 |
| " 9898 | yes | yes | | yes | | yes | 3 |
| " 9988 | yes | yes | yes | | | yes | 3 |
| " 9998 | yes | yes | | | | yes | 3 |
| " 8889 | | (n) yes | yes | yes | | yes | 1 |
| " 8899 | | (n) yes | | yes | | yes | 1 |
| " 8989 | | (n) yes | yes | | | yes | 1 |
| " 8999 | | (n) yes | | | | yes | 1 |
| " 9999 | yes | | | | | | 3 |

Sample results for all console settings are shown in Table VI in the appendix.

Step 2. Assemble the input in the read hopper of the 533 in the following order:

- (a) Program (135 seven-word load cards)
- (b) Transfer card (load card)
- (c) Data for first pass (non-load cards)
- (d) Trailer card (load card)

Duplicate data decks of the same data may be used, along with trailer cards after each data deck, thus reducing the amount of manual control of the program:

- (e) Data for second pass: duplicate of (c)
- (f) Trailer card: duplicate of (d)
- (g) Data for third pass: duplicate of (c)
- (h) Trailer card: duplicate of (d)
-
- (i) Data for (LL-1)th pass: duplicate of (c)
- (j) Trailer card: duplicate of (d)

For new (different) data repeat steps (b) through (j), changing the transfer card if necessary.

Step 3. Press COMPUTER RESET, PROGRAM START keys on the console, READ START and (punch) START keys on the 533. Processing should begin.

Step 4. After the cards have passed through the 533 read unit press END OF FILE, which causes the last three cards to be read. Then press READ START, running these cards out of the 533 read unit. Remove the program deck and transfer card, then place the remaining deck (containing one or more data decks and trailer cards) in the read hopper. Press READ

START, and when the punching is finished, the cards will be read for the $(n + 1)$ th pass where n (duplicate) decks of data have been used. When the cards have passed through the 533 again, press END OF FILE to read the last three cards, then READ START, running these cards out. Reload the deck and press READ START once again. Continue this process for $LL - 1$ passes of the data. At the end of the last pass the console will read 01 0000 0927, which indicates that the analysis is completed. Any preceding pass will give a console reading of 70 1951 1251 before and after pressing END OF FILE.

Output

All statistics are calculated to three decimal places. The output may be either three cards per pair of legislators or one card per pair, depending upon the console switches as indicated in Table IV. The following formats are used for the output, where xx and yy are the identification numbers for the individual legislators of the pair, and a , b , c , d and n correspond to Table 1 with legislator A denoted xx and legislator B denoted yy .

Three cards per pair of legislators:

| Col: | (1-10) | (11-15) | (16-20) | (21-24) | (31-40) | (41-50) | (51-80) |
|------------|---------|---------|---------|------------|------------|---------|---------|
| 00000xxyy1 | a | b | $a + b$ | n/N | C | zeros | |
| 00000xxyy2 | c | d | $c + d$ | ϕ | blank | zeros | |
| 00000xxyy3 | $a + c$ | $b + d$ | n | χ_u^2 | χ_c^2 | zeros | |

One card per pair of legislators:

| Col: | (1-10) | (11-20) | (21-30) | (31-40) | (41-50) | (51-80) |
|------------|--------|---------|---------|------------|---------|---------|
| 00000xxyy0 | n | ϕ | C | χ_c^2 | zeros | |

In either of the above cases, the card preceding the output described above will be the analysis identification card. Care must be taken if two or more analyses are run so as not to mix the outputs.

Internal operation of the program

During the first pass of the data the program calculates the tables and statistics for the first legislator paired with all other legislators; the second pass gives the same results for the second legislator paired with all other legislators except the first, and so forth. The program self-adjusts from the first pass to the second so that the output can be properly identified as shown in the output formats above.

Time required for operation of the program

The amount of time required for running the program varies with the number of variables (legislators), the number of cards (votes) and the console switch settings. Exactly one hour is required for running the complete analysis of thirty-six variables on ninety-five data cards using console setting 70 1951 8888+. Computing time will increase or decrease according to the increase or decrease in the number of variables or cards.

Error stops

Should the program stop during the processing of the data, the following information will be of aid in determining the nature of the failure and the steps to take to correct some of the common mistakes the operator may have made. The digits on the left below refer to the program register, which can be displayed, when the machine stops, in the console lights by setting the display switch on PROGRAM REGISTER.

- 01 0001 8000 This instruction indicates that LL = 1 is in the transfer card. Correct the card and reload the program.
- 70 1951 8888 This instruction indicates that LL = 1 is in the transfer card and that the PROGRAMMED STOP key is on RUN. Correct both situations and reload the program.
- 70 1951 1251 If this instruction occurs in a machine stop situation, check to see if the last three cards have been read by looking in the read hopper. If half of the last card (trailer card) is visible, press END OF FILE on the 533 and continue as in step 4 above. If the last three cards of the data have been read (i.e. if END OF FILE has already been pressed) then this instruction indicates that the trailer card has been left off of the data deck. Correct this by placing in the read hopper the trailer card, followed by any unprocessed duplicate data decks. Press READ START. The computations should continue. If the READ START key has been erroneously pressed instead of the END OF FILE, remove all cards from the feed hopper, press READ START and run all cards out of the read side. Remove the last three cards in the read stacker and place them in front of the unprocessed data decks, replace in the read hopper and press READ START. The computations should continue.

It should be noted here that, when duplicate data decks are being used, failure to place a trailer card at the end of a data deck will allow the program to continue operation,

counting both adjoining data decks as one deck, thus giving a double count of the data.

69 195x 1054 This instruction, with the distributor light on the console burning, indicates a mispunched data card. Look at the distributor display for the offending blank or multiple punch, which will be in word x of the fourth card from the last of the cards removed from the read hopper. Correct the mispunched card and reload the program, that is, start from the beginning.

69 1951 1988 This instruction indicates that a "+" instead of a "-" has been put in column 10 or the transfer card. Correct the card and reload the program.

9x ---- ---- An instruction in the nineties indicates that some number other than 8 or 9 has been placed in the four low-order digits of the console setting. See Table IV for the correct setting and reload the program.

If the program continues to run after the last pair of variables have been processed, the program stop switch has been left on RUN. No harm has been done. Change the program stop switch to STOP. The program register display will show 01 0000 0927 which indicates the end of all calculations.

CHAPTER IV

SUMMARY AND CONCLUSIONS

An IBM 650 program was written which will compute any or all of a set of statistics which may be used in the analysis of attribute-cluster-blocs. These statistics include a chi-square, a chi-square corrected for continuity, a coefficient of contingency, and an indicator of the direction and intensity of association for every possible pair of variables in a group of variables to be analyzed by bloc analysis.

The interwoven example of application of the program to the bloc analysis of the voting behavior of a legislative body was used. The variables were the legislators, the frequency counts were roll-call votes by the legislators.

The program was written with the computer layman in mind. Particularly, those sections dealing with the setting up and operation of the program and the 650, as well as the error stops which may be encountered, will be of value to the operator.

By way of suggestion for future work, more investigation needs to be done into the present use of the statistics currently popular in bloc analysis. It would seem particularly desirable to find some procedure to which some sort of valid statement of confidence could be attached.

This paper, however, was not intended as a comment upon the "validity" of any of the statistics discussed, but rather is a tool useful in

eliminating much of the tiresome drudgery of calculations of statistics for all possible pairs of variables in a bloc analysis.

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APPENDIX

Table V

SOAP II PROGRAM LISTING

| | | | | | | | | | |
|----|------|----|------|------|---|------|-------|-------|-------|
| 1 | | | | | | BLR | 0000 | 0720 | |
| 2 | | | | | | BLR | 1938 | 1999 | |
| 3 | | | | | | BLR | 1800 | 1875 | |
| 4 | | | | | | REG | A0721 | 0800 | |
| 5 | | | | | | REG | B0801 | 0881 | |
| 6 | | | | | | SYN | START | 1000 | |
| 7 | | | | | | SYN | READ1 | 1001 | |
| 8 | | | | | | SYN | ADUMP | 1002 | |
| 9 | | | | | | SYN | SQRT | 1831 | |
| 10 | | | | | | REL | 1800 | | |
| 11 | | | | | | RBR | 0000 | 0059 | |
| 12 | | | | | | REQ | SQRT | 0031 | |
| 13 | 1831 | 24 | 1835 | 1844 | 2 | 0031 | STD | 0035 | 0044 |
| 14 | 1844 | 46 | 1850 | 1808 | 2 | 0044 | BMI | 0050 | 0008 |
| 15 | 1808 | 21 | 1846 | 1815 | 2 | 0008 | STU | 0046 | 0015 |
| 16 | 1815 | 30 | 0002 | 1825 | 2 | 0015 | SRT | F0002 | 0025 |
| 17 | 1825 | 44 | 1832 | 1835 | 2 | 0025 | NZU | 0032 | 0035 |
| 18 | 1832 | 60 | 8002 | 1801 | 2 | 0032 | RAU | F8002 | 0001 |
| 19 | 1801 | 11 | 1804 | 1809 | 2 | 0001 | SUP | 0004 | 0009 |
| 20 | 1809 | 19 | 8001 | 1802 | 2 | 0009 | MPY | F8001 | 0002 |
| 21 | 1802 | 10 | 8001 | 1859 | 2 | 0002 | AUP | F8001 | 0059 |
| 22 | 1859 | 30 | 0008 | 1849 | 2 | 0059 | SRT | F0008 | 0049 |
| 23 | 1849 | 15 | 8001 | 1826 | 2 | 0049 | ALO | F8001 | 0026 |
| 24 | 1826 | 21 | 1828 | 1833 | 2 | 0026 | STU | 0028 | 0033 |
| 25 | 1833 | 60 | 8002 | 1842 | 2 | 0033 | RAU | F8002 | 0042 |
| 26 | 1842 | 15 | 1846 | 1830 | 2 | 0042 | ALO | 0046 | 0030 |
| 27 | 1830 | 44 | 1841 | 1834 | 2 | 0030 | NZU | 0041 | 0034 |
| 28 | 1834 | 30 | 0001 | 1841 | 2 | 0034 | SRT | F0001 | 0041 |
| 29 | 1841 | 20 | 1846 | 1800 | 2 | 0041 | STL | 0046 | 0000 |
| 30 | 1800 | 30 | 0008 | 1820 | 2 | 0000 | SRT | F0008 | 0020 |
| 31 | 1820 | 35 | 0008 | 1839 | 2 | 0020 | SLT | F0008 | 0039 |
| 32 | 1839 | 60 | 8002 | 1847 | 2 | 0039 | RAU | F8002 | 0047 |
| 33 | 1847 | 84 | 1850 | 1811 | 2 | 0047 | TLU | 0050 | 0011 |
| 34 | 1811 | 15 | 1816 | 8002 | 2 | 0011 | ALO | 0016 | F8002 |
| 35 | 1816 | 60 | 0000 | 1812 | 2 | 0016 | RAU | F0000 | 0012 |
| 36 | 1812 | 35 | 0002 | 1819 | 2 | 0012 | SLT | F0002 | 0019 |
| 37 | 1819 | 21 | 1824 | 1827 | 2 | 0019 | STU | 0024 | 0027 |
| 38 | 1827 | 35 | 0004 | 1838 | 2 | 0027 | SLT | F0004 | 0038 |
| 39 | 1838 | 19 | 1846 | 1814 | 2 | 0038 | MPY | 0046 | 0014 |
| 40 | 1814 | 35 | 0001 | 1821 | 2 | 0014 | SLT | F0001 | 0021 |
| 41 | 1821 | 10 | 1824 | 1829 | 2 | 0021 | AUP | 0024 | 0029 |
| 42 | 1829 | 30 | 0002 | 1836 | 2 | 0029 | SRT | F0002 | 0036 |
| 43 | 1836 | 21 | 1840 | 1805 | 2 | 0036 | STU | 0040 | 0005 |
| 44 | 1805 | 60 | 1810 | 1817 | 2 | 0005 | RAU | 0010 | 0017 |
| 45 | 1817 | 19 | 1846 | 1837 | 2 | 0017 | MPY | 0046 | 0037 |
| 46 | 1837 | 64 | 1840 | 1822 | 2 | 0037 | DVR | 0040 | 0022 |

Table V (continued)

| | | | | | | | | | |
|----|------|----|------|------|---|-------|-----|-------|-------|
| 47 | 1822 | 15 | 1840 | 1845 | 2 | 0022 | ALO | 0040 | 0045 |
| 48 | 1845 | 61 | 8002 | 1803 | 2 | 0045 | RSU | F8002 | 0003 |
| 49 | 1803 | 46 | 1806 | 1807 | 2 | 0003 | BMI | 0006 | 0007 |
| 50 | 1806 | 21 | 1840 | 1843 | 2 | 0006 | STU | 0040 | 0043 |
| 51 | 1843 | 60 | 1848 | 1817 | 2 | 0043 | RAU | 0048 | 0017 |
| 52 | 1807 | 35 | 0002 | 1813 | 2 | 0007 | SLT | F0002 | 0013 |
| 53 | 1813 | 10 | 1828 | 1835 | 2 | 0013 | AUP | 0028 | 0035 |
| 54 | 1850 | 01 | 0150 | 1025 | 2 | 0050 | 01 | F0150 | F1025 |
| 55 | 1851 | 02 | 0193 | 0800 | 2 | 0051 | 02 | F0193 | F0800 |
| 56 | 1852 | 07 | 0275 | 0550 | 2 | 0052 | 07 | F0275 | F0550 |
| 57 | 1853 | 17 | 0435 | 0350 | 2 | 0053 | 17 | F0435 | F0350 |
| 58 | 1854 | 29 | 0618 | 0250 | 2 | 0054 | 29 | F0618 | F0250 |
| 59 | 1855 | 59 | 0760 | 0200 | 2 | 0055 | 59 | F0760 | F0200 |
| 60 | 1856 | 99 | 1123 | 0138 | 2 | 0056 | 99 | F1123 | F0138 |
| 61 | 1804 | 50 | 0000 | 0000 | 2 | 0004 | 50 | F0000 | F0000 |
| 62 | 1848 | 00 | 0025 | 0000 | 2 | 0048 | 00 | F0025 | F0000 |
| 63 | 1810 | 00 | 0006 | 2500 | 2 | 0010 | 00 | F0006 | F2500 |
| 64 | 1000 | 67 | 1951 | 0905 | | START | RAM | 1951 | |
| 65 | 0905 | 20 | 0909 | 0912 | | | STL | SAVE | |
| 66 | 0912 | 69 | 1952 | 0955 | | | LDD | 1952 | |
| 67 | 0955 | 24 | 1977 | 0930 | | | STD | 1977 | |
| 68 | 0930 | 21 | 1978 | 0931 | | | STU | 1978 | |
| 69 | 0931 | 24 | 1979 | 0882 | | | STD | 1979 | |
| 70 | 0882 | 24 | 1980 | 0883 | | | STD | 1980 | |
| 71 | 0883 | 24 | 1981 | 0884 | | | STD | 1981 | |
| 72 | 0884 | 24 | 1982 | 0885 | | | STD | 1982 | |
| 73 | 0885 | 24 | 1983 | 0886 | | | STD | 1983 | |
| 74 | 0886 | 24 | 1984 | 0887 | | | STD | 1984 | |
| 75 | 0887 | 71 | 1977 | 0927 | | | PCH | 1977 | CNTNU |
| 76 | 0927 | 67 | 0909 | 0913 | | CNTNU | RAM | SAVE | |
| 77 | 0913 | 30 | 0004 | 0923 | | | SRT | 0004 | |
| 78 | 0923 | 20 | 0977 | 0980 | | | STL | NN | |
| 79 | 0980 | 88 | 0721 | 0936 | | | RAC | A0001 | |
| 80 | 0936 | 58 | 8002 | 0895 | | | AXC | 8002 | |
| 81 | 0895 | 59 | 0001 | 0901 | | | SXC | 0001 | |
| 82 | 0901 | 82 | 8002 | 0959 | | | RAB | 8002 | |
| 83 | 0959 | 53 | 0002 | 0915 | | | SXB | 0002 | |
| 84 | 0915 | 43 | 0918 | 0919 | | | BMB | STOP1 | |
| 85 | 0919 | 52 | 0002 | 0925 | | | AXB | 0002 | |
| 86 | 0925 | 67 | 0928 | 0933 | | | RAM | STOP2 | |
| 87 | 0933 | 20 | 6000 | 0903 | | | STL | 0000 | C |
| 88 | 0903 | 88 | 0801 | 1009 | | | RAC | B0001 | |
| 89 | 1009 | 58 | 4000 | 0916 | | | AXC | 0000 | B |
| 90 | 0916 | 67 | 1001 | 1005 | | | RAM | READ1 | |
| 91 | 1005 | 20 | 6000 | 0953 | | | STL | 0000 | C |
| 92 | 0953 | 60 | 8006 | 0911 | | | RAU | 8006 | |

Table V (continued)

| | | | | | | | |
|-----|------|----|------|------|-------|----------|-------|
| 93 | 0911 | 19 | 0914 | 0934 | MPY | NINE | |
| 94 | 0934 | 18 | 8001 | 0891 | SML | 8001 | |
| 95 | 0891 | 35 | 0004 | 0951 | SLT | 0004 | |
| 96 | 0951 | 69 | 0904 | 0907 | LDD | RESC | |
| 97 | 0907 | 22 | 0904 | 0957 | SDA | RESC | |
| 98 | 0957 | 30 | 0004 | 0917 | SRT | 0004 | |
| 99 | 0917 | 16 | 0914 | 0969 | SLO | NINE | |
| 100 | 0969 | 35 | 0004 | 0929 | SLT | 0004 | |
| 101 | 0929 | 69 | 0932 | 0935 | LDD | CTEST | |
| 102 | 0935 | 22 | 0932 | 0721 | SDA | CTEST | A0001 |
| 103 | 0721 | 82 | 0000 | 1027 | RAB | 0000 | SETUP |
| 104 | 0722 | 82 | 0001 | 1027 | A0002 | RAB 0001 | SETUP |
| 105 | 0723 | 82 | 0002 | 1027 | A0003 | RAB 0002 | SETUP |
| 106 | 0724 | 82 | 0003 | 1027 | A0004 | RAB 0003 | SETUP |
| 107 | 0725 | 82 | 0004 | 1027 | A0005 | RAB 0004 | SETUP |
| 108 | 0726 | 82 | 0005 | 1027 | A0006 | RAB 0005 | SETUP |
| 109 | 0727 | 82 | 0006 | 1027 | A0007 | RAB 0006 | SETUP |
| 110 | 0728 | 82 | 0007 | 1027 | A0008 | RAB 0007 | SETUP |
| 111 | 0729 | 82 | 0008 | 1027 | A0009 | RAB 0008 | SETUP |
| 112 | 0730 | 82 | 0009 | 1027 | A0010 | RAB 0009 | SETUP |
| 113 | 0731 | 82 | 0010 | 1027 | A0011 | RAB 0010 | SETUP |
| 114 | 0732 | 82 | 0011 | 1027 | A0012 | RAB 0011 | SETUP |
| 115 | 0733 | 82 | 0012 | 1027 | A0013 | RAB 0012 | SETUP |
| 116 | 0734 | 82 | 0013 | 1027 | A0014 | RAB 0013 | SETUP |
| 117 | 0735 | 82 | 0014 | 1027 | A0015 | RAB 0014 | SETUP |
| 118 | 0736 | 82 | 0015 | 1027 | A0016 | RAB 0015 | SETUP |
| 119 | 0737 | 82 | 0016 | 1027 | A0017 | RAB 0016 | SETUP |
| 120 | 0738 | 82 | 0017 | 1027 | A0018 | RAB 0017 | SETUP |
| 121 | 0739 | 82 | 0018 | 1027 | A0019 | RAB 0018 | SETUP |
| 122 | 0740 | 82 | 0019 | 1027 | A0020 | RAB 0019 | SETUP |
| 123 | 0741 | 82 | 0020 | 1027 | A0021 | RAB 0020 | SETUP |
| 124 | 0742 | 82 | 0021 | 1027 | A0022 | RAB 0021 | SETUP |
| 125 | 0743 | 82 | 0022 | 1027 | A0023 | RAB 0022 | SETUP |
| 126 | 0744 | 82 | 0023 | 1027 | A0024 | RAB 0023 | SETUP |
| 127 | 0745 | 82 | 0024 | 1027 | A0025 | RAB 0024 | SETUP |
| 128 | 0746 | 82 | 0025 | 1027 | A0026 | RAB 0025 | SETUP |
| 129 | 0747 | 82 | 0026 | 1027 | A0027 | RAB 0026 | SETUP |
| 130 | 0748 | 82 | 0027 | 1027 | A0028 | RAB 0027 | SETUP |
| 131 | 0749 | 82 | 0028 | 1027 | A0029 | RAB 0028 | SETUP |
| 132 | 0750 | 82 | 0029 | 1027 | A0030 | RAB 0029 | SETUP |
| 133 | 0751 | 82 | 0030 | 1027 | A0031 | RAB 0030 | SETUP |
| 134 | 0752 | 82 | 0031 | 1027 | A0032 | RAB 0031 | SETUP |
| 135 | 0753 | 82 | 0032 | 1027 | A0033 | RAB 0032 | SETUP |
| 136 | 0754 | 82 | 0033 | 1027 | A0034 | RAB 0033 | SETUP |
| 137 | 0755 | 82 | 0034 | 1027 | A0035 | RAB 0034 | SETUP |
| 138 | 0756 | 82 | 0035 | 1027 | A0036 | RAB 0035 | SETUP |

Table V (continued)

| | | | | | | | | |
|-----|------|----|------|------|-------|-----|------|-------|
| 139 | 0757 | 82 | 0036 | 1027 | A0037 | RAB | 0036 | SETUP |
| 140 | 0758 | 82 | 0037 | 1027 | A0038 | RAB | 0037 | SETUP |
| 141 | 0759 | 82 | 0038 | 1027 | A0039 | RAB | 0038 | SETUP |
| 142 | 0760 | 82 | 0039 | 1027 | A0040 | RAB | 0039 | SETUP |
| 143 | 0761 | 82 | 0040 | 1027 | A0041 | RAB | 0040 | SETUP |
| 144 | 0762 | 82 | 0041 | 1027 | A0042 | RAB | 0041 | SETUP |
| 145 | 0763 | 82 | 0042 | 1027 | A0043 | RAB | 0042 | SETUP |
| 146 | 0764 | 82 | 0043 | 1027 | A0044 | RAB | 0043 | SETUP |
| 147 | 0765 | 82 | 0044 | 1027 | A0045 | RAB | 0044 | SETUP |
| 148 | 0766 | 82 | 0045 | 1027 | A0046 | RAB | 0045 | SETUP |
| 149 | 0767 | 82 | 0046 | 1027 | A0047 | RAB | 0046 | SETUP |
| 150 | 0768 | 82 | 0047 | 1027 | A0048 | RAB | 0047 | SETUP |
| 151 | 0769 | 82 | 0048 | 1027 | A0049 | RAB | 0048 | SETUP |
| 152 | 0770 | 82 | 0049 | 1027 | A0050 | RAB | 0049 | SETUP |
| 153 | 0771 | 82 | 0050 | 1027 | A0051 | RAB | 0050 | SETUP |
| 154 | 0772 | 82 | 0051 | 1027 | A0052 | RAB | 0051 | SETUP |
| 155 | 0773 | 82 | 0052 | 1027 | A0053 | RAB | 0052 | SETUP |
| 156 | 0774 | 82 | 0053 | 1027 | A0054 | RAB | 0053 | SETUP |
| 157 | 0775 | 82 | 0054 | 1027 | A0055 | RAB | 0054 | SETUP |
| 158 | 0776 | 82 | 0055 | 1027 | A0056 | RAB | 0055 | SETUP |
| 159 | 0777 | 82 | 0056 | 1027 | A0057 | RAB | 0056 | SETUP |
| 160 | 0778 | 82 | 0057 | 1027 | A0058 | RAB | 0057 | SETUP |
| 161 | 0779 | 82 | 0058 | 1027 | A0059 | RAB | 0058 | SETUP |
| 162 | 0780 | 82 | 0059 | 1027 | A0060 | RAB | 0059 | SETUP |
| 163 | 0781 | 82 | 0060 | 1027 | A0061 | RAB | 0060 | SETUP |
| 164 | 0782 | 82 | 0061 | 1027 | A0062 | RAB | 0061 | SETUP |
| 165 | 0783 | 82 | 0062 | 1027 | A0063 | RAB | 0062 | SETUP |
| 166 | 0784 | 82 | 0063 | 1027 | A0064 | RAB | 0063 | SETUP |
| 167 | 0785 | 82 | 0064 | 1027 | A0065 | RAB | 0064 | SETUP |
| 168 | 0786 | 82 | 0065 | 1027 | A0066 | RAB | 0065 | SETUP |
| 169 | 0787 | 82 | 0066 | 1027 | A0067 | RAB | 0066 | SETUP |
| 170 | 0788 | 82 | 0067 | 1027 | A0068 | RAB | 0067 | SETUP |
| 171 | 0789 | 82 | 0068 | 1027 | A0069 | RAB | 0068 | SETUP |
| 172 | 0790 | 82 | 0069 | 1027 | A0070 | RAB | 0069 | SETUP |
| 173 | 0791 | 82 | 0070 | 1027 | A0071 | RAB | 0070 | SETUP |
| 174 | 0792 | 82 | 0071 | 1027 | A0072 | RAB | 0071 | SETUP |
| 175 | 0793 | 82 | 0072 | 1027 | A0073 | RAB | 0072 | SETUP |
| 176 | 0794 | 82 | 0073 | 1027 | A0074 | RAB | 0073 | SETUP |
| 177 | 0795 | 82 | 0074 | 1027 | A0075 | RAB | 0074 | SETUP |
| 178 | 0796 | 82 | 0075 | 1027 | A0076 | RAB | 0075 | SETUP |
| 179 | 0797 | 82 | 0076 | 1027 | A0077 | RAB | 0076 | SETUP |
| 180 | 0798 | 82 | 0077 | 1027 | A0078 | RAB | 0077 | SETUP |
| 181 | 0799 | 82 | 0078 | 1027 | A0079 | RAB | 0078 | SETUP |
| 182 | 0800 | 01 | 9999 | 9999 | A0080 | HLT | 9999 | 9999 |
| 183 | 1027 | 67 | 8006 | 0985 | SETUP | RAM | 8006 | |
| 184 | 0985 | 15 | 0888 | 0893 | | ALO | ONE | |

Table V (continued)

| | | | | | | | | |
|-----|------|----|------|------|-----------|-------|---|-------|
| 185 | 0893 | 15 | 0888 | 0943 | ALO | ONE | | |
| 186 | 0943 | 35 | 0004 | 1003 | SLT | 0004 | | |
| 187 | 1003 | 69 | 0801 | 0954 | LDD | B0001 | | |
| 188 | 0954 | 22 | 0801 | 1004 | SDA | B0001 | | |
| 189 | 1004 | 60 | 8006 | 0961 | RAU | 8006 | | |
| 190 | 0961 | 19 | 0914 | 0984 | MPY | NINE | | |
| 191 | 0984 | 35 | 0004 | 0945 | SLT | 0004 | | |
| 192 | 0945 | 69 | 0898 | 1051 | LDD | SETA | | |
| 193 | 1051 | 22 | 0898 | 1101 | SDA | SETA | | |
| 194 | 1101 | 69 | 1002 | 1055 | LDD | ADUMP | | |
| 195 | 1055 | 22 | 1002 | 1105 | SDA | ADUMP | | |
| 196 | 1105 | 67 | 8006 | 0963 | RAM | 8006 | | |
| 197 | 0963 | 30 | 0001 | 1019 | SRT | 0001 | | |
| 198 | 1019 | 15 | 0922 | 1077 | ALO | WORDC | | |
| 199 | 1077 | 35 | 0004 | 0937 | SLT | 0004 | | |
| 200 | 0937 | 69 | 0890 | 0993 | LDD | WORDX | | |
| 201 | 0993 | 22 | 0890 | 1043 | SDA | WORDX | | |
| 202 | 1043 | 67 | 8006 | 1151 | RAM | 8006 | | |
| 203 | 1151 | 35 | 0004 | 1011 | SLT | 0004 | | |
| 204 | 1011 | 69 | 0964 | 0967 | LDD | SLTXY | | |
| 205 | 0967 | 22 | 0964 | 1017 | SDA | SLTXY | | |
| 206 | 1017 | 60 | 8006 | 0975 | RAU | 8006 | | |
| 207 | 0975 | 35 | 0003 | 0983 | SLT | 0003 | | |
| 208 | 0983 | 10 | 0986 | 0941 | AUP | IDCON | | |
| 209 | 0941 | 21 | 0896 | 0899 | STU | IDENT | | |
| 210 | 0899 | 88 | 4722 | 0906 | RAC | A0002 | B | |
| 211 | 0906 | 67 | 8007 | 1013 | RAM | 8007 | | |
| 212 | 1013 | 20 | 0721 | 0924 | STL | A0001 | | |
| 213 | 0924 | 80 | 0719 | 1030 | RAA | 0719 | | |
| 214 | 1030 | 88 | 0000 | 1036 | RAC | 0000 | | |
| 215 | 1036 | 60 | 0889 | 1093 | RAU | ZERO1 | | |
| 216 | 1093 | 17 | 0946 | 1201 | AML | ZERO2 | | |
| 217 | 1201 | 69 | 8007 | 8003 | LDD | 8007 | | 8003 |
| 218 | 0889 | 24 | 2000 | 8002 | ZERO1 STD | 0000 | A | 8002 |
| 219 | 0946 | 40 | 0949 | 1001 | ZERO2 NZA | | | READ1 |
| 220 | 0949 | 51 | 0001 | 8003 | SXA | 0001 | | 8003 |
| 221 | 1001 | 70 | 1951 | 1251 | READ1 RD1 | 1951 | | |
| 222 | 1251 | 69 | 1951 | 1054 | LDD | 1951 | | |
| 223 | 1054 | 69 | 1952 | 1155 | LDD | 1952 | | |
| 224 | 1155 | 69 | 1953 | 0956 | LDD | 1953 | | |
| 225 | 0956 | 69 | 1954 | 1007 | LDD | 1954 | | |
| 226 | 1007 | 69 | 1955 | 0908 | LDD | 1955 | | |
| 227 | 0908 | 69 | 1956 | 1059 | LDD | 1956 | | |
| 228 | 1059 | 69 | 1957 | 0910 | LDD | 1957 | | |
| 229 | 0910 | 69 | 1958 | 0898 | LDD | 1958 | | SETA |
| 230 | 0898 | 80 | 0948 | 0890 | SETA RAA | XY9 | | WORDX |

Table V (continued)

| | | | | | | | | |
|-----|------|----|------|------|-------|-----|------|-------|
| 231 | 0890 | 67 | 1143 | 0964 | WORDX | RAM | X195 | SLTXY |
| 232 | 0964 | 35 | 1014 | 1025 | SLTXY | SLT | XY00 | |
| 233 | 1025 | 11 | 8003 | 1033 | | SUP | 8003 | |
| 234 | 1033 | 35 | 0001 | 0939 | | SLT | 0001 | |
| 235 | 0939 | 50 | 8003 | 0998 | | AXA | 8003 | |
| 236 | 0998 | 50 | 8003 | 1006 | | AXA | 8003 | |
| 237 | 1006 | 50 | 8003 | 0801 | | AXA | 8003 | B0001 |
| 238 | 0801 | 88 | 0002 | 1057 | B0001 | RAC | 0002 | BNTRY |
| 239 | 0802 | 67 | 8002 | 1061 | B0002 | RAM | 8002 | SUM1 |
| 240 | 0803 | 67 | 8002 | 1061 | B0003 | RAM | 8002 | SUM1 |
| 241 | 0804 | 67 | 8002 | 1061 | B0004 | RAM | 8002 | SUM1 |
| 242 | 0805 | 67 | 8002 | 1061 | B0005 | RAM | 8002 | SUM1 |
| 243 | 0806 | 67 | 8002 | 1061 | B0006 | RAM | 8002 | SUM1 |
| 244 | 0807 | 67 | 8002 | 1061 | B0007 | RAM | 8002 | SUM1 |
| 245 | 0808 | 67 | 8002 | 1061 | B0008 | RAM | 8002 | SUM1 |
| 246 | 0809 | 67 | 8002 | 1061 | B0009 | RAM | 8002 | SUM1 |
| 247 | 0810 | 67 | 8002 | 1061 | B0010 | RAM | 8002 | SUM1 |
| 248 | 0811 | 67 | 1952 | 1061 | B0011 | RAM | 1952 | SUM1 |
| 249 | 0812 | 67 | 8002 | 1061 | B0012 | RAM | 8002 | SUM1 |
| 250 | 0813 | 67 | 8002 | 1061 | B0013 | RAM | 8002 | SUM1 |
| 251 | 0814 | 67 | 8002 | 1061 | B0014 | RAM | 8002 | SUM1 |
| 252 | 0815 | 67 | 8002 | 1061 | B0015 | RAM | 8002 | SUM1 |
| 253 | 0816 | 67 | 8002 | 1061 | B0016 | RAM | 8002 | SUM1 |
| 254 | 0817 | 67 | 8002 | 1061 | B0017 | RAM | 8002 | SUM1 |
| 255 | 0818 | 67 | 8002 | 1061 | B0018 | RAM | 8002 | SUM1 |
| 256 | 0819 | 67 | 8002 | 1061 | B0019 | RAM | 8002 | SUM1 |
| 257 | 0820 | 67 | 8002 | 1061 | B0020 | RAM | 8002 | SUM1 |
| 258 | 0821 | 67 | 1953 | 1061 | B0021 | RAM | 1953 | SUM1 |
| 259 | 0822 | 67 | 8002 | 1061 | B0022 | RAM | 8002 | SUM1 |
| 260 | 0823 | 67 | 8002 | 1061 | B0023 | RAM | 8002 | SUM1 |
| 261 | 0824 | 67 | 8002 | 1061 | B0024 | RAM | 8002 | SUM1 |
| 262 | 0825 | 67 | 8002 | 1061 | B0025 | RAM | 8002 | SUM1 |
| 263 | 0826 | 67 | 8002 | 1061 | B0026 | RAM | 8002 | SUM1 |
| 264 | 0827 | 67 | 8002 | 1061 | B0027 | RAM | 8002 | SUM1 |
| 265 | 0828 | 67 | 8002 | 1061 | B0028 | RAM | 8002 | SUM1 |
| 266 | 0829 | 67 | 8002 | 1061 | B0029 | RAM | 8002 | SUM1 |
| 267 | 0830 | 67 | 8002 | 1061 | B0030 | RAM | 8002 | SUM1 |
| 268 | 0831 | 67 | 1954 | 1061 | B0031 | RAM | 1954 | SUM1 |
| 269 | 0832 | 67 | 8002 | 1061 | B0032 | RAM | 8002 | SUM1 |
| 270 | 0833 | 67 | 8002 | 1061 | B0033 | RAM | 8002 | SUM1 |
| 271 | 0834 | 67 | 8002 | 1061 | B0034 | RAM | 8002 | SUM1 |
| 272 | 0835 | 67 | 8002 | 1061 | B0035 | RAM | 8002 | SUM1 |
| 273 | 0836 | 67 | 8002 | 1061 | B0036 | RAM | 8002 | SUM1 |
| 274 | 0837 | 67 | 8002 | 1061 | B0037 | RAM | 8002 | SUM1 |
| 275 | 0838 | 67 | 8002 | 1061 | B0038 | RAM | 8002 | SUM1 |
| 276 | 0839 | 67 | 8002 | 1061 | B0039 | RAM | 8002 | SUM1 |

Table V (continued)

| | | | | | | | | |
|-----|------|----|------|------|-------|-----|------|---------|
| 277 | 0840 | 67 | 8002 | 1061 | B0040 | RAM | 8002 | SUM1 |
| 278 | 0841 | 67 | 1955 | 1061 | B0041 | RAM | 1955 | SUM1 |
| 279 | 0842 | 67 | 8002 | 1061 | B0042 | RAM | 8002 | SUM1 |
| 280 | 0843 | 67 | 8002 | 1061 | B0043 | RAM | 8002 | SUM1 |
| 281 | 0844 | 67 | 8002 | 1061 | B0044 | RAM | 8002 | SUM1 |
| 282 | 0845 | 67 | 8002 | 1061 | B0045 | RAM | 8002 | SUM1 |
| 283 | 0846 | 67 | 8002 | 1061 | B0046 | RAM | 8002 | SUM1 |
| 284 | 0847 | 67 | 8002 | 1061 | B0047 | RAM | 8002 | SUM1 |
| 285 | 0848 | 67 | 8002 | 1061 | B0048 | RAM | 8002 | SUM1 |
| 286 | 0849 | 67 | 8002 | 1061 | B0049 | RAM | 8002 | SUM1 |
| 287 | 0850 | 67 | 8002 | 1061 | B0050 | RAM | 8002 | SUM1 |
| 288 | 0851 | 67 | 1956 | 1061 | B0051 | RAM | 1956 | SUM1 |
| 289 | 0852 | 67 | 8002 | 1061 | B0052 | RAM | 8002 | SUM1 |
| 290 | 0853 | 67 | 8002 | 1061 | B0053 | RAM | 8002 | SUM1 |
| 291 | 0854 | 67 | 8002 | 1061 | B0054 | RAM | 8002 | SUM1 |
| 292 | 0855 | 67 | 8002 | 1061 | B0055 | RAM | 8002 | SUM1 |
| 293 | 0856 | 67 | 8002 | 1061 | B0056 | RAM | 8002 | SUM1 |
| 294 | 0857 | 67 | 8002 | 1061 | B0057 | RAM | 8002 | SUM1 |
| 295 | 0858 | 67 | 8002 | 1061 | B0058 | RAM | 8002 | SUM1 |
| 296 | 0859 | 67 | 8002 | 1061 | B0059 | RAM | 8002 | SUM1 |
| 297 | 0860 | 67 | 8002 | 1061 | B0060 | RAM | 8002 | SUM1 |
| 298 | 0861 | 67 | 1957 | 1061 | B0061 | RAM | 1957 | SUM1 |
| 299 | 0862 | 67 | 8002 | 1061 | B0062 | RAM | 8002 | SUM1 |
| 300 | 0863 | 67 | 8002 | 1061 | B0063 | RAM | 8002 | SUM1 |
| 301 | 0864 | 67 | 8002 | 1061 | B0064 | RAM | 8002 | SUM1 |
| 302 | 0865 | 67 | 8002 | 1061 | B0065 | RAM | 8002 | SUM1 |
| 303 | 0866 | 67 | 8002 | 1061 | B0066 | RAM | 8002 | SUM1 |
| 304 | 0867 | 67 | 8002 | 1061 | B0067 | RAM | 8002 | SUM1 |
| 305 | 0868 | 67 | 8002 | 1061 | B0068 | RAM | 8002 | SUM1 |
| 306 | 0869 | 67 | 8002 | 1061 | B0069 | RAM | 8002 | SUM1 |
| 307 | 0870 | 67 | 8002 | 1061 | B0070 | RAM | 8002 | SUM1 |
| 308 | 0871 | 67 | 1958 | 1061 | B0071 | RAM | 1958 | SUM1 |
| 309 | 0872 | 67 | 8002 | 1061 | B0072 | RAM | 8002 | SUM1 |
| 310 | 0873 | 67 | 8002 | 1061 | B0073 | RAM | 8002 | SUM1 |
| 311 | 0874 | 67 | 8002 | 1061 | B0074 | RAM | 8002 | SUM1 |
| 312 | 0875 | 67 | 8002 | 1061 | B0075 | RAM | 8002 | SUM1 |
| 313 | 0876 | 67 | 8002 | 1061 | B0076 | RAM | 8002 | SUM1 |
| 314 | 0877 | 67 | 8002 | 1061 | B0077 | RAM | 8002 | SUM1 |
| 315 | 0878 | 67 | 8002 | 1061 | B0078 | RAM | 8002 | SUM1 |
| 316 | 0879 | 67 | 8002 | 1061 | B0079 | RAM | 8002 | SUM1 |
| 317 | 0880 | 67 | 8002 | 1061 | B0080 | RAM | 8002 | SUM1 |
| 318 | 0881 | 00 | 1960 | 1001 | B0081 | NOP | 1960 | READ1 |
| 319 | 1057 | 00 | 0000 | 6800 | BNTRY | NOP | 0000 | B0000 C |
| 320 | 1061 | 35 | 0001 | 1067 | SUM1 | SLT | 0001 | |
| 321 | 1067 | 82 | 2000 | 0974 | | RAB | 0000 | A |
| 322 | 0974 | 11 | 8003 | 0981 | | SUP | 8003 | |
| 323 | 0981 | 52 | 8001 | 0987 | | AXB | 8001 | |

Table V (continued)

| | | | | | | | | | |
|-----|------|----|------|------|-------|-----|-------|---|---------|
| 324 | 0987 | 10 | 4000 | 1205 | | AUP | 0000 | B | |
| 325 | 1205 | 10 | 0888 | 1193 | | AUP | ONE | | |
| 326 | 1193 | 21 | 4000 | 1053 | | STU | 0000 | B | |
| 327 | 1053 | 58 | 0001 | 1109 | | AXC | 0001 | | |
| 328 | 1109 | 50 | 0009 | 6800 | | AXA | 0009 | | B0000 C |
| 329 | 1002 | 88 | 9999 | 1111 | ADUMP | RAC | 9999 | | |
| 330 | 1111 | 82 | 0058 | 1117 | | RAB | 0058 | | MOVEB |
| 331 | 1117 | 80 | 0008 | 0973 | MOVEB | RAA | 0008 | | FLOAT |
| 332 | 0973 | 60 | 6000 | 1255 | FLOAT | RAU | 0000 | C | |
| 333 | 1255 | 44 | 1159 | 0960 | | NZU | | | TSTA1 |
| 334 | 1159 | 35 | 0002 | 0965 | | SLT | 0002 | | |
| 335 | 0965 | 10 | 0968 | 1023 | | AUP | C58 | | |
| 336 | 1023 | 32 | 8002 | 1103 | | FAD | 8002 | | |
| 337 | 1103 | 21 | 6000 | 0960 | | STU | 0000 | C | TSTA1 |
| 338 | 0960 | 40 | 1063 | 1064 | TSTA1 | NZA | | | CALC |
| 339 | 1063 | 51 | 0001 | 1069 | | SXA | 0001 | | |
| 340 | 1069 | 58 | 0001 | 0973 | | AXC | 0001 | | FLOAT |
| 341 | 1064 | 59 | 0006 | 0920 | CALC | SXC | 0006 | | |
| 342 | 0920 | 32 | 6000 | 1127 | | FAD | 0000 | C | |
| 343 | 1127 | 32 | 6003 | 0979 | | FAD | 0003 | C | |
| 344 | 0979 | 21 | 1034 | 1037 | | STU | TMP43 | | |
| 345 | 1037 | 59 | 0001 | 1243 | | SXC | 0001 | | |
| 346 | 1243 | 60 | 6000 | 1305 | | RAU | 0000 | C | |
| 347 | 1305 | 32 | 6003 | 1029 | | FAD | 0003 | C | |
| 348 | 1029 | 21 | 1084 | 1087 | | STU | TMPBD | | |
| 349 | 1087 | 32 | 6006 | 1083 | | FAD | 0006 | C | |
| 350 | 1083 | 21 | 0938 | 0991 | | STU | TMP42 | | |
| 351 | 0991 | 59 | 0001 | 0897 | | SXC | 0001 | | |
| 352 | 0897 | 60 | 6000 | 1355 | | RAU | 0000 | C | |
| 353 | 1355 | 32 | 6003 | 1079 | | FAD | 0003 | C | |
| 354 | 1079 | 21 | 1134 | 1137 | | STU | TMPAC | | |
| 355 | 1137 | 32 | 6006 | 1133 | | FAD | 0006 | C | |
| 356 | 1133 | 21 | 0988 | 1041 | | STU | TMP41 | | |
| 357 | 1041 | 60 | 6003 | 1107 | | RAU | 0003 | C | |
| 358 | 1107 | 32 | 6004 | 1031 | | FAD | 0004 | C | |
| 359 | 1031 | 21 | 1086 | 0989 | | STU | TMPCD | | |
| 360 | 0989 | 60 | 6000 | 1405 | | RAU | 0000 | C | |
| 361 | 1405 | 32 | 6001 | 1177 | | FAD | 0001 | C | |
| 362 | 1177 | 21 | 0982 | 1035 | | STU | TMPAB | | |
| 363 | 1035 | 60 | 0988 | 1293 | | RAU | TMP41 | | |
| 364 | 1293 | 32 | 0938 | 1015 | | FAD | TMP42 | | |
| 365 | 1015 | 32 | 1034 | 1161 | | FAD | TMP43 | | |
| 366 | 1161 | 21 | 0966 | 1119 | | STU | BIGN | | |
| 367 | 1119 | 60 | 0982 | 1187 | | RAU | TMPAB | | |
| 368 | 1187 | 32 | 1086 | 1113 | | FAD | TMPCD | | |
| 369 | 1113 | 21 | 1018 | 0921 | | STU | SMALN | | TEST1 |

Table V (continued)

| | | | | | | | | |
|-----|------|----|------|------|-------|-----|-------|-------|
| 370 | 0921 | 65 | 8000 | 1129 | TEST1 | RAL | 8000 | |
| 371 | 1129 | 46 | 1032 | 1183 | | BMI | OKAY | TEST |
| 372 | 1183 | 60 | 1018 | 1073 | TEST | RAU | SMALN | |
| 373 | 1073 | 33 | 0926 | 1153 | | FSB | FLT20 | |
| 374 | 1153 | 46 | 1056 | 1157 | | BMI | SKIP | |
| 375 | 1157 | 33 | 0926 | 1203 | | FSB | FLT20 | |
| 376 | 1203 | 46 | 1106 | 1032 | | BMI | QUERY | OKAY |
| 377 | 1106 | 60 | 0982 | 1237 | QUERY | RAU | TMPAB | |
| 378 | 1237 | 39 | 1134 | 1184 | | FMP | TMPAC | |
| 379 | 1184 | 34 | 1018 | 1068 | | FDV | SMALN | |
| 380 | 1068 | 33 | 0971 | 0947 | | FSB | FLT05 | |
| 381 | 0947 | 46 | 1056 | 1301 | | BMI | SKIP | |
| 382 | 1301 | 60 | 0982 | 1287 | | RAU | TMPAB | |
| 383 | 1287 | 39 | 1084 | 1234 | | FMP | TMPBD | |
| 384 | 1234 | 34 | 1018 | 1118 | | FDV | SMALN | |
| 385 | 1118 | 33 | 0971 | 0997 | | FSB | FLT05 | |
| 386 | 0997 | 46 | 1056 | 1351 | | BMI | SKIP | |
| 387 | 1351 | 60 | 1086 | 1091 | | RAU | TMPCD | |
| 388 | 1091 | 39 | 1134 | 1284 | | FMP | TMPAC | |
| 389 | 1284 | 34 | 1018 | 1168 | | FDV | SMALN | |
| 390 | 1168 | 33 | 0971 | 1047 | | FSB | FLT05 | |
| 391 | 1047 | 46 | 1056 | 1401 | | BMI | SKIP | |
| 392 | 1401 | 60 | 1086 | 1141 | | RAU | TMPCD | |
| 393 | 1141 | 39 | 1084 | 1334 | | FMP | TMPBD | |
| 394 | 1334 | 34 | 1018 | 1218 | | FDV | SMALN | |
| 395 | 1218 | 33 | 0971 | 1097 | | FSB | FLT05 | |
| 396 | 1097 | 46 | 1056 | 1032 | | BMI | SKIP | OKAY |
| 397 | 1056 | 60 | 8003 | 1163 | SKIP | RAU | 8003 | |
| 398 | 1163 | 20 | 1167 | 0970 | | STL | PHI | |
| 399 | 0970 | 20 | 1075 | 0978 | | STL | KISQU | |
| 400 | 0978 | 20 | 1233 | 1136 | | STL | KISQC | |
| 401 | 1136 | 20 | 1191 | 0894 | | STL | C | |
| 402 | 0894 | 20 | 0999 | 0902 | | STL | RATIO | PUNCH |
| 403 | 1032 | 60 | 0982 | 1337 | OKAY | RAU | TMPAB | |
| 404 | 1337 | 39 | 1134 | 1384 | | FMP | TMPAC | |
| 405 | 1384 | 39 | 1084 | 1434 | | FMP | TMPBD | |
| 406 | 1434 | 39 | 1086 | 1186 | | FMP | TMPCD | |
| 407 | 1186 | 21 | 0940 | 1343 | | STU | TMP1 | |
| 408 | 1343 | 60 | 6000 | 1455 | | RAU | 0000 | C |
| 409 | 1455 | 39 | 6004 | 1104 | | FMP | 0004 | C |
| 410 | 1104 | 21 | 0958 | 1211 | | STU | TMP2 | |
| 411 | 1211 | 61 | 6001 | 1505 | | RSU | 0001 | C |
| 412 | 1505 | 39 | 6003 | 1253 | | FMP | 0003 | C |
| 413 | 1253 | 32 | 0958 | 1085 | | FAD | TMP2 | |
| 414 | 1085 | 21 | 0990 | 1393 | | STU | TMP3 | |
| 415 | 1393 | 69 | 8000 | 1049 | | LDD | 8000 | |

Table V (continued)

| | | | | | | | | |
|-----|------|----|------|------|-------|-----|-------|-------|
| 416 | 1049 | 92 | 0952 | 1154 | | BD2 | GOON1 | ELPHI |
| 417 | 0952 | 93 | 1555 | 1207 | GOON1 | BD3 | GOON2 | ELC |
| 418 | 1154 | 93 | 1257 | 1209 | ELPHI | BD3 | GOON3 | ELC2 |
| 419 | 1555 | 60 | 0940 | 0995 | GOON2 | RAU | TMP1 | |
| 420 | 0995 | 69 | 1048 | 1831 | | LDD | DNOM1 | SQRT |
| 421 | 1048 | 21 | 1052 | 1605 | DNOM1 | STU | TMP4 | |
| 422 | 1605 | 60 | 0990 | 1045 | | RAU | TMP3 | |
| 423 | 1045 | 34 | 1052 | 1102 | | FDV | TMP4 | |
| 424 | 1102 | 21 | 1167 | 1020 | | STU | PHI | |
| 425 | 1020 | 39 | 8003 | 1123 | | FMP | 8003 | |
| 426 | 1123 | 21 | 1028 | 1081 | | STU | TMP5 | |
| 427 | 1081 | 32 | 1484 | 1261 | | FAD | FLT01 | |
| 428 | 1261 | 21 | 1016 | 1169 | | STU | TMP6 | |
| 429 | 1169 | 60 | 1028 | 1283 | | RAU | TMP5 | |
| 430 | 1283 | 34 | 1016 | 1066 | | FDV | TMP6 | |
| 431 | 1066 | 69 | 1219 | 1831 | | LDD | C1 | SQRT |
| 432 | 1219 | 21 | 1191 | 0944 | C1 | STU | C | KISQ1 |
| 433 | 0944 | 61 | 1018 | 1173 | KISQ1 | RSU | SMALN | |
| 434 | 1173 | 34 | 0976 | 1026 | | FDV | FLT02 | |
| 435 | 1026 | 21 | 1080 | 1333 | | STU | TMPX1 | |
| 436 | 1333 | 67 | 0990 | 1095 | | RAM | TMP3 | |
| 437 | 1095 | 60 | 8002 | 1303 | | RAU | 8002 | |
| 438 | 1303 | 32 | 1080 | 1307 | | FAD | TMPX1 | |
| 439 | 1307 | 39 | 8003 | 1311 | | FMP | 8003 | |
| 440 | 1311 | 39 | 1018 | 1268 | | FMP | SMALN | |
| 441 | 1268 | 34 | 0940 | 1040 | | FDV | TMP1 | |
| 442 | 1040 | 21 | 1233 | 1236 | | STU | KISQC | |
| 443 | 1236 | 60 | 1018 | 1223 | | RAU | SMALN | |
| 444 | 1223 | 34 | 0966 | 1116 | | FDV | BIGN | |
| 445 | 1116 | 21 | 0999 | 1152 | | STU | RATIO | TEST2 |
| 446 | 1207 | 60 | 0940 | 1145 | ELC | RAU | TMP1 | |
| 447 | 1145 | 69 | 1098 | 1831 | | LDD | DNOM2 | SQRT |
| 448 | 1098 | 21 | 1052 | 1655 | DNOM2 | STU | TMP4 | |
| 449 | 1655 | 60 | 0990 | 1195 | | RAU | TMP3 | |
| 450 | 1195 | 34 | 1052 | 1202 | | FDV | TMP4 | |
| 451 | 1202 | 21 | 1167 | 1070 | | STU | PHI | |
| 452 | 1070 | 20 | 1191 | 0944 | | STL | C | KISQ1 |
| 453 | 1257 | 60 | 0990 | 1245 | GOON3 | RAU | TMP3 | |
| 454 | 1245 | 39 | 8003 | 1099 | | FMP | 8003 | |
| 455 | 1099 | 34 | 0940 | 1090 | | FDV | TMP1 | |
| 456 | 1090 | 21 | 1052 | 1705 | | STU | TMP4 | |
| 457 | 1705 | 32 | 1484 | 1361 | | FAD | FLT01 | |
| 458 | 1361 | 21 | 1028 | 1131 | | STU | TMP5 | |
| 459 | 1131 | 60 | 1052 | 1357 | | RAU | TMP4 | |
| 460 | 1357 | 34 | 1028 | 1078 | | FDV | TMP5 | |
| 461 | 1078 | 69 | 1181 | 1831 | | LDD | CSQ | SQRT |

Table V (continued)

| | | | | | | | | |
|-----|------|----|------|------|-------|-----|-------|---------|
| 462 | 1181 | 21 | 1191 | 0994 | CSQ | STU | C | |
| 463 | 0994 | 20 | 1167 | 0944 | | STL | PHI | KISQ1 |
| 464 | 1209 | 20 | 1191 | 1044 | ELC2 | STL | C | |
| 465 | 1044 | 20 | 1167 | 0944 | | STL | PHI | KISQ1 |
| 466 | 1152 | 69 | 8000 | 1008 | TEST2 | LDD | 8000 | |
| 467 | 1008 | 91 | 1411 | 1213 | | BD1 | OUT3 | OUT1 |
| 468 | 1411 | 94 | 1114 | 1166 | OUT3 | BD4 | KISQ2 | |
| 469 | 1166 | 20 | 1075 | 1128 | | STL | KISQU | PCH3 |
| 470 | 1213 | 94 | 1216 | 1318 | OUT1 | BD4 | PCH1 | |
| 471 | 1318 | 20 | 0999 | 1252 | | STL | RATIO | |
| 472 | 1252 | 20 | 1233 | 1286 | | STL | KISQC | |
| 473 | 1286 | 20 | 1075 | 1128 | | STL | KISQU | PCH3 |
| 474 | 1114 | 60 | 0990 | 1295 | KISQ2 | RAU | TMP3 | |
| 475 | 1295 | 39 | 8003 | 1149 | | FMP | 8003 | |
| 476 | 1149 | 39 | 1018 | 1368 | | FMP | SMALN | |
| 477 | 1368 | 34 | 0940 | 1140 | | FDV | TMP1 | |
| 478 | 1140 | 21 | 1075 | 1178 | | STU | KISQU | |
| 479 | 1178 | 60 | 1018 | 1273 | | RAU | SMALN | |
| 480 | 1273 | 34 | 0966 | 1266 | | FDV | BIGN | |
| 481 | 1266 | 21 | 0999 | 1128 | | STU | RATIO | PCH3 |
| 482 | 0902 | 69 | 8000 | 1058 | PUNCH | LDD | 8000 | |
| 483 | 1058 | 91 | 1128 | 1263 | | BD1 | PCH3 | |
| 484 | 1263 | 94 | 1216 | 1128 | | BD4 | PCH1 | PCH3 |
| 485 | 0900 | 24 | 1353 | 1156 | DFLOT | STD | TSDF1 | |
| 486 | 1156 | 30 | 0002 | 1313 | | SRT | 0002 | |
| 487 | 1313 | 21 | 1418 | 1021 | | STU | TSDF2 | |
| 488 | 1021 | 67 | 8002 | 1179 | | RAM | 8002 | |
| 489 | 1179 | 35 | 0002 | 1135 | | SLT | 0002 | |
| 490 | 1135 | 50 | 0054 | 1241 | | AXA | 0054 | |
| 491 | 1241 | 51 | 8003 | 0950 | | SXA | 8003 | |
| 492 | 0950 | 65 | 1418 | 1323 | | RAL | TSDF2 | |
| 493 | 1323 | 31 | 2000 | 1353 | | SRD | 0000 | A TSDF1 |
| 494 | 1216 | 60 | 1018 | 1373 | PCH1 | RAU | SMALN | |
| 495 | 1373 | 44 | 1227 | 1228 | | NZU | | TSP01 |
| 496 | 1227 | 80 | 0004 | 1383 | | RAA | 0004 | |
| 497 | 1383 | 69 | 1228 | 0900 | | LDD | TSP01 | DFLOT |
| 498 | 1228 | 20 | 1978 | 1231 | TSP01 | STL | 1978 | |
| 499 | 1231 | 60 | 1167 | 1071 | | RAU | PHI | |
| 500 | 1071 | 44 | 1125 | 1076 | | NZU | | TSP02 |
| 501 | 1125 | 80 | 0001 | 1281 | | RAA | 0001 | |
| 502 | 1281 | 69 | 1076 | 0900 | | LDD | TSP02 | DFLOT |
| 503 | 1076 | 20 | 1979 | 1082 | TSP02 | STL | 1979 | |
| 504 | 1082 | 60 | 1191 | 1345 | | RAU | C | |
| 505 | 1345 | 44 | 1199 | 1050 | | NZU | | TSP03 |
| 506 | 1199 | 80 | 0001 | 1755 | | RAA | 0001 | |
| 507 | 1755 | 69 | 1050 | 0900 | | LDD | TSP03 | DFLOT |

Table V (continued)

| | | | | | | | | |
|-----|------|----|------|------|-------|-----|-------|---------|
| 508 | 1050 | 20 | 1980 | 1433 | TSP03 | STL | 1980 | |
| 509 | 1433 | 60 | 1233 | 1387 | | RAU | KISQC | |
| 510 | 1387 | 44 | 1291 | 0892 | | NZU | | TSP04 |
| 511 | 1291 | 80 | 0001 | 1147 | | RAA | 0001 | |
| 512 | 1147 | 69 | 0892 | 0900 | | LDD | TSP04 | DFLOT |
| 513 | 0892 | 20 | 1981 | 1534 | TSP04 | STL | 1981 | |
| 514 | 1534 | 21 | 1982 | 1185 | | STU | 1982 | |
| 515 | 1185 | 21 | 1983 | 1336 | | STU | 1983 | |
| 516 | 1336 | 21 | 1984 | 1437 | | STU | 1984 | IDNT0 |
| 517 | 1437 | 65 | 8007 | 1395 | IDNT0 | RAL | 8007 | |
| 518 | 1395 | 64 | 0914 | 1024 | | DVR | NINE | |
| 519 | 1024 | 35 | 0001 | 1331 | | SLT | 0001 | |
| 520 | 1331 | 15 | 0896 | 1451 | | ALO | IDENT | |
| 521 | 1451 | 20 | 1977 | 1130 | | STL | 1977 | |
| 522 | 1130 | 71 | 1977 | 0932 | | PCH | 1977 | CTEST |
| 523 | 1128 | 60 | 6000 | 1905 | PCH3 | RAU | 0000 | C CARD1 |
| 524 | 1905 | 44 | 1259 | 1010 | CARD1 | NZU | | TSP05 |
| 525 | 1259 | 80 | 0004 | 1065 | | RAA | 0004 | |
| 526 | 1065 | 69 | 1010 | 0900 | | LDD | TSP05 | DFLOT |
| 527 | 1010 | 35 | 0005 | 1423 | TSP05 | SLT | 0005 | |
| 528 | 1423 | 20 | 1978 | 1381 | | STL | 1978 | |
| 529 | 1381 | 60 | 6001 | 1206 | | RAU | 0001 | C |
| 530 | 1206 | 44 | 1309 | 1060 | | NZU | | TSP06 |
| 531 | 1309 | 80 | 0004 | 1115 | | RAA | 0004 | |
| 532 | 1115 | 69 | 1060 | 0900 | | LDD | TSP06 | DFLOT |
| 533 | 1060 | 10 | 1978 | 1483 | TSP06 | AUP | 1978 | |
| 534 | 1483 | 10 | 8002 | 1341 | | AUP | 8002 | |
| 535 | 1341 | 21 | 1978 | 1431 | | STU | 1978 | |
| 536 | 1431 | 60 | 0982 | 1487 | | RAU | TMPAB | |
| 537 | 1487 | 44 | 1391 | 0942 | | NZU | | TSP07 |
| 538 | 1391 | 80 | 0004 | 1197 | | RAA | 0004 | |
| 539 | 1197 | 69 | 0942 | 0900 | | LDD | TSP07 | DFLOT |
| 540 | 0942 | 35 | 0006 | 1407 | TSP07 | SLT | 0006 | |
| 541 | 1407 | 20 | 1979 | 1132 | | STL | 1979 | |
| 542 | 1132 | 60 | 0999 | 1403 | | RAU | RATIO | |
| 543 | 1403 | 44 | 1457 | 1108 | | NZU | | TSP08 |
| 544 | 1457 | 80 | 0001 | 1363 | | RAA | 0001 | |
| 545 | 1363 | 69 | 1108 | 0900 | | LDD | TSP08 | DFLOT |
| 546 | 1108 | 20 | 1980 | 1533 | TSP08 | STL | 1980 | |
| 547 | 1533 | 60 | 1191 | 1445 | | RAU | C | |
| 548 | 1445 | 44 | 1249 | 1100 | | NZU | | TSP09 |
| 549 | 1249 | 80 | 0001 | 1256 | | RAA | 0001 | |
| 550 | 1256 | 69 | 1100 | 0900 | | LDD | TSP09 | DFLOT |
| 551 | 1100 | 20 | 1981 | 1584 | TSP09 | STL | 1981 | |
| 552 | 1584 | 21 | 1982 | 1235 | | STU | 1982 | |
| 553 | 1235 | 21 | 1983 | 1386 | | STU | 1983 | |

Table V (continued)

| | | | | | | | | |
|-----|------|----|------|------|-------|-----|-------|-------|
| 554 | 1386 | 21 | 1984 | 1537 | | STU | 1984 | IDNT1 |
| 555 | 1537 | 65 | 8007 | 1495 | IDNT1 | RAL | 8007 | |
| 556 | 1495 | 64 | 0914 | 1074 | | DVR | NINE | |
| 557 | 1074 | 35 | 0001 | 1481 | | SLT | 0001 | |
| 558 | 1481 | 15 | 0896 | 1501 | | ALO | IDENT | |
| 559 | 1501 | 15 | 0888 | 1443 | | ALO | ONE | |
| 560 | 1443 | 20 | 1977 | 1180 | | STL | 1977 | |
| 561 | 1180 | 71 | 1977 | 1277 | | PCH | 1977 | CARD2 |
| 562 | 1277 | 60 | 6003 | 1507 | CARD2 | RAU | 0003 | C |
| 563 | 1507 | 44 | 1461 | 0962 | | NZU | | TSP10 |
| 564 | 1461 | 80 | 0004 | 1217 | | RAA | 0004 | |
| 565 | 1217 | 69 | 0962 | 0900 | | LDD | TSP10 | DFLOT |
| 566 | 0962 | 35 | 0005 | 1175 | TSP10 | SLT | 0005 | |
| 567 | 1175 | 20 | 1978 | 1531 | | STL | 1978 | |
| 568 | 1531 | 60 | 6004 | 1359 | | RAU | 0004 | C |
| 569 | 1359 | 44 | 1413 | 1164 | | NZU | | TSP11 |
| 570 | 1413 | 80 | 0004 | 1269 | | RAA | 0004 | |
| 571 | 1269 | 69 | 1164 | 0900 | | LDD | TSP11 | DFLOT |
| 572 | 1164 | 10 | 1978 | 1583 | TSP11 | AUP | 1978 | |
| 573 | 1583 | 10 | 8002 | 1441 | | AUP | 8002 | |
| 574 | 1441 | 21 | 1978 | 1581 | | STU | 1978 | |
| 575 | 1581 | 60 | 1086 | 1491 | | RAU | TMPCD | |
| 576 | 1491 | 44 | 1545 | 0996 | | NZU | | TSP12 |
| 577 | 1545 | 80 | 0004 | 1551 | | RAA | 0004 | |
| 578 | 1551 | 69 | 0996 | 0900 | | LDD | TSP12 | DFLOT |
| 579 | 0996 | 35 | 0006 | 1511 | TSP12 | SLT | 0006 | |
| 580 | 1511 | 20 | 1979 | 1182 | | STL | 1979 | |
| 581 | 1182 | 60 | 1167 | 1121 | | RAU | PHI | |
| 582 | 1121 | 44 | 1225 | 1126 | | NZU | | TSP13 |
| 583 | 1225 | 80 | 0001 | 1631 | | RAA | 0001 | |
| 584 | 1631 | 69 | 1126 | 0900 | | LDD | TSP13 | DFLOT |
| 585 | 1126 | 20 | 1980 | 1633 | TSP13 | STL | 1980 | |
| 586 | 1633 | 21 | 1981 | 1634 | | STU | 1981 | IDNT2 |
| 587 | 1634 | 65 | 1977 | 1681 | IDNT2 | RAL | 1977 | |
| 588 | 1681 | 15 | 0888 | 1493 | | ALO | ONE | |
| 589 | 1493 | 20 | 1977 | 1230 | | STL | 1977 | |
| 590 | 1230 | 71 | 1977 | 1327 | | PCH | 1977 | CARD3 |
| 591 | 1327 | 60 | 1134 | 1039 | CARD3 | RAU | TMPAC | |
| 592 | 1039 | 44 | 1543 | 1094 | | NZU | | TSP14 |
| 593 | 1543 | 80 | 0004 | 1299 | | RAA | 0004 | |
| 594 | 1299 | 69 | 1094 | 0900 | | LDD | TSP14 | DFLOT |
| 595 | 1094 | 35 | 0005 | 1557 | TSP14 | SLT | 0005 | |
| 596 | 1557 | 20 | 1978 | 1731 | | STL | 1978 | |
| 597 | 1731 | 60 | 1084 | 1089 | | RAU | TMPBD | |
| 598 | 1089 | 44 | 1593 | 1144 | | NZU | | TSP15 |
| 599 | 1593 | 80 | 0004 | 1349 | | RAA | 0004 | |

Table V (continued)

| | | | | | | | | |
|-----|------|----|------|------|-------|-----|-------|---------|
| 600 | 1349 | 69 | 1144 | 0900 | | LDD | TSP15 | DFLOT |
| 601 | 1144 | 10 | 1978 | 1683 | TSP15 | AUP | 1978 | |
| 602 | 1683 | 10 | 8002 | 1541 | | AUP | 8002 | |
| 603 | 1541 | 21 | 1978 | 1781 | | STU | 1978 | |
| 604 | 1781 | 60 | 1018 | 1473 | | RAU | SMALN | |
| 605 | 1473 | 44 | 1377 | 1278 | | NZU | | TSP16 |
| 606 | 1377 | 80 | 0004 | 1733 | | RAA | 0004 | |
| 607 | 1733 | 69 | 1278 | 0900 | | LDD | TSP16 | DFLOT |
| 608 | 1278 | 35 | 0006 | 1643 | TSP16 | SLT | 0006 | |
| 609 | 1643 | 20 | 1979 | 1232 | | STL | 1979 | |
| 610 | 1232 | 60 | 1075 | 1229 | | RAU | KISQU | |
| 611 | 1229 | 44 | 1783 | 1684 | | NZU | | TSP17 |
| 612 | 1783 | 80 | 0001 | 1139 | | RAA | 0001 | |
| 613 | 1139 | 69 | 1684 | 0900 | | LDD | TSP17 | DFLOT |
| 614 | 1684 | 20 | 1980 | 1883 | TSP17 | STL | 1980 | |
| 615 | 1883 | 60 | 1233 | 1587 | | RAU | KISQC | |
| 616 | 1587 | 44 | 1591 | 0992 | | NZU | | TSP18 |
| 617 | 1591 | 80 | 0001 | 1247 | | RAA | 0001 | |
| 618 | 1247 | 69 | 0992 | 0900 | | LDD | TSP18 | DFLOT |
| 619 | 0992 | 20 | 1981 | 1734 | TSP18 | STL | 1981 | IDNT3 |
| 620 | 1734 | 65 | 1977 | 1881 | IDNT3 | RAL | 1977 | |
| 621 | 1881 | 15 | 0888 | 1693 | | ALO | ONE | |
| 622 | 1693 | 20 | 1977 | 1280 | | STL | 1977 | |
| 623 | 1280 | 71 | 1977 | 0932 | | PCH | 1977 | CTEST |
| 624 | 0932 | 80 | 9999 | 1641 | CTEST | RAA | 9999 | |
| 625 | 1641 | 59 | 2000 | 1148 | | SXC | 0000 | A |
| 626 | 1148 | 48 | 0904 | 0721 | | NZC | RESTC | A0001 |
| 627 | 0904 | 58 | 2001 | 1117 | RESTC | AXC | 0001 | A MOVEB |
| 628 | 0914 | 00 | 0000 | 0009 | NINE | 00 | 0000 | 0009 |
| 629 | 1150 | 00 | 0001 | 0000 | ONEM | 00 | 0001 | 0000 |
| 630 | 0888 | 00 | 0000 | 0001 | ONE | 00 | 0000 | 0001 |
| 631 | 0922 | 00 | 0000 | 1951 | WORDC | 00 | 0000 | 1951 |
| 632 | 0986 | 00 | 0000 | 1020 | IDCON | 00 | 0000 | 1020 |
| 633 | 0968 | 00 | 0000 | 0058 | C58 | 00 | 0000 | 0058 |
| 634 | 1484 | 10 | 0000 | 0051 | FLT01 | 10 | 0000 | 0051 |
| 635 | 0926 | 20 | 0000 | 0052 | FLT20 | 20 | 0000 | 0052 |
| 636 | 0971 | 50 | 0000 | 0051 | FLT05 | 50 | 0000 | 0051 |
| 637 | 0976 | 20 | 0000 | 0051 | FLT02 | 20 | 0000 | 0051 |
| 638 | 0918 | 01 | 0001 | 8000 | STOP1 | HLT | 0001 | 8000 |
| 639 | 0928 | 01 | 0000 | 0927 | STOP2 | HLT | 0000 | CNTNU |

Table VI

SAMPLE RESULTS FOR VARIOUS CONSOLE SETTINGS

| Con. Set | Col: (5-10) | (11-15) | (16-20) | (21-24) | (25-30) | (31-40) | (41-50) |
|----------|--------------------------|---------|---------|---------|---------|---------|---------|
| 8888- | | | | | | | |
| 1785 | (Problem Identification) | | | | | | |
| 1021 | 22 | 4 | 26 | | | 600+ | 635+ |
| 1022 | | 16 | 16 | | | 823+ | |
| 1023 | 22 | 20 | 42 | | | 28431+ | 25140+ |
| 1031 | 8 | 2 | 10 | | | 229+ | 423+ |
| 1032 | 2 | 4 | 6 | | | 467+ | |
| 1033 | 10 | 6 | 16 | | | 3484+ | 1778+ |
| 1041 | 17 | 9 | 26 | | | 600+ | 91+ |
| 1042 | 9 | 7 | 16 | | | 91+ | |
| 1043 | 26 | 16 | 42 | | | 350+ | 70+ |
| 2031 | 11 | 1 | 12 | | | 443+ | 476+ |
| 2032 | 7 | 12 | 19 | | | 541+ | |
| 2033 | 18 | 13 | 31 | | | 9079+ | 6967+ |
| 2041 | 20 | 8 | 28 | | | 800+ | 277+ |
| 2042 | 12 | 16 | 28 | | | 289+ | |
| 2043 | 32 | 24 | 56 | | | 4667+ | 3573+ |
| 3041 | 17 | 10 | 27 | | | 614+ | 184+ |
| 3042 | 7 | 9 | 16 | | | 187+ | |
| 3043 | 24 | 19 | 43 | | | 1504+ | 826+ |

8888+

| | | | | | | | |
|------|--------------------------|----|----|--|--|--------|--------|
| 1785 | (Problem Identification) | | | | | | |
| 1021 | 22 | 4 | 26 | | | 600+ | 635+ |
| 1022 | | 16 | 16 | | | 823+ | |
| 1023 | 22 | 20 | 42 | | | 28431+ | 25140+ |
| 1031 | 8 | 2 | 10 | | | | |
| 1032 | 2 | 4 | 6 | | | | |
| 1033 | 10 | 6 | 16 | | | | |
| 1041 | 17 | 9 | 26 | | | 600+ | 91+ |
| 1042 | 9 | 7 | 16 | | | 91+ | |
| 1043 | 26 | 16 | 42 | | | 350+ | 70+ |
| 2031 | 11 | 1 | 12 | | | 443+ | 476+ |
| 2032 | 7 | 12 | 19 | | | 541+ | |
| 2033 | 18 | 13 | 31 | | | 9079+ | 6967+ |
| 2041 | 20 | 8 | 28 | | | 800+ | 277+ |
| 2042 | 12 | 16 | 28 | | | 289+ | |
| 2043 | 32 | 24 | 56 | | | 4667+ | 3573+ |
| 3041 | 17 | 10 | 27 | | | 614+ | 184+ |
| 3042 | 7 | 9 | 16 | | | 187+ | |
| 3043 | 24 | 19 | 43 | | | 1504+ | 826+ |

Table VI (continued)

| Con. Set. | Col: (5-10) | (11-15) | (16-20) | (21-24) | (25-30) | (31-40) | (41-50) |
|-----------|--------------------------|---------|---------|---------|---------|---------|---------|
| 8898- | | | | | | | |
| 1785 | (Problem Identification) | | | | | | |
| 1021 | 22 | 4 | 26 | | | 600+ | 635+ |
| 1022 | | 16 | 16 | | | | |
| 1023 | 22 | 20 | 42 | | | 28431+ | 25140+ |
| 1031 | 8 | 2 | 10 | | | 229+ | 423+ |
| 1032 | 2 | 4 | 6 | | | | |
| 1033 | 10 | 6 | 16 | | | 3484+ | 1778+ |
| 1041 | 17 | 9 | 26 | | | 600+ | 91+ |
| 1042 | 9 | 7 | 16 | | | | |
| 1043 | 26 | 16 | 42 | | | 350+ | 70+ |
| 2031 | 11 | 1 | 12 | | | 443+ | 476+ |
| 2032 | 7 | 12 | 19 | | | | |
| 2033 | 18 | 13 | 31 | | | 9079+ | 6967+ |
| 2041 | 20 | 8 | 28 | | | 800+ | 277+ |
| 2042 | 12 | 16 | 28 | | | | |
| 2043 | 32 | 24 | 56 | | | 4667+ | 3573+ |
| 3041 | 17 | 10 | 27 | | | 614+ | 184+ |
| 3042 | 7 | 9 | 16 | | | | |
| 3043 | 24 | 19 | 43 | | | 1504+ | 826+ |
| 8898+ | | | | | | | |
| 1785 | (Problem Identification) | | | | | | |
| 1021 | 22 | 4 | 26 | | | 600+ | 635+ |
| 1022 | | 16 | 16 | | | | |
| 1023 | 22 | 20 | 42 | | | 28431+ | 25140+ |
| 1031 | 8 | 2 | 10 | | | | |
| 1032 | 2 | 4 | 6 | | | | |
| 1033 | 10 | 6 | 16 | | | | |
| 1041 | 17 | 9 | 26 | | | 600+ | 91+ |
| 1042 | 9 | 7 | 16 | | | | |
| 1043 | 26 | 16 | 42 | | | 350+ | 70+ |
| 2031 | 11 | 1 | 12 | | | 443+ | 476+ |
| 2032 | 7 | 12 | 19 | | | | |
| 2033 | 18 | 13 | 31 | | | 9079+ | 6967+ |
| 2041 | 20 | 8 | 28 | | | 800+ | 277+ |
| 2042 | 12 | 16 | 28 | | | | |
| 2043 | 32 | 24 | 56 | | | 4667+ | 3573+ |
| 3041 | 17 | 10 | 27 | | | 614+ | 184+ |
| 3042 | 7 | 9 | 16 | | | | |
| 3043 | 24 | 19 | 43 | | | 1504+ | 826+ |

Table VI (continued)

| Con. Set. | Col: (5-10) | (11-15) | (16-20) | (21-24) | (25-30) | (31-40) | (41-50) |
|-----------|-------------------------------|---------|---------|---------|---------|---------|---------|
| 8988- | 1785 (Problem Identification) | | | | | | |
| 1021 | 22 | 4 | 26 | | | 600+ | |
| 1022 | | 16 | 16 | | | 823+ | |
| 1023 | 22 | 20 | 42 | | | 28431+ | 25140+ |
| 1031 | 8 | 2 | 10 | | | 229+ | |
| 1032 | 2 | 4 | 6 | | | 467+ | |
| 1033 | 10 | 6 | 16 | | | 3484+ | 1778+ |
| 1041 | 17 | 9 | 26 | | | 600+ | |
| 1042 | 9 | 7 | 16 | | | 91+ | |
| 1043 | 26 | 16 | 42 | | | 350+ | 70+ |
| 2031 | 11 | 1 | 12 | | | 443+ | |
| 2032 | 7 | 12 | 19 | | | 541+ | |
| 2033 | 18 | 13 | 31 | | | 9079+ | 6967+ |
| 2041 | 20 | 8 | 28 | | | 800+ | |
| 2042 | 12 | 16 | 28 | | | 289+ | |
| 2043 | 32 | 24 | 56 | | | 4667+ | 3573+ |
| 3041 | 17 | 10 | 27 | | | 614+ | |
| 3042 | 7 | 9 | 16 | | | 187+ | |
| 3043 | 24 | 19 | 43 | | | 1504+ | 826+ |

| | | | | | | | |
|-------|-------------------------------|----|----|--|--|--------|--------|
| 8988+ | 1785 (Problem Identification) | | | | | | |
| 1021 | 22 | 4 | 26 | | | 600+ | |
| 1022 | | 16 | 16 | | | 823+ | |
| 1023 | 22 | 20 | 42 | | | 28431+ | 25140+ |
| 1031 | 8 | 2 | 10 | | | | |
| 1032 | 2 | 4 | 6 | | | | |
| 1033 | 10 | 6 | 16 | | | | |
| 1041 | 17 | 9 | 26 | | | 600+ | |
| 1042 | 9 | 7 | 16 | | | 91+ | |
| 1043 | 26 | 16 | 42 | | | 350+ | 70+ |
| 2031 | 11 | 1 | 12 | | | 443+ | |
| 2032 | 7 | 12 | 19 | | | 541+ | |
| 2033 | 18 | 13 | 31 | | | 9079+ | 6967+ |
| 2041 | 20 | 8 | 28 | | | 800+ | |
| 2042 | 12 | 16 | 28 | | | 289+ | |
| 2043 | 32 | 24 | 56 | | | 4667+ | 3573+ |
| 3041 | 17 | 10 | 27 | | | 614+ | |
| 3042 | 7 | 9 | 16 | | | 187+ | |
| 3043 | 24 | 19 | 43 | | | 1504+ | 826+ |

Table VI (continued)

| Con. Set. | Col: (5-10) | (11-15) | (16-20) | (21-24) | (25-30) | (31-40) | (41-50) |
|-----------|-------------|--------------------------|---------|---------|---------|---------|---------|
| 8998- | 1785 | (Problem Identification) | | | | | |
| | 1021 | 22 | 4 | 26 | | 600+ | |
| | 1022 | | 16 | 16 | | | |
| | 1023 | 22 | 20 | 42 | | 28431+ | 25140+ |
| | 1031 | 8 | 2 | 10 | | 229+ | |
| | 1032 | 2 | 4 | 6 | | | |
| | 1033 | 10 | 6 | 16 | | 3484+ | 1778+ |
| | 1041 | 17 | 9 | 26 | | 600+ | |
| | 1042 | 9 | 7 | 16 | | | |
| | 1043 | 26 | 16 | 42 | | 350+ | 70+ |
| | 2031 | 11 | 1 | 12 | | 443+ | |
| | 2032 | 7 | 12 | 19 | | | |
| | 2033 | 18 | 13 | 31 | | 9079+ | 6967+ |
| | 2041 | 20 | 8 | 28 | | 800+ | |
| | 2042 | 12 | 16 | 28 | | | |
| | 2043 | 32 | 24 | 56 | | 4667+ | 3573+ |
| | 3041 | 17 | 10 | 27 | | 614+ | |
| | 3042 | 7 | 9 | 16 | | | |
| | 3043 | 24 | 19 | 43 | | 1504+ | 826+ |
| 8998+ | 1785 | (Problem Identification) | | | | | |
| | 1021 | 22 | 4 | 26 | | 600+ | |
| | 1022 | | 16 | 16 | | | |
| | 1023 | 22 | 20 | 42 | | 28431+ | 25140+ |
| | 1031 | 8 | 2 | 10 | | | |
| | 1032 | 2 | 4 | 6 | | | |
| | 1033 | 10 | 6 | 16 | | | |
| | 1041 | 17 | 9 | 26 | | 600+ | |
| | 1042 | 9 | 7 | 16 | | | |
| | 1043 | 26 | 16 | 42 | | 350+ | 70+ |
| | 2031 | 11 | 1 | 12 | | 443+ | |
| | 2032 | 7 | 12 | 19 | | | |
| | 2033 | 18 | 13 | 31 | | 9079+ | 6967+ |
| | 2041 | 20 | 8 | 28 | | 800+ | |
| | 2042 | 12 | 16 | 28 | | | |
| | 2043 | 32 | 24 | 56 | | 4667+ | 3573+ |
| | 3041 | 17 | 10 | 27 | | 614+ | |
| | 3042 | 7 | 9 | 16 | | | |
| | 3043 | 24 | 19 | 43 | | 1504+ | 826+ |

Table VI (continued)

| Con. Set. | Col: (5-10) | (11-15) | (16-20) | (21-24) | (25-30) | (31-40) | (41-50) |
|-----------|--------------------------|---------|---------|---------|---------|---------|---------|
| 9888- | | | | | | | |
| 1785 | (Problem Identification) | | | | | | |
| 1021 | 22 | 4 | 26 | | 600+ | | 635+ |
| 1022 | | 16 | 16 | | 823+ | | |
| 1023 | 22 | 20 | 42 | | | | 25140+ |
| 1031 | 8 | 2 | 10 | | 229+ | | 423+ |
| 1032 | 2 | 4 | 6 | | 467+ | | |
| 1033 | 10 | 6 | 16 | | | | 1778+ |
| 1041 | 17 | 9 | 26 | | 600+ | | 91+ |
| 1042 | 9 | 7 | 16 | | 91+ | | |
| 1043 | 26 | 16 | 42 | | | | 70+ |
| 2031 | 11 | 1 | 12 | | 443+ | | 476+ |
| 2032 | 7 | 12 | 19 | | 541+ | | |
| 2033 | 18 | 13 | 31 | | | | 6967+ |
| 2041 | 20 | 8 | 28 | | 800+ | | 277+ |
| 2042 | 12 | 16 | 28 | | 289+ | | |
| 2043 | 32 | 24 | 56 | | | | 3573+ |
| 3041 | 17 | 10 | 27 | | 614+ | | 184+ |
| 3042 | 7 | 9 | 16 | | 187+ | | |
| 3043 | 24 | 19 | 43 | | | | 826+ |
| 9888+ | | | | | | | |
| 1785 | (Problem Identification) | | | | | | |
| 1021 | 22 | 4 | 26 | | 600+ | | 635+ |
| 1022 | | 16 | 16 | | 823+ | | |
| 1023 | 22 | 20 | 42 | | | | 25140+ |
| 1031 | 8 | 2 | 10 | | | | |
| 1032 | 2 | 4 | 6 | | | | |
| 1033 | 10 | 6 | 16 | | | | |
| 1041 | 17 | 9 | 26 | | 600+ | | 91+ |
| 1042 | 9 | 7 | 16 | | 91+ | | |
| 1043 | 26 | 16 | 42 | | | | 70+ |
| 2031 | 11 | 1 | 12 | | 443+ | | 476+ |
| 2032 | 7 | 12 | 19 | | 541+ | | |
| 2033 | 18 | 13 | 31 | | | | 6967+ |
| 2041 | 20 | 8 | 28 | | 800+ | | 277+ |
| 2042 | 12 | 16 | 28 | | 289+ | | |
| 2043 | 32 | 24 | 56 | | | | 3573+ |
| 3041 | 17 | 10 | 27 | | 614+ | | 184+ |
| 3042 | 7 | 9 | 16 | | 187+ | | |
| 3043 | 24 | 19 | 43 | | | | 826+ |

Table VI (continued)

| Con. Set. | Col: (5-10) | (11-15) | (16-20) | (21-24) | (25-30) | (31-40) | (41-50) |
|--------------|--------------------------|---------|---------|---------|---------|---------|---------|
| 9898- | | | | | | | |
| 1785 | (Problem Identification) | | | | | | |
| 1021 | 22 | 4 | 26 | | 600+ | | 635+ |
| 1022 | | 16 | 16 | | | | |
| 1023 | 22 | 20 | 42 | | | | 25140+ |
| 1031 | 8 | 2 | 10 | | 229+ | | 423+ |
| 1032 | 2 | 4 | 6 | | | | |
| 1033 | 10 | 6 | 16 | | | | 1778+ |
| 1041 | 17 | 9 | 26 | | 600+ | | 91+ |
| 1042 | 9 | 7 | 16 | | | | |
| 1043 | 26 | 16 | 42 | | | | 70+ |
| 2031 | 11 | 1 | 12 | | 443+ | | 476+ |
| 2032 | 7 | 12 | 19 | | | | |
| 2033 | 18 | 13 | 31 | | | | 6967+ |
| 2041 | 20 | 8 | 28 | | 800+ | | 277+ |
| 2042 | 12 | 16 | 28 | | | | |
| 2043 | 32 | 24 | 56 | | | | 3573+ |
| 3041 | 17 | 10 | 27 | | 614+ | | 184+ |
| 3042 | 7 | 9 | 16 | | | | |
| 3043 | 24 | 19 | 43 | | | | 826+ |
| 9898+ | | | | | | | |
| 1785 | (Problem Identification) | | | | | | |
| 1021 | 22 | 4 | 26 | | 600+ | | 635+ |
| 1022 | | 16 | 16 | | | | |
| 1023 | 22 | 20 | 42 | | | | 25140+ |
| 1031 | 8 | 2 | 10 | | | | |
| 1032 | 2 | 4 | 6 | | | | |
| 1033 | 10 | 6 | 16 | | | | |
| 1041 | 17 | 9 | 26 | | 600+ | | 91+ |
| 1042 | 9 | 7 | 16 | | | | |
| 1043 | 26 | 16 | 42 | | | | 70+ |
| 2031 | 11 | 1 | 12 | | 443+ | | 476+ |
| 2032 | 7 | 12 | 19 | | | | |
| 2033 | 18 | 13 | 31 | | | | 6967+ |
| 2041 | 20 | 8 | 28 | | 800+ | | 277+ |
| 2042 | 12 | 16 | 28 | | | | |
| 2043 | 32 | 24 | 56 | | | | 3573+ |
| 3041 | 17 | 10 | 27 | | 614+ | | 184+ |
| 3042 | 7 | 9 | 16 | | | | |
| 3043 | 24 | 19 | 43 | | | | 826+ |

Table VI (continued)

| Con. Set. | Col: (5-10) | (11-15) | (16-20) | (21-24) | (25-30) | (31-40) | (41-50) |
|-----------|--------------------------|---------|---------|---------|---------|---------|---------|
| 9988- | | | | | | | |
| 1785 | (Problem Identification) | | | | | | |
| 1021 | 22 | 4 | 26 | | | 600+ | |
| 1022 | | 16 | 16 | | | 823+ | |
| 1023 | 22 | 20 | 42 | | | | 25140+ |
| 1031 | 8 | 2 | 10 | | | 229+ | |
| 1032 | 2 | 4 | 6 | | | 467+ | |
| 1033 | 10 | 6 | 16 | | | | 1778+ |
| 1041 | 17 | 9 | 26 | | | 600+ | |
| 1042 | 9 | 7 | 16 | | | 91+ | |
| 1043 | 26 | 16 | 42 | | | | 70+ |
| 2031 | 11 | 1 | 12 | | | 443+ | |
| 2032 | 7 | 12 | 19 | | | 541+ | |
| 2033 | 18 | 13 | 31 | | | | 6967+ |
| 2041 | 20 | 8 | 28 | | | 800+ | |
| 2042 | 12 | 16 | 28 | | | 289+ | |
| 2043 | 32 | 24 | 56 | | | | 3573+ |
| 3041 | 17 | 10 | 27 | | | 614+ | |
| 3042 | 7 | 9 | 16 | | | 187+ | |
| 3043 | 24 | 19 | 43 | | | | 826+ |

9988+

| | | | | | | | |
|------|--------------------------|----|----|--|--|------|--------|
| 1785 | (Problem Identification) | | | | | | |
| 1021 | 22 | 4 | 26 | | | 600+ | |
| 1022 | | 16 | 16 | | | 823+ | |
| 1023 | 22 | 20 | 42 | | | | 25140+ |
| 1031 | 8 | 2 | 10 | | | | |
| 1032 | 2 | 4 | 6 | | | | |
| 1033 | 10 | 6 | 16 | | | | |
| 1041 | 17 | 9 | 26 | | | 600+ | |
| 1042 | 9 | 7 | 16 | | | 91+ | |
| 1043 | 26 | 16 | 42 | | | | 70+ |
| 2031 | 11 | 1 | 12 | | | 443+ | |
| 2032 | 7 | 12 | 19 | | | 541+ | |
| 2033 | 18 | 13 | 31 | | | | 6967+ |
| 2041 | 20 | 8 | 28 | | | 800+ | |
| 2042 | 12 | 16 | 28 | | | 289+ | |
| 2043 | 32 | 24 | 56 | | | | 3573+ |
| 3041 | 17 | 10 | 27 | | | 614+ | |
| 3042 | 7 | 9 | 16 | | | 187+ | |
| 3043 | 24 | 19 | 43 | | | | 826+ |

Table VI (continued)

| Con. Set. | Col: (5-10) | (11-15) | (16-20) | (21-24) | (25-30) | (31-40) | (41-50) | |
|--------------|----------------|--------------------------|---------|---------|---------|---------|---------|--|
| 9998- | 1785 | (Problem Identification) | | | | | | |
| | 1021 | 22 | 4 | 26 | | 600+ | | |
| | 1022 | | 16 | 16 | | | | |
| | 1023 | 22 | 20 | 42 | | | 25140+ | |
| | 1031 | 8 | 2 | 10 | | 229+ | | |
| | 1032 | 2 | 4 | 6 | | | | |
| | 1033 | 10 | 6 | 16 | | | 1778+ | |
| | 1041 | 17 | 9 | 26 | | 600+ | | |
| | 1042 | 9 | 7 | 16 | | | | |
| | 1043 | 26 | 16 | 42 | | | 70+ | |
| | 2031 | 11 | 1 | 12 | | 443+ | | |
| | 2032 | 7 | 12 | 19 | | | | |
| | 2033 | 18 | 13 | 31 | | | 6967+ | |
| | 2041 | 20 | 8 | 28 | | 800+ | | |
| | 2042 | 12 | 16 | 28 | | | | |
| | 2043 | 32 | 24 | 56 | | | 3573+ | |
| | 3041 | 17 | 10 | 27 | | 614+ | | |
| | 3042 | 7 | 9 | 16 | | | | |
| | 3043 | 24 | 19 | 43 | | | 826+ | |
| 9998+ | 1785 | (Problem Identification) | | | | | | |
| | 1021 | 22 | 4 | 26 | | 600+ | | |
| | 1022 | | 16 | 16 | | | | |
| | 1023 | 22 | 20 | 42 | | | 25140+ | |
| | 1031 | 8 | 2 | 10 | | | | |
| | 1032 | 2 | 4 | 6 | | | | |
| | 1033 | 10 | 6 | 16 | | | | |
| | 1041 | 17 | 9 | 26 | | 600+ | | |
| | 1042 | 9 | 7 | 16 | | | | |
| | 1043 | 26 | 16 | 42 | | | 70+ | |
| | 2031 | 11 | 1 | 12 | | 443+ | | |
| | 2032 | 7 | 12 | 19 | | | | |
| | 2033 | 18 | 13 | 31 | | | 6967+ | |
| | 2041 | 20 | 8 | 28 | | 800+ | | |
| | 2042 | 12 | 16 | 28 | | | | |
| | 2043 | 32 | 24 | 56 | | | 3573+ | |
| | 3041 | 17 | 10 | 27 | | 614+ | | |
| | 3042 | 7 | 9 | 16 | | | | |
| | 3043 | 24 | 19 | 43 | | | 826+ | |

Table VI (continued)

| Con. Set. | Col: (5-10) | (11-20) | (21-30) | (31-40) | (41-50) |
|-----------|-------------|--------------------------|---------|---------|---------|
| 8889- | 1785 | (Problem Identification) | | | |
| | 1020 | 42 | 823+ | 635+ | 25140+ |
| | 1030 | 16 | 467+ | 423+ | 1778+ |
| | 1040 | 42 | 91+ | 91+ | 70+ |
| | 2030 | 31 | 541+ | 476+ | 6967+ |
| | 2040 | 56 | 289+ | 277+ | 3573+ |
| | 3040 | 43 | 187+ | 184+ | 826+ |
| 8889+ | 1785 | (Problem Identification) | | | |
| | 1020 | 42 | 823+ | 635+ | 25140+ |
| | 1030 | 16 | | | |
| | 1040 | 42 | 91+ | 91+ | 70+ |
| | 2030 | 31 | 541+ | 476+ | 6967+ |
| | 2040 | 56 | 289+ | 277+ | 3573+ |
| | 3040 | 43 | 187+ | 184+ | 826+ |
| 8899- | 1785 | (Problem Identification) | | | |
| | 1020 | 42 | | 635+ | 25140+ |
| | 1030 | 16 | | 423+ | 1778+ |
| | 1040 | 42 | | 91+ | 70+ |
| | 2030 | 31 | | 476+ | 6967+ |
| | 2040 | 56 | | 277+ | 3573+ |
| | 3040 | 43 | | 184+ | 826+ |
| 8899+ | 1785 | (Problem Identification) | | | |
| | 1020 | 42 | | 635+ | 25140+ |
| | 1030 | 16 | | | |
| | 1040 | 42 | | 91+ | 70+ |
| | 2030 | 31 | | 476+ | 6967+ |
| | 2040 | 56 | | 277+ | 3573+ |
| | 3040 | 43 | | 184+ | 826+ |

Table VI (continued)

| Con. Set. | Col: (5-10) | (11-20) | (21-30) | (31-40) | (41-50) |
|-----------|-------------|--------------------------|---------|---------|---------|
| 8989- | 1785 | (Problem Identification) | | | |
| | 1020 | 42 | 823+ | | 25140+ |
| | 1030 | 16 | 467+ | | 1778+ |
| | 1040 | 42 | 91+ | | 70+ |
| | 2030 | 31 | 541+ | | 6967+ |
| | 2040 | 56 | 289+ | | 3573+ |
| | 3040 | 43 | 187+ | | 826+ |
| 8989+ | 1785 | (Problem Identification) | | | |
| | 1020 | 42 | 823+ | | 25140+ |
| | 1030 | 16 | | | |
| | 1040 | 42 | 91+ | | 70+ |
| | 2030 | 31 | 541+ | | 6967+ |
| | 2040 | 56 | 289+ | | 3573+ |
| 8999- | 1785 | (Problem Identification) | | | |
| | 1020 | 42 | | | 25140+ |
| | 1030 | 16 | | | 1778+ |
| | 1040 | 42 | | | 70+ |
| | 2030 | 31 | | | 6967+ |
| | 2040 | 56 | | | 3573+ |
| | 3040 | 43 | | | 826+ |
| 8999+ | 1785 | (Problem Identification) | | | |
| | 1020 | 42 | | | 25140+ |
| | 1030 | 16 | | | |
| | 1040 | 42 | | | 70+ |
| | 2030 | 31 | | | 6967+ |
| | 2040 | 56 | | | 3573+ |
| | 3040 | 43 | | | 826+ |

Table VI (continued)

| Con. Set. | Col: (5-10) | (11-15) | (16-20) | (21-24) | (25-30) | (31-40) | (41-50) |
|-----------|-------------|--------------------------|---------|---------|---------|---------|---------|
| 9999- | 1785 | (Problem Identification) | | | | | |
| | 1021 | 22 | 4 | | 26 | | |
| | 1022 | | 16 | | 16 | | |
| | 1023 | 22 | 20 | | 42 | | |
| | 1031 | 8 | 2 | | 10 | | |
| | 1032 | 2 | 4 | | 6 | | |
| | 1033 | 10 | 6 | | 16 | | |
| | 1041 | 17 | 9 | | 26 | | |
| | 1042 | 9 | 7 | | 16 | | |
| | 1043 | 26 | 16 | | 42 | | |
| | 2031 | 11 | 1 | | 12 | | |
| | 2032 | 7 | 12 | | 19 | | |
| | 2033 | 18 | 13 | | 31 | | |
| | 2041 | 20 | 8 | | 28 | | |
| | 2042 | 12 | 16 | | 28 | | |
| | 2043 | 32 | 24 | | 56 | | |
| | 3041 | 17 | 10 | | 27 | | |
| | 3042 | 7 | 9 | | 16 | | |
| | 3043 | 24 | 19 | | 43 | | |

| | | | | | | | |
|-------|------|--------------------------|----|--|----|--|--|
| 9999+ | 1785 | (Problem Identification) | | | | | |
| | 1021 | 22 | 4 | | 26 | | |
| | 1022 | | 16 | | 16 | | |
| | 1023 | 22 | 20 | | 42 | | |
| | 1031 | 8 | 2 | | 10 | | |
| | 1032 | 2 | 4 | | 6 | | |
| | 1033 | 10 | 6 | | 16 | | |
| | 1041 | 17 | 9 | | 26 | | |
| | 1042 | 9 | 7 | | 16 | | |
| | 1043 | 26 | 16 | | 42 | | |
| | 2031 | 11 | 1 | | 12 | | |
| | 2032 | 7 | 12 | | 19 | | |
| | 2033 | 18 | 13 | | 31 | | |
| | 2041 | 20 | 8 | | 28 | | |
| | 2042 | 12 | 16 | | 28 | | |
| | 2043 | 32 | 24 | | 56 | | |
| | 3041 | 17 | 10 | | 27 | | |
| | 3042 | 7 | 9 | | 16 | | |
| | 3043 | 24 | 19 | | 43 | | |

VITA

Henry Allen Evans

Candidate for the Degree of

MASTER OF SCIENCE

Thesis: AN IBM 650 PROGRAM FOR THE ANALYSIS OF ATTRIBUTE-CLUSTER-BLOCS

Major Field: Mathematics

Biographical:

Personal Data: Born in Holdenville, Oklahoma, February 9, 1938, the son of Henry Armon and Pansy Ingle Evans.

Education: Attended grade school at Frewsburg, New York, Agar, South Dakota, and Watts, Oklahoma; graduated valedictorian from Watts High School in 1956; received the Bachelor of Science degree from the Oklahoma State University, with a major in mathematics, oriented in statistics, in May, 1960; completed the requirements for the Master of Science degree, with a major in mathematics, oriented in statistics, in May, 1962.

Professional experience: Worked as an undergraduate assistant in the Statistical Laboratory at the Oklahoma State University; received a National Science Foundation undergraduate assistantship during senior year; worked as a graduate assistant in the Statistical Laboratory, teaching laboratories and aiding in the handling of statistical analyses from various university departments; is a member of Pi Mu Epsilon, Phi Eta Sigma, Omicron Delta Kappa, and Phi Kappa Phi.