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October 5, 1977

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SUBJECT: Research Report No. 479, "Computer Storage of Traffic Volume Data;" KYP-74-64; HPR-PL-1(13), Part III B

Traffic volume data obtained from automatic traffic recording stations are often needed for various planning and traffic studies. To extend the utility of these data, it is necessary to review and edit the data for potentially erroneous entries. The LOADVOL computer program described in the attached report provides a method of reviewing and replacing erroneous or missing data entries. The UPDATE program allows for engineer intervention to reconsider the replacement of erroneous data.

The attached report describing the application of LOADVOL and UPDATE was written by Marvin Virgin to satisfy requirements for his Master of Science in Civil Engineering degree. The report was prepared under the direction of Dr. John A. Deacon, Chairman of the Department of Civil Engineering at the University of Kentucky. Consultation was provided by R. C. Deen and J. G. Pigman of the Division of Research and R. L. Hyatt of the Division of Systems Planning. Mr. Virgin is currently assigned to the District 9 office in Flemingsburg as Bridge Engineer.

Respectfully submitted,

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Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.

4. Title and Subtitle	5. Report Date
COMPUTER STORAGE OF TRAFFIC VOLUME DATA	October 1977
	6. Performing Organization Code
7. Author(s) Marvin Virgin	8. Performing Organization Report No. 479
9. Performing Organization Name and Address Division of Research Kentucky Bureau of Highways 533 South Limestone Lexington, Kentucky 40508	10. Work Unit No. (TRAIS)
	11. Contract or Grant No. KYP-74-64
12. Sponsoring Agency Name and Address	13. Type of Report and Period Covered Interim
	14. Sponsoring Agency Code

15. Supplementary Notes

Study Title: Data File Management

16. Abstract

LOADVOL is a program developed to assimilate raw traffic volume data into a more readily usable form. Several identifying parameters are added to enhance the clarity and to extend the utility of the data base.

Criteria were set to detect possibly erroneous traffic count data. LOADVOL detects and replaces "erroneous" data with simulated data. LOADVOL produces cards which contain the orignal data which are replaced. Thus, the original data can be reviewed, and it can be ascertained whether it is erroneous or was affected by a special event, holiday, location, traffic recorder malfunction, or some other occurrence.

UPDATE, a second program, was developed to allow the replacement of original or simulated volumes with other volumes determined by the user to be more accurate.

17. Key Words	18. Distribution Statement
Traffic Volume Data Computer Storage Error Detection Data Simulation	

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
None	None		

Research Report
479

COMPUTER STORAGE OF TRAFFIC VOLUME DATA

KYP-74-64; HPR-PL-1(13), Part III B

by
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DEPARTMENT OF TRANSPORTATION
Commonwealth of Kentucky

October 1977

INTRODUCTION

The process of transforming raw traffic volume data obtained from automatic traffic recorders (ATR's) into a usable form is very important. Planning, research, design, construction, operations, and maintenance depend on accurate traffic volume data to enable the efficient expenditure of available funds.

Once usable data is obtained, a need for efficient storage of the data becomes apparent. Brevity and clarity are essential elements in the storage process. The handling of extensive amounts of data becomes tedious and inefficient unless done properly.

LOADVOL is a program which was developed to assimilate raw traffic volume data into a more readily usable form. Accumulated traffic count data on punched cards can be transformed into hourly and daily volume data on magnetic tape. Several identifying parameters are added to enhance the clarity and to extend the utility of the data base.

Criteria were set to detect possibly erroneous traffic count data. LOADVOL detects and replaces "erroneous" data with simulated data. In setting limits, the possibility of detecting data which were not erroneous was encountered. To enable the use of judgment in data replacement, LOADVOL produces cards which contain the original data which are replaced. Thus, the original data can be reviewed, and it can be ascertained whether it is erroneous or was affected by a special event, holiday, location, traffic recorder malfunction, or some other occurrence.

UPDATE, a second program, was developed to allow the replacement of original or simulated volumes with other volumes determined by the user to be more accurate. A set of data cards is input into UPDATE to enable the replacement of volumes on the tape produced by LOADVOL. The output of UPDATE is a completely corrected tape containing hourly and daily volume data.

LOADVOL

Procedure

Raw traffic volume data on punched cards (APPENDIX A) are the primary input to LOADVOL. LOADVOL. data set is considered to be the annual (January 1st - December 31st) volume data for one station, one direction, and one year.

Each computer run processes data for only one year; however, as many data sets as are available for that particular year may be processed. Data sets may be input in any order; however, the following is suggested:

1. data sets should be input in order of increasing station number and
2. if directional counts are available, the two data sets should be input back to back with the one having the lowest directional code loaded first.

The raw traffic volume data consist of three types of cards:

1. header card,
2. previous count card, and
3. data card.

The header card (Figure A-1) contains the route designation, station, direction code, county name, and previous count. One such card is normally placed at the beginning of each week of data. A previous count card (Figure A-2) contains count data used to facilitate the correct computation of the first hourly volume counted after some missing count period has occurred. Raw data cards (Figure A-3) contain county code, station, road system code, year, month, day of month, day of week code, and count interval along with the accumulated count data. (Count interval = "1" from midnight until noon and "13" from noon until midnight.)

Detection of Erroneous Data

To develop a process for detecting possibly erroneous traffic count data, a procedure as well as some governing criteria had to be developed. First, hourly volumes were grouped into sets by the LOADVOL computer program; each set represented one day of the week (e.g., Monday) and one hour of the day (e.g., 2 p.m. - 3 p.m.). This results in 168 sets (7 x 24) which were each treated independently (consider only a single data set in applying the error detection routine).

The following equations are used as criteria. The individual criterion are applied sequentially in the order given. Missing data or data identified as erroneous in a prior step are not used in the computation for a subsequent step. The hourly volume of the ith week, V_i, is erroneous if

1. $V_i > CAP$ or
2. $V_i < 0.05\ AV$ and $|V_i - AV| > 80$ or $V_i > 6.0\ AV$ and $|V_i - AV| > 80$ or
3. $V_i < 0.2\ MAV_i$ and $|V_i - MAV_i| > 20$ or $V_i > 5.0\ MAV_i$ and $|V_i - MAV_i| > 20$

(see Figures 1 and 2)

where V_i = an hourly volume from a given set for the ith week of the year,

CAP = hourly capacity (service volume at Level of Service E E ideal conditions or other maximum permissible volume),

AV = annual average hourly volume for the given set,

$= \Sigma\ V_i/N$

(for all V_i which exist and have not been previously identified as erroneous),

N = number of V_i's which exist and have not been previously identified as erroneous, and

MAV_i = a seven-item moving average hourly volume centered about week i (for beginning-of-year periods (V_1, V_2, V_3), V_{i-1}, V_{i-2}, and V_{i-3} are taken from the end-of-year data; for end-of-year periods (V_{50}, V_{51}, V_{52}) or (V_{51}, V_{52}, V_{53}), V_{i+1}, V_{i+2}, and V_{i+3} are taken from the beginning-of-year data),

$= (V_{i-3} + V_{i-2} + V_{i-1} + V_i + V_{i+1} + V_{i+2} + V_{i+3})/N$

(for all V_i's which exist and have not been previously identified as erroneous).

Substitutions for Missing or Erroneous Data

The hourly volumes are grouped into sets, identical to the sets used for detecting erroneous data, each set of 52 or 53 volumes representing one day of the week and one hour of the day. If a set has one or more hours of missing or erroneous data, a fifth-degree polynomial is fitted to the "good" data (see Figure 3). Desired estimates for missing or erroneous volumes are obtained by interpolation. This is a method of curve fitting which is an "averaging" technique. Extremely large and extremely small volumes will not always be handled properly. LOADVOL can handle up to 2,000 hours of missing and erroneous data.

Input

The success of LOADVOL is dependent on the correct order of input. Many of its internal checks which are crucial to the identification of acceptable data rely upon the input. The order of input is

1. a card identifying holidays (see APPENDIX B, Table B-1);
2. a card identifying days under the influence of holidays (see APPENDIX B, Table B-1);
3. a data set card (see APPENDIX B, Table B-2); and
4. the corresponding header, previous count, and raw data cards for the particular data set (see APPENDIX A, Figures A-1, A-2, and A-3).

It should be recognized that only one identification card for holidays and one identification card for days under the influence of holidays should be supplied for each run. One data set card must be supplied for each data set to be processed. One header card is normally supplied at the beginning of each week of raw data for every data set processed. Previous count cards are only supplied after a period of missing data. Any data input should always be right justified.

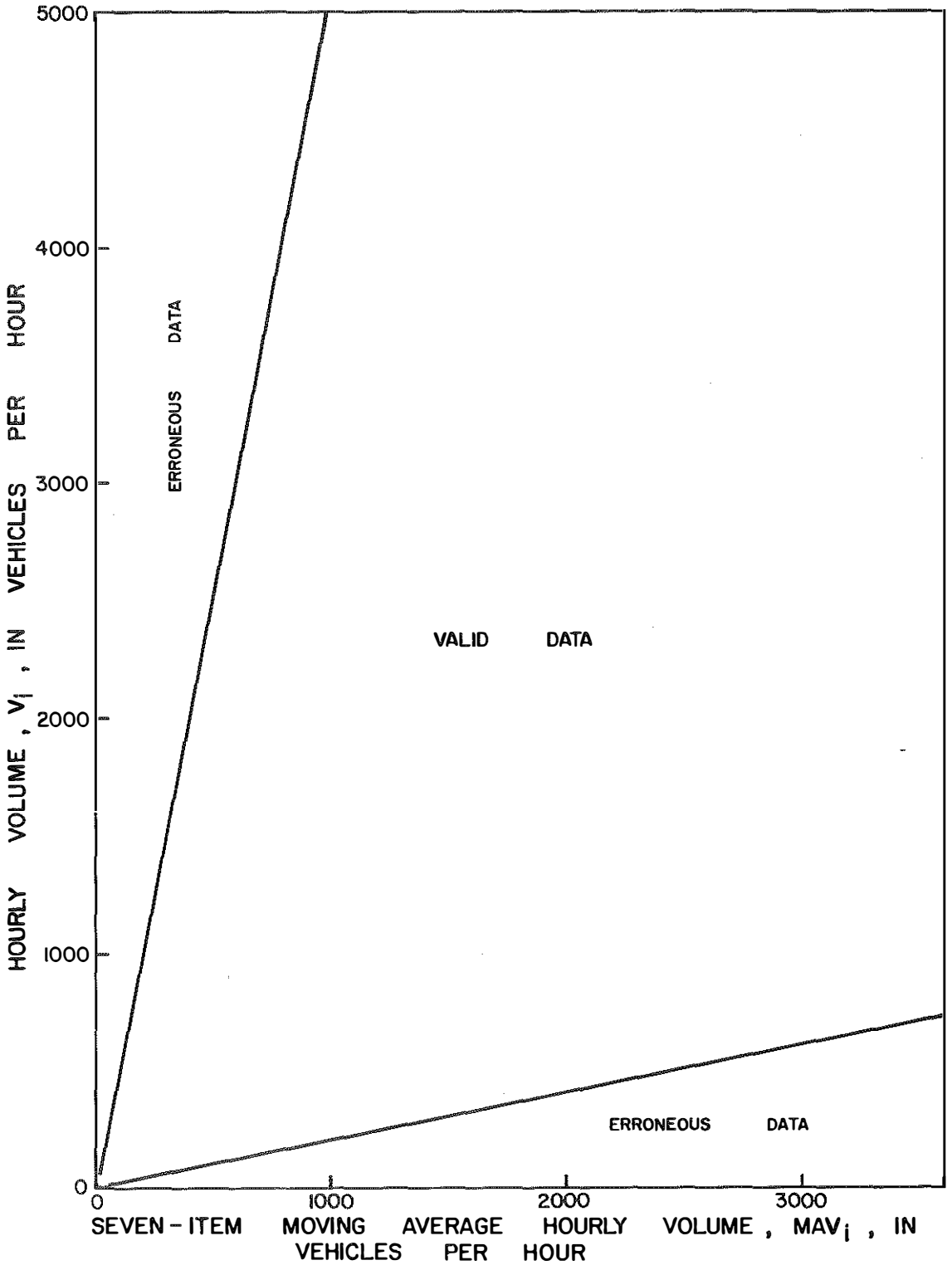


Figure 1. Limits of Erroneous Data as Identified by Annual Average Hourly Volume Criterion for a Given Set of Data.

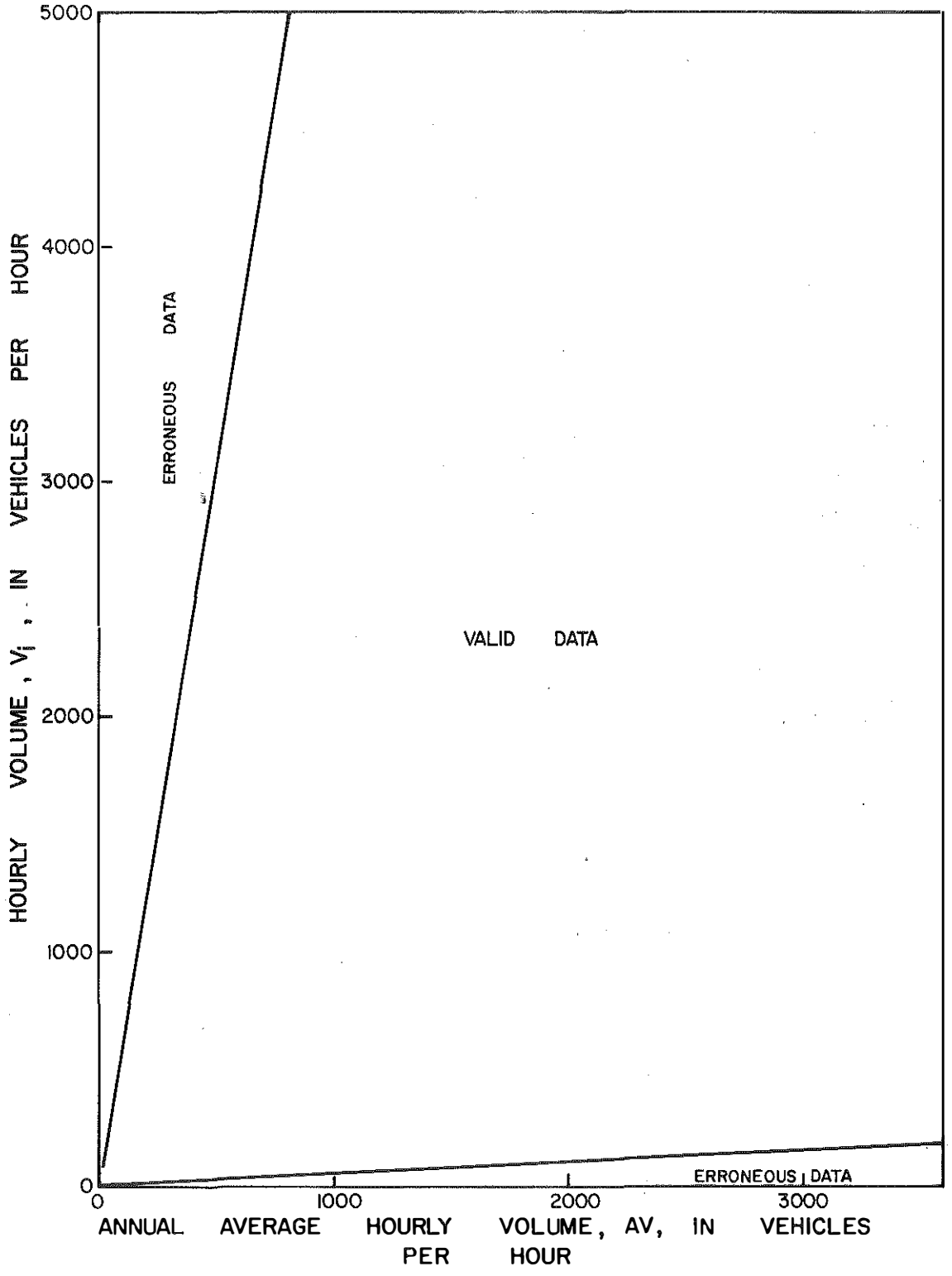
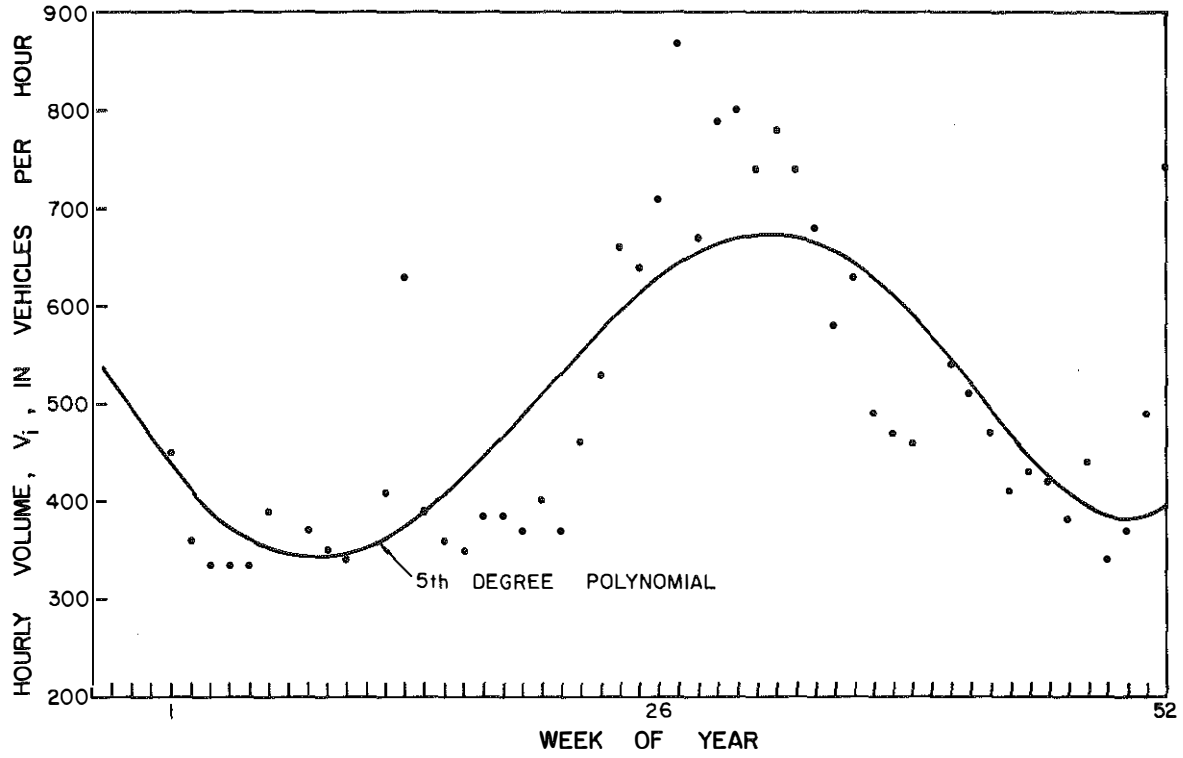


Figure 2. Limits of Erroneous Data as Identified by Seven-Item Moving Average Hourly Volume Criterion for a Given Set of Data.

Figure 3. **Fluctuation of Hourly Volumes throughout the Year for a Given Set of Data; 5th-Degree Polynomial Is Used for Replacement of Missing or Erroneous Data.**



Output

The printed output for each data set includes

1. a list of any incorrect header and data cards (see APPENDIX C, Table C-1),
2. a list of the uncorrected hourly volumes (see APPENDIX C, Table C-2, the negative one's identify missing data),
3. a list of the substitutions for missing or erroneous data (see APPENDIX C, Table C-3, negative quantities identify missing or erroneous data), and
4. a list of the information placed on tape (see APPENDIX C, Tables C-4 and C-5).

The tape output for each data set includes

1. a header record (see APPENDIX D, Table D-1) and
2. tape data records (365 or 366 depending on whether or not it is leap year) (see APPENDIX D, Table D-2).

Data correction cards (see APPENDIX D, Table D-3) to be considered as input to UPDATE are punched on Unit 7. There are two cards (a pair) punched for each tape record for which a substitution has been made for data identified as being erroneous. The order of the punched output is identical to the order of the corresponding tape records. Data correction cards contain the original hourly volumes that existed prior to the internally generated substitutions.

LOADVOL (see APPENDICES E and F) takes raw traffic volume data as input, reads one card at a time and performs checks. The identifying parameters such as station, direction, and year are crucial to the identification of correct data. If an incorrect station is encountered on a header card, execution is terminated. Station, direction, year, month, day of month, week, day of week, and count interval are checked and the data on that specific card is ignored if any parameters are incorrect. This data is subsequently treated as missing data.

After reading all the data, any missing or erroneous data detected is replaced by use of a fifth-degree polynomial (a curve-fitting technique which utilizes only the good data). The good data plus the replaced data is output on tape.

UPDATE

Procedure

The output of LOADVOL includes punched data correction cards that contained the field volumes which were detected as erroneous and replaced. Due to the judgmental process of selection as well as the governing criteria for replacement of missing and erroneous data, the user may want to supply his own substitutions. He may want to use the original data (contained on data correction cards output from LOADVOL) or another source.

The user can look at the list of substitutions for missing or erroneous data (see APPENDIX C, Table C-3) and compare it with uncorrected hourly volumes (see APPENDIX C, Table C-2) and the final output data placed on tape (see APPENDIX C, Table C-5). Thus, along with the identifying holiday codes and days under the influence of holiday codes, a judgment can be made on the acceptability of the substitutions. If it is determined that some unacceptable substitutions were made, UPDATE allows the user to alter the tape output as desired.

UPDATE (see APPENDICES G and H) incorporates a series of checks to assure that reasonable data correction cards have been submitted. UPDATE goes through pairs of data cards and checks for a matched pair, correct sequence, count interval, station, direction, and year. It matches the data correction cards with tape records by using the station, direction, year, and day of year codes.

Input

The tape input is the tape produced by LOADVOL and is mounted on Unit 8. The card input is a set of data correction cards (see APPENDIX D, Table D-3) supplied by the user or produced by LOADVOL. The data correction cards should be input in pairs (one for the first count interval and one for the second count interval). The maximum number of permissible substitutions is 1,000.

Output

The printed output of UPDATE contains appropriate instructions to the user. APPENDIX I contains some samples of these messages. In Table I-1 there is a printed output of the data correction cards input to program UPDATE. Table I-2 is a sample output if erroneous information is contained on data correction cards. Table I-3 is the output listing if no data correction cards are submitted. If any errors are detected, the errors and appropriate error messages are listed. If there are no errors, UPDATE informs the user that the corrected data is now written in its proper location on Unit 9.

CONCLUSION

The use of the programs LOADVOL and UPDATE is relatively simple. The reliability and accuracy of the final output depends largely on the care taken in preparation of the input. The form of the final output allows many possibilities in further data manipulation. The raw traffic volume data which were bulky and difficult to interpret are now in a form which enhances interpretation and incorporates brevity.

APPENDIX A

FORMAT OF RAW DATA CARDS FROM ATR's

Prior to Feb. 2, 1975

Col 15	North	N
	South	S
	East	E
	West	W
	Non-Dir	

Feb. 2, 1975 - Mar. 1, 1975

Col 23	North	1
	South	5
	East	3
	West	7
	Non-Dir	0

After Mar. 1, 1975

Col 23	North	1
	South	5
	East	3
	West	7
	Non-Dir	0

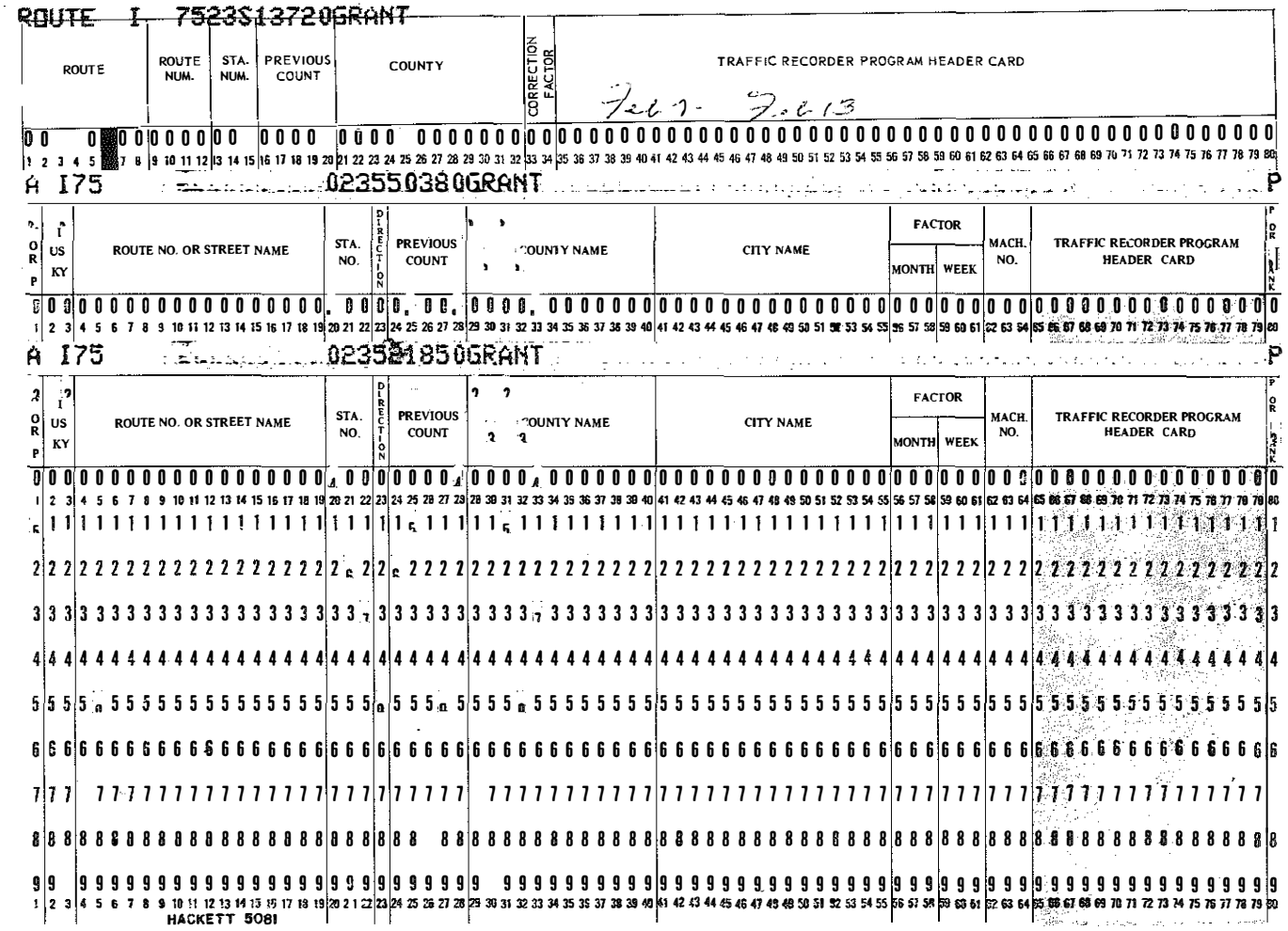


Figure A-1. Format of Header Cards.

Prior to Feb 2, 1975

Feb 2, 1975 - Mar 1, 1975

After Mar 1, 1975

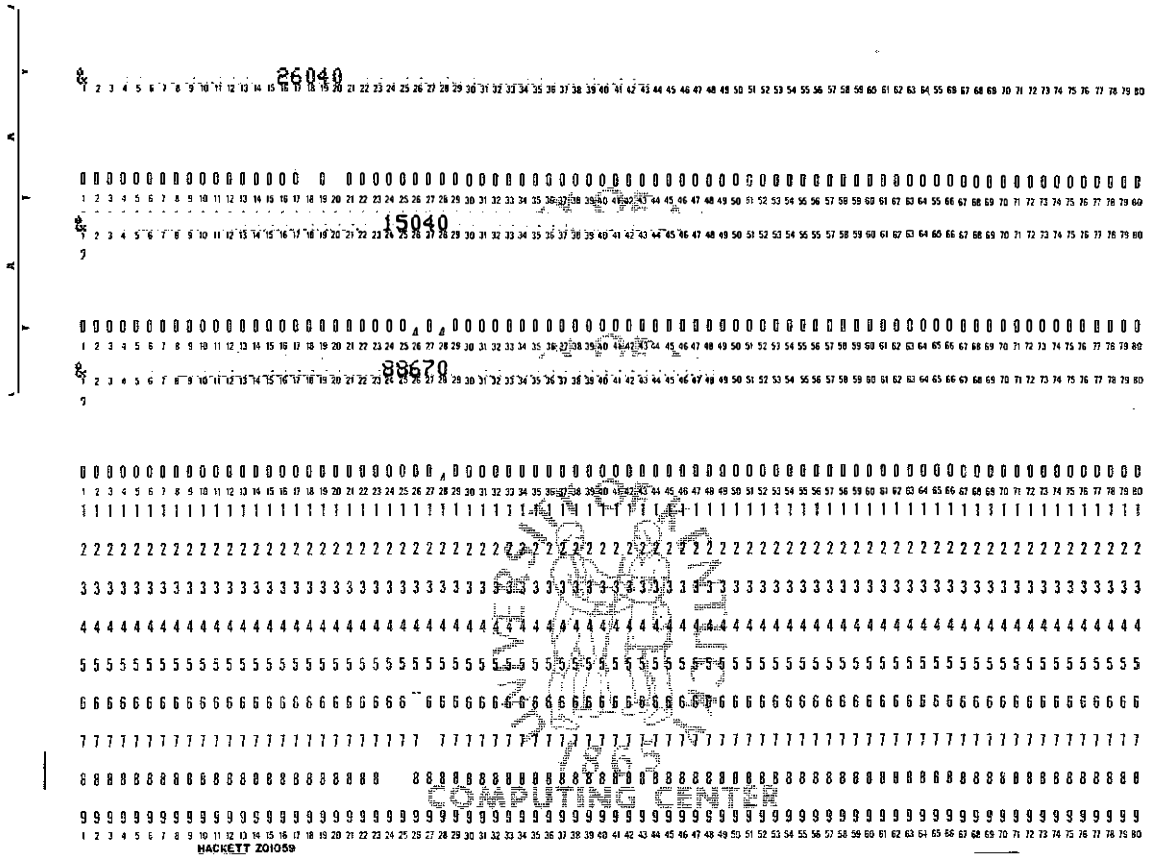


Figure A-2. Format of Previous Count Cards.

Prior to Feb 2, 1975

Col 6	North	5
	South	2
	East	5
	West	6
	Non-Dir	0

Feb 2, 1975 - Mar 1, 1975

Col 6	North	5
	South	2
	East	5
	West	6
	Non-Dir	0

After Mar 1, 1975

Col 6	North	1
	South	5
	East	3
	West	7
	Non-Dir	0

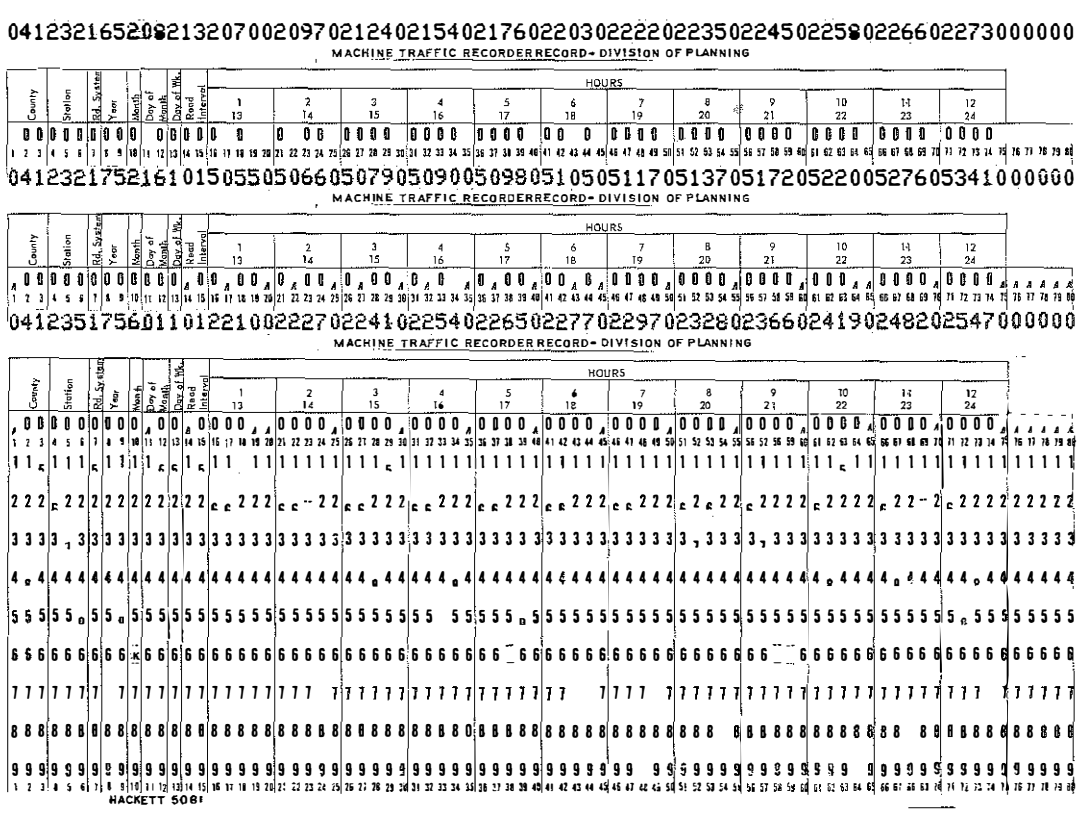


Figure A-3. Format of Data Cards.

APPENDIX B

FORMAT OF LOADVOL INPUT

TABLE B-1. FORMATS OF IDENTIFICATION CARD FOR HOLIDAYS AND IDENTIFICATION CARD FOR DAYS UNDER THE INFLUENCE OF HOLIDAYS

CARD COLUMN	CONTENTS	VARIABLE NAME	FORMAT
Identification Card for Holidays[1]			
1-2	Last two digits of year[2]		I2
3-80	Up to 26 day-of-year codes for holidays	HDAY	26I3
Identification Card for Days under the Influence of Holidays[1]			
1-78	Up to 26 day-of-year codes for the days under the influence of holidays	HIDAY	26I3

[1]One such card must be supplied as input to each run of LOADVOL.

[2]For 1976, the numbers "76" would be inserted.

TABLE B-2. FORMAT OF DATA SET CARD[1]

CARD COLUMN	CONTENTS	VARIABLE NAME	FORMAT
1	Alphanumeric Letter "C" which Identifies This as a Data Set Card		A1
2	Blank		1X
3-5	County Code Number	CCO	I3
6-8	Blank		3X
9-10	Station Code Number	CSTA	I2
11-14	Blank		4X
15	Data Set Identifier	CNO	I1
16-19	Blank		4X
20	Direction Code	CDIR	I1
21	Blank		1X
22-25	Verbal Description of Direction of Travel, such as NB, SB, EB, WB, BOTH	CDDES	A4
26-28	Blank		3X
29-30	Integer Route Group Code	CGP	I2
31-33	Blank		
34-40	Route Designation Code	CRT(1), CRT(2)	A3, A4
41-44	Blank		4X
45-50	Milepost Number (in thousandths of a mile, leading zeros must be punched)		2A3
51-53	Blank		3X
54-55	Last Two Digits of Year	CYR	I2
56-59	Blank		4X
60	Day of Week Code for Corresponding January 1st[3]	CFDOY	I1
61-65	Hourly Capacity Used for Identifying Erroneous Data	CAP	I5

[1]One data set card must be supplied for each set of raw data associated with a given station, direction, and year.

[2]Sunday = 1, Monday = 2, etc.
Select a code which corresponds to January 1st of the particular year the data was obtained.

[3]Refers to January 1st of the year the particular data is taken.

APPENDIX C

SAMPLE LOADVOL PRINTED OUTPUT

TABLE C-1. SAMPLE OUTPUT WITH INCORRECT DATA CARDS

```
THE FOLLOWING ARE INCORRECT HEADER OR DATA CARDS FOR STA 22, DIRECTION 3, AND YEAR 1976

DATA CARD HAS INCORRECT YEAR FOR STA  22 DIR   3 YR  77 MONTH 1     DAY    1. DATA IGNORED.
DATA CARD HAS INCORRECT YEAR FOR STA  22 DIR   3 YR  77 MONTH 1     DAY    1. DATA IGNORED.
```

OUTPUT VARIABLE LIST

CO	=	County
STA	=	Station[1]
DIR	=	Direction
GP	=	Integer Route Group Code[2]
MP	=	Milepoint
YR	=	Year
DOY	=	Day of Year
HO	=	Holiday Indicator[3]
SE	=	Season of Year[4]
MO	=	Month of Year
DOM	=	Day of Month
WK	=	Week of Year
DOW	=	Day of Week
DVOL	=	Daily Volume
PER	=	Period of the Count

[1]Designated as ST in printout before substitutions for missing or erroneous data are made.

[2]A two digit integer number supplied by the user.

[3]See Appendix J for coded values.

[4]Designated as SEA in printout before substitutions for missing or erroneous data are made.

TABLE C-2. SAMPLE OUTPUT OF UNCORRECTED HOURLY VOLUMES (NEGATIVE ONE'S REPRESENT MISSING DATA)

THE FOLLOWING ARE UNCORRECTED HOURLY VOLUMES FOR STA 22, DIRECTION 3, AND YEAR 1976

ST	DI	YR	DOY	SEA	MO	DOM	WK	DOW	PER	HOURLY VOLUMES 1	2	3	4	5	6	7	8	9	10	11	12
22	3	76	1	1	1	1	1	5	1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
22	3	76	1	1	1	1	1	5	13	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
22	3	76	2	1	1	2	1	6	1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
22	3	76	2	1	1	2	1	6	13	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
22	3	76	3	1	1	3	1	7	1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
22	3	76	3	1	1	3	1	7	13	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
22	3	76	4	1	1	4	1	1	1	100	90	60	40	30	50	50	80	130	240	330	410
22	3	76	4	1	1	4	1	1	13	410	450	540	550	540	500	400	360	270	220	140	140
22	3	76	5	1	1	5	1	2	1	70	50	60	50	50	80	210	420	330	380	400	400
22	3	76	5	1	1	5	1	2	13	340	370	350	350	380	330	290	210	180	150	130	110
22	3	76	6	1	1	6	1	3	1	90	80	70	50	50	70	190	390	470	490	440	410
22	3	76	6	1	1	6	1	3	13	350	380	330	380	430	520	420	200	190	150	140	120
22	3	76	7	1	1	7	1	4	1	90	80	50	50	50	70	200	390	390	440	380	330
22	3	76	7	1	1	7	1	4	13	320	310	330	370	370	290	230	130	80	80	50	70
22	3	76	8	1	1	8	2	5	1	60	50	50	50	30	60	100	170	190	240	260	240
22	3	76	8	1	1	8	2	5	13	230	250	240	270	280	180	140	130	110	110	110	70
22	3	76	9	1	1	9	2	6	1	70	70	40	40	50	120	270	330	330	290	290	290
22	3	76	9	1	1	9	2	6	13	320	330	390	390	430	380	310	230	170	150	180	110
22	3	76	10	1	1	10	2	7	1	90	80	60	60	50	80	130	160	230	310	360	270
22	3	76	10	1	1	10	2	7	13	320	370	420	400	420	330	250	190	160	110	140	100
22	3	76	11	1	1	11	2	1	1	80	50	50	30	30	30	70	80	150	200	270	290
22	3	76	11	1	1	11	2	1	13	350	460	470	510	460	410	350	280	240	190	130	110
22	3	76	12	1	1	12	2	2	1	50	50	40	50	70	180	420	430	450	440	430	360
22	3	76	12	1	1	12	2	2	13	100	400	400	410	400	410	320	220	170	170	140	100
22	3	76	13	1	1	13	2	3	1	80	70	60	50	40	60	220	420	460	480	430	380
22	3	76	13	1	1	13	2	3	13	340	360	330	360	420	300	210	150	110	110	110	110
22	3	76	14	1	1	14	2	4	1	70	60	40	50	50	80	260	420	430	430	380	300
22	3	76	14	1	1	14	2	4	13	340	300	350	360	360	370	240	160	170	140	130	80
22	3	76	15	1	1	15	3	5	1	100	70	60	40	60	100	260	430	420	370	380	340
22	3	76	15	1	1	15	3	5	13	300	310	320	350	350	340	230	180	150	150	130	100
22	3	76	16	1	1	16	3	6	1	70	70	70	40	50	100	240	370	340	340	320	300
22	3	76	16	1	1	16	3	6	13	330	320	360	430	490	470	420	300	220	200	150	140
22	3	76	17	1	1	17	3	7	1	130	90	90	50	70	70	100	200	250	310	360	390
22	3	76	17	1	1	17	3	7	13	340	380	380	380	390	370	310	250	190	160	130	170
22	3	76	18	1	1	18	3	1	1	100	110	50	40	30	30	60	90	130	210	270	340
22	3	76	18	1	1	18	3	1	13	330	330	370	330	420	440	490	450	320	230	210	170
22	3	76	19	1	1	19	3	2	1	90	60	40	40	60	110	320	470	440	360	350	320
22	3	76	19	1	1	19	3	2	13	260	230	260	250	340	320	200	150	130	100	90	80
22	3	76	20	1	1	20	3	3	1	50	50	40	40	40	30	90	180	140	450	340	270
22	3	76	20	1	1	20	3	3	13	280	270	290	340	340	350	410	230	130	130	140	100
22	3	76	21	1	1	21	3	4	1	70	60	50	50	40	60	190	330	180	190	190	280
22	3	76	21	1	1	21	3	4	13	260	240	220	270	230	240	200	130	120	80	110	90
22	3	76	22	1	1	22	4	5	1	80	60	50	50	40	80	190	360	430	460	480	370
22	3	76	22	1	1	22	4	5	13	290	310	310	350	330	290	260	170	160	140	140	120
22	3	76	23	1	1	23	4	6	1	240	150	60	60	50	70	190	370	370	400	370	360
22	3	76	23	1	1	23	4	6	13	330	410	470	480	490	540	470	370	270	220	210	150
22	3	76	24	1	1	24	4	7	1	130	90	80	60	50	60	120	180	250	310	360	310
22	3	76	24	1	1	24	4	7	13	340	390	360	390	380	460	380	330	240	230	170	190
22	3	76	25	1	1	25	4	1	1	110	80	70	30	40	40	40	60	110	150	240	330
22	3	76	25	1	1	25	4	1	13	360	350	400	450	600	620	530	470	350	240	190	170
22	3	76	26	1	1	26	4	2	1	90	70	40	50	50	90	260	480	400	420	370	340
22	3	76	26	1	1	26	4	2	13	300	320	360	320	310	330	200	160	140	130	110	90
22	3	76	27	1	1	27	4	3	1	100	70	50	50	60	70	210	440	470	440	370	340
22	3	76	27	1	1	27	4	3	13	310	310	300	320	380	340	270	190	150	160	150	140

TABLE C-3. SAMPLE OUTPUT OF SUBSTITUTIONS MADE FOR MISSING OR ERRONEOUS DATA (NEGATIVE QUANTITIES IDENTIFY MISSING OR ERRONEOUS DATA)

THE FOLLOWING SUBSTITUTIONS HAVE BEEN MADE FOR MISSING OR ERRONEOUS DATA FOR STA 27, DIRECTION 0, AND YEAR 1976

DAY OF YEAR CODES FOR HOLIDAYS:
1 109 152 186 250 330 360 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

DAY OF YEAR CODES FOR DAYS UNDER THE INFLUENCE OF HOLIDAYS
2 3 4 107 108 149 150 151 184 185 187 247 248 249 329 331 332 333 358 359 361 366 0 0 0 0

ST	DI	YR	DOY	SEA	MO	DOM	WK	DOW	PER	HOURLY VOLUMES 1	2	3	4	5	6	7	8	9	10	11	12
27	0	76	1	1	1	1	1	5	1	-21	-11	-7	-6	-5	-22	-186	-132	-126	-123	-127	-165
27	0	76	1	1	1	1	1	5	13	-213	-199	-180	-257	-228	-176	-124	-84	-56	-47	-48	-31
27	0	76	2	1	1	2	1	6	1	-20	-14	-9	-4	-9	-20	-162	-113	-103	-117	-131	-172
27	0	76	2	1	1	2	1	6	13	-233	-183	-185	-298	-233	-191	-143	-109	-77	-65	-52	-42
27	0	76	3	1	1	3	1	7	1	-42	-30	-18	-9	-4	-13	-75	-69	-95	-152	-186	-201
27	0	76	3	1	1	3	1	7	13	-221	-187	-178	-194	-182	-160	-145	-106	-79	-64	-49	-46
27	0	76	4	1	1	4	1	1	1	-37	10	20	10	0	10	10	30	40	80	90	110
27	0	76	4	1	1	4	1	1	13	140	140	170	140	170	140	130	100	70	60	40	20
27	0	76	26	1	1	26	4	2	1	10	0	10	10	20	-32	250	140	160	110	130	130
27	0	76	26	1	1	26	4	2	13	190	150	150	320	240	160	100	90	60	40	50	30
27	0	76	116	2	4	25	17	1	1	-46	-38	-34	-15	-9	-13	-18	-35	-58	-133	-152	-177
27	0	76	116	2	4	25	17	1	13	-220	-214	-240	-239	-256	-257	-224	-161	-145	-97	-62	-36
27	0	76	117	2	4	26	17	2	1	-20	-9	-8	-5	-12	-33	-292	-158	-143	-145	-146	-200
27	0	76	117	2	4	26	17	2	13	-254	-161	-180	-335	-238	-179	-149	-118	-87	-86	-51	-29
27	0	76	152	2	5	31	22	2	1	80	30	20	0	10	10	-276	50	70	110	160	200
27	0	76	152	2	5	31	22	2	13	260	230	240	270	270	260	250	200	120	100	80	30
27	0	76	181	3	6	29	26	3	1	20	10	10	0	20	30	290	150	150	140	150	210
27	0	76	181	3	6	29	26	3	13	250	180	160	320	200	130	70	60	30	20	-62	10
27	0	76	187	3	7	5	27	2	1	30	20	10	10	10	10	-244	50	70	120	140	160
27	0	76	187	3	7	5	27	2	13	200	200	170	190	200	180	180	180	140	150	80	60
27	0	76	197	3	7	15	29	5	1	-23	-20	-6	-5	-7	-31	-219	-153	-128	-131	-143	-187
27	0	76	197	3	7	15	29	5	13	-274	-187	-176	-274	-262	-231	-174	-134	-119	-95	-66	-35
27	0	76	229	3	8	16	33	2	1	-28	-15	-9	-4	-11	-30	-212	-148	-128	-143	-153	-175
27	0	76	229	3	8	16	33	2	13	-254	-182	-170	-216	-249	-234	-181	-149	-111	-98	-58	-40
27	0	76	230	3	8	17	33	3	1	-24	-13	-6	-3	-8	-36	-227	-157	-136	-138	-158	-189
27	0	76	230	3	8	17	33	3	13	-267	-177	-162	-231	-255	-227	-158	-133	-91	-85	-60	-37
27	0	76	231	3	8	18	33	4	1	-23	-14	-6	-4	-9	-34	-219	-153	-131	-131	-142	-167
27	0	76	231	3	8	18	33	4	13	-249	-163	-155	-222	-253	-223	-158	-128	-99	-91	-55	-36
27	0	76	232	3	8	19	34	5	1	-24	-19	-7	-5	-6	-33	-207	-150	-122	-123	-135	-176
27	0	76	232	3	8	19	34	5	13	-260	-177	-166	-253	-263	-241	-170	-130	-111	-87	-62	-34
27	0	76	233	3	8	20	34	6	1	-22	-16	-8	-4	-10	-34	-243	-152	-131	-147	-150	-202
27	0	76	233	3	8	20	34	6	13	-305	-205	-198	-321	-263	-247	-219	-182	-153	-115	-77	-64
27	0	76	234	3	8	21	34	7	1	-49	-41	-22	-15	-10	-24	-105	-89	-112	-154	-192	-233
27	0	76	234	3	8	21	34	7	13	-288	-230	-209	-239	-207	-202	-188	-178	-144	-115	-84	-67
27	0	76	235	3	8	22	34	1	1	-56	-48	-29	-15	-9	-14	-22	-32	-53	-114	-146	-172
27	0	76	235	3	8	22	34	1	13	-209	-202	-203	-222	-233	-238	-228	-202	-160	-121	-77	-46
27	0	76	240	3	8	27	35	6	1	30	40	10	0	10	10	-244	270	130	140	140	150
27	0	76	240	3	8	27	35	6	13	190	360	170	180	230	320	320	250	190	150	80	110
27	0	76	265	4	9	21	38	3	1	-22	-13	-5	-3	-8	-36	-237	-153	-132	-135	-153	-183
27	0	76	265	4	9	21	38	3	13	-257	-170	-155	-241	-259	-229	-155	-123	-78	-77	-55	-32
27	0	76	266	4	9	22	38	4	1	-22	-12	-6	-4	-8	-36	-227	-154	-130	-131	-142	-168
27	0	76	266	4	9	22	38	4	13	-246	-160	-156	-234	-253	-228	-157	-121	-95	-81	-50	-34
27	0	76	267	4	9	23	39	5	1	-23	-17	-8	-5	-5	-36	-229	-149	-120	-125	-137	-175
27	0	76	267	4	9	23	39	5	13	-248	-166	-164	-257	-258	-238	-164	-122	-93	-75	-57	-34
27	0	76	330	4	11	25	48	5	1	40	40	10	10	0	10	-281	70	100	150	220	200
27	0	76	330	4	11	25	48	5	13	140	120	110	140	160	200	160	120	80	80	60	40
27	0	76	359	1	12	24	52	6	1	30	20	10	0	10	20	-139	50	80	130	170	190
27	0	76	359	1	12	24	52	6	13	220	220	230	230	220	180	120	100	90	80	70	60
27	0	76	360	1	12	25	52	7	1	30	30	10	0	10	10	-56	30	50	110	160	190
27	0	76	360	1	12	25	52	7	13	120	100	150	150	160	120	90	70	50	40	40	40

TABLE C-4. SAMPLE OUTPUT LISTING OF HEADER RECORD

THE FOLLOWING HAS BEEN PLACED ON TAPE FOR STA 22, DIRECTION 3, AND YEAR 1976

HEADER RECORD

STA	YR	DS	DIR
22	76	1	EB

TABLE C-5. SAMPLE OUTPUT LISTING OF DATA PLACED ON TAPE

CC	STA	DIR	GP	ROUTE	MP	YR	DOY	HO	SE	MO	DOM	WK	DOW	DVOL	HOURLY VOLUMES 1	2	3	4	5	6	7	8	9	10	11	12
106	P22	3	1	I 9064	000000	76	1	2	1	1	1	1	5	6214	103	82	64	52	58	87	194	336	366	395	390	374
106	P22	3	1	I 9064	000000	76	2	1	1	1	2	1	6	6773	362	387	385	427	432	398	288	230	206	190	234	174
106	P22	3	1	I 9064	000000	76	3	1	1	1	3	1	7	6224	131	107	73	63	68	96	208	314	322	361	379	380
106	P22	3	1	I 9064	000000	76	4	1	1	1	4	1	1	6130	396	418	448	477	495	491	414	325	236	209	189	173
106	P22	3	1	I 9064	000000	76	5	0	1	1	5	1	2	5690	148	103	78	68	61	76	173	181	262	328	395	428
106	P22	3	1	I 9064	000000	76	6	0	1	1	6	1	3	6410	390	401	404	445	465	471	369	268	209	174	167	160
106	P22	3	1	I 9064	000000	76	7	0	1	1	7	1	4	5150	100	90	60	40	30	50	50	80	130	240	330	410
106	P22	3	1	I 9064	000000	76	8	0	1	1	8	2	5	3620	410	450	540	550	540	500	400	360	270	220	140	140
106	P22	3	1	I 9064	000000	76	9	0	1	1	9	2	6	5580	70	50	60	50	50	80	210	420	330	380	400	400
106	P22	3	1	I 9064	000000	76	10	0	1	1	10	2	7	5090	340	370	350	350	380	330	290	210	180	150	130	110
106	P22	3	1	I 9064	000000	76	11	0	1	1	11	2	1	5290	90	80	70	50	50	70	190	390	470	490	440	410
106	P22	3	1	I 9064	000000	76	12	0	1	1	12	2	2	6210	350	380	330	380	430	520	420	200	190	150	140	120
106	P22	3	1	I 9064	000000	76	13	0	1	1	13	2	3	5660	90	80	50	50	50	70	200	390	390	440	380	330
106	P22	3	1	I 9064	000000	76	14	0	1	1	14	2	4	5570	320	310	330	370	370	290	230	130	80	80	50	70
106	P22	3	1	I 9064	000000	76	15	0	1	1	15	3	5	5540	60	50	50	50	30	60	100	170	190	240	260	240
106	P22	3	1	I 9064	000000	76	16	0	1	1	16	3	6	6140	230	250	240	270	280	180	140	130	110	110	110	70
106	P22	3	1	I 9064	000000	76	17	0	1	1	17	3	7	5560	70	70	40	40	50	120	270	330	330	290	290	290
106	P22	3	1	I 9064	000000	76	18	0	1	1	18	3	1	5550	320	330	390	390	430	380	310	230	170	150	180	110
106	P22	3	1	I 9064	000000	76	19	0	1	1	19	3	2	5070	90	80	60	60	50	80	130	160	230	310	360	270
106	P22	3	1	I 9064	000000	76	20	0	1	1	20	3	3	4730	320	370	420	400	420	330	250	190	160	110	140	100
106	P22	3	1	I 9064	000000	76	21	0	1	1	21	3	4	3880	80	50	50	30	30	30	70	80	150	200	270	290
106	P22	3	1	I 9064	000000	76	22	0	1	1	22	4	5	5520	350	460	470	510	460	410	350	280	240	190	130	110
106	P22	3	1	I 9064	000000	76	23	0	1	1	23	4	6	7100	50	50	40	50	70	180	420	430	450	440	430	360
106	P22	3	1	I 9064	000000	76	24	0	1	1	24	4	7	5860	100	400	400	410	400	410	320	220	170	170	140	100
106	P22	3	1	I 9064	000000	76	25	0	1	1	25	4	1	6030	80	70	60	50	40	60	220	420	460	480	430	380
106	P22	3	1	I 9064	000000	76	26	0	1	1	26	4	2	5430	340	360	330	360	420	300	210	150	110	110	110	110
106	P22	3	1	I 9064	000000	76	27	0	1	1	27	4	3	5690	70	60	40	50	50	80	260	420	430	430	380	300
															340	300	350	360	360	370	240	160	170	140	130	80
															100	70	60	40	60	100	260	430	420	370	380	340
															300	310	320	350	350	340	230	180	150	150	130	100
															70	70	70	40	50	100	240	370	340	340	320	300
															330	320	360	430	490	470	420	300	220	200	150	140
															130	90	90	50	70	70	100	200	250	310	360	390
															340	380	380	380	390	370	310	250	190	160	130	170
															100	110	50	40	30	30	60	90	130	210	270	340
															330	330	370	330	420	440	490	450	320	230	210	170
															90	60	40	40	60	110	320	470	440	360	350	320
															260	230	260	250	340	320	200	150	130	100	90	80
															50	50	40	40	40	30	90	180	140	450	340	270
															280	270	290	340	340	350	410	230	130	130	140	100
															70	60	50	50	40	60	190	330	180	190	190	280
															260	240	220	270	230	240	200	130	120	80	110	90
															80	60	50	50	40	80	190	360	430	460	480	370
															290	310	310	350	330	290	260	170	160	140	140	120
															240	150	60	60	50	70	190	370	370	400	370	360
															330	410	470	480	490	540	470	370	270	220	210	150
															130	90	80	60	50	60	120	180	250	310	360	310
															340	390	360	390	380	460	380	330	240	230	170	190
															110	80	70	30	40	40	40	60	110	150	240	330
															360	350	400	450	600	620	530	470	350	240	190	170
															90	70	40	50	50	90	260	480	400	420	370	340
															300	320	360	320	310	330	200	160	140	130	110	90
															100	70	50	50	60	70	210	440	470	440	370	340
															310	310	300	320	380	340	270	190	150	160	150	140

APPENDIX D

FORMAT OF LOADVOL OUTPUT AND UPDATE INPUT

TABLE D-1. FORMAT OF HEADER RECORD[1]

RECORD COLUMN	CONTENTS	FORMAT
1-3	Blank	3X
4-5	Station Code Number	I2
6-8	Blank	3X
9-10	Last Two Digits of Year	I2
11-14	Blank	4X
15	Data Set Identifier	I1
16	Blank	1X
17-20	Verbal Description of Direction of Travel such as NB, SB, EB, WB, BOTH	A4

[1]One header record precedes each set of data records for a given data set i.e., station, year, and direction.

TABLE D-2. FORMAT OF TAPE DATA RECORD[1]

RECORD COLUMN	CONTENTS	FORMAT
1-3	County Code Number	I3
4	Alphanumeric Letter "P"	A1
5-6	Station Code Number	I2
7	Direction Code	I1
8-9	Integer Route Group Code	I2
10-16	Route Designation Code	A3, A4
17-22	Milepost Number	2A3
23-24	Last Two Digits of Year	I2
25-27	Day of Year Code	I3
28	Holiday Indicator	I1
29	Season of Year Code	I1
30-31	Month of Year Code	I2
32-33	Day of Month Code	I2
34-35	Week of Year Code	I2
36	Day of Week Code	I1
37-41	Daily Volume	I5
42-137	24 Hourly Volumes	24I4
138-150	Blank	13X

[1]One data record for each day of year.

TABLE D-3. FORMAT OF DATA CORRECTION CARDS[1]

CARD COLUMN	CONTENTS	FORMAT
1-2	Blank	2X
3-4	Station Code Number	I2
5-7	Blank	3X
8	Direction Code	I1
9-10	Blank	2X
11-12	Last Two Digits of Year	I2
13	Blank	1X
14-16	Day of Year for Data to be Replaced	I3
17-18	Blank	2X
19-20	Period of Count[2] -- "1" or "13"	I2
21-80	12 Hourly Volumes for Replacement of Data on Tape[3]	12I5

[1]Data correction cards must be arranged in pairs for input, otherwise execution will be terminated. There are a pair (two cards) of data correction cards. They differ only in Columns 19-20 and 21-80.

[2]Use a "1" for the first count period from midnight until noon and a "13" for the period from noon until midnight. The "1" should be right justified.

[3]Volumes are arranged in chronological order; the first count period, "1", begins with the hour from midnight to 1 a.m. and proceeds through the hour from 11 a.m. to noon; the second count interval, "13", begins with the hour from noon to 1 p.m. and proceeds through the hour from 11 p.m. to midnight.

APPENDIX E

LOADVOL PROGRAM LISTING

```
//DTRN73D1 JOB (4317,9019),VIRGIN,MSGLEVEL=(1,1),CLASS=E
/*ROUTE  PUNCH RMT3
//STEPA EXEC FORTGCLG
//FORT.SYSIN DD *
C      DATE:       MARCH 2,1977                                              0010
C      PROGRAMMER: THIS PROGRAM WAS WRITTEN BY MARVIN L. VIRGIN,             0020
C      GRADUATE STUDENT, UNIVERSITY OF KENTUCKY                              0030
C      PURPOSE:    THIS PROGRAM ASSIMILATES RAW TRAFFIC VOLUME DATA          0040
C      OBTAINED FROM ATR STATIONS INTO A FORM WHICH CAN BE EASILY            0050
C      MANIPULATED IN LATER WORK.                                            0060
C      VARIABLE IDENTIFICATION:                                              0070
C                  V(I,J) IS THE VOLUME FOR THE I-TH DAY OF YEAR AND         0080
C                     J-TH HOUR OF DAY                                       0090
C                  VOL(I) IS THE DAILY VOLUME FOR THE I-TH DAY OF YEAR       0100
C                  DOW(I) IS THE DAY OF WEEK FOR THE I-TH DAY OF YEAR        0110
C                  W(I) IS THE WEEK FOR THE I-TH DAY OF YEAR                 0120
C                  DOM(I) IS THE DAY OF MONTH FOR THE I-TH DAY OF YEAR       0130
C                  M(I) IS THE DAY OF YEAR FOR THE I-TH DAY                  0140
C                  SE(I) IS THE SEASON OF YEAR FOR THE I-TH DAY OF YEAR      0150
C                  HOL(I) IS A HOLIDAY CODE FOR THE I-TH DAY OF YEAR         0160
C                  LL IS THE NUMBER OF DAYS IN THE PARTICULAR YEAR           0170
       INTEGER          HIDAY(26),CCO,CSTA,CNO,CDIR,CGP,CYR,CFDOY,CAP,       0180
      1STA,PREC,DIR,YR,DAYM,DAYW,PER,AC(12),HDAY(26)                         0190
       DIMENSION A(80),CRT(2),CMP(2)                                         0200
       INTEGER STOP,DAYL,SEA,DOY,WK,MO,HV(12),B(58),BADWK(58),NMISOE,        0210
      1MISOE(2000)                                                           0220
       REAL YI(58),WI(58),DI(6),PRED(58)                                     0230
       DIMENSION ALPHA(80),BETA(80),S(80),SGMSQ(80),PR(80),PO(80),Q(80)      0240
       INTEGER CNUM,HOL(366),SE(366),M(366),DOM(366),W(366),DOW(366),        0250
      1VOL(366),V(366,24),OV(366,24)                                         0260
       DATA ZERO,ROUTE,AMP,CONTR,DASH/'0','R','&','C','-'/                   0270
       DATA ONE,AROUTE/'1','A'/                                              0280
       DATA BLANK/' '/                                                       0290
       CALL REREAD                                                           0300
       NAUGHT = 0                                                            0310
       MO = 0                                                                0320
       DAYM = 0                                                              0330
       STOP=0                                                                0340
       CSTA=8888B                                                            0350
C      READ A HOLIDAY CARD                                                   0360
       READ(5,1000) IYEAR,HDAY                                               0370
 1000 FORMAT(I2,26I3)                                                        0380
C      READ A CARD OF DAYS UNDER THE INFLUENCE OF HOLIDAYS                   0390
       READ(5,1010) HIDAY                                                    0400
 1010 FORMAT(26I3)                                                           0410
       DO 10 I=1,366                                                         0420
   10 HOL(I) = 0                                                             0430
C      CODE HOLIDAYS WITH A ''2''                                            0440
       DO 20 I=1,26                                                          0450
       II = HDAY(I)                                                          0460
       IF(II.EQ.0) GO TO 20                                                  0470
       HOL(II) = 2                                                           0480
   20  CONTINUE                                                              0490
C      CODE DAYS UNDER THE INFLUENCE OF HOLIDAYS WITH A ''1''                0500
       DO 30 I=1,26                                                          0510
       II = HIDAY(I)                                                         0520
       IF(II.EQ.0) GO TO 30                                                  0530
       HOL(II) = 1                                                           0540
   30 CONTINUE                                                               0550
C      BEGIN ACTUAL DATA PROCESSING                                          0560
```

```
      WRITE(6,1020) IYEAR                                                    0570
 1020 FORMAT('1',T36,'TRAFFIC VOLUME DATA FOR THE YEAR 19',I2,' ARE BEIN     0580
     1G PROCESSED')                                                          0590
C     READ IN DATA                                                           0600
   40 READ(5,1030,END=540) A                                                0610
 1030 FORMAT(80A1)                                                          0620
C     CHECK FOR TYPE OF CARD                                                 0630
C        IF FIRST CARD COLUMN CONTAINS ZERO OR ONE IT IS A DATA CARD         0640
C        IF FIRST CARD COLUMN CONTAINS AN R IT IS A HEADER CARD              0650
C        IF FIRST CARD COLUMN CONTAINS AN A IT IS A NEW HEADER CARD          0660
C        IF FIRST CARD COLUMN CONTAINS AN AMPERSAND IT IS A PREVIOUS         0670
C           COUNT CARD                                                       0680
C        IF FIRST CARD COLUMN CONTAINS A C IT IS A DATA SET CARD             0690
      IF(A(1).EQ.ZERO.OR.A(1).EQ.ONE) GO TO 260                             0700
      IF(A(1).EQ.ROUTE) GO TO 220                                           0710
      IF(A(1).EQ.AROUTE) GO TO 230                                          0720
      IF(A(1).EQ.AMP) GO TO 240                                             0730
      IF(A(1).EQ.CONTR) GO TO 50                                            0740
      WRITE(6,1040) A                                                       0750
 1040 FORMAT(' THE FOLLOWING CARD TYPE IS UNKNOWN ',80A1)                    0760
      GO TO 40                                                              0770
C     CHECK TO SEE IF THIS IS FIRST DATA SET TO BE PROCESSED                 0780
   50 IF(CSTA.NE.88888) GO TO 550                                           0790
   60 WRITE(99,1030) A                                                      0800
      READ(99,1050) CCO,CSTA,CNO,CDIR,CDOES,CGP,CRT,CMP,CYR,CFDOY,CAP       0810
 1050 FORMAT(2X,I3,3X,I2,4X,I1,4X,I1,1X,A4,3X,I2,3X,A3,A4,4X, 2A3,3X,       0820
     1I2,4X,I1,I5)                                                          0830
      WRITE(6,1060) CSTA,CDIR,CYR                                           0840
 1060 FORMAT('1','THE FOLLOWING ARE INCORRECT HEADER DR DATA CARDS FOR S     0850
     1TA ',I2,', DIRECTION ',I1,', AND YEAR 19',I2,/)                       0860
C     CHECK FOR LEAP YEAR                                                    0870
      LY=0                                                                  0880
      I=CYR/4                                                               0890
      X=CYR/4.                                                              0900
      DIFF=X-I                                                              0910
      DIFF = ABS(DIFF)                                                      0920
      IF(DIFF.LT.0.00001) LY=1                                              0930
      DAYL = CFDOY - 1                                                      0940
      LL = 365 + LY                                                         0950
C     DETERMINE MONTH, DAY OF MONTH AND SEASON FOR THE I-TH DAY              0960
      DO 210 L=1,LL                                                         0970
      I= L - LY                                                             0980
      IF(L.LT.1.OR.L.GT.31) GO TO 70                                        0990
      M(L) = 1                                                              1000
      DOM(L) = L                                                            1010
      SE(L) = 1                                                             1020
      GO TO 200                                                             1030
   70 IF(L.LT.32.OR.L.GT.59) GO TO 80                                       1040
      M(L) = 2                                                              1050
      DOM(L) = L - 31                                                       1060
      SE(L) = 1                                                             1070
      GO TO 200                                                             1080
   80 IF(L.EQ.60.AND.LY.EQ.1) GO TO 90                                      1090
      GO TO 100                                                             1100
   90 M(L) = 2                                                              1110
      DOM(L) = 29                                                           1120
      SE(L) = 1                                                             1130
      GO TO 200                                                             1140
  100 IF(I.LT.60.OR.I.GT.90) GO TO 110                                      1150
      M(L) = 3                                                              1160
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      DOM(L) = I - 59                                                    1170
      SE(L) = 2                                                          1180
      GO TO 200                                                          1190
  110 IF(I.LT.91.OR.I.GT.120) GO TO 120                                  1200
      M(L) = 4                                                           1210
      DOM(L) = I - 90                                                    1220
      SE(L) = 2                                                          1230
      GO TO 200                                                          1240
  120 IF(I.LT.121.OR.I.GT.151) GO TO 130                                 1250
      M(L) = 5                                                           1260
      DOM(L) = I - 120                                                   1270
      SE(L) = 2                                                          1280
      GO TO 200                                                          1290
  130 IF(I.LT.152.OR.I.GT.181) GO TO 140                                 1300
      M(L) = 6                                                           1310
      DOM(L) = I - 151                                                   1320
      SE(L) = 3                                                          1330
      GO TO 200                                                          1340
  140 IF(I.LT.182.OR.I.GT.212) GO TO 150                                 1350
      M(L) = 7                                                           1360
      DOM(L) = I - 181                                                   1370
      SE(L) = 3                                                          1380
      GO TO 200                                                          1390
  150 IF(I.LT.213.OR.I.GT.243) GO TO 160                                 1400
      M(L) = 8                                                           1410
      DOM(L) = I - 212                                                   1420
      SE(L) = 3                                                          1430
      GO TO 200                                                          1440
  160 IF(I.LT.244.OR.I.GT.273) GO TO 170                                 1450
      M(L) = 9                                                           1460
      DOM(L) = I - 243                                                   1470
      SE(L) = 4                                                          1480
      GO TO 200                                                          1490
  170 IF(I.LT.274.OR.I.GT.304) GO TO 180                                 1500
      M(L) = 10                                                          1510
      DOM(L) = I - 273                                                   1520
      SE(L) = 4                                                          1530
      GO TO 200                                                          1540
  180 IF(I.LT.305.OR.I.GT.334) GO TO 190                                 1550
      M(L) = 11                                                          1560
      DOM(L) = I - 304                                                   1570
      SE(L) = 4                                                          1580
      GO TO 200                                                          1590
  190 M(L) = 12                                                          1600
      DOM(L) = I - 334                                                   1610
      SE(L) = 1                                                          1620
  200 W(L) = (L+6.)/7.                                                   1630
      DAYL = DAYL + 1                                                    1640
      IF(DAYL.EQ.8) DAYL = DAYL - 7                                      1650
      DOW(L) = DAYL                                                      1660
      DO 210 II=1,24                                                     1670
      V(L,II) = -1                                                       1680
      OV(L,II)=-1                                                        1690
  210 CONTINUE                                                           1700
      PREC = 99999999                                                    1710
      GO TO 40                                                           1720
  220 WRITE(99,1030) A                                                   1730
      READ(99,1070) STA,PREC                                             1740
 1070 FORMAT(12X,I2,1X,I5)                                               1750
C     IF STATION ON HEADER CARD IS INCORRECT EXECUTION TERMINATED        1760
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      IF(STA.EQ.CSTA) GO TO 40                                          1770
      WRITE(6,1080) STA,PREC                                            1780
 1080 FORMAT(' HEADER CARD IS INCORRECT FOR STA',I4,' PREC',I6,          1790
     1'. EXECUTION TERMINATED.')                                        1800
      GO TO 870                                                         1810
  230 WRITE(99,1030) A                                                  1820
      READ(99,1090) STA,PREC                                            1830
 1090 FORMAT(19X,I3,1X,I5)                                              1840
C     IF STATION ON NEW HEADER CARD IS INCORRECT EXECUTION TERMINATED   1850
      IF(STA.EQ.CSTA) GO TO 40                                          1860
      WRITE(6,1080) STA,PREC                                            1870
      GO TO 870                                                         1880
  240 WRITE(99,1030) A                                                  1890
C     FORMAT OF PREVIOUS COUNT CARD DEPENDS ON DATE                     1900
      IF(CYR.GT.75) GO TO 250                                           1910
      IF(CYR.EQ.75.AND.MO.GE.2) GO TO 250                               1920
      READ(99,1100) PREC                                                1930
 1100 FORMAT(15X,I5)                                                    1940
      GO TO 40                                                          1950
  250 READ(99,1110) PREC                                                1960
 1110 FORMAT(23X,I5)                                                    1970
      GO TO 40                                                          1980
C     CHECK FOR MISSING DATA LESS THAN ONE DAY                          1990
  260 NBEG = 0                                                          2000
      NEND = 0                                                          2010
      DO 270 I=1,12                                                     2020
      IF(A((I*5)+15).EQ.BLANK) GO TO 270                                2030
      NBEG = I                                                          2040
      GO TO 280                                                         2050
  270 CONTINUE                                                          2060
      GO TO 40                                                          2070
  280 DO 290 I=NBEG,12                                                  2080
      IF(A((I*5)+15).NE.BLANK) GO TO 290                                2090
      NEND = I-1                                                        2100
      GO TO 300                                                         2110
  290 CONTINUE                                                          2120
      NEND = 12                                                         2130
  300 WRITE(99,1030) A                                                  2140
      READ(99,1120) STA,DIR,YR,AM,DAYM,DAYW,PER,AC                      2150
 1120 FORMAT(3X,I2,I1,1X,I2,A1,I2,I1,I2,12I5)                           2160
C     CHECK THE STATION ON THE DATA CARD                                2170
      IF(STA.EQ.CSTA) GO TO 310                                         2180
      WRITE(6,1130) STA,DIR,YR,AM,DAYM                                  2190
 1130 FORMAT(' DATA CARD HAS INCORRECT STA FOR STA',I4,' DIR',I4,' YR',  2200
     1I4,' MONTH ',A4,' DAY',I4,'. DATA IGNORED.')                      2210
      GO TO 40                                                          2220
C     CHECK THE YEAR ON THE DATA CARD                                   2230
  310 IF(YR.EQ.IYEAR) GO TO 320                                         2240
      WRITE(6,1140) STA,DIR,YR,AM,DAYM                                  2250
 1140 FORMAT(' DATA CARD HAS INCORRECT YEAR FOR STA',I4,' DIR',I4,' YR',  2260
     1I4,' MONTH ',A4,' DAY',I4,'. DATA IGNORED.')                      2270
      GO TO 40                                                          2280
C     CHANGE ALPHANUMERIC MONTH CODES TO NUMERIC                        2290
  320 IF(AM.NE.ZERO) GO TO 330                                          2300
      MO = 10                                                           2310
      GO TO 360                                                         2320
  330 IF(AM.NE.DASH) GO TO 340                                          2330
      MO = 11                                                           2340
      GO TO 360                                                         2350
  340 IF(AM.NE.AMP) GO TO 350                                           2360
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      MO = 12                                                          2370
      GO TO 360                                                        2380
  350 WRITE(99,1150) AM                                                2390
 1150 FORMAT(A1)                                                       2400
      READ(99,1160) MONTH                                              2410
 1160 FORMAT(I1)                                                       2420
      MO = MONTH                                                       2430
C     CHECK FOR INCORRECT MONTH CODES AND IGNORE SUCH DATA             2440
      IF(MO.GE.1.AND.MO.LE.9) GO TO 360                                2450
      WRITE(6,1170) STA,DIR,YR,AM,DAYM                                 2460
 1170 FORMAT(' DATA CARD HAS INCORRECT MONTH FOR STA',I4,' DIR',I4,' YR'  2470
     1,I4,' MONTH ',A4,' DAY',I4,'. DATA IGNORED.')                    2480
      GO TO 40                                                         2490
C     CHECK FOR INCORRECT DAY OF MONTH CODES AND IGNORE SUCH DATA      2500
  360 IF(DAYM.GE.1.AND.DAYM.LE.31) GO TO  370                          2510
      WRITE(6,1180) STA,DIR,YR,AM,DAYM                                 2520
 1180 FORMAT(' DATA CARD HAS INCORRECT DAY OF MONTH FOR STA',I4,' DIR',  2530
     1I4,' YR',I4,' MONTH ',A4,' DAY',I4,'. DATA IGNORED.')            2540
      GO TO 40                                                         2550
C     CHECK TO DETERMINE FORMAT CODE OF DIRECTION                      2560
  370 IF(CYR.LT.75) GO TO 390                                          2570
       IF(CYR.GT.75) GO TO 380                                         2580
      IF(MO.LE.2) GO TO 390                                            2590
      IF(MO.EQ.3.AND.DAYM.LE.1) GO TO 390                              2600
  380 IF(DIR.EQ.CDIR) GO TO 410                                        2610
       GO TO 400                                                       2620
  390 IF(DIR.EQ.0.AND.CDIR.EQ.0) GO TO 410                             2630
      IF(DIR.EQ.5.AND.CDIR.EQ.1.OR.DIR.EQ.5.AND.CDIR.EQ.3) GO TO 410   2640
      IF(DIR.EQ.2.AND.CDIR.EQ.5) GO TO 410                             2650
      IF(DIR.EQ.6.AND.CDIR.EQ.7) GO TO 410                             2660
  400 WRITE(6,1190) STA,DIR,YR,AM,DAYM                                 2670
 1190 FORMAT(' DATA CARD HAS INCORRECT DIRECTION FOR STA',I4,' DIR',I4,  2680
     1' YR',I4,' MONTH ',A4,' DAY',I4,'. DATA IGNORED.')               2690
      GO TO 40                                                         2700
C     CHECK FOR VALID DAY OF WEEK RANGE AND IGNORE ERRONEOUS DATA      2710
  410 IF(DAYW.GE.1.AND.DAYW.LE.7) GO TO 420                            2720
      WRITE(6,1200) STA,DIR,YR,AM,DAYM                                 2730
 1200 FORMAT(' DATA CARD HAS INCORRECT DAY OF WEEK FOR STA',I4,' DIR',   2740
     1I4,' YR',I4,' MONTH ',A4,' DAY',I4,'. DATA IGNORED.')            2750
      GO TO 40                                                         2760
C     COMPUTE DAY OF YEAR                                              2770
  420 X = (30.416*MO) + DAYM - 30.416                                  2780
      IF(X.GE.1.0.AND.X.LE.31.2) GO TO 430                             2790
      IF(X.GT.31.2.AND.X.LE.60.0) GO TO 440                            2800
      IF(X.GT.60.0.AND.X.LE.213.6.AND.LY.EQ.1) GO TO 430               2810
      IF(X.GT.60.0.AND.X.LE.213.6.AND.LY.EQ.0) GO TO 450               2820
      IF(X.GT.213.6.AND.LY.EQ.0) GO TO 430                             2830
      IF(X.GT.213.6.AND.LY.EQ.1) GO TO 440                             2840
  430 DOY = X                                                          2850
      GO TO 460                                                        2860
  440 DOY = X + 1.                                                     2870
      GO TO 460                                                        2880
  450 DOY = X - 1.                                                     2890
C     CHECK FOR INPUT DAY OF WEEK CORRESPONDENCE WITH COMPUTED DAY OF  2891
C       WEEK AND IGNORE ERRONEOUS DATA                                 2892
  460 IF(DAYW.EQ.DOW(DOY)) GO TO 465                                   2893
      WRITE(6,1205) STA,DIR,YR,AM,DAYM,DAYW                            2894
 1205 FORMAT(' DATA CARD HAS INCORRECT DAY OF WEEK FOR STA',I4,' DIR',   2895
     1I4,' YR',I4,' MONTH ',A4,' DAY',I4,' DAY OF WEEK',I4,'. DATA IGNOR  2896
     2ED.')                                                            2897
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      GO TO 40                                                          2898
C     COMPUTE WEEK OF YEAR                                              2900
  465 WK = (DOY+6.)/7.                                                  2910
C     COMPUTE SEASON FOR ALL MONTHS                                     2920
      IF(MO.EQ.1.OR.MO.EQ.2.OR.MO.EQ.12) SEA=1                          2930
      IF(MO.EQ.3.OR.MO.EQ.4.OR.MO.EQ.5) SEA=2                           2940
      IF(MO.EQ.6.OR.MO.EQ.7.OR.MO.EQ.8) SEA=3                           2950
      IF(MO.EQ.9.OR.MO.EQ.10.OR.MO.EQ.11) SEA=4                         2960
C     COMPUTE UNCORRECTED HOURLY VOLUMES                                2970
      HV(NBEG) = AC(NBEG) - PREC                                        2980
      NBEGP = NBEG + 1                                                  2990
      DO 470 N=NBEGP,NEND                                               3000
      HV(N) = AC(N) - AC(N-1)                                           3010
  470 CONTINUE                                                          3020
C     COMPENSATE FOR ERROR OF COUNTER CAPACITY                          3030
      DO 480 N=NBEG,NEND                                                3040
      IF(HV(N).LT.0) HV(N) = HV(N) + 100000                             3050
  480 CONTINUE                                                          3060
      PREC = AC(NEND)                                                   3070
      SE(DOY) = SEA                                                     3080
      M(DOY) = MO                                                       3090
      DOM(DOY) = DAYM                                                   3100
      W(DOY) = WK                                                       3110
      DOW(DOY) = DAYW                                                   3120
C     CHECK FOR INCORRECT PERIOD OF COUNT AND IGNORE SUCH DATA          3130
      IF(PER.EQ.1) GO TO 490                                            3140
      IF(PER.EQ.13) GO TO 510                                           3150
      WRITE(6,1210) STA,DIR,YR,AM,DAYM,PER                              3160
 1210 FORMAT(' DATA CARD HAS INCORRECT PERIOD FOR STA',I4,' DIR',I4,     3170
     1' YR',I4,'MONTH ',A4,' DAY',I4,' PERIOD',I4,'. DATA IGNORED.')    3180
      GO TO 40                                                          3190
C     COMPUTE VOLUMES WITHIN APPROPRIATE COUNT PERIOD                   3200
  490 DO 500 N=NBEG,NEND                                                3210
      OV(DOY,N)=HV(N)                                                   3220
  500 V(DOY,N) = HV(N)                                                  3230
      GO TO 530                                                         3240
  510 DO 520 N=NBEG,NEND                                                3250
      OV(DOY,N+12)=HV(N)                                                3260
  520 V(DOY,N+12) = HV(N)                                               3270
  530 CONTINUE                                                          3280
      GO TO 40                                                          3290
  540 STOP = 1                                                          3300
  550 CONTINUE                                                          3310
C                                                                       3320
C     WRITE OUT UNCORRECTED HOURLY VOLUMES                              3330
C                                                                       3340
  560 WRITE(6,1220) CSTA,CDIR,CYR                                       3350
 1220 FORMAT('1','THE FOLLOWING ARE UNCORRECTED HOURLY VOLUMES FOR STA  3360
     1,I2,', DIRECTION ',I1,', AND YEAR 19',I2,/)                       3370
      K = 0                                                             3380
      LL = 365 + LY                                                     3390
      DO 580 L=1,LL                                                     3400
      N = L + 26 -K                                                     3410
      IF(N.NE.27) GO TO 570                                             3420
      K = K + 27                                                        3430
      WRITE(6,1230)                                                     3440
 1230 FORMAT('1ST DI  YR  DOY SEA MO DOM  WK DOW PER',30X,              3450
     1'HOURLY VOLUMES')                                                 3460
      WRITE(6,1240)                                                     3470
 1240 FORMAT(44X,'1      2      3      4      5      6      7      8     3480
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     1  9      10      11      12',//)                                        3490
  570 WRITE(6,1250) CSTA,CDIR,CYR,L,SE(L),M(L),DOM(L),W(L),DOW(L),           3500
     1(V(L,J),J=1,12)                                                       3510
 1250 FORMAT(' ',I2,I3,I4,I5,I3,3I4,I3,'   1',2X,12I7)                      3520
      WRITE(6,1260) CSTA,CDIR,CYR,L,SE(L),M(L),DOM(L),W(L),DOW(L),          3530
     1(V(L,J),J=13,24)                                                      3540
 1260 FORMAT(' ',I2,I3,I4,I5,I3,3I4,I3,'  13',2X,12I7)                      3550
  580 CONTINUE                                                              3560
C                                                                           3570
C     ROUTINE FOR CORRECTION OF HOURLY VOLUMES                              3580
C                                                                           3590
C     WRITE OUT THE MISSING AND OR REPLACED DATA PRECEDED BY THE            3600
C     HOLIDAY AND DAYS UNDER THE INFLUENCE CARDS                            3610
      WRITE(6,1270) CSTA,CDIR,CYR                                           3620
 1270 FORMAT('1THE FOLLOWING SUBSTITUTIONS HAVE BEEN MADE FOR MISSING OR    3630
     1 ERRONEOUS DATA FOR STA ',I2,', DIRECTION',I2,', AND YEAR 19',I2)     3640
      WRITE(6,1280) HDAY,HIDAY                                              3650
 1280 FORMAT('0',T3,'DAY OF YEAR CODES FOR HOLIDAYS:',/,T15,26(1X,I3),/,    3660
     1' ',T3,'DAY OF YEAR CODES FOR DAYS UNDER THE INFLUENCE OF HOLIDAYS    3670
     2:'/,T15,26(1X,I3),//,' ST DI  YR  DOY SEA MO DOM  WK DOW PER',30X,    3680
     3'HOURLY VOLUMES')                                                     3690
      WRITE(6,1240)                                                         3700
      NMISOE = 0                                                            3710
      DO 590 I=1,2000                                                       3720
  590 MISOE(I) = 0                                                          3730
      DO 760 K=1,24                                                         3740
      DO 760 J=1,7                                                          3750
      NG = 0                                                                3760
      NB = 0                                                                3770
      NN = 0                                                                3780
      DO 600 I = 1,58                                                       3790
  600 BADWK(I) = 0                                                          3800
      DO 610 N=J,371,7                                                      3810
      NUM = 365 + LY                                                        3820
      IF(N.GT.NUM) GO TO 610                                                3830
      NN = NN + 1                                                           3840
      B(NN+3) = V(N,K)                                                      3850
  610 CONTINUE                                                              3860
C     ASSIGN APPROPRIATE VOLUMES TO BEGINNING AND ENDING WEEKS OF YEAR      3870
      B(1) = B(NN+1)                                                        3880
      B(2) = B(NN+2)                                                        3890
      B(3) = B(NN+3)                                                        3900
      IF(NN.EQ.53) GO TO 620                                                3910
      B(56) = B(4)                                                          3920
      B(57) = B(5)                                                          3930
      B(58) = B(6)                                                          3940
      GO TO 630                                                             3950
  620 B(57) = B(4)                                                          3960
      B(58) = B(5)                                                          3970
  630 CONTINUE                                                              3980
C     CHECK VOLUME AGAINST CAPACITY                                         3990
      DO 640 N=1,58                                                         4000
      IF(B(N).GT.CAP) B(N) = -B(N)                                          4010
  640 CONTINUE                                                              4020
C     COMPUTE AN ANNUAL AVERAGE HOURLY VOLUME                               4030
      BAVG = 0.                                                             4040
      D = 0.                                                                4050
      NNN = NN + 3                                                          4060
      DO 650 N=4,NNN                                                        4070
      IF(B(N).LT.0) GO TO 650                                               4080
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      BAVG = BAVG + B(N)                                                4090
      O = O + 1.                                                        4100
  650 CONTINUE                                                          4110
      BAVG = BAVG/D                                                     4120
      DO 660 N=1,58                                                     4130
      IF(B(N).LT.0) GO TO 660                                           4140
      DIFF = B(N) - BAVG                                                4150
      DIFF = ABS(DIFF)                                                  4160
C     CHECK HOURLY VOLUMES WITH ANNUAL AVERAGE HOURLY VOLUME            4170
      IF(DIFF.LE.80) GO TO 660                                          4180
      DIFF = B(N) - BAVG                                                4190
      DIFF = DIFF/BAVG                                                  4200
      Z = -.95                                                          4210
      IF(DIFF.LT.Z.OR.DIFF.GT.5.) B(N) = -B(N) - 1                      4220
  660 CONTINUE                                                          4230
C     COMPUTE SEVEN-ITEM MOVING AVERAGE                                 4240
      DO 680 N=4,55                                                     4250
      IF(B(N).LT.0) GO TO 680                                           4260
      AVG = 0.                                                          4270
      O = 0.                                                            4280
      OO 670 JD=1,7                                                     4290
      NI = N + JD - 4                                                   4300
      IF(B(NI).LT.0) GO TO 670                                          4310
      D = O + 1.                                                        4320
      AVG = AVG + B(NI)                                                 4330
  670 CONTINUE                                                          4340
      AVG = AVG/O                                                       4350
      DIFF = B(N) - AVG                                                 4360
      DIFF = ABS(DIFF)                                                  4370
C     CHECK HOURLY VOLUMES AGAINST SEVEN-ITEM MOVING AVERAGE            4380
      IF(OIFF.LT.20) GO TO 680                                          4390
      DIFF = B(N) - AVG                                                 4400
      DIFF = OIFF/AVG                                                   4410
      Z = -.8                                                           4420
      IF(DIFF.LT.Z.OR.DIFF.GT.4.0)  B(N) = -B(N) - 1                    4430
  680 CONTINUE                                                          4440
      IF(NN.EQ.52) GO TO 690                                            4450
      IF(B(56).LT.0) GO TO 690                                          4460
      DIFF = B(56) - AVG                                                4470
      DIFF = ABS(OIFF)                                                  4480
      IF(DIFF.LT.20) GO TO 690                                          4490
      DIFF = B(56) - AVG                                                4500
      DIFF = DIFF/AVG                                                   4510
      IF(DIFF.LT.Z.OR.DIFF.GT.4.0) B(56) = -B(56) - 1                   4520
  690 CONTINUE                                                          4530
C     COMPUTE NUMBER OF GOOD HOURS AND NUMBER OF BAD HOURS IN EACH DATA 4540
C       SET                                                             4550
      DO 710 I=1,58                                                     4560
      IF(B(I).GE.0) GO TO 700                                           4570
      NB = NB + 1                                                       4580
      BADWK(NB) = I                                                     4590
      GO TO 710                                                         4600
  700 NG = NG + 1                                                       4610
      YI(NG) = B(I)                                                     4620
      WI(NG) = I                                                        4630
  710 CONTINUE                                                          4640
C     CHECK TO SEE IF THERE IS ANY BAD DATA                             4650
      IF(NG.EQ.58) GO TO 760                                            4660
      DO 720 I=1,NG                                                     4670
C                                                                       4680
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C      ROUTINE THAT USES A FIFTH DEGREE POLYNOMIAL TO REPLACE MISSING OR      4690
C        ERRONEOUS DATA                                                       4700
C                                                                             4710
  720 Q(I) = 1.                                                               4720
      NPM = 6 + NG                                                            4730
      CALL FLSQFY (5,NG,WI,YI,Q,DI,ALPHA,BETA,S,SGMSQ,PR,PO,6,NPM)            4740
      DO 730 JZ=1,NB                                                          4750
      DO 730 I=1,58                                                           4760
      IF(I.NE.BADWK(JZ)) GO TO 730                                            4770
C     PRED CONTAINS THE PREDICTED VOLUMES FROM THIS ROUTINE                   4780
      PRED(JZ)= ((((DI(6)*I + DI(5))*I + DI(4))*I + DI(3))*I +                4790
     1DI(2))*I + DI(1)                                                        4800
      IF(PRED(JZ).LT.0.) PRED(JZ) = 0.                                        4810
      B(I) = NAUGHT - PRED(JZ) - .5                                           4820
  730 CONTINUE                                                                4830
      L = NN + 3                                                              4840
      DO 740 JZ=1,NB                                                          4850
      DO 740 I=4,L                                                            4860
      IF(I.NE.BADWK(JZ)) GO TO 740                                            4870
      NMISOE = NMISOE + 1                                                     4880
      MISOE(NMISOE) = (BADWK(JZ)-4)*7 + J                                     4890
  740 CONTINUE                                                                4900
      DO 750 I=4,L                                                            4910
      NO = (I-4)*7 + J                                                        4920
      V(NO,K) = B(I)                                                          4930
  750 CONTINUE                                                                4940
  760 CONTINUE                                                                4950
      N = NMISOE - 1                                                          4960
      DO 770 I=1,N                                                            4970
      K = I + 1                                                               4980
      DO 770 J=K,NMISOE                                                       4990
      IF(MISOE(I).LT.MISOE(J)) GO TO 770                                      5000
      NUM = MISOE(I)                                                          5010
      MISOE(I) = MISOE(J)                                                     5020
      MISOE(J) = NUM                                                          5030
  770 CONTINUE                                                                5040
      NO = 0                                                                  5050
      DO 790 I=1,NMISOE                                                       5060
      IF(MISOE(I).EQ.0) GO TO 790                                             5070
      IF(MISOE(I).EQ.NO) GO TO 790                                            5080
      NO = MISOE(I)                                                           5090
C     WRITE THE DATA THAT WILL BE SUBSTITUTED                                 5100
      WRITE(6,1250) CSTA,CDIR,CYR,NO,SE(NO),M(NO),DOM(NO),W(NO),DOW(NO),      5110
     1(V(NO,KK),KK=1,12)                                                      5120
      WRITE(6,1260) CSTA,CDIR,CYR,NO,SE(NO),M(NO),DOM(NO),W(NO),DOW(NO),      5130
     1(V(NO,KK),KK=13,24)                                                     5140
      NNN=0                                                                   5150
      DO 780 KK=1,24                                                          5160
  780 NNN=NNN+OV(NO,KK)                                                       5170
      IF(NNN.EQ.-24) GO TO 790                                                5180
C     PUNCH OUT TWO-CARD SETS OF OLD VOLUMES THAT HAVE BEEN REPLACED          5190
      WRITE(7,1290) CSTA,CDIR,CYR,NO,(OV(NO,KK),KK=1,12)                      5200
 1290 FORMAT(4I4,3X,'1',12I5)                                                 5210
      WRITE(7,1295) CSTA,CDIR,CYR,NO,(OV(NO,KK),KK=13,24)                     5211
 1295 FORMAT(4I4,2X,'13',12I5)                                                5212
  790 CONTINUE                                                                5220
      L = 365 + LY                                                            5230
      DO 800 I=1,L                                                            5240
      VOL(I) = 0                                                              5250
      DO 800 K=1,24                                                           5260
```

```
  800 V(I,K) = IABS(V(I,K))
C     COMPUTE THE DAILY VOLUMES
      DO 810 I=1,L
      DO 810 K=1,24
  810 VOL(I) = VOL(I) + V(I,K)
      WRITE(6,1300) CSTA,CDIR,CYR
 1300 FORMAT('1','THE FOLLOWING HAS BEEN PLACED ON TAPE FOR STA ',I2,',
     1DIRECTION ',I1,', AND YEAR 19',I2,/)
      WRITE(6,1310) CSTA,CYR,CNO,CDOES
 1310 FORMAT(T5,'HEADER RECORD',/,2X,'STA',3X,'YR',3X,'DS',2X,'DIR',/,
     13I5,1X,A4)
C     IF TAPE OUTPUT NOT DESIRED USE--//GO.FT08F001  DD DUMMY
C     WRITE HEADER ON TAPE---UNIT 8
      WRITE(8,1320) CSTA,CYR,CNO,CDOES
 1320 FORMAT(3X,I2,3X,I2,4X,I1,1X,A4)
C     WRITE VOLUME RECORDS
      K = 0
      LL = 365 + LY
      DO 840 L=1,LL
      N = L + 26 - K
      IF(N.NE.27) GO TO 820
      K = K + 27
      WRITE(6,1330)
 1330 FORMAT('1 CO STA DIR GP  ROUTE    MP   YR  ODY HO SE  MD DDM  WK D
     1OW  DVOL',T90,'HOURLY VOLUMES')
      WRITE(6,1340)
 1340 FORMAT(71X,'1    2    3    4    5    6    7    8    9   10   11
     112',//)
C     PRINT THE HOURLY VOLUMES AND DAILY VOLUMES
  820 WRITE(6,1350) CCO,CSTA,CDIR,CGP,CRT,CMP,CYR,L,HOL(L),SE(L),M(L),
     1DOM(L),W(L),DOW(L),VOL(L),(V(L,I),I=1,24)
 1350 FORMAT(I4,' P',I2,I3,I3,2X,A3,A4,1X,2A3,I3,I5,2I3,4I4,I7,1X,12I5,/
     1,68X,12I5)
C     WRITE THE CORRECTED HOURLY VOLUMES ON TAPE
C     WRITE DATA ON TAPE---UNIT 8
      DOY=L
  830 WRITE(8,1360) CCO,CSTA,CDIR,CGP,CRT,CMP,        CYR,DOY,HOL(DOY),
     1SE(DOY),M(DOY),DOM(DOY),W(DOY),DOW(DOY),VOL(DOY),(V(DOY,I),I=1,24)
 1360 FORMAT(I3,'P',I2,I1,I2,A3,A4,2A3,I2,I3,I1,I1,I2,I2,I2,I1,I5,24I4)
  840 CONTINUE
  850 CONTINUE
  860 CONTINUE
      IF(STOP.EQ.1) GO TO 870
      MD = 0
      DAYM = 0
      GO TO 60
  870 STOP
      END
C
C     ***************************************************************
C     * LEAST SQUARES ORDINARY POLYNOMIAL CURVE FITTING SUBROUTINE. *
C     ***************************************************************
C
C
C                              NUMALIB
C
C                        UNIVERSITY OF KENTUCKY
C
C                           COMPUTER CENTER
C
```

```
C                                MCVEY HALL                                    00000130
C                             LEXINGTON, KENTUCKY                              00000140
C                                                                              00000150
C                                                                              00000160
      SUBROUTINE FLSQFY(N,M,X,Y,W,C,ALPHA,BETA,S,SGMSQ,PR,PO,N1,MN1)           00000170
      DIMENSION C(N1),ALPHA(MN1),BETA(MN1),S(MN1),SGMSQ(MN1),PR(MN1),PO(00000180
     $MN1),W(M),X(M),Y(M)                                                     00000190
      GAMDA=1.                                                                 00000200
      NO=0                                                                     00000210
      CALL FGEFYT(N,NO,X,Y,W,BETA,S,SGMSQ,ALPHA,PR,PO,M,MN1)                   00000220
      CALL FCODA(N,C,PO,PR,ALPHA,BETA,GAMDA,S,N+1)                             00000230
      RETURN                                                                   00000240
      END                                                                      00000250
      SUBROUTINE FCODA(N,C,PM,PR,ALPHA,BETA,GAMDA,S,NN)                        00000010
      DIMENSION C(NN),ALPHA(NN),BETA(NN),PM(NN),PR(NN),S(NN)                   00000020
      N1=N+1                                                                   00000030
      DO 10 IB=1,N1                                                            00000040
      C(IB)=0.                                                                 00000050
      PM(IB)=0.                                                                00000060
   10 PR(IB)=0.                                                                00000070
      PR(1)=1.                                                                 00000080
      C(1)=S(1)                                                                00000090
      DO 20 I=1,N                                                              00000100
      T2=0.                                                                    00000110
      N1=I+1                                                                   00000120
      DO 20 IB=1,N1                                                            00000130
      T1=(T2-ALPHA(I)*PR(IB)-BETA(I)*PM(IB))/GAMDA                             00000140
      T2=PR(IB)                                                                00000150
      PM(IB)=PR(IB)                                                            00000160
      PR(IB)=T1                                                                00000170
   20 C(IB)=C(IB)+T1*S(I+1)                                                    00000180
      RETURN                                                                   00000190
      END                                                                      00000200
      SUBROUTINE FGEFYT(N,NO,X,Y,W,BETA,S,SGMSQ,ALPHA,PR,PO,M,NI)              00000010
      DIMENSION X(M),Y(M),BETA(NI),ALPHA(NI),S(NI),SGMSQ(NI),PR(M),            00000020
     $PO(M),W(M)                                                              00000030
 1000 FORMAT(32H  THERE IS AN ERROR IN YOUR DATA)                              00000040
      IF (N -NO -M) 10,30,20                                                   00000050
   10 IF(N-NO)20,30,30                                                         00000060
   20 PRINT 1000                                                               00000070
      GOTO 210                                                                 00000080
   30 BETA(NO+1)=0.                                                            00000090
      DSQ=0.                                                                   00000100
      WPP=0.                                                                   00000110
      LXACT=0                                                                  00000120
      IF(N-NO-M+1)50,40,40                                                     00000130
   40 LXACT=1                                                                  00000140
   50 DO 80 J=1,M                                                              00000150
      PR(J)=1.                                                                 00000160
      PO(J)=0.                                                                 00000170
   60 WPP=WPP+W(J)                                                             00000180
      IF(LXACT)80,70,80                                                        00000190
   70 DSQ=DSQ+W(J)*Y(J)*Y(J)                                                   00000200
   80 CONTINUE                                                                 00000210
      NON=NO+1                                                                 00000220
      NN=N+1                                                                   00000230
      DO 200 I=NON,NN                                                          00000240
      LREEDO=M-I+NO                                                            00000250
      WYP=0.                                                                   00000260
      WXPP=0.                                                                  00000270
```

```
      DO 120 J=1,M                                                    00000280
      TEMP=W(J)*PR(J)                                                 00000290
      IF(I-NN)90,100,100                                              00000300
   90 WXPP=WXPP+TEMP*X(J)*PR(J)                                       00000310
  100 IF(LREEDO)120,110,110                                           00000320
  110 WYP=WYP+TEMP*Y(J)                                               00000330
  120 CONTINUE                                                        00000340
      IF(LREEDO)140,130,130                                           00000350
  130 S(I)=WYP/WPP                                                    00000360
  140 IF(LXACT)160,150,160                                            00000370
  150 DSQ=DSQ-S(I)*S(I)*WPP                                           00000380
      BR=LREEDO                                                       00000390
      SGMSQ(I)=DSQ/BR                                                 00000400
      GOTO 170                                                        00000410
  160 SGMSQ(I)=0.                                                     00000420
  170 IF(I-NN)180,200,200                                             00000430
  180 ALPHA(I)=WXPP/WPP                                               00000440
      WPPO=WPP                                                        00000450
      WPP=0.                                                          00000460
      DO 190 J=1,M                                                    00000470
      TEMP=(X(J)-ALPHA(I))*PR(J)-BETA(I)*PO(J)                        00000480
      WPP=WPP+W(J)*TEMP**2                                            00000490
      PO(J)=PR(J)                                                     00000500
  190 PR(J)=TEMP                                                      00000510
      BETA(I+1)=WPP/WPPO                                              00000520
  200 CONTINUE                                                        00000530
  210 RETURN                                                          00000540
      END                                                             00000550
/*
//GO.FT08F001 DD UNIT=(TAPE,,DEFER),VOL=SER=E09625,DSN=DTRTEST,
//  LABEL=(1,SL),DISP=(NEW,KEEP),
//  DCB=(RECFM=FB,LRECL=150,BLKSIZE=15000)
//GO.FT07F001  DD  SYSOUT=B
//GO.FT06F001  DD  SYSOUT=A,DCB=(RECFM=FBA,BLKSIZE=3458,LRECL=133),     X
//  UNIT=SYSDA
//GO.FT05F001  DD  *
```

APPENDIX F

LOADVOL FLOWCHART

00000090	28.04	30	00000050	28.01	00000060	28.02	
00000140	28.06	40					
00000150	28.07	50	00000130	28.05			
00000160	28.08		00000210	28.12			
00000180	28.09	60					
00000200	28.11	70					
00000210	28.12	80	00000190	28.10			
00000250	28.15		00000530	29.09			
00000290	28.17		00000340	28.22			
00000310	28.19	90					
00000320	28.20	100	00000300	28.18			
00000330	28.21	110					
00000340	28.22	120	00000320	28.20			
00000360	28.24	130					
00000370	28.25	140	00000350	28.23			
00000380	28.26	150					
00000420	29.01	160	00000370	28.25			
00000430	29.02	170	00000410	28.26			
00000440	29.03	180					
00000480	29.05		00000510	29.07			
00000510	29.06	190					
00000530	29.09	200	00000430	29.02			
00000540	29.10	210	00000080	28.03			

CHART TITLE - NON-PROCEDURAL STATEMENTS

09/19/77 TABLE OF DIAGNOSTICS AUTOFLOW CHART SET - PROGRAM

LOCATION CARD ID	PAGE/BOX	DIAGNOSTIC
0300	2.01	UNDEFINED - 'REREAD' EXTERNAL REFERENCE

09/19/77 AUTOFLOW CHART SET - PROGRAM

CHART TITLE - INTRODUCTORY COMMENTS

DATE: MARCH 2,1977

PROGRAMMER: THIS PROGRAM WAS WRITTEN BY MARVIN L. VIRGIN,

GRADUATE STUDENT, UNIVERSITY OF KENTUCKY

PURPOSE: THIS PROGRAM ASSIMILATES RAW TRAFFIC VOLUME DATA

OBTAINED FROM ATR STATIONS INTO A FORM WHICH CAN BE EASILY

MANIPULATED IN LATER WORK.

VARIABLE IDENTIFICATION:

V(I,J) IS THE VOLUME FOR THE I-TH DAY OF YEAR AND

J-TH HOUR OF DAY

VOL(I) IS THE DAILY VOLUME FOR THE I-TH DAY OF YEAR

F.2

DOW(I) IS THE DAY OF WEEK FOR THE I-TH DAY OF YEAR

W(I) IS THE WEEK FOR THE I-TH DAY OF YEAR

DOM(I) IS THE DAY OF MONTH FOR THE I-TH DAY OF YEAR

M(I) IS THE DAY OF YEAR FOR THE I-TH DAY

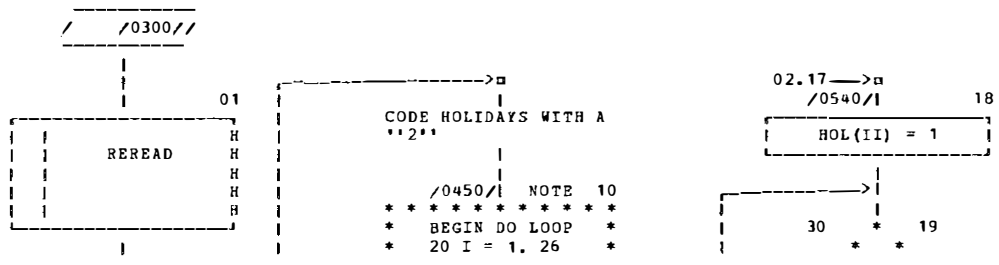
SE(I) IS THE SEASON OF YEAR FOR THE I-TH DAY OF YEAR

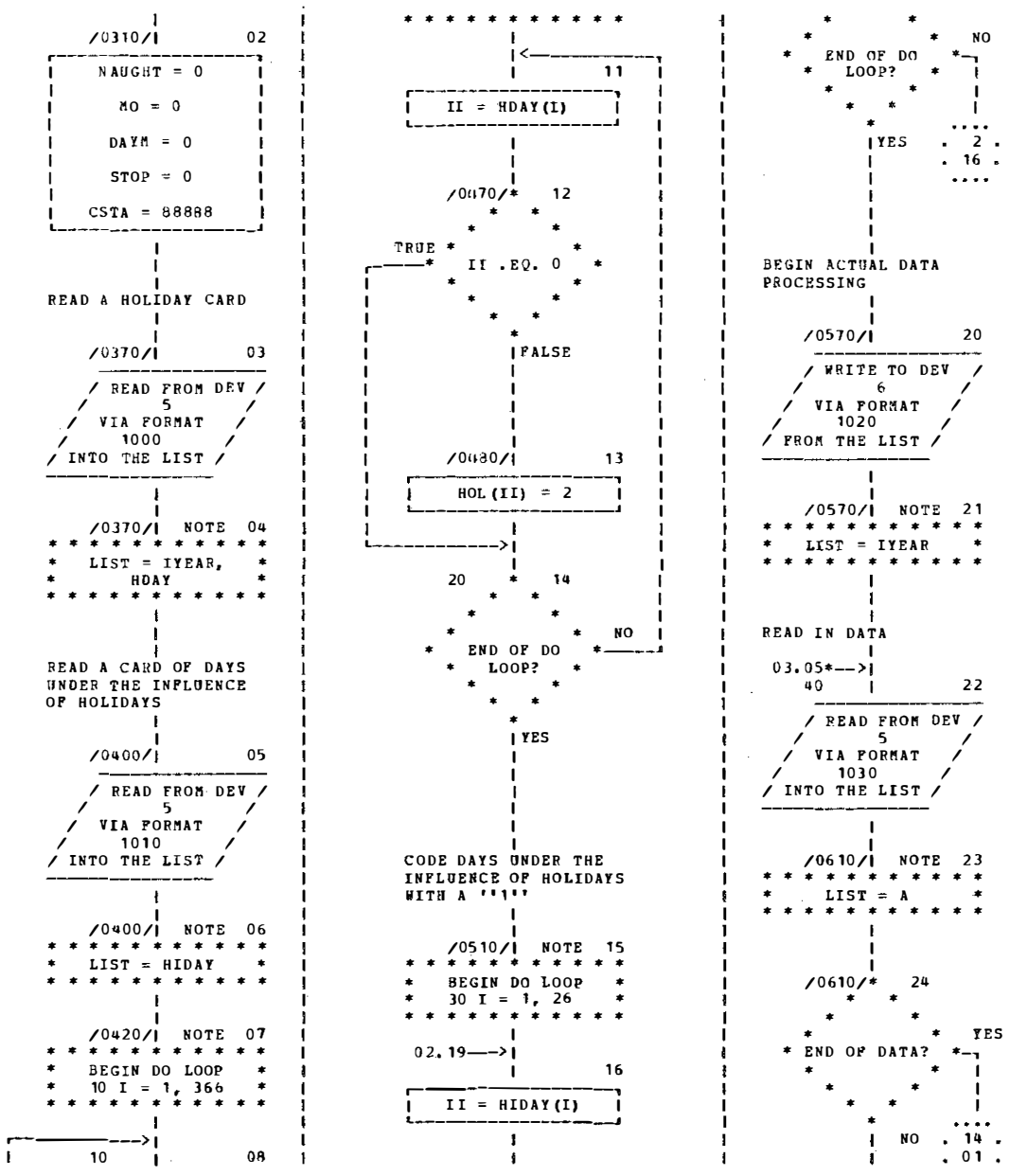
HOL(I) IS A HOLIDAY CODE FOR THE I-TH DAY OF YEAR

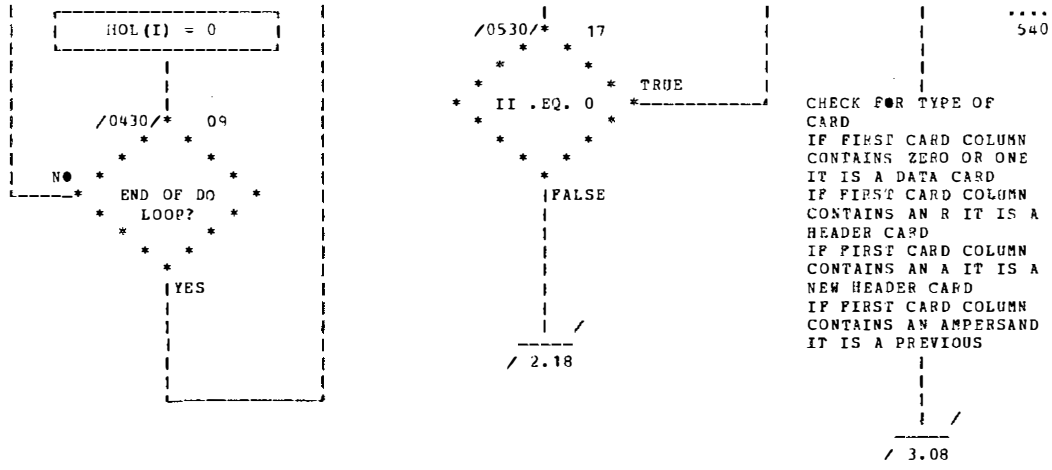
LL IS THE NUMBER OF DAYS IN THE PARTICULAR YEAR

09/19/77
CHART TITLE - PROCEDURES

AUTOFLOW CHART SET - PROGRAM

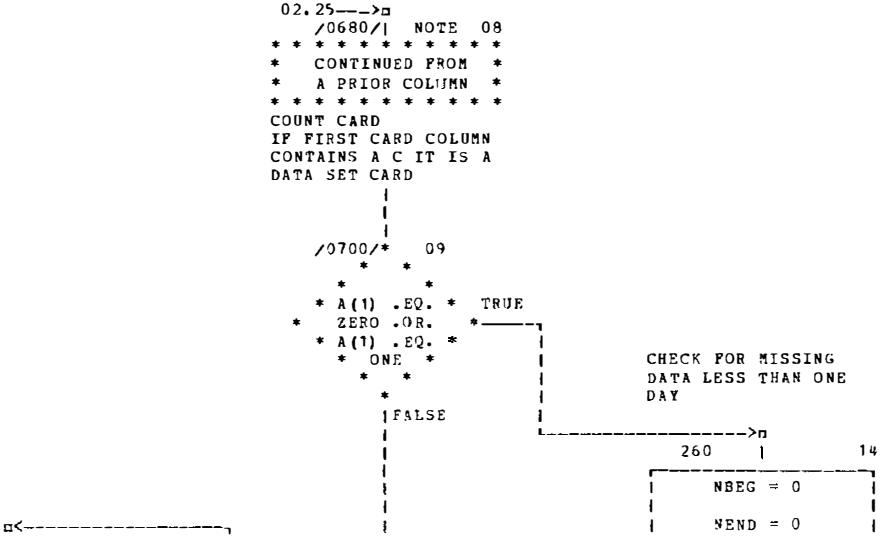


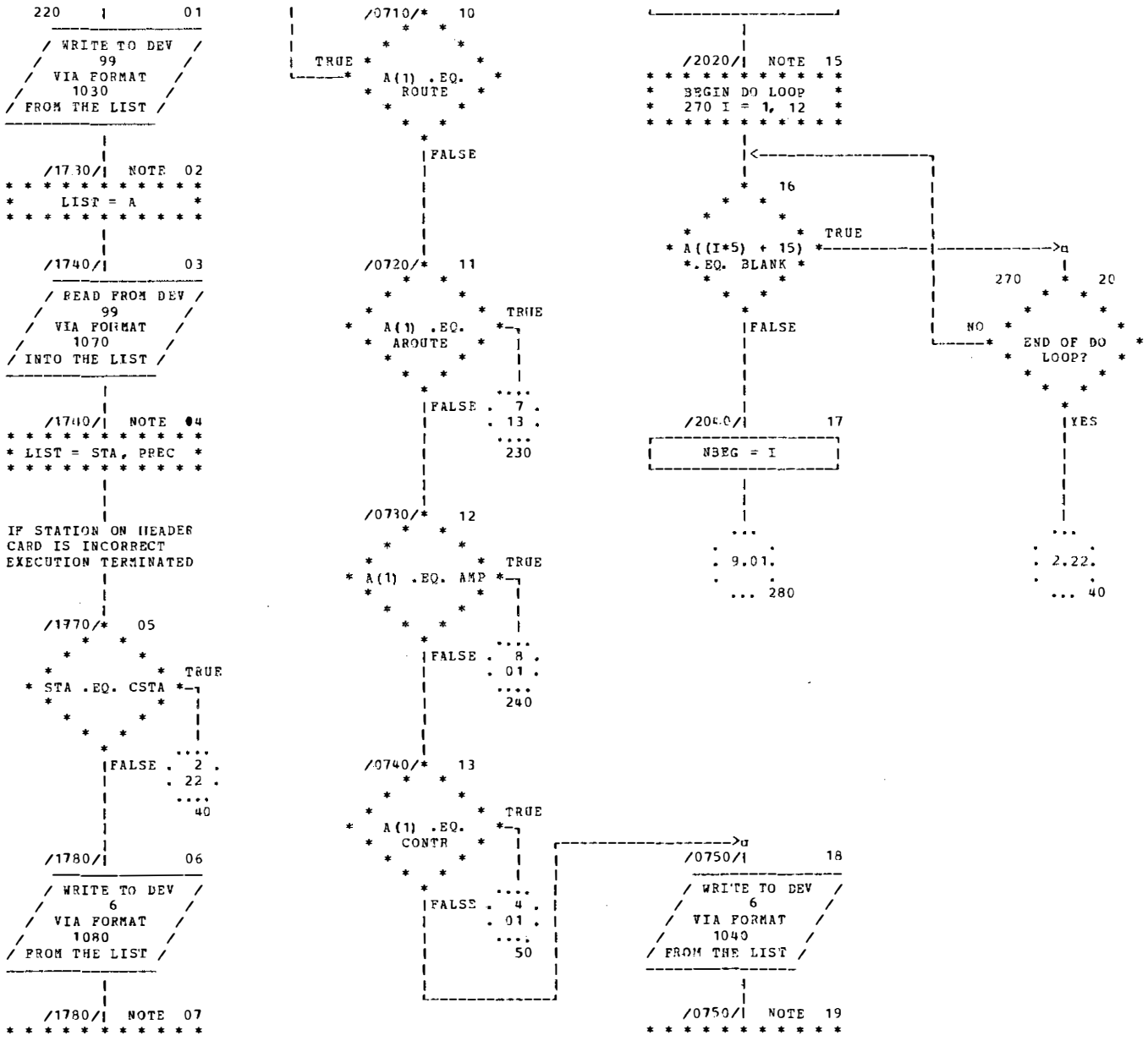

/0310/ 02
NAUGHT = 0
MO = 0
DAYM = 0
STOP = 0
CSTA = 88888
READ A HOLIDAY CARD
/0370/ 03
READ FROM DEV 5 VIA FORMAT 1000 INTO THE LIST
/0370/ NOTE 04
LIST = IYEAR, HDAY
READ A CARD OF DAYS UNDER THE INFLUENCE OF HOLIDAYS
/0400/ 05
READ FROM DEV 5 VIA FORMAT 1010 INTO THE LIST
/0400/ NOTE 06
LIST = HIDAY
/0420/ NOTE 07
BEGIN DO LOOP
10 I = 1, 366
10
08
11
II = HDAY(I)
/0470/ 12
TRUE
II .EQ. 0
FALSE
/0480/ 13
HOL(II) = 2
20
14
NO
END OF DO LOOP?
YES
CODE DAYS UNDER THE INFLUENCE OF HOLIDAYS WITH A "1"
/0510/ NOTE 15
BEGIN DO LOOP
30 I = 1, 26
02.19
16
II = HIDAY(I)
NO
END OF DO LOOP?
YES
. 2 .
. 16 .
BEGIN ACTUAL DATA PROCESSING
/0570/ 20
WRITE TO DEV 6 VIA FORMAT 1020 FROM THE LIST
/0570/ NOTE 21
LIST = IYEAR
READ IN DATA
03.05
40
/0610/ 22
READ FROM DEV 5 VIA FORMAT 1030 INTO THE LIST
/0610/ NOTE 23
LIST = A
/0610/ 24
YES
END OF DATA?
NO
. 14 .
. 01 .

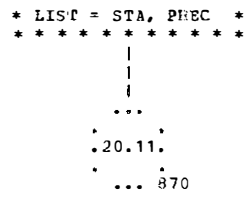


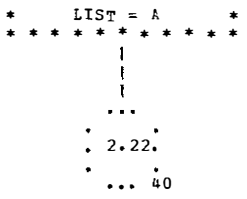
09/19/77
CHART TITLE - PROCEDURES

AUTOFLOW CHART SET - PROGRAM



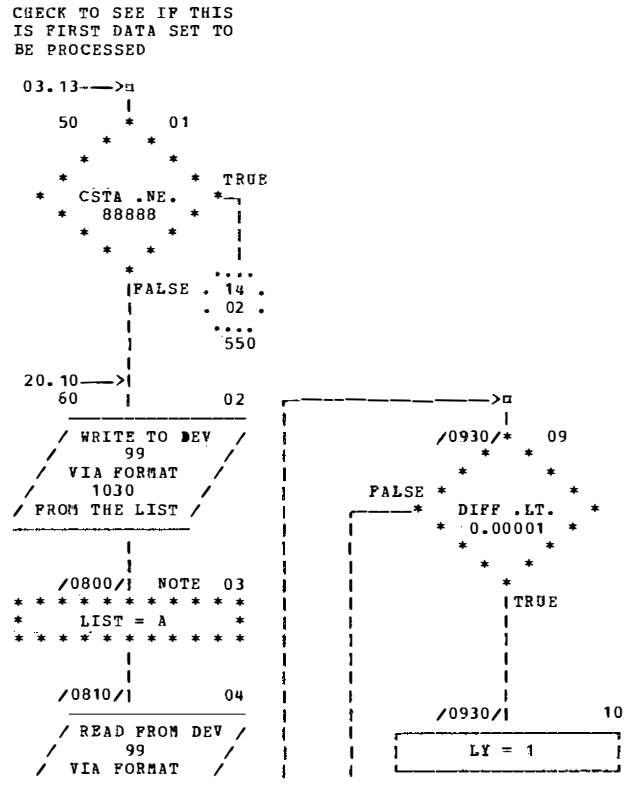

220 01
WRITE TO DEV 99 VIA FORMAT 1030 FROM THE LIST
/1730/ NOTE 02
LIST = A
/1740/ 03
READ FROM DEV 99 VIA FORMAT 1070 INTO THE LIST
/1760/ NOTE 04
LIST = STA, PREC
IF STATION ON HEADER CARD IS INCORRECT EXECUTION TERMINATED
/1770/ 05
STA .EQ. CSTA
TRUE
FALSE . 2 . . 22 40
/1780/ 06
WRITE TO DEV 6 VIA FORMAT 1080 FROM THE LIST
/1780/ NOTE 07
/0710/ 10
A(1) .EQ. ROUTE
TRUE
FALSE
/0720/ 11
A(1) .EQ. AROUTE
TRUE
FALSE . 7 . . 13 230
/0730/ 12
A(1) .EQ. AMP
TRUE
FALSE . 8 . . 01 240
/0740/ 13
A(1) .EQ. CONTR
TRUE
FALSE . 4 . . 01 50
/2020/ NOTE 15
BEGIN DO LOOP 270 I = 1, 12
16
A((I*5) + 15) .EQ. BLANK
TRUE
FALSE
/2040/ 17
NBEG = I
. 9.01. ... 280
/0750/ 18
WRITE TO DEV 6 VIA FORMAT 1040 FROM THE LIST
/0750/ NOTE 19
270 20
NO
END OF DO LOOP?
YES
. 2.22. ... 40

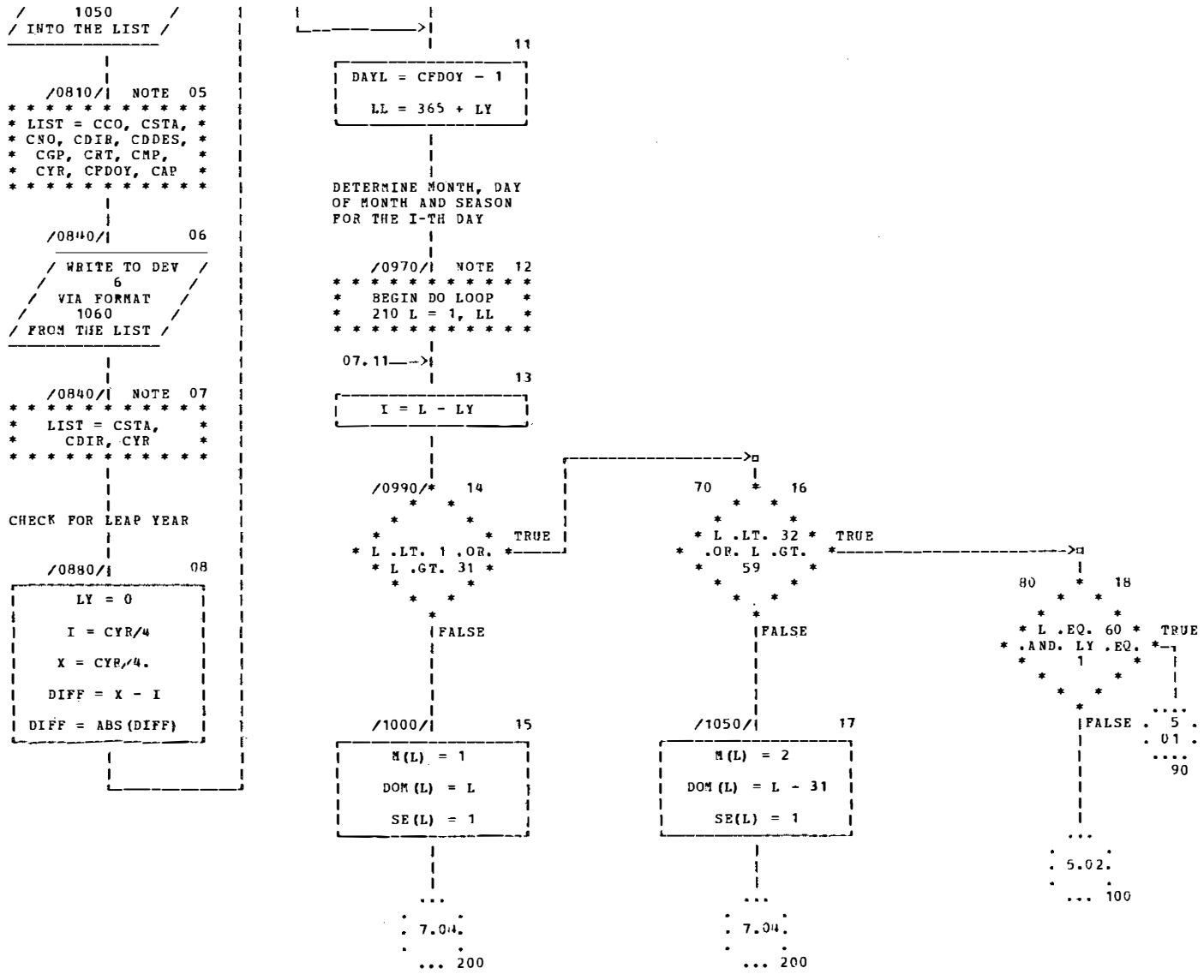




09/19/77
CHART TITLE - PROCEDURES

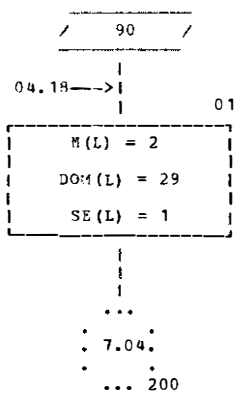
AUTOFLOW CHART SET - PROGRAM

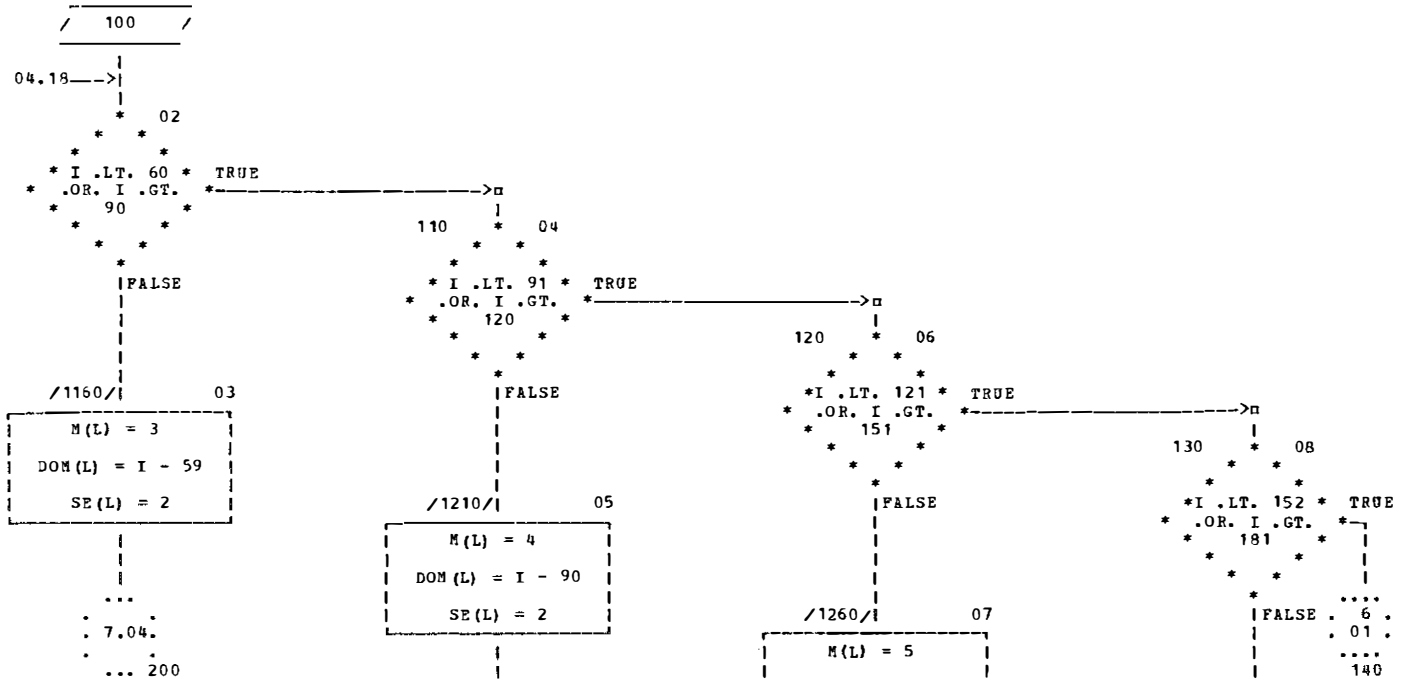


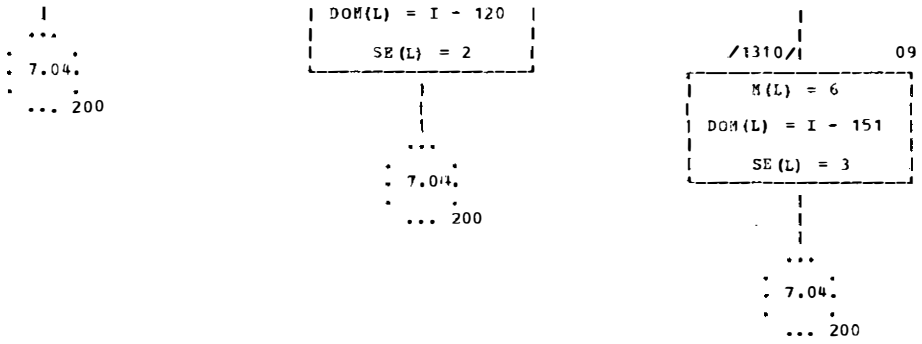


09/19/77
CHART TITLE - PROCEDURES

AUTOFLOW CHART SET - PROGRAM

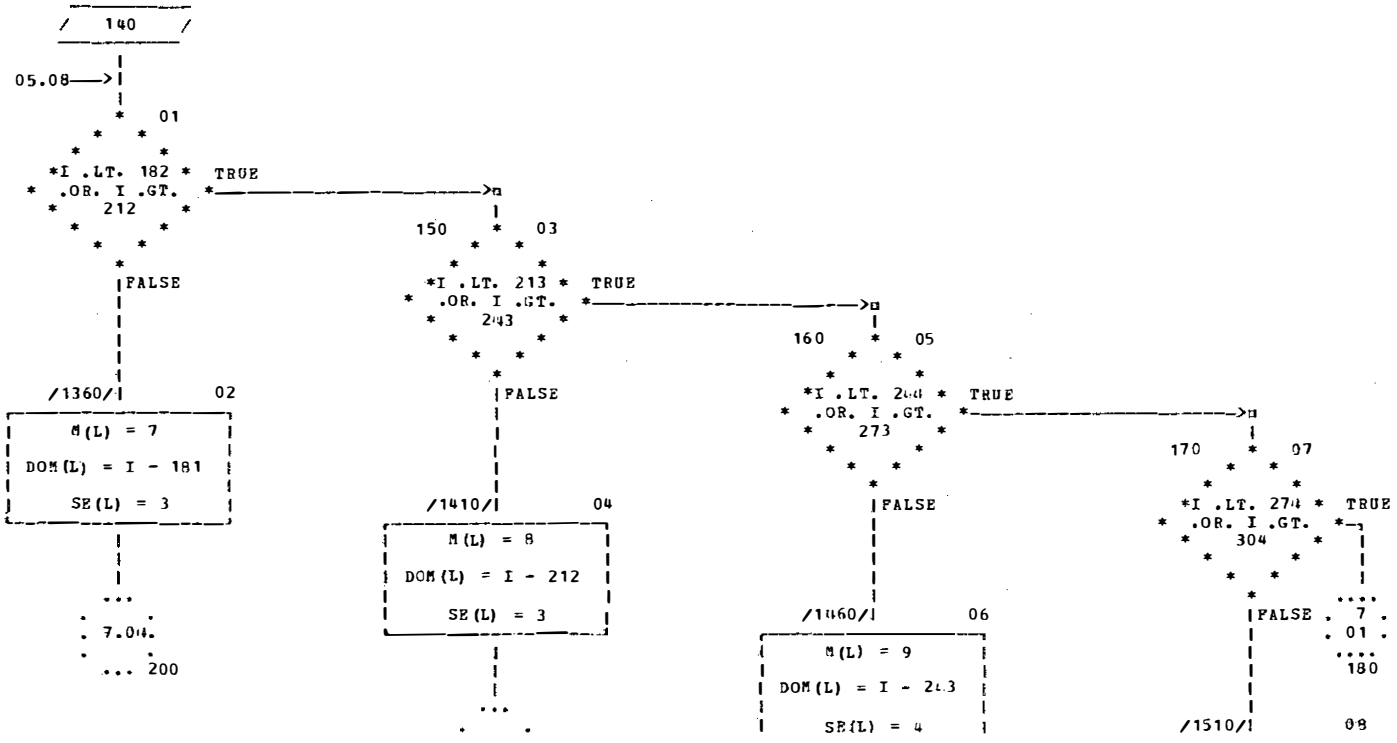

/ 90 /
04.18
01
M(L) = 2
DOM(L) = 29
SE(L) = 1
7.04.
200

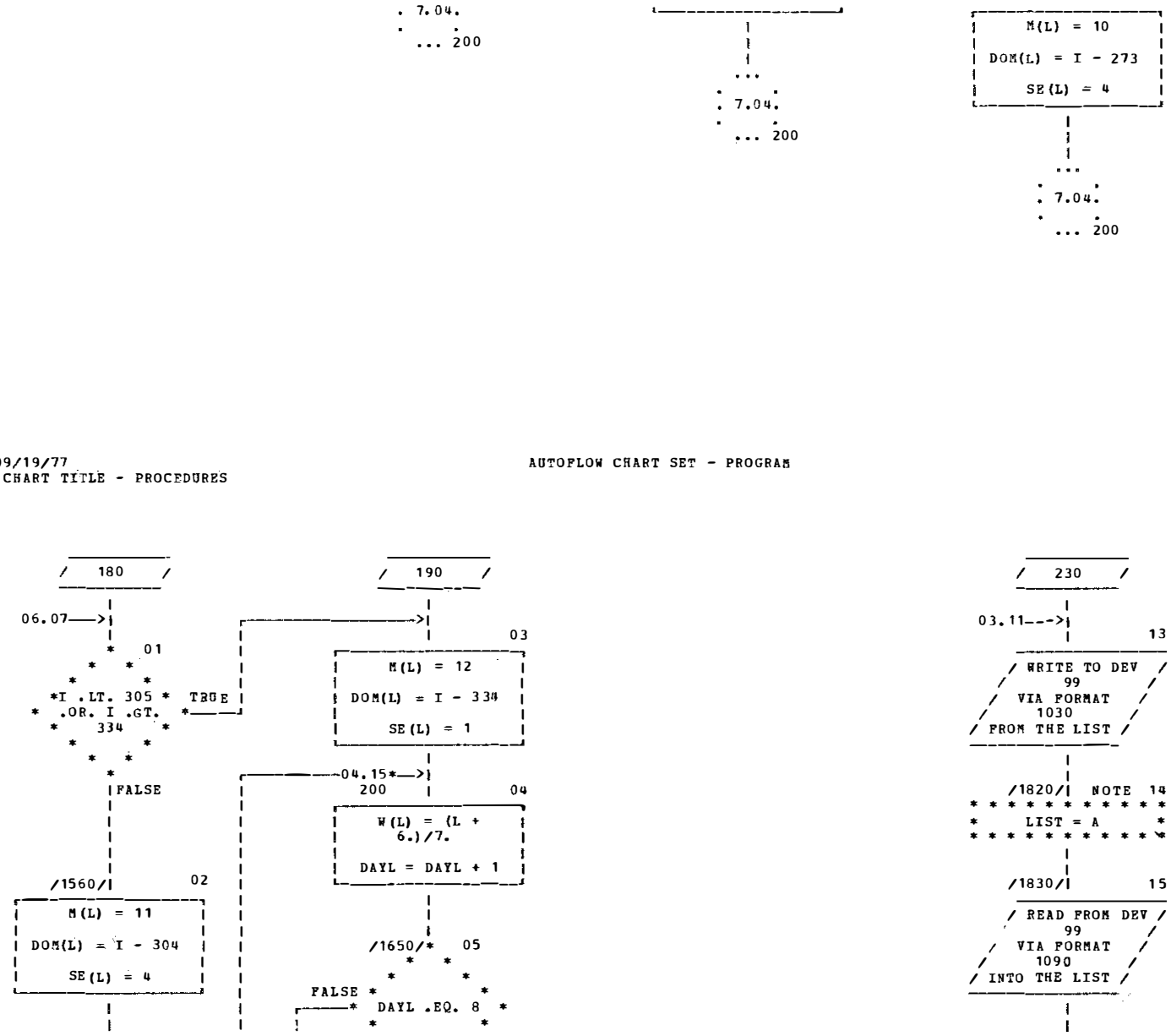

/ 100 /
04.18
02
I .LT. 60 .OR. I .GT. 90
TRUE
FALSE
/1160/
03
M(L) = 3
DOM(L) = I - 59
SE(L) = 2
110
04
I .LT. 91 .OR. I .GT. 120
TRUE
FALSE
/1210/
05
M(L) = 4
DOM(L) = I - 90
SE(L) = 2
120
06
I .LT. 121 .OR. I .GT. 151
TRUE
FALSE
/1260/
07
M(L) = 5
130
08
I .LT. 152 .OR. I .GT. 181
TRUE
FALSE
6
01
140
7.04.
200

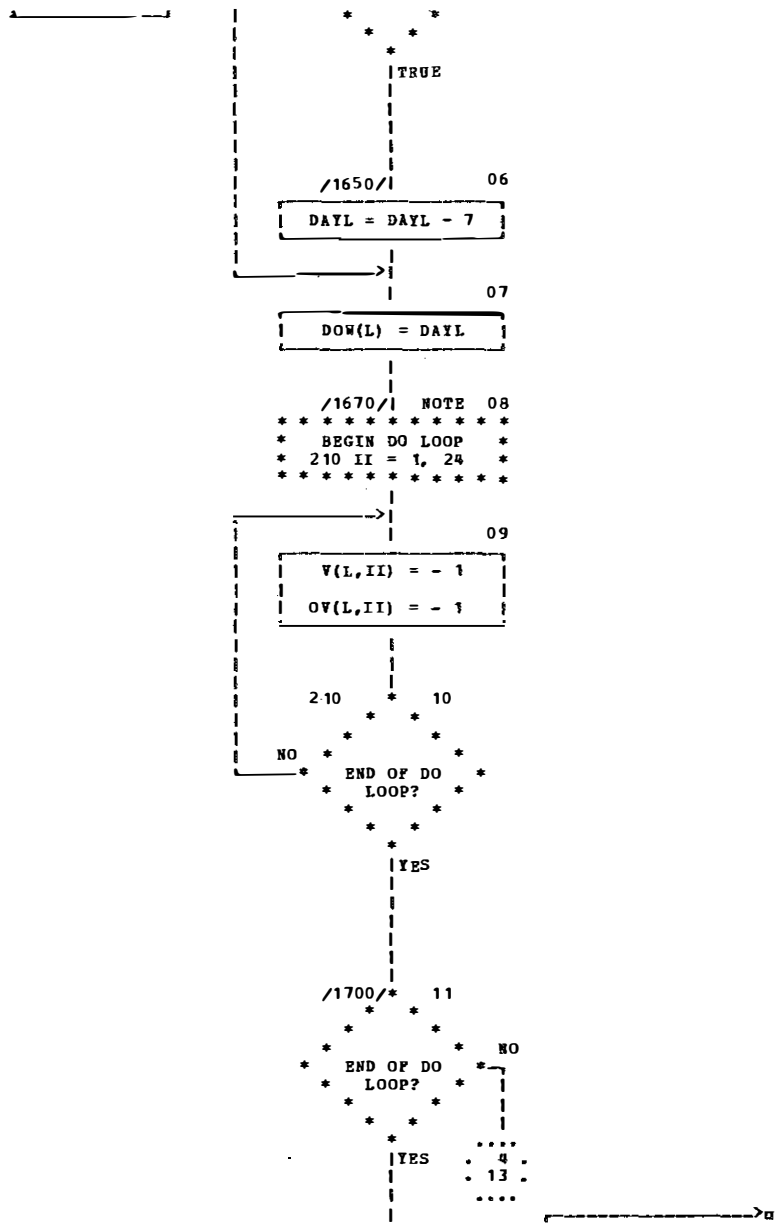


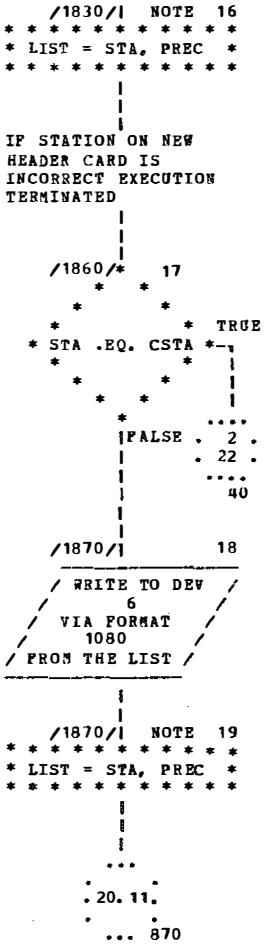
09/19/77
CHART TITLE - PROCEDURES

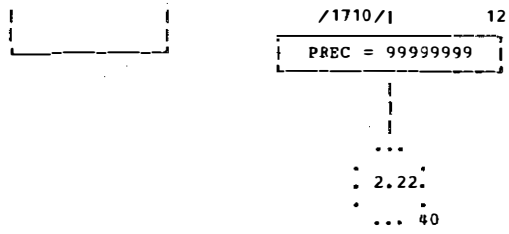
AUTOFLOW CHART SET - PROGRAM

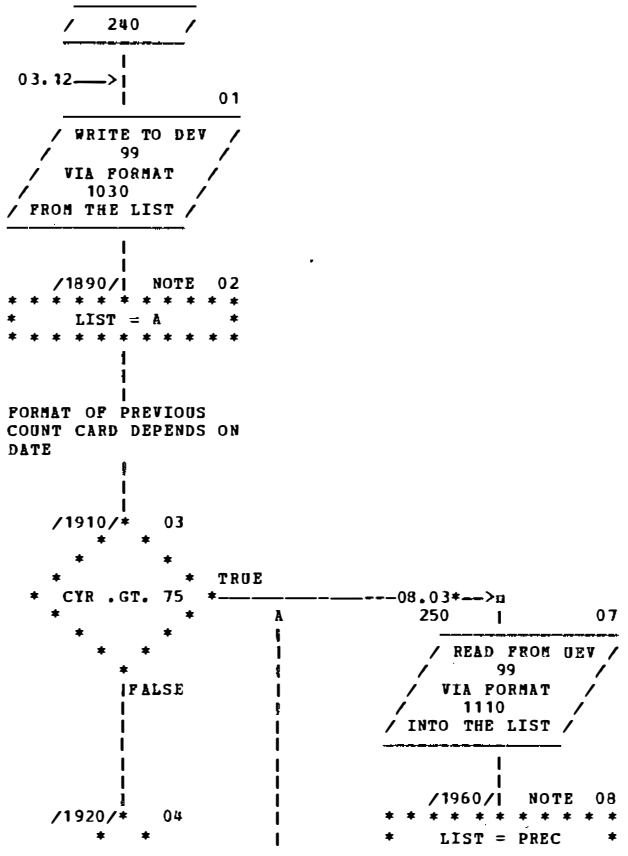


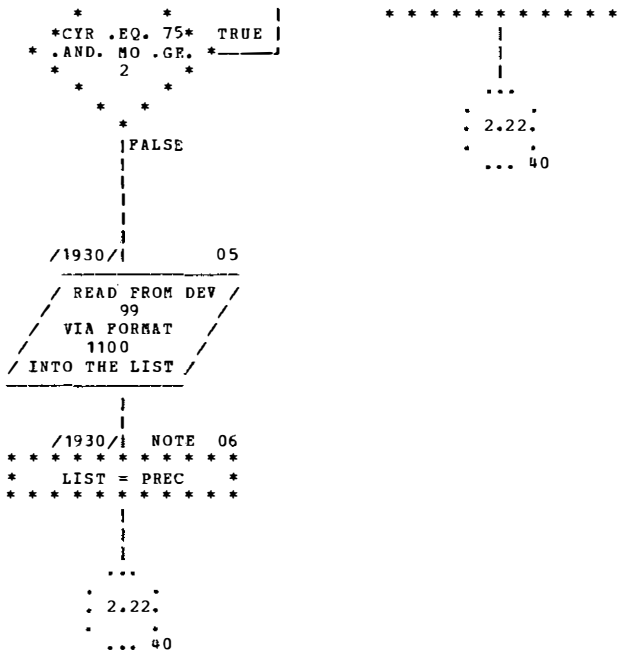

. 7.04.
. .
... 200
. 7.04.
. .
... 200
M(L) = 10
DOM(L) = I - 273
SE(L) = 4
. 7.04.
. .
... 200
09/19/77
CHART TITLE - PROCEDURES
AUTOFLOW CHART SET - PROGRAM
180
06.07
01
*I .LT. 305 * TRUE
* .OR. I .GT. *
* 334 *
FALSE
/1560/ 02
M(L) = 11
DOM(L) = I - 304
SE(L) = 4
190
03
M(L) = 12
DOM(L) = I - 334
SE(L) = 1
04.15
200
04
W(L) = (L + 6.)/7.
DAYL = DAYL + 1
/1650/ 05
FALSE
DAYL .EQ. 8
230
03.11
13
WRITE TO DEV 99
VIA FORMAT 1030
FROM THE LIST
/1820/ NOTE 14
LIST = A
/1830/ 15
READ FROM DEV 99
VIA FORMAT 1090
INTO THE LIST


TRUE
/1650/
06
DAYL = DAYL - 7
07
DOW(L) = DAYL
/1670/ NOTE 08
BEGIN DO LOOP
210 II = 1, 24
09
V(L,II) = - 1
OV(L,II) = - 1
210
10
NO
END OF DO LOOP?
YES
/1700/
11
END OF DO LOOP?
NO
YES
4
13
a


/1830/ NOTE 16
LIST = STA, PREC
IF STATION ON NEW HEADER CARD IS INCORRECT EXECUTION TERMINATED
/1860/ 17
STA .EQ. CSTA
TRUE
FALSE
2
22
40
/1870/ 18
WRITE TO DEV 6 VIA FORMAT 1080 FROM THE LIST
/1870/ NOTE 19
LIST = STA, PREC
20
11
870

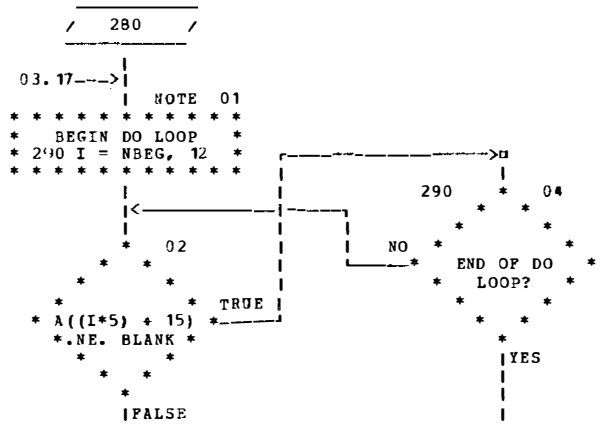

/1710/
12
PREC = 99999999
2.22.
40

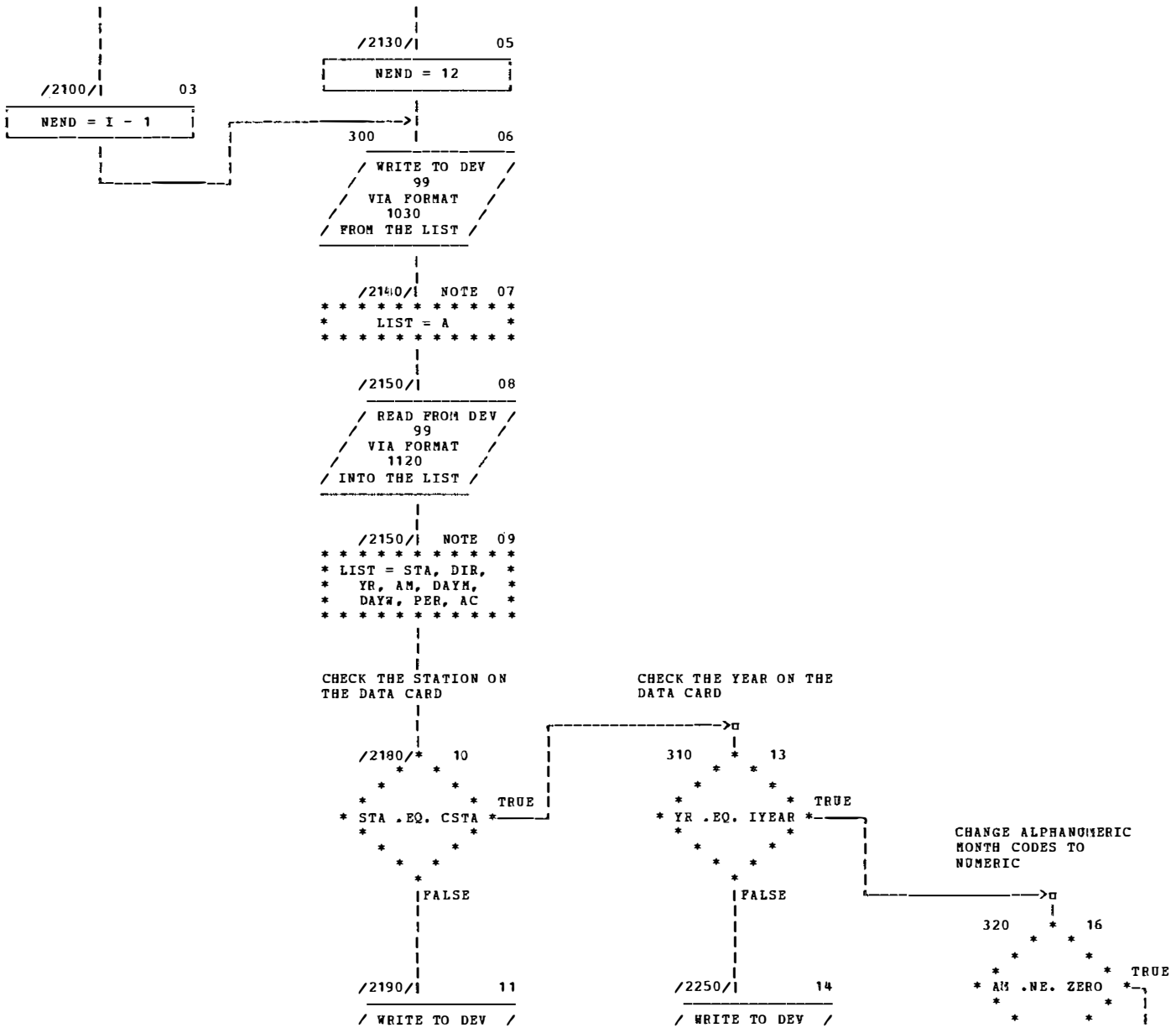

240
03.12
01
WRITE TO DEV
99
VIA FORMAT
1030
FROM THE LIST
/1890/
NOTE 02
LIST = A
FORMAT OF PREVIOUS
COUNT CARD DEPENDS ON
DATE
/1910/
03
CYR .GT. 75
TRUE
08.03
A
250
07
FALSE
READ FROM DEV
99
VIA FORMAT
1110
INTO THE LIST
/1920/
04
/1960/
NOTE 08
LIST = PREC

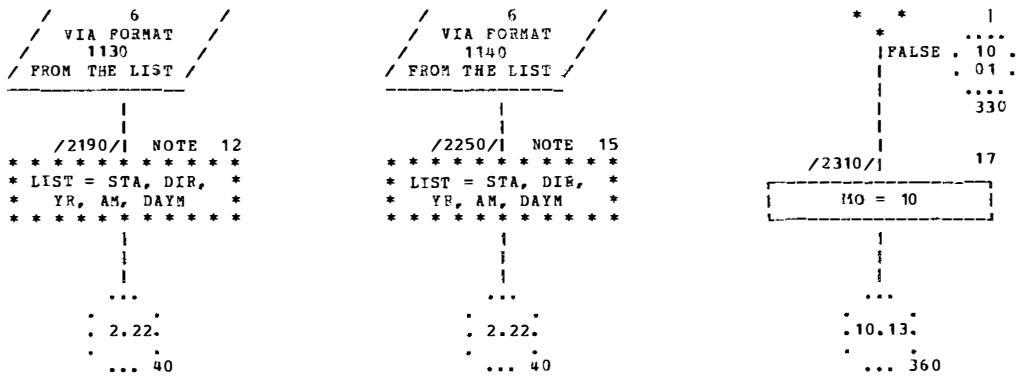


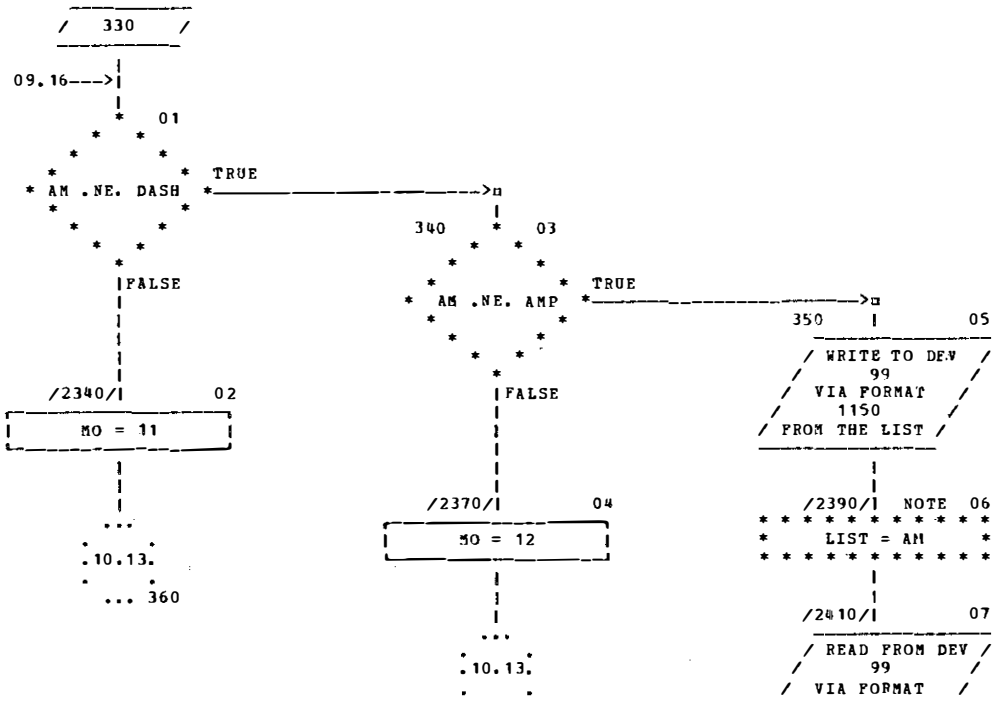
09/19/77
CHART TITLE - PROCEDURES

AUTOFLOW CHART SET - PROGRAM

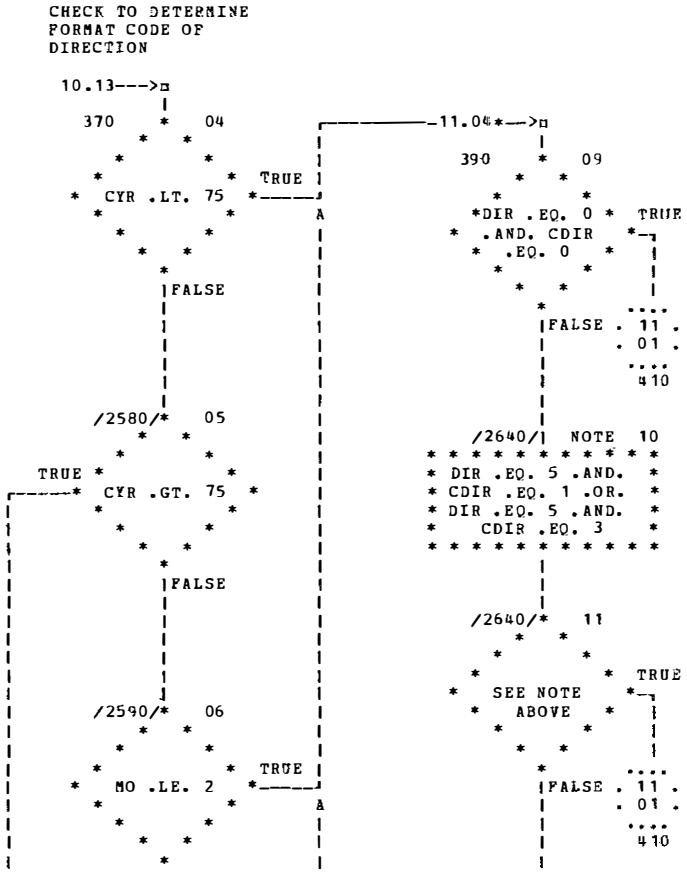


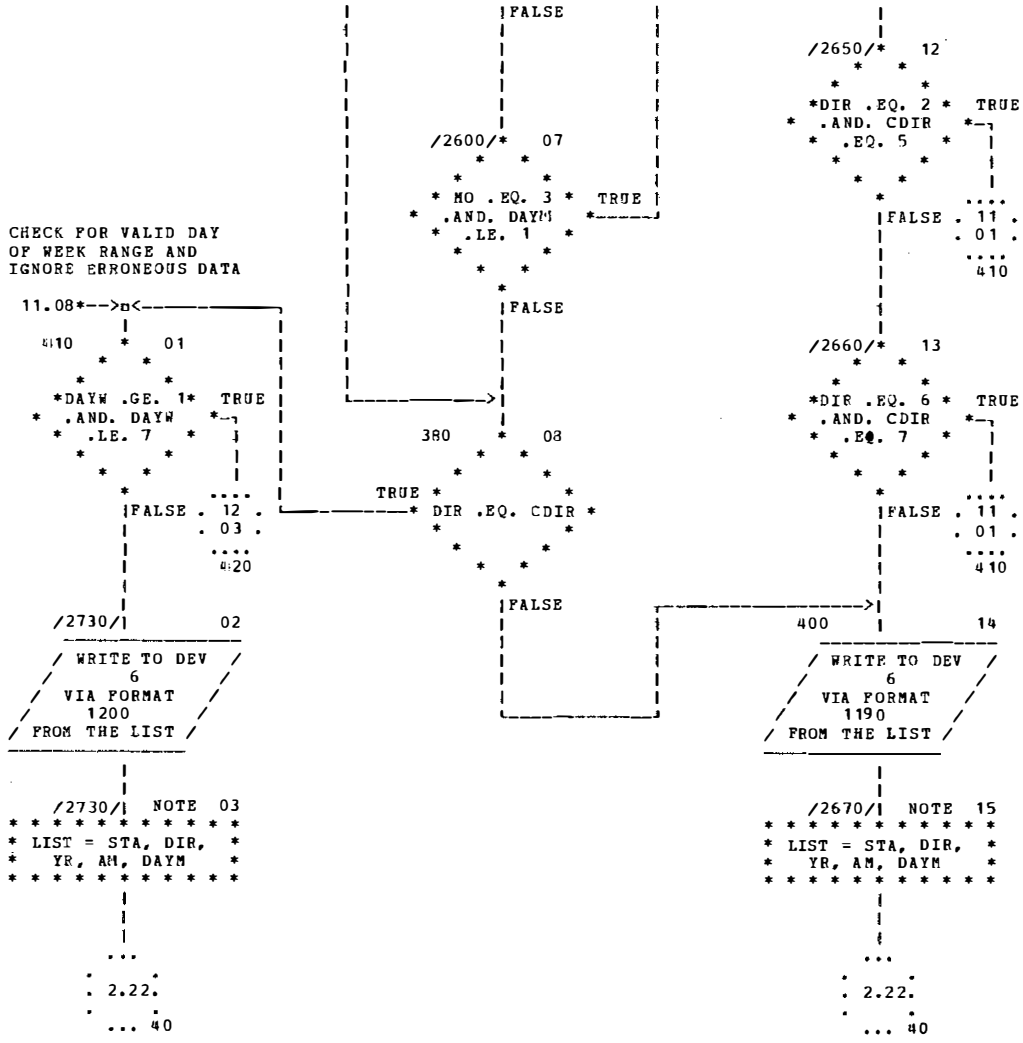

/2100/ 03
NEND = I - 1
/2130/ 05
NEND = 12
300 06
WRITE TO DEV 99 VIA FORMAT 1030 FROM THE LIST
/2140/ NOTE 07
LIST = A
/2150/ 08
READ FROM DEV 99 VIA FORMAT 1120 INTO THE LIST
/2150/ NOTE 09
LIST = STA, DIR, YR, AM, DAYM, DAYW, PER, AC
CHECK THE STATION ON THE DATA CARD
/2180/ 10
STA .EQ. CSTA
TRUE
FALSE
/2190/ 11
WRITE TO DEV
CHECK THE YEAR ON THE DATA CARD
310 13
YR .EQ. IYEAR
TRUE
FALSE
/2250/ 14
WRITE TO DEV
CHANGE ALPHANUMERIC MONTH CODES TO NUMERIC
320 16
AM .NE. ZERO
TRUE


6
VIA FORMAT
1130
FROM THE LIST
/2190/ NOTE 12
LIST = STA, DIR,
YR, AM, DAYM
. 2.22.
... 40
6
VIA FORMAT
1140
FROM THE LIST
/2250/ NOTE 15
LIST = STA, DIR,
YR, AM, DAYM
. 2.22.
... 40
FALSE . 10 .
. 01 .
330
/2310/ 17
MO = 10
.10.13.
... 360


330
09.16
01
AM .NE. DASH
TRUE
FALSE
/2340/ 02
MO = 11
.10.13.
... 360
340
03
AM .NE. AMP
TRUE
FALSE
/2370/ 04
MO = 12
.10.13.
350
05
WRITE TO DEV
99
VIA FORMAT
1150
FROM THE LIST
/2390/ NOTE 06
LIST = AM
/2410/ 07
READ FROM DEV
99
VIA FORMAT

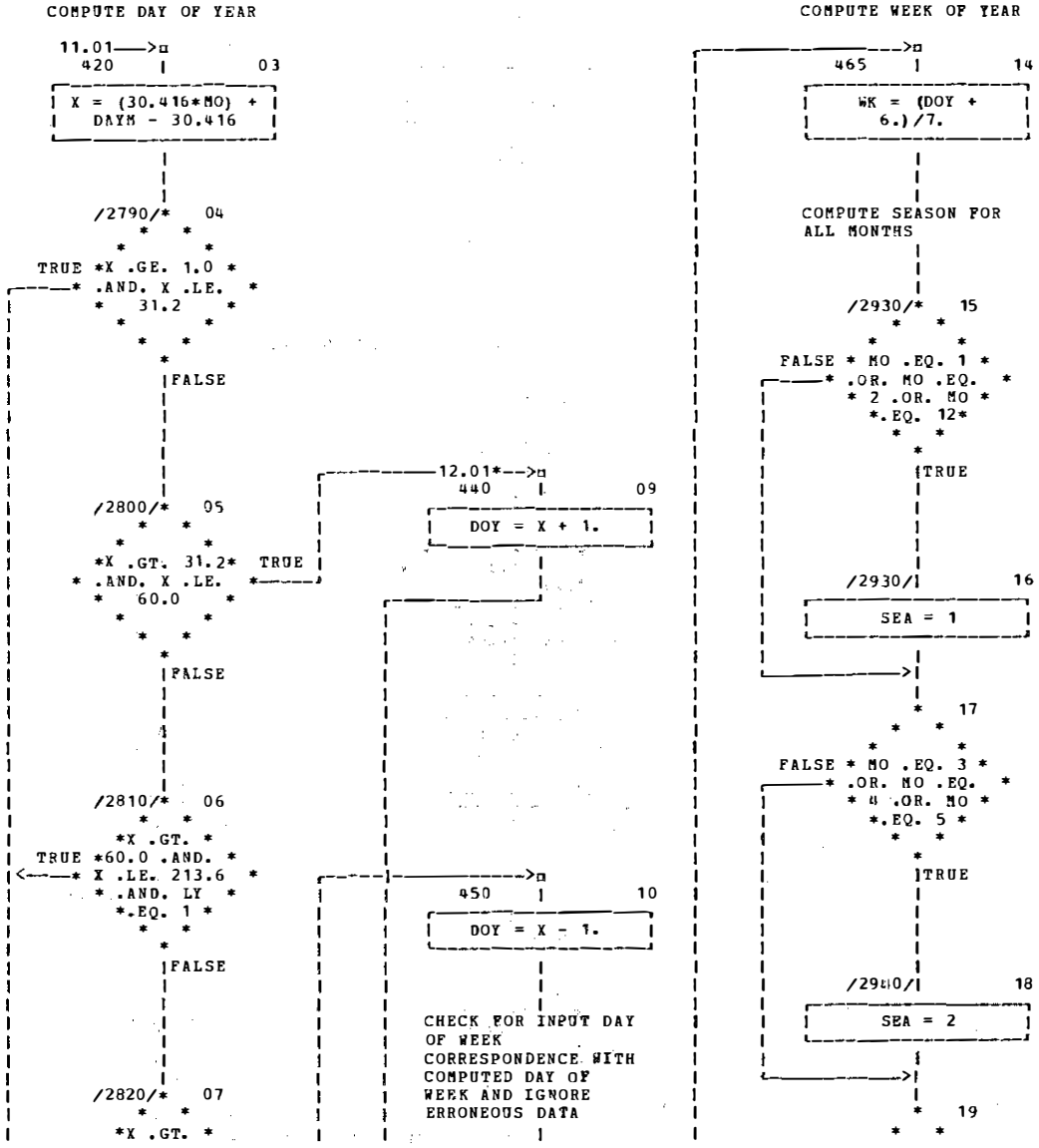
... 360
1160
INTO THE LIST
/2410/ NOTE 08
LIST = MONTH
/2430/ 09
MO = MONTH
CHECK FOR INCORRECT
MONTH CODES AND
IGNORE SUCH DATA
/2450/ 10
MO .GE. 1 .AND. MO .LE. 9
TRUE
FALSE
/2460/ 11
WRITE TO DEV 6
VIA FORMAT 1170
FROM THE LIST
/2460/ NOTE 12
LIST = STA, DIR, YR, AM, DAYM
2.22.
... 40
CHECK FOR INCORRECT
DAY OF MONTH CODES
AND IGNORE SUCH DATA
09.17
360 13
DAYM .GE. 1 .AND. DAYM .LE. 31
TRUE
FALSE . 11 . . 04 . 370
/2520/ 14
WRITE TO DEV 6
VIA FORMAT 1180
FROM THE LIST
/2520/ NOTE 15
LIST = STA, DIR, YR, AM, DAYM


CHECK TO DETERMINE
FORMAT CODE OF
DIRECTION
10.13
370
04
CYR .LT. 75
TRUE
FALSE
/2580/
05
CYR .GT. 75
TRUE
FALSE
/2590/
06
MO .LE. 2
TRUE
11.04
390
09
DIR .EQ. 0
.AND. CDIR
.EQ. 0
TRUE
FALSE
11
01
410
/2640/
NOTE 10
DIR .EQ. 5 .AND.
CDIR .EQ. 1 .OR.
DIR .EQ. 5 .AND.
CDIR .EQ. 3
/2640/
11
SEE NOTE
ABOVE
TRUE
FALSE
11
01
410



09/19/77
CHART TITLE - PROCEDURES

AUTOFLOW CHART SET - PROGRAM


COMPUTE DAY OF YEAR
11.01
420
03
X = (30.416*MO) + DAYM - 30.416
/2790/*
04
TRUE *X .GE. 1.0 * .AND. X .LE. * 31.2 *
FALSE
/2800/*
05
X .GT. 31.2 .AND. X .LE. * 60.0 *
TRUE
FALSE
/2810/*
06
*X .GT. * 60.0 .AND. X .LE. 213.6 * .AND. LY *.EQ. 1 *
TRUE
FALSE
/2820/*
07
*X .GT. *
12.01*
440
09
DOY = X + 1.
450
10
DOY = X - 1.
CHECK FOR INPUT DAY OF WEEK CORRESPONDENCE WITH COMPUTED DAY OF WEEK AND IGNORE ERRONEOUS DATA
COMPUTE WEEK OF YEAR
465
14
WK = (DOY + 6.)/7.
COMPUTE SEASON FOR ALL MONTHS
/2930/*
15
FALSE * MO .EQ. 1 * .OR. MO .EQ. * 2 .OR. MO * *.EQ. 12*
TRUE
/2930/
16
SEA = 1
17
FALSE * MO .EQ. 3 * .OR. MO .EQ. * 4 .OR. MO * *.EQ. 5 *
TRUE
/2940/
18
SEA = 2
19

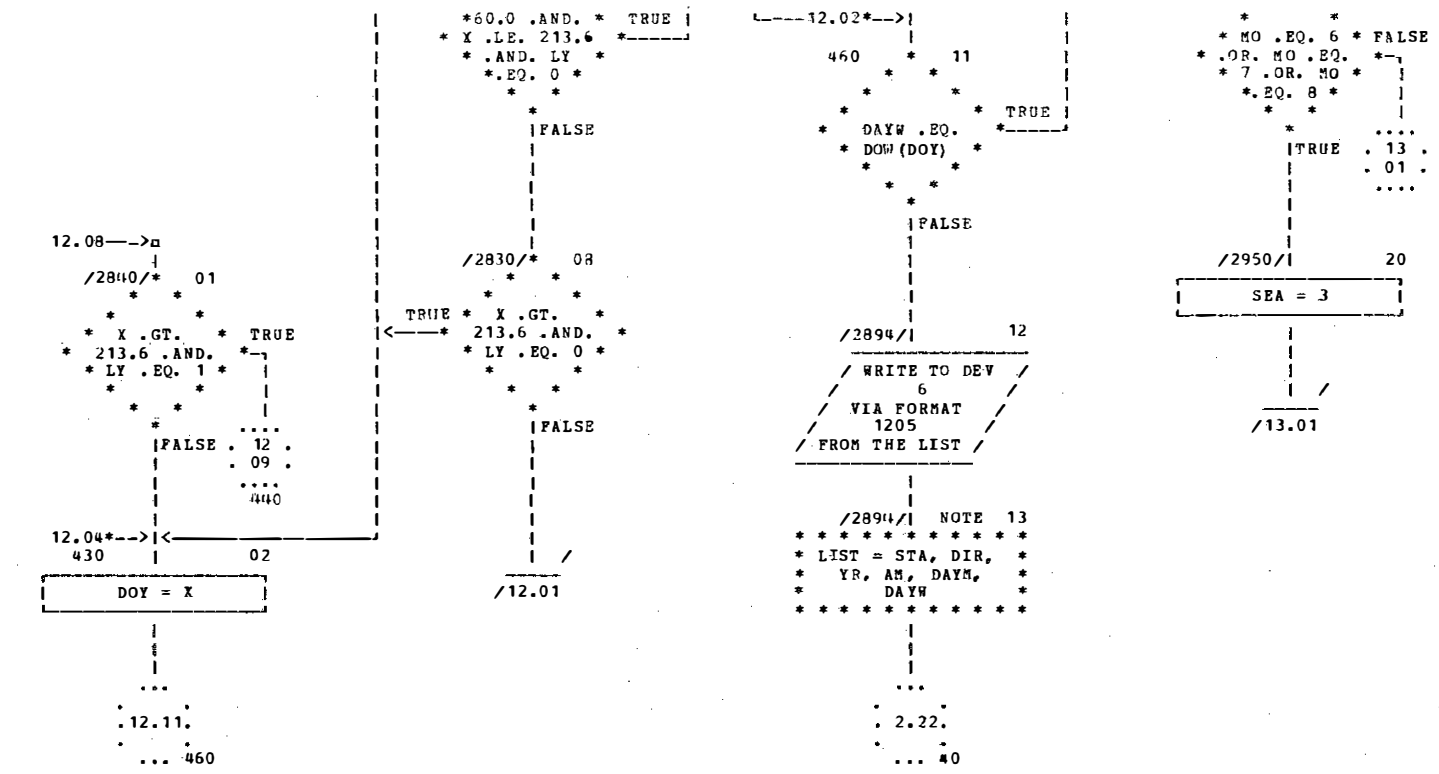


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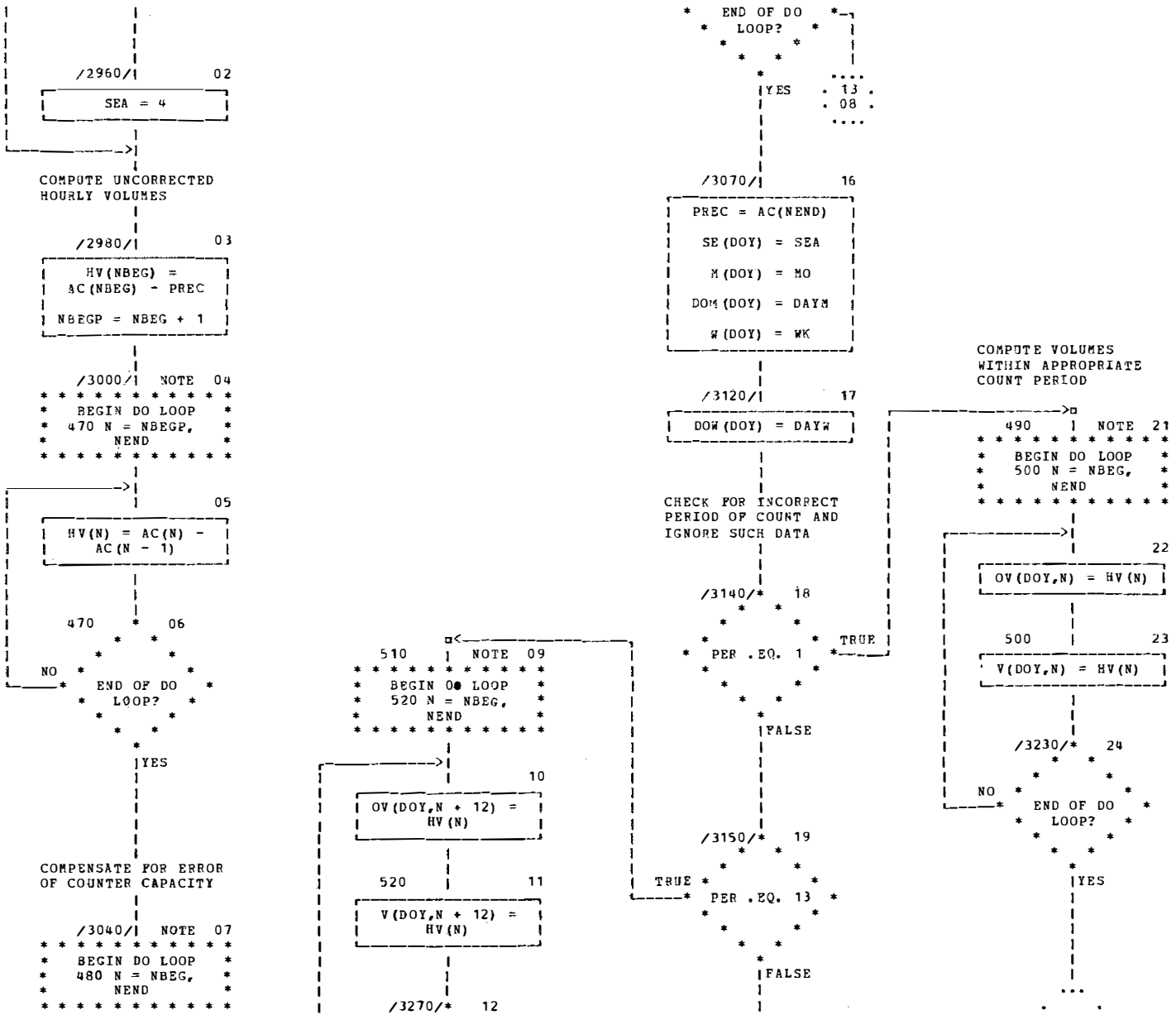
CHART TITLE - PROCEDURES

AUTOFLOW CHART SET - PROGRAM


/2960/ 02
SEA = 4
COMPUTE UNCORRECTED HOURLY VOLUMES
/2980/ 03
HV(NBEG) = AC(NBEG) - PREC
NBEGP = NBEG + 1
/3000/ NOTE 04
BEGIN DO LOOP 470 N = NBEGP, NEND
05
HV(N) = AC(N) - AC(N - 1)
470 06
NO
END OF DO LOOP?
YES
COMPENSATE FOR ERROR OF COUNTER CAPACITY
/3040/ NOTE 07
BEGIN DO LOOP 480 N = NBEG, NEND
510 NOTE 09
BEGIN DO LOOP 520 N = NBEG, NEND
10
OV(DOY,N + 12) = HV(N)
520 11
V(DOY,N + 12) = HV(N)
/3270/ 12
END OF DO LOOP?
YES 13 08
/3070/ 16
PREC = AC(NEND)
SE(DOY) = SEA
M(DOY) = MO
DOM(DOY) = DAYM
W(DOY) = WK
/3120/ 17
DOW(DOY) = DAYW
CHECK FOR INCORRECT PERIOD OF COUNT AND IGNORE SUCH DATA
/3140/ 18
PER .EQ. 1
TRUE
FALSE
/3150/ 19
PER .EQ. 13
TRUE
FALSE
COMPUTE VOLUMES WITHIN APPROPRIATE COUNT PERIOD
490 NOTE 21
BEGIN DO LOOP 500 N = NBEG, NEND
22
OV(DOY,N) = HV(N)
500 23
V(DOY,N) = HV(N)
/3230/ 24
NO
END OF DO LOOP?
YES

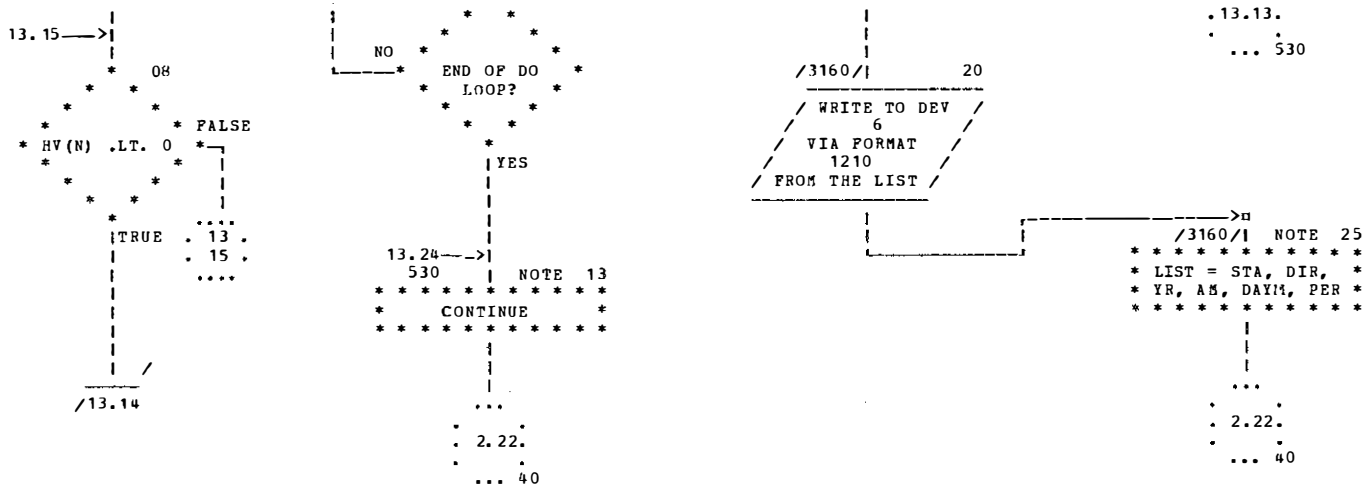


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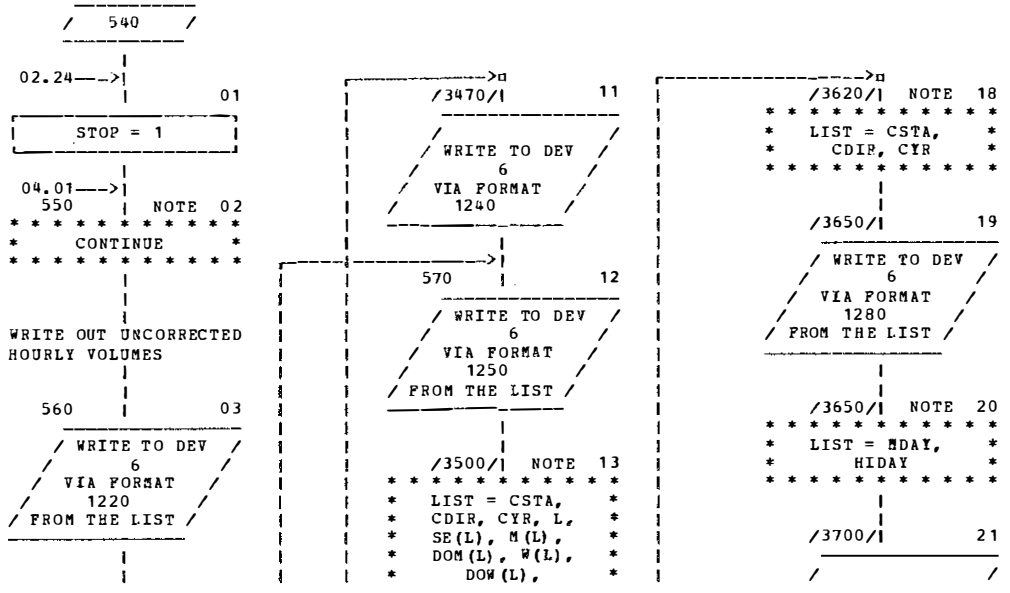
CHART TITLE - PROCEDURES

AUTOFLOW CHART SET - PROGRAM



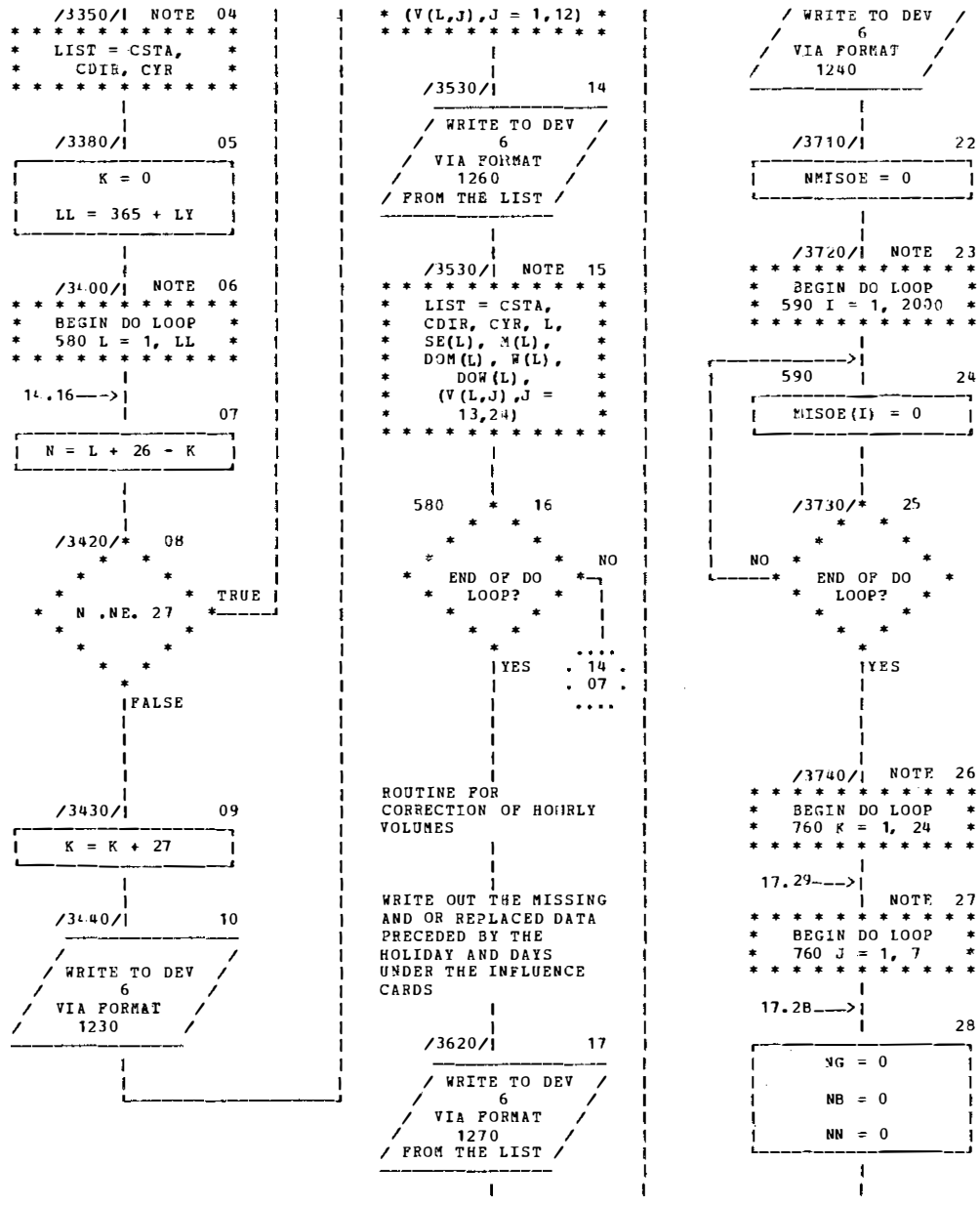

/3350/ NOTE 04
LIST = CSTA, CDIR, CYR
/3380/ 05
K = 0
LL = 365 + LY
/3400/ NOTE 06
BEGIN DO LOOP
580 L = 1, LL
14.16
07
N = L + 26 - K
/3420/ 08
N .NE. 27
TRUE
FALSE
/3430/ 09
K = K + 27
/3440/ 10
WRITE TO DEV 6
VIA FORMAT 1230
(V(L,J),J = 1,12)
/3530/ 14
WRITE TO DEV 6
VIA FORMAT 1260
FROM THE LIST
/3530/ NOTE 15
LIST = CSTA, CDIR, CYR, L, SE(L), M(L), DOM(L), W(L), DOW(L), (V(L,J),J = 13,24)
580
16
END OF DO LOOP?
NO
YES . 14 .
. 07 .
ROUTINE FOR CORRECTION OF HOURLY VOLUMES
WRITE OUT THE MISSING AND OR REPLACED DATA PRECEDED BY THE HOLIDAY AND DAYS UNDER THE INFLUENCE CARDS
/3620/ 17
WRITE TO DEV 6
VIA FORMAT 1270
FROM THE LIST
WRITE TO DEV 6
VIA FORMAT 1240
/3710/ 22
NMISOE = 0
/3720/ NOTE 23
BEGIN DO LOOP
590 I = 1, 2000
590
24
MISOE(I) = 0
/3730/ 25
NO
END OF DO LOOP?
YES
/3740/ NOTE 26
BEGIN DO LOOP
760 K = 1, 24
17.29
NOTE 27
BEGIN DO LOOP
760 J = 1, 7
17.28
28
NG = 0
NB = 0
NN = 0

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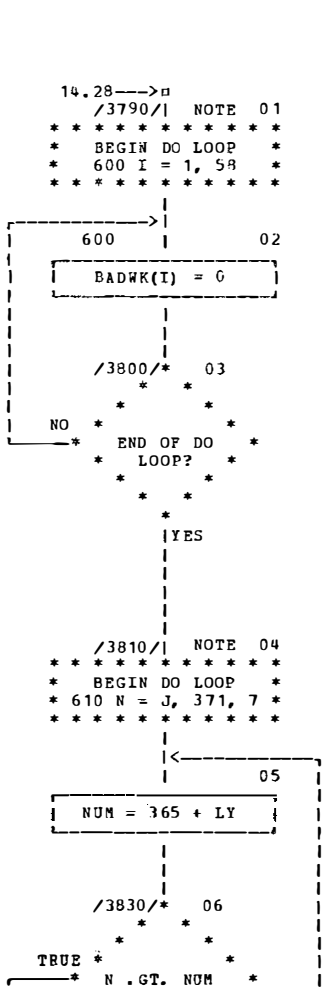
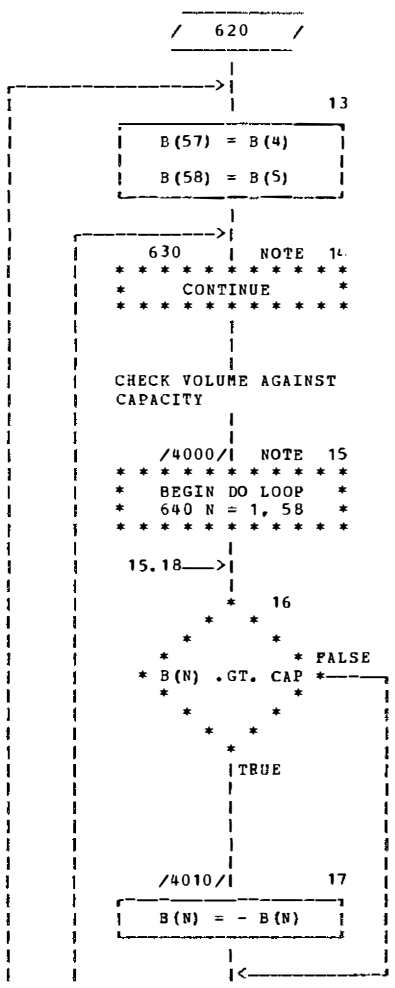
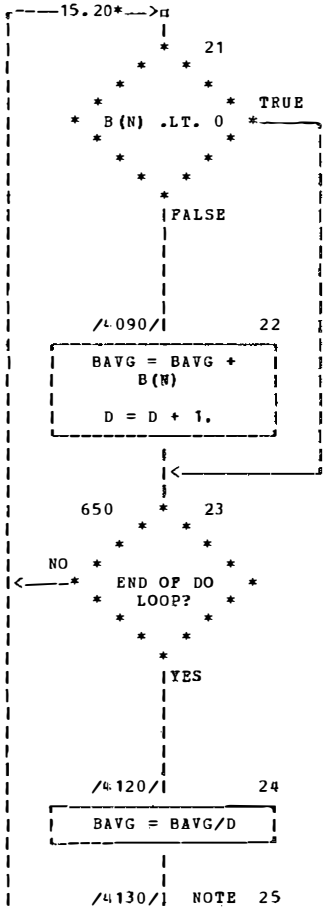
CHART TITLE - PROCEDURES

AUTOFLOW CHART SET - PROGRAM







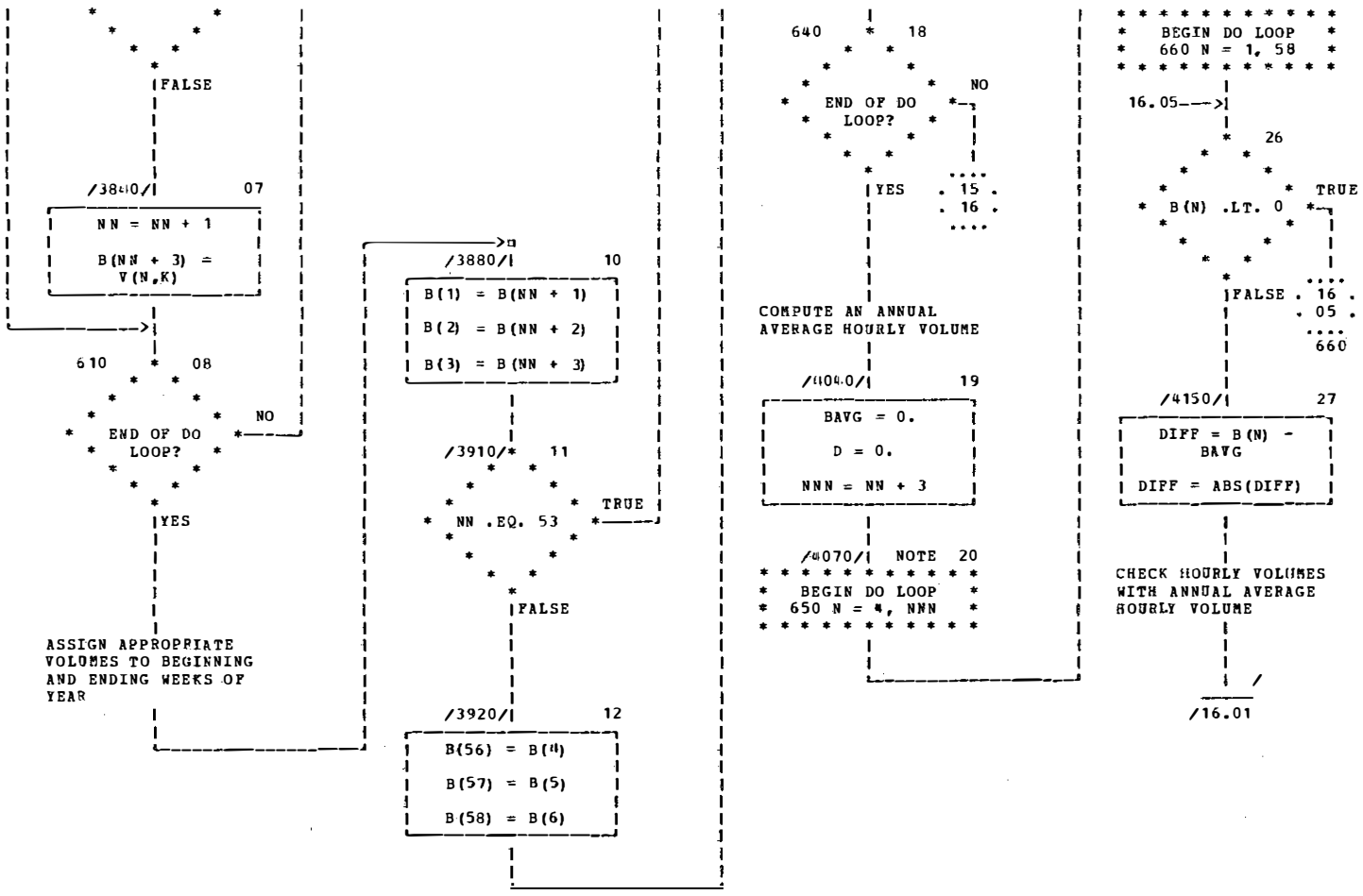


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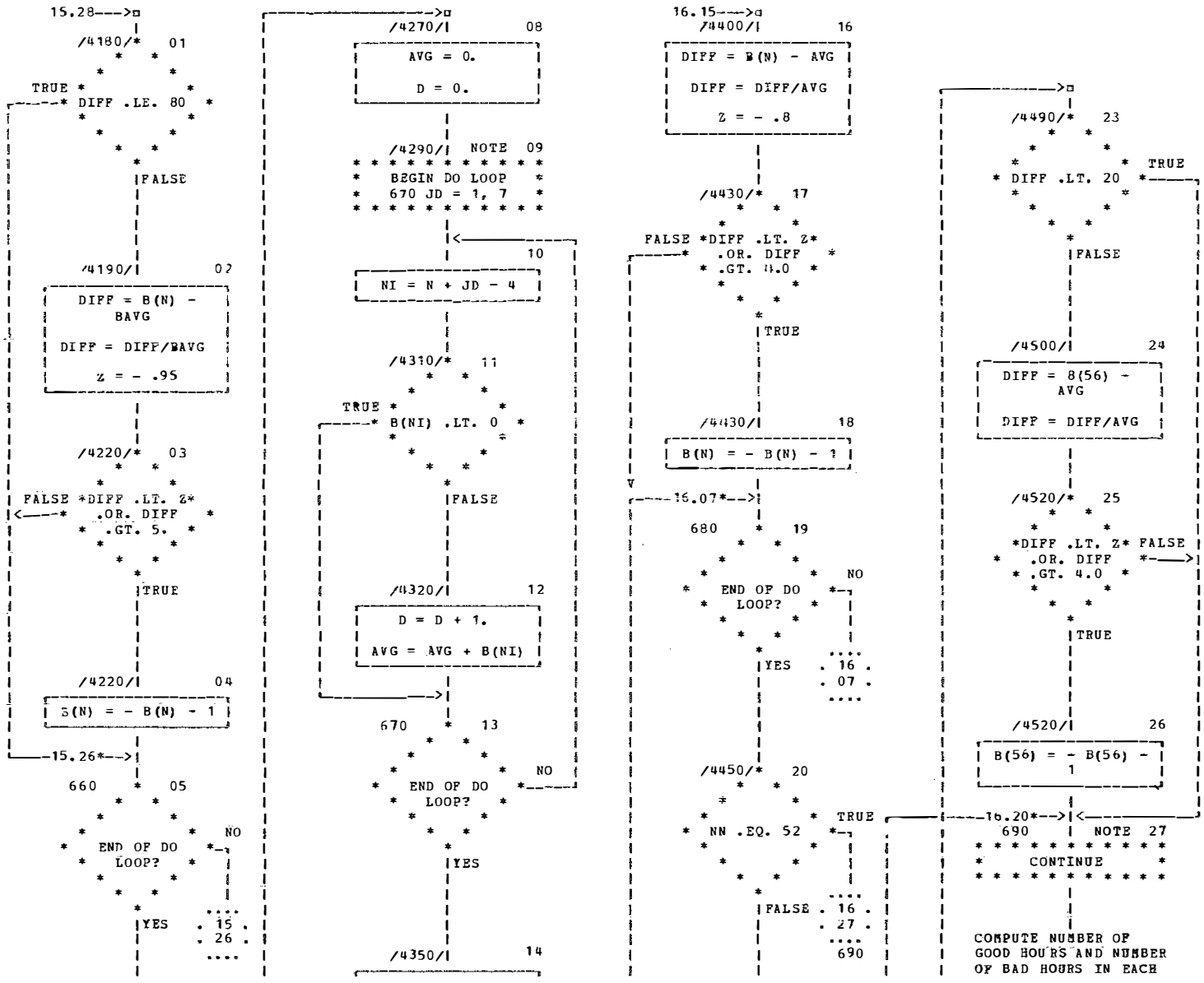
CHART TITLE - PROCEDURES

AUTOFLOW CHART SET - PROGRAM


15.28
/4180/ 01
TRUE
DIFF .LE. 80
FALSE
/4190/ 02
DIFF = B(N) - BAVG
DIFF = DIFF/BAVG
Z = - .95
/4220/ 03
FALSE
DIFF .LT. Z
.OR. DIFF
.GT. 5.
TRUE
/4220/ 04
B(N) = - B(N) - 1
15.26
660 05
END OF DO LOOP?
NO
YES
15
26
/4270/ 08
AVG = 0.
D = 0.
/4290/ NOTE 09
BEGIN DO LOOP
670 JD = 1, 7
10
NI = N + JD - 4
/4310/ 11
TRUE
B(NI) .LT. 0
FALSE
/4320/ 12
D = D + 1.
AVG = AVG + B(NI)
670 13
END OF DO LOOP?
NO
YES
/4350/ 14
16.15
/4400/ 16
DIFF = B(N) - AVG
DIFF = DIFF/AVG
Z = - .8
/4430/ 17
FALSE
DIFF .LT. Z
.OR. DIFF
.GT. 4.0
TRUE
/4430/ 18
B(N) = - B(N) - 1
16.07
680 19
END OF DO LOOP?
NO
YES
16
07
/4450/ 20
NN .EQ. 52
TRUE
FALSE
16
27
690
/4490/ 23
TRUE
DIFF .LT. 20
FALSE
/4500/ 24
DIFF = B(56) - AVG
DIFF = DIFF/AVG
/4520/ 25
DIFF .LT. Z
.OR. DIFF
.GT. 4.0
FALSE
TRUE
/4520/ 26
B(56) = - B(56) - 1
16.20
690 NOTE 27
CONTINUE
COMPUTE NUMBER OF GOOD HOURS AND NUMBER OF BAD HOURS IN EACH

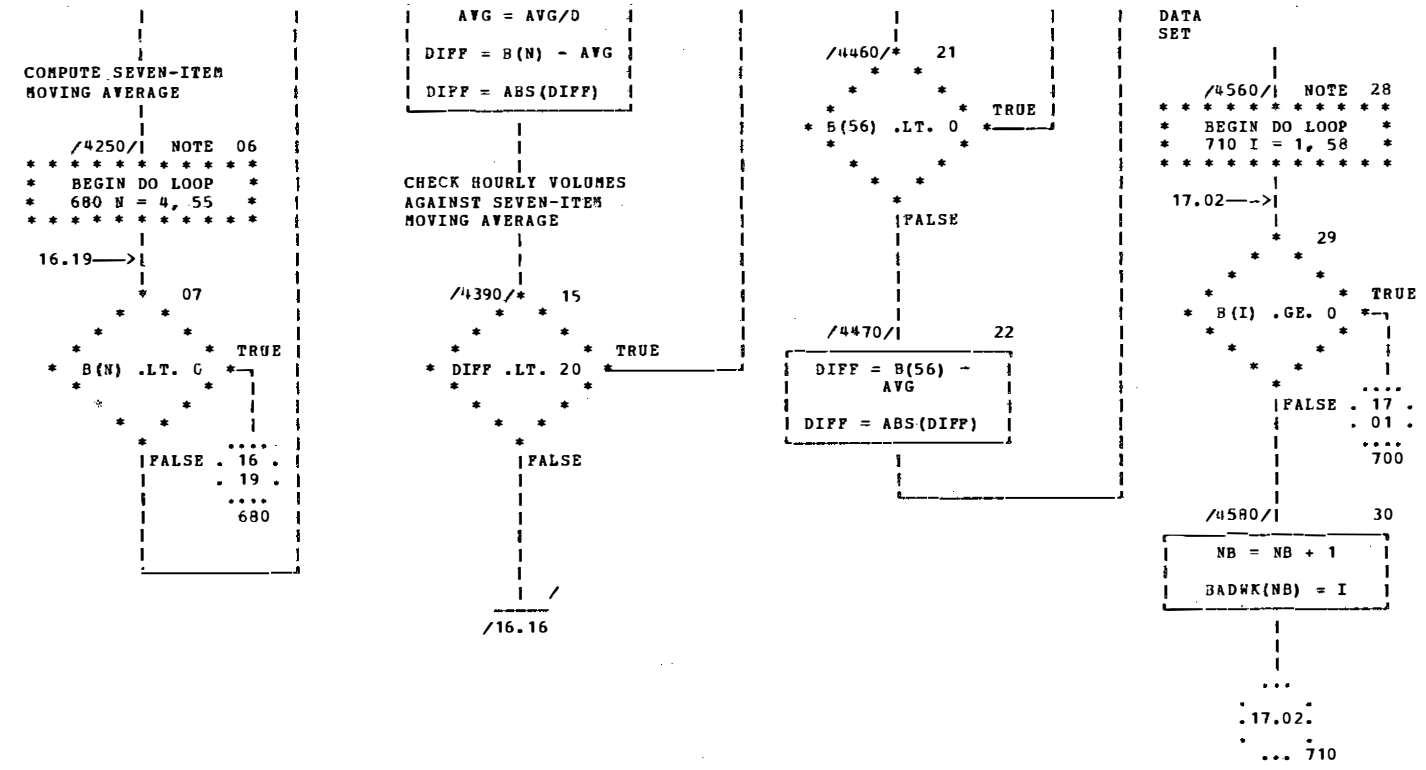


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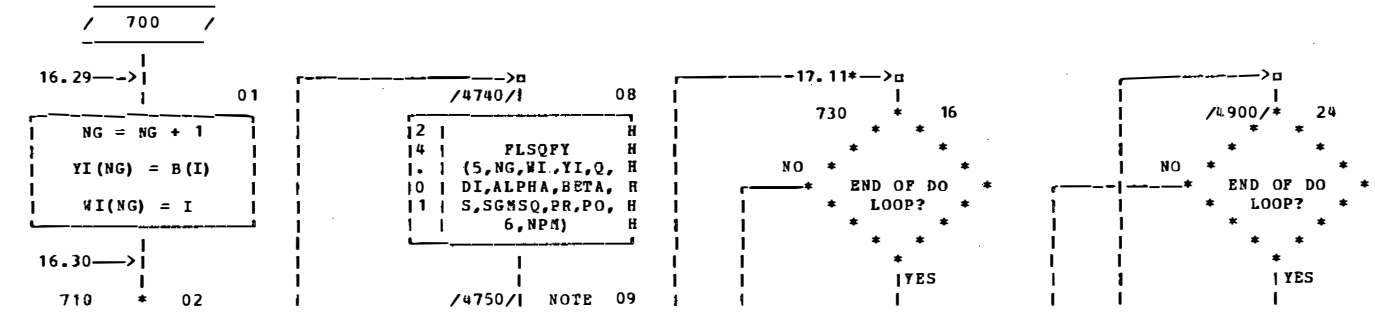
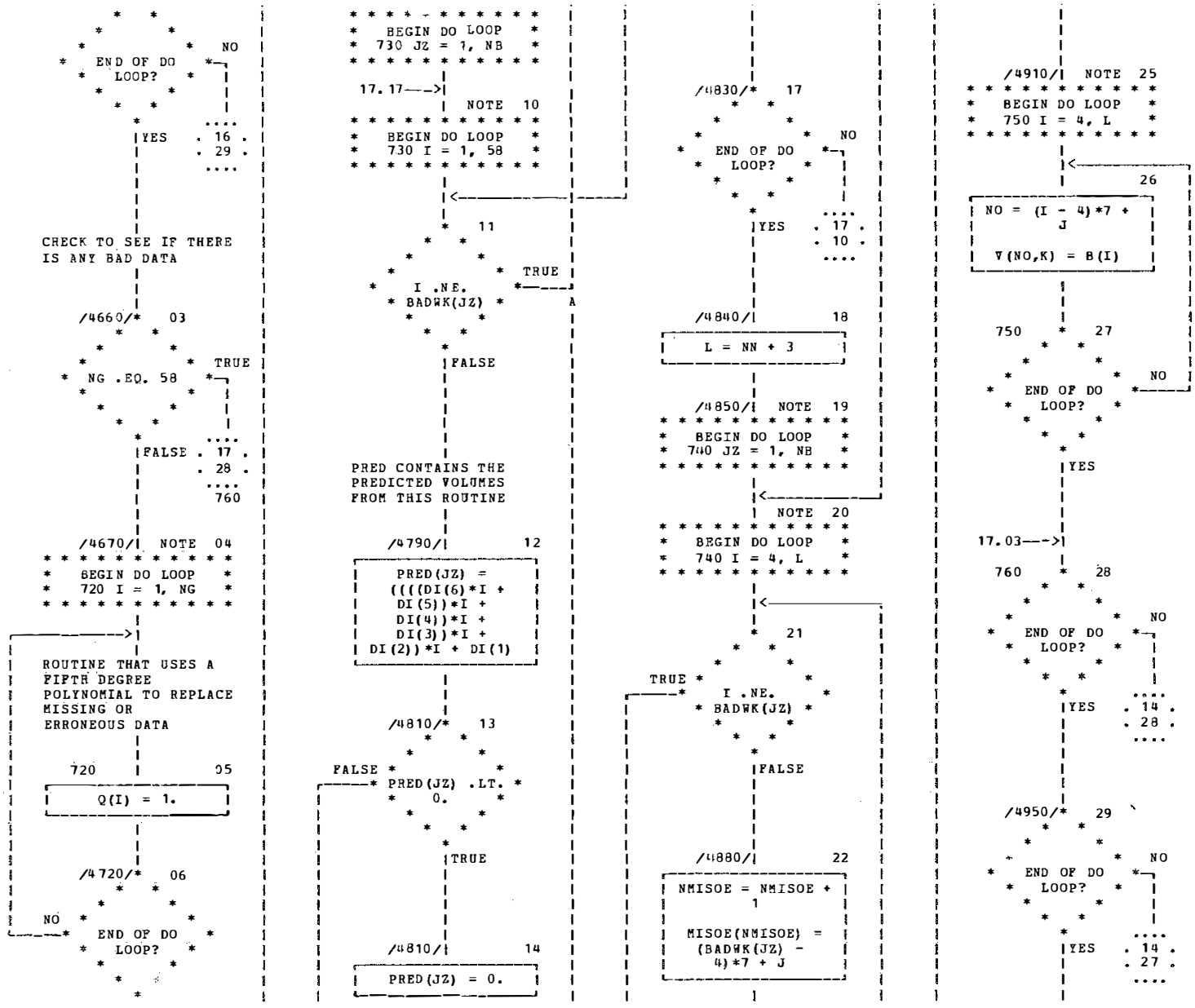
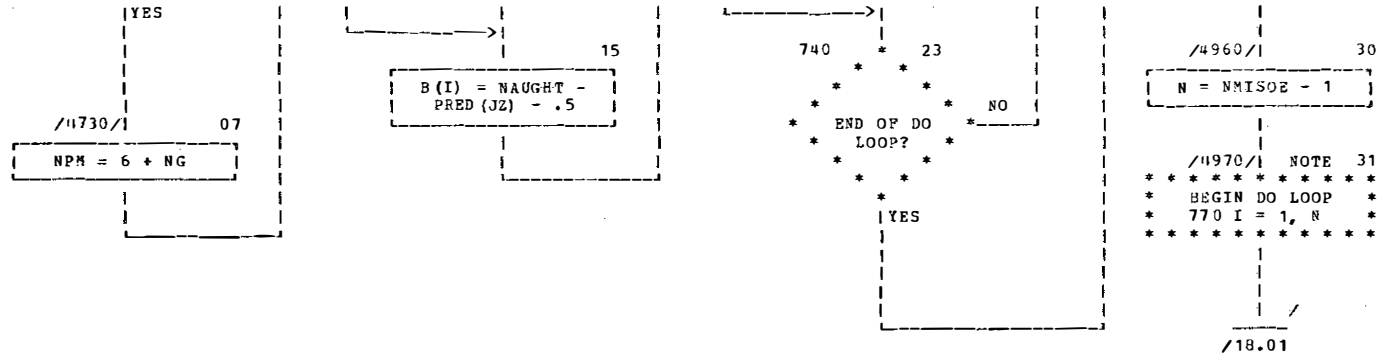
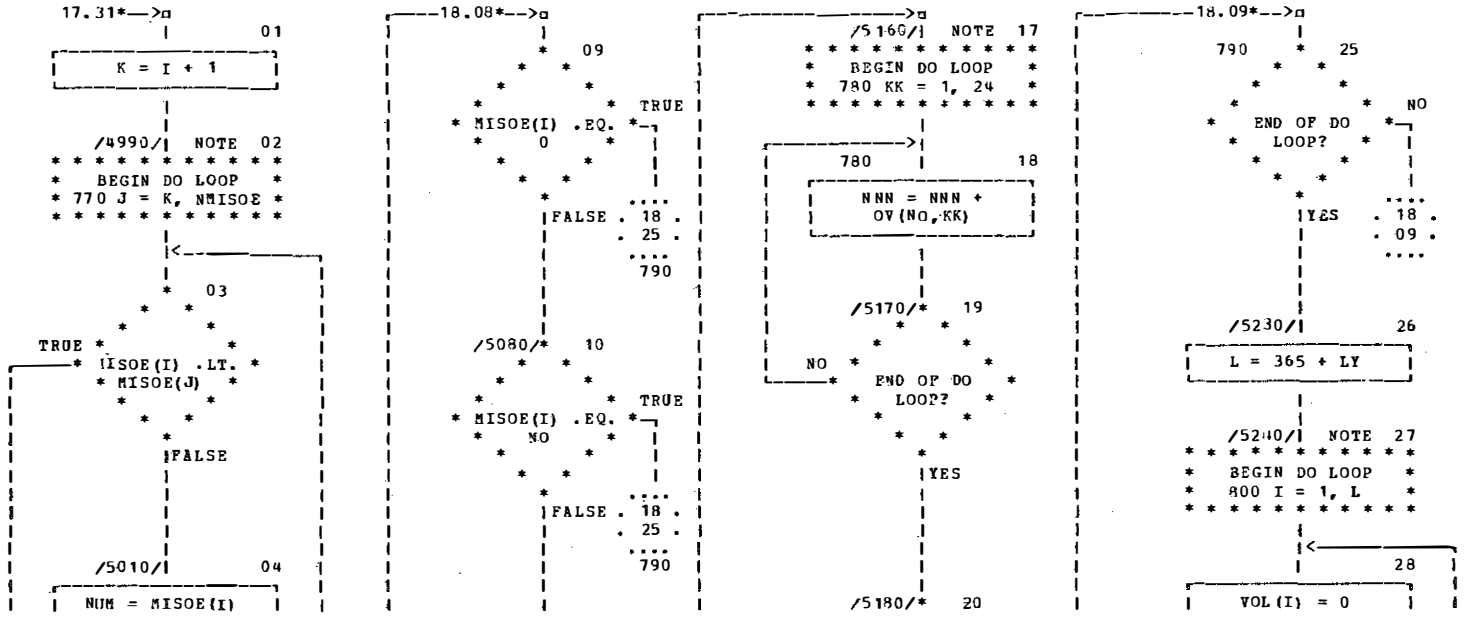
CHART TITLE - PROCEDURES

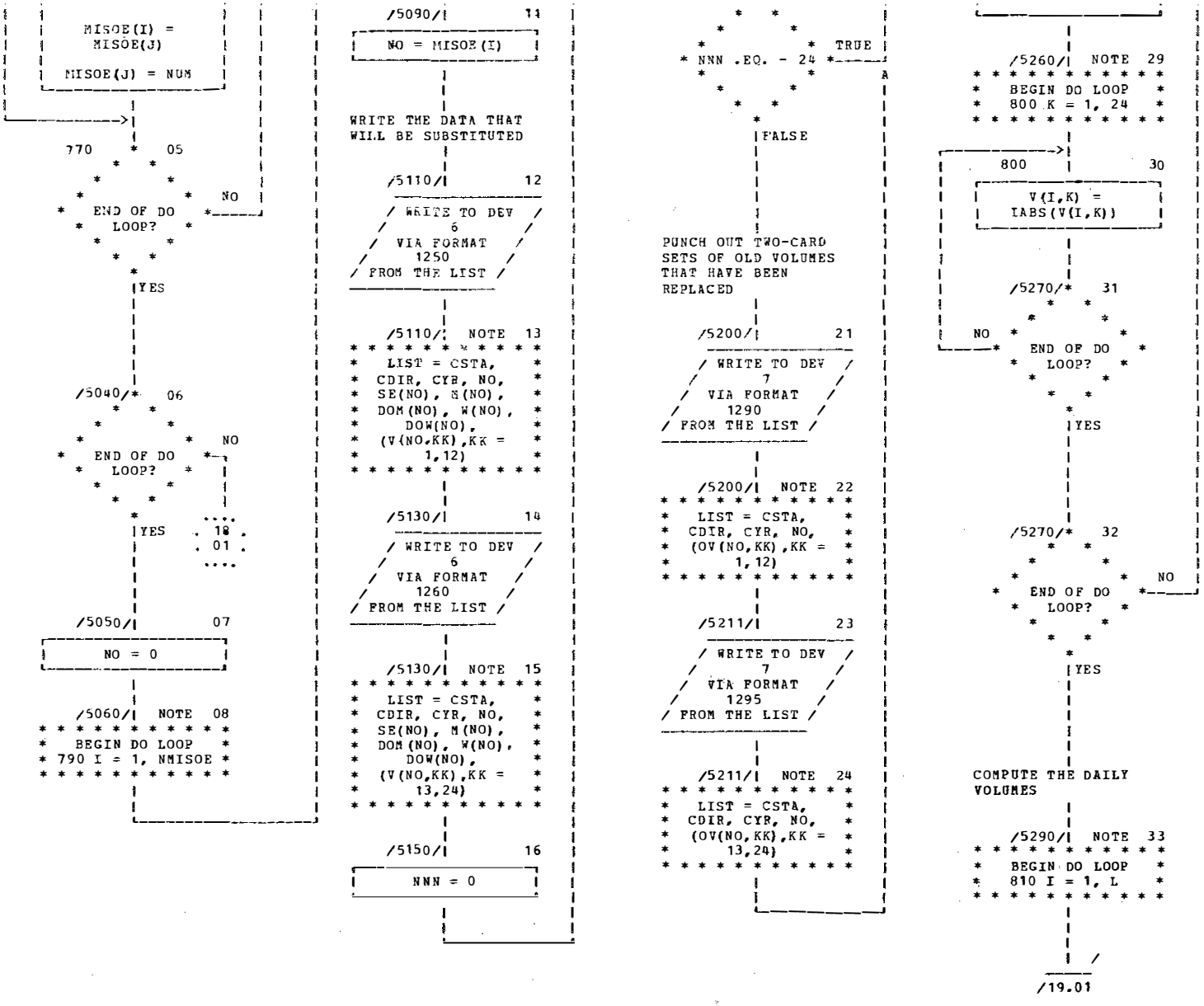
AUTOFLOW CHART SET - PROGRAM

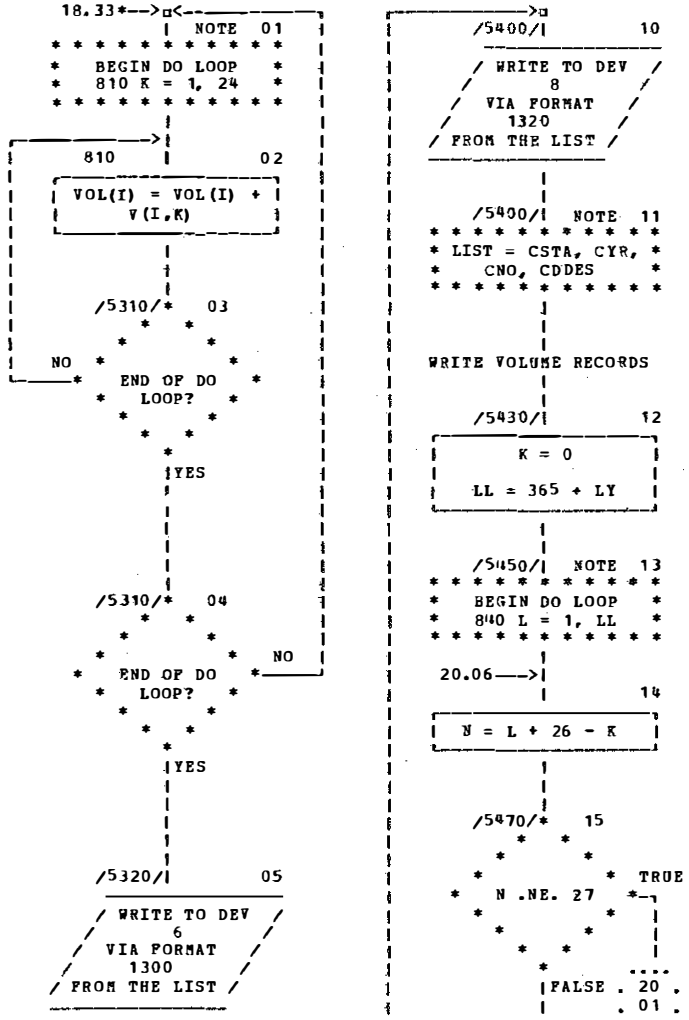


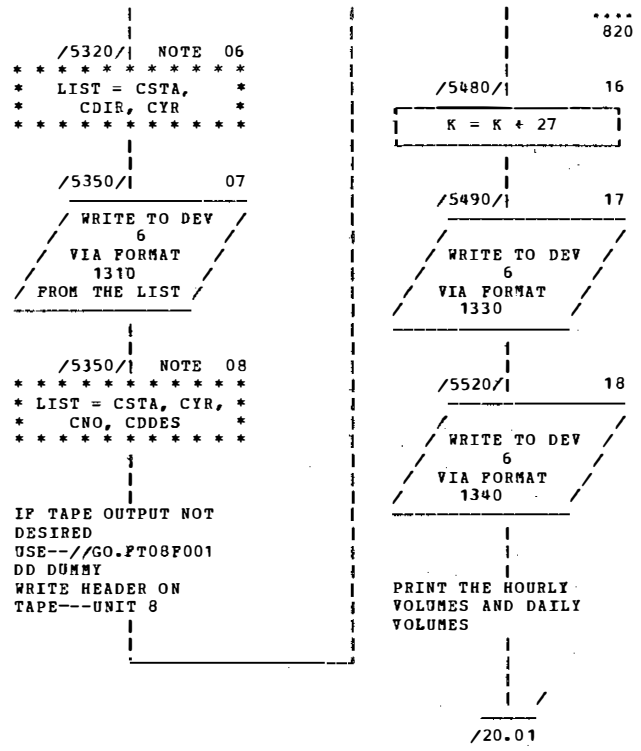

END OF DO LOOP?
NO
YES . 16 . . 29 .
CHECK TO SEE IF THERE IS ANY BAD DATA
/4660/ 03
NG .EQ. 58
TRUE
FALSE . 17 . . 28 . 760
/4670/ NOTE 04
BEGIN DO LOOP 720 I = 1, NG
ROUTINE THAT USES A FIFTH DEGREE POLYNOMIAL TO REPLACE MISSING OR ERRONEOUS DATA
720 05
Q(I) = 1.
/4720/ 06
END OF DO LOOP?
NO
BEGIN DO LOOP 730 JZ = 1, NB
17.17
NOTE 10
BEGIN DO LOOP 730 I = 1, 58
11
I .NE. BADWK(JZ)
TRUE
A
FALSE
PRED CONTAINS THE PREDICTED VOLUMES FROM THIS ROUTINE
/4790/ 12
PRED(JZ) = ((((DI(6)*I + DI(5))*I + DI(4))*I + DI(3))*I + DI(2))*I + DI(1)
/4810/ 13
PRED(JZ) .LT. 0.
FALSE
TRUE
/4810/ 14
PRED(JZ) = 0.
/4830/ 17
END OF DO LOOP?
NO
YES . 17 . . 10 .
/4840/ 18
L = NN + 3
/4850/ NOTE 19
BEGIN DO LOOP 740 JZ = 1, NB
NOTE 20
BEGIN DO LOOP 740 I = 4, L
21
I .NE. BADWK(JZ)
TRUE
FALSE
/4880/ 22
NMISOE = NMISOE + 1
MISOE(NMISOE) = (BADWK(JZ) - 4)*7 + J
/4910/ NOTE 25
BEGIN DO LOOP 750 I = 4, L
26
NO = (I - 4)*7 + J
V(NO,K) = B(I)
750
27
END OF DO LOOP?
NO
YES
17.03
760
28
END OF DO LOOP?
NO
YES . 14 . . 28 .
/4950/ 29
END OF DO LOOP?
NO
YES . 14 . . 27 .


YES
/4730/ 07
NPM = 6 + NG
15
B(I) = NAUGHT - PRED(JZ) - .5
740 23
END OF DO LOOP?
NO
YES
/4960/ 30
N = NMISOE - 1
/4970/ NOTE 31
BEGIN DO LOOP
770 I = 1, N
/18.01


17.31
01
K = I + 1
/4990/ NOTE 02
BEGIN DO LOOP
770 J = K, NMISOE
03
TRUE
MISOE(I) .LT. MISOE(J)
FALSE
/5010/ 04
NUM = MISOE(I)
18.08
09
MISOE(I) .EQ. 0
TRUE
FALSE . 18 . . 25 . 790
/5080/ 10
MISOE(I) .EQ. NO
TRUE
FALSE . 18 . . 25 . 790
/5160/ NOTE 17
BEGIN DO LOOP
780 KK = 1, 24
780 18
NNN = NNN + OV(NO,KK)
/5170/ 19
NO
END OF DO LOOP?
YES
/5180/ 20
18.09
790 25
NO
END OF DO LOOP?
YES . 18 . . 09 .
/5230/ 26
L = 365 + LY
/5240/ NOTE 27
BEGIN DO LOOP
800 I = 1, L
28
VOL(I) = 0

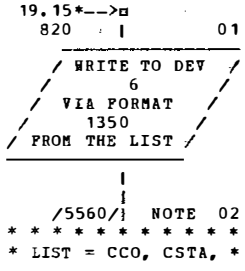

MISOE(I) = MISOE(J)
MISOE(J) = NUM
770
05
END OF DO LOOP?
NO
YES
/5040/
06
END OF DO LOOP?
NO
YES
10
01
/5050/
07
NO = 0
/5060/ NOTE 08
BEGIN DO LOOP
790 I = 1, NMISOE
/5090/
11
NO = MISOE(I)
WRITE THE DATA THAT WILL BE SUBSTITUTED
/5110/
12
WRITE TO DEV 6
VIA FORMAT 1250
FROM THE LIST
/5110/ NOTE 13
LIST = CSTA, CDIR, CYR, NO, SE(NO), M(NO), DOM(NO), W(NO), DOW(NO), (V(NO,KK),KK = 1,12)
/5130/
14
WRITE TO DEV 6
VIA FORMAT 1260
FROM THE LIST
/5130/ NOTE 15
LIST = CSTA, CDIR, CYR, NO, SE(NO), M(NO), DOM(NO), W(NO), DOW(NO), (V(NO,KK),KK = 13,24)
/5150/
16
NNN = 0
NNN .EQ. - 24
TRUE
FALSE
PUNCH OUT TWO-CARD SETS OF OLD VOLUMES THAT HAVE BEEN REPLACED
/5200/
21
WRITE TO DEV 7
VIA FORMAT 1290
FROM THE LIST
/5200/ NOTE 22
LIST = CSTA, CDIR, CYR, NO, (OV(NO,KK),KK = 1,12)
/5211/
23
WRITE TO DEV 7
VIA FORMAT 1295
FROM THE LIST
/5211/ NOTE 24
LIST = CSTA, CDIR, CYR, NO, (OV(NO,KK),KK = 13,24)
/5260/ NOTE 29
BEGIN DO LOOP
800 K = 1, 24
800
30
V(I,K) = IABS(V(I,K))
/5270/
31
NO
END OF DO LOOP?
YES
/5270/
32
NO
END OF DO LOOP?
YES
COMPUTE THE DAILY VOLUMES
/5290/ NOTE 33
BEGIN DO LOOP
810 I = 1, L
/19.01

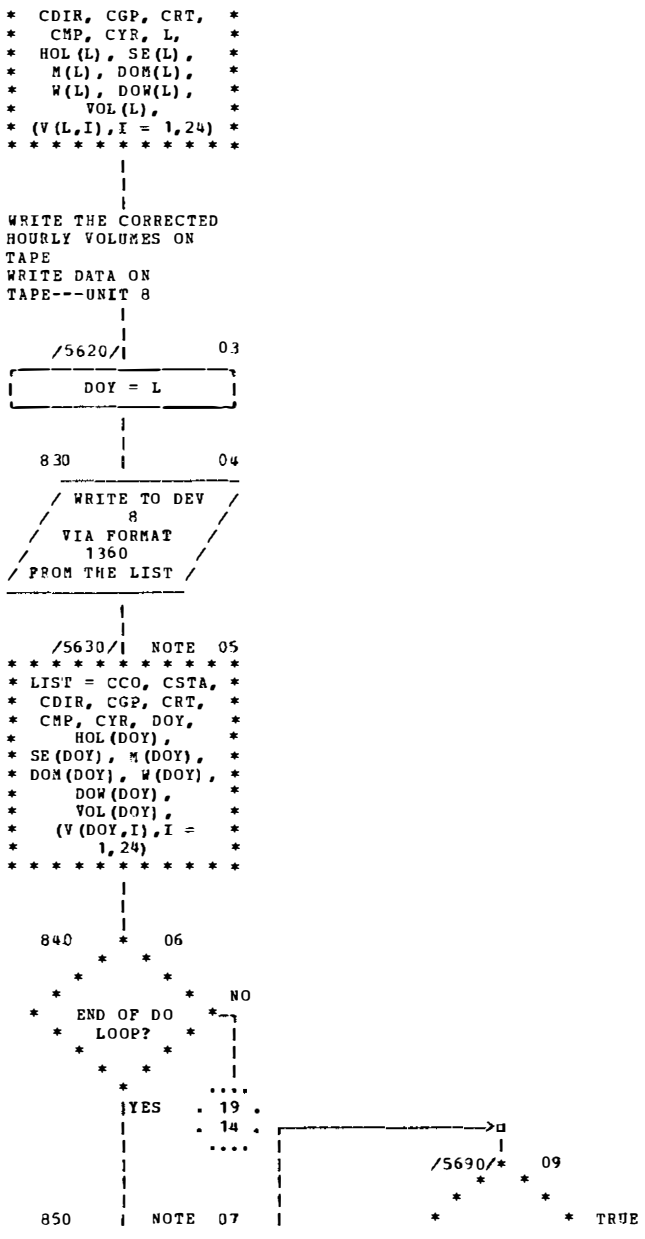

18.33
NOTE 01
BEGIN DO LOOP
810 K = 1, 24
810
02
VOL(I) = VOL(I) + V(I,K)
/5310/
03
NO
END OF DO LOOP?
YES
/5310/
04
NO
END OF DO LOOP?
YES
/5320/
05
WRITE TO DEV 6
VIA FORMAT 1300
FROM THE LIST
/5400/
10
WRITE TO DEV 8
VIA FORMAT 1320
FROM THE LIST
/5400/
NOTE 11
LIST = CSTA, CYR, CNO, CDDES
WRITE VOLUME RECORDS
/5430/
12
K = 0
LL = 365 + LY
/5450/
NOTE 13
BEGIN DO LOOP
840 L = 1, LL
20.06
14
N = L + 26 - K
/5470/
15
N .NE. 27
TRUE
FALSE . 20 .
. 01 .

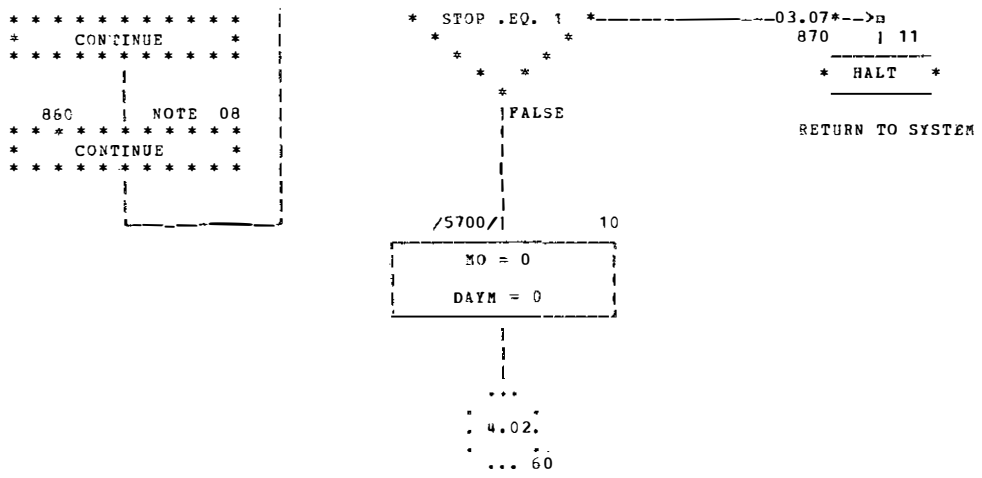


09/19/77
CHART TITLE - PROCEDURES

AUTOFLOW CHART SET - PROGRAM




CDIR, CGP, CRT,
CMP, CYR, L,
HOL(L), SE(L),
M(L), DOM(L),
W(L), DOW(L),
VOL(L),
(V(L,I),I = 1,24)
WRITE THE CORRECTED
HOURLY VOLUMES ON
TAPE
WRITE DATA ON
TAPE---UNIT 8
/5620/
03
DOY = L
830
04
WRITE TO DEV
8
VIA FORMAT
1360
FROM THE LIST
/5630/
NOTE 05
LIST = CCO, CSTA,
CDIR, CGP, CRT,
CMP, CYR, DOY,
HOL(DOY),
SE(DOY), M(DOY),
DOM(DOY), W(DOY),
DOW(DOY),
VOL(DOY),
(V(DOY,I),I =
1,24)
840
06
END OF DO
LOOP?
NO
YES
19
14
/5690/
09
TRUE
850
NOTE 07



09/19/77
CHART TITLE - NON-PROCEDURAL STATEMENTS

AUTOFLOW CHART SET - PROGRAM

```
      INTEGER         HIDAY(26),CCO,CSTA,CNO,CDIR,CGP,CYR,CFDOY,CAP,
     STA,PREC,DIR,YR,DAYM,DAYW,PER,AC(12),HDAY(26)
      DIMENSION A(80),CRT(2),CMP(2)
      INTEGER STOP,DAYL,SEA,DOY,WK,MO,HV(12),B(58),BADWK(58),NMISOE,
     MISOE(2000)
      REAL YI(58),WI(58),DI(6),PRED(58)
      DIMENSION ALPHA(80),BETA(80),S(80),SGMSQ(80),PR(80),PO(80),Q(80)
      INTEGER CNUM,HOL(366),SE(366),M(366),DOM(366),W(366),DOW(366),
     VOL(366),V(366,24),OV(366,24)
      DATA ZERO,ROUTE,AMP,CONTR,DASH/'0','R','&','C','-'/
      DATA ONE,AROUTE/'1','A'/
      DATA BLANK/' '/
 1000 FORMAT(I2,26I3)
 1010 FORMAT(26I3)
 1020 FORMAT('1',T36,'TRAFFIC VOLUME DATA FOR THE YEAR 19',I2,' ARE BEIN
```

```
      G PROCESSED')
1030  FORMAT(80A1)
1040  FORMAT(' THE FOLLOWING CARD TYPE IS UNKNOWN ',80A1)
1050  FORMAT(2X,I3,3X,I2,4X,I1,4X,I1,1X,A4,3X,I2,3X,A3,A4,4X, 2A3,3X,
      I2,4X,I1,I5)
1060  FORMAT('1','THE FOLLOWING ARE INCORRECT HEADER OR DATA CARDS FOR S
      TA ',I2,', DIRECTION ',I1,', AND YEAR 19',I2,/)
1070  FORMAT(12X,I2,1X,I5)
1080  FORMAT(' HEADER CARD IS INCORRECT FOR STA',I4,' PREC',I6,
      '. EXECUTION TERMINATED.')
1090  FORMAT(19X,I3,1X,I5)
1100  FORMAT(15X,I5)
1110  FORMAT(23X,I5)
1120  FORMAT(3X,I2,I1,1X,I2,A1,I2,I1,I2,12I5)
1130  FORMAT(' DATA CARD HAS INCORRECT STA FOR STA',I4,' DIR',I4,' YR',
      I4,' MONTH ',A4,' DAY',I4,'. DATA IGNORED.')
1140  FORMAT(' DATA CARD HAS INCORRECT YEAR FOR STA',I4,' DIR',I4,' YR',
      I4,' MONTH ',A4,' DAY',I4,'. DATA IGNORED.')
1150  FORMAT(A1)
1160  FORMAT(I1)
1170  FORMAT(' DATA CARD HAS INCORRECT MONTH FOR STA',I4,' DIR',I4,' YR'
      ,I4,' MONTH ',A4,' DAY',I4,'. DATA IGNORED.')
1180  FORMAT(' DATA CARD HAS INCORRECT DAY OF MONTH FOR STA',I4,' DIR',
      I4,' YR',I4,' MONTH ',A4,' DAY',I4,'. DATA IGNORED.')
1190  FORMAT(' DATA CARD HAS INCORRECT DIRECTION FOR STA',I4,' DIR',I4,
      ' YR',I4,' MONTH ',A4,' DAY',I4,'. DATA IGNORED.')
1200  FORMAT(' DATA CARD HAS INCORRECT DAY OF WEEK FOR STA',I4,' DIR',
      I4,' YR',I4,' MONTH ',A4,' DAY',I4,'. DATA IGNORED.')
1205  FORMAT(' DATA CARD HAS INCORRECT DAY OF WEEK FOR STA',I4,' DIR',
      I4,' YR',I4,' MONTH ',A4,' DAY',I4,' DAY OF WEEK',I4,'. DATA IGNOR
      ED.')
1210  FORMAT(' DATA CARD HAS INCORRECT PERIOD FOR STA',I4,' DIR',I4,
      ' YR',I4,'MONTH ',A4,' DAY',I4,' PERIOD',I4,'. DATA IGNORED.')
```

```
1220    FORMAT('1','TRE FOLLOWING ARE UNCORRECTED HOURLY VOLUMES FOR STA
        ,I2,', DIRECTION ',I1,', AND YEAR 19',I2,/)
1230    FORMAT('1ST DI  YR  DOY SEA MO DOM  WK DOW PER',30X,
        'HOURLY VOLUMES')
1240    FORMAT(44X,'1      2      3      4      5      6      7      8
          9     10     11     12',//)
1250    FORMAT(' ',I2,I3,I4,I5,I3,3I4,I3,'   1',2X,12I7)
1260    FORMAT(' ',I2,I3,I4,I5,I3,3I4,I3,'  13',2X,12I7)
1270    FORMAT('1THE FOLLOWING SUBSTITUTIONS HAVE BEEN MADE FOR MISSING OR
         ERRONEOUS DATA FOR STA ',I2,', DIRECTION',I2,', AND YEAR 19',I2)
1280    FORMAT('0',T3,'DAY OF YEAR CODES FOR HOLIDAYS:',/,T15,26(1X,I3),/,
        ' ',T3,'DAY OF YEAR CODES FOR DAYS UNDER THE INFLUENCE OF HOLIDAYS
        :'/,T15,26(1X,I3),//,' ST DI  YR  DOY SEA MO DOM  WK DOW PER',30X,
        'HOURLY VOLUMES')
1290    FORMAT(4I4,3X,'1',12I5)
1295    FORMAT(4I4,2X,'13',12I5)
1300    FORMAT('1','THE FOLLOWING HAS BEEN PLACED ON TAPE FOR STA ',I2,',
        DIRECTION ',I1,', AND YEAR 19',I2,/)
1310    FORMAT(T5,'HEADER RECORD',/,2X,'STA',3X,'YR',3X,'DS',2X,'DIR',/,
        3I5,1X,A4)
1320    FORMAT(3X,I2,3X,I2,4X,I1,1X,A4)
1330    FORMAT('1 CO STA DIR GP  ROUTE    MP   YR  DOY HO SE  MO DOM  WK D
        OW  DVOL',T90,'HOURLY VOLUMES')
1340    FORMAT(71X,'1    2    3    4    5    6    7    8    9   10   11
        12',//)
1350    FORMAT(I4,' P',I2,I3,I3,2X,A3,A4,1X,2A3,I3,I5,2I3,4I4,I7,1X,12I5,/
        ,68X,12I5)
1360    FORMAT(I3,'P',I2,I1,I2,A3,A4,2A3,I2,I3,I1,I1,I2,I2,I2,I1,I5,24I4)
```

****
* LEAST SQUARES ORDINARY POLYNOMIAL CURVE FITTING SUBROUTINE.*
****

NUMALIB

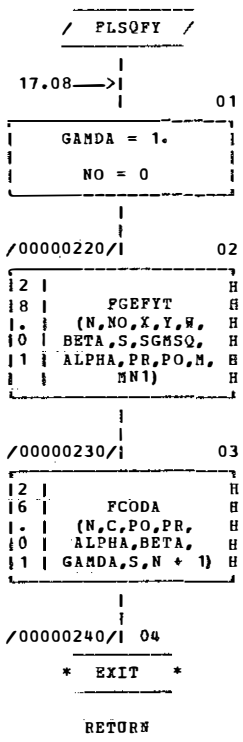
UNIVERSITY OF KENTUCKY

COMPUTER CENTER

MCVEY HALL

LEXINGTON, KENTUCKY

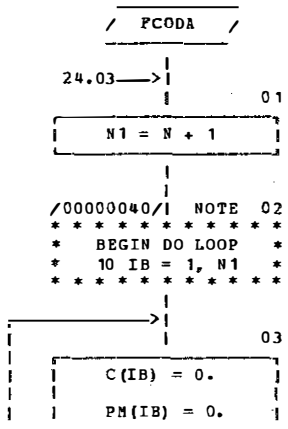
09/19/77 AUTOFLOW CHART SET - PROGRAM
CHART TITLE - SUBROUTINE FLSQFY(N,M,X,Y,W,C,ALPHA,BETA,S,SGMSQ,PR,PO,N1,MN1)

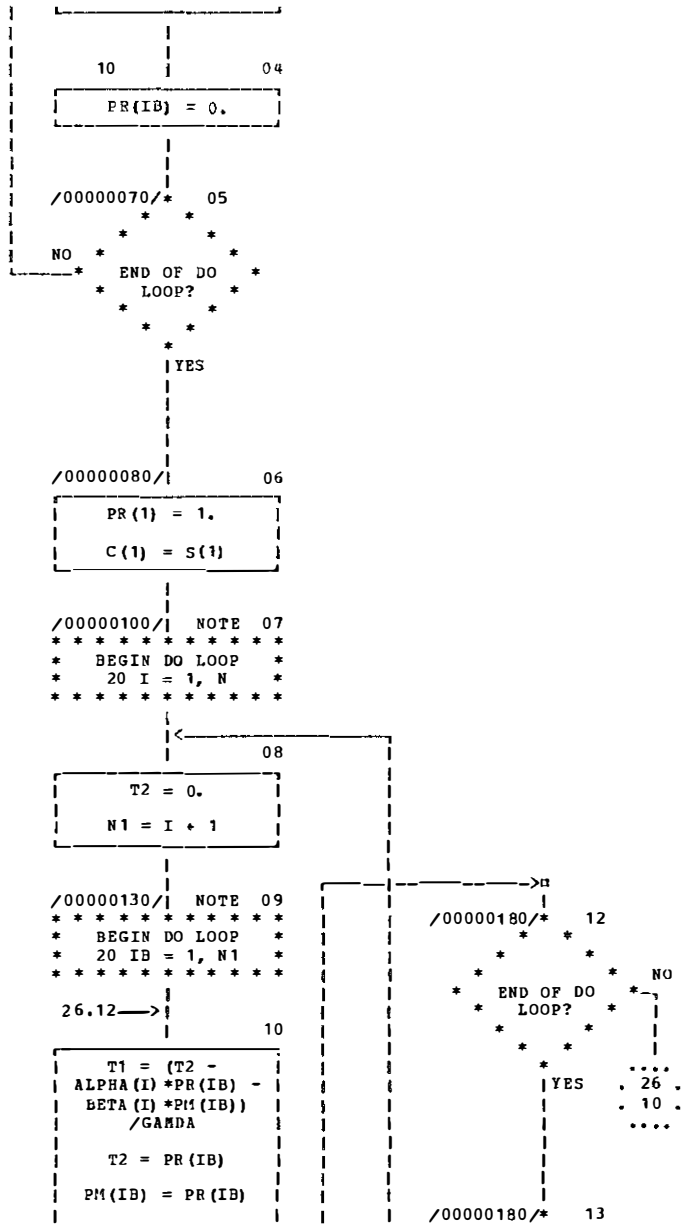


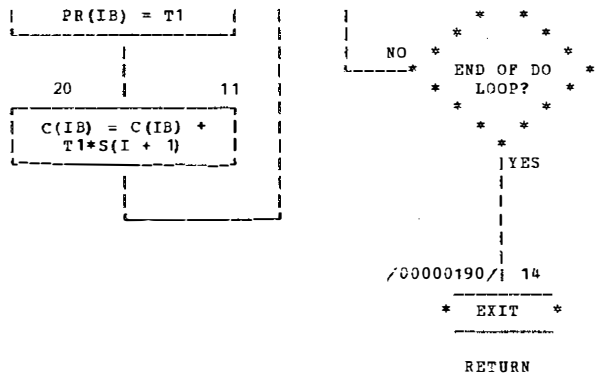
09/19/77 AUTOFLOW CHART SET - PROGRAM
CHART TITLE - NON-PROCEDURAL STATEMENTS

```
      DIMENSION C(N1),ALPHA(MN1),BETA(MN1),S(MN1),SGMSQ(MN1),PR(MN1),PO(
     MN1),W(M),X(M),Y(M)
```

09/19/77 AUTOFLOW CHART SET - PROGRAM
CHART TITLE - SUBROUTINE FCODA(N,C,PM,PR,ALPHA,BETA,GAMDA,S,NN)




10
04
PR(IB) = 0.
/00000070/
05
NO
END OF DO LOOP?
YES
/00000080/
06
PR(1) = 1.
C(1) = S(1)
/00000100/
NOTE 07
BEGIN DO LOOP
20 I = 1, N
08
T2 = 0.
N1 = I + 1
/00000130/
NOTE 09
BEGIN DO LOOP
20 IB = 1, N1
26.12
10
T1 = (T2 - ALPHA(I) *PR(IB) - BETA(I) *PM(IB)) /GAMDA
T2 = PR(IB)
PM(IB) = PR(IB)
/00000180/
12
NO
END OF DO LOOP?
YES
. 26 .
. 10 .
/00000180/
13



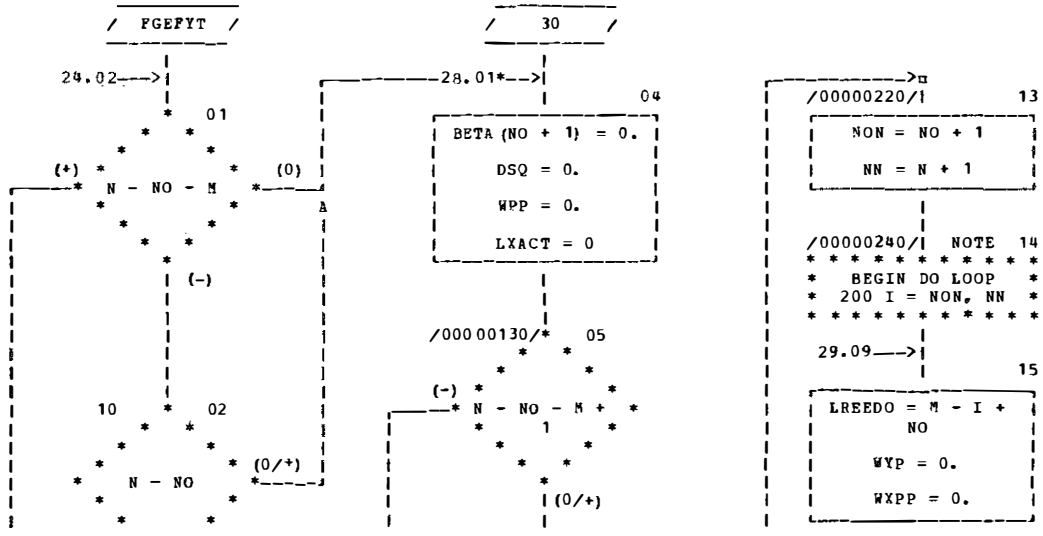
09/19/77
CHART TITLE - NON-PROCEDURAL STATEMENTS

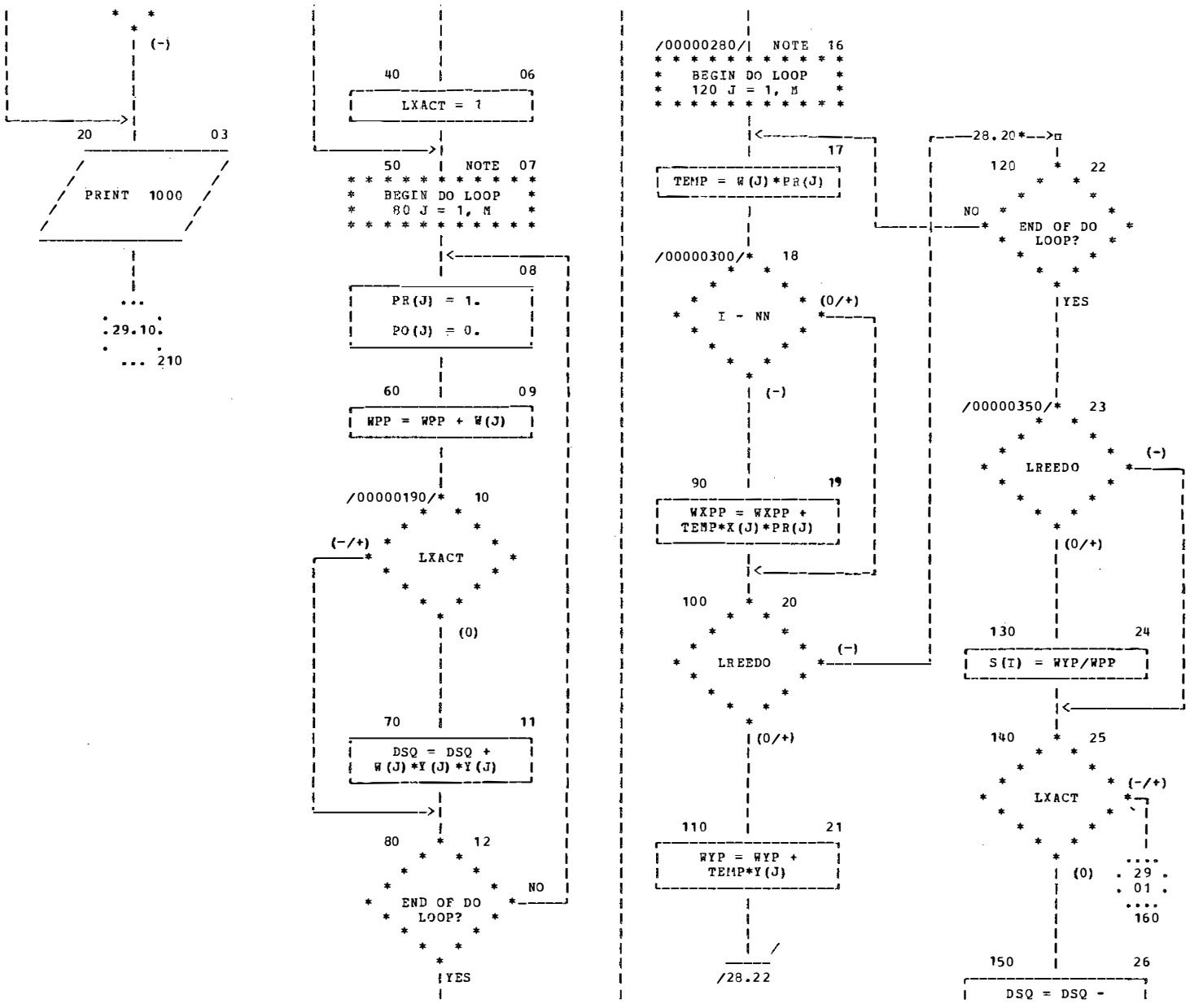
AUTOFLOW CHART SET - PROGRAM

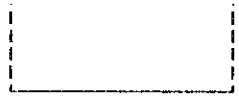
```
DIMENSION C(NN),ALPHA(NN),BETA(NN),PM(NN),PR(NN),S(NN)
```

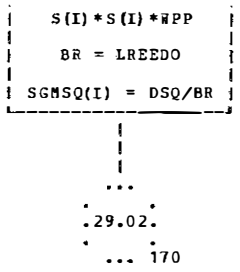
09/19/77 AUTOFLOW CHART SET - PROGRAM

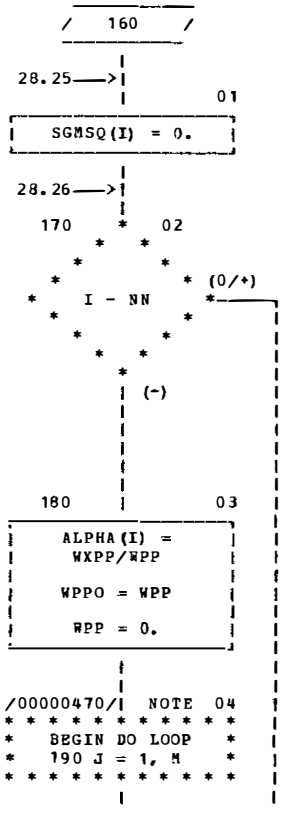
CHART TITLE - SUBROUTINE FGEFYT(N,NO,X,Y,W,BETA,S,SGMSQ,ALPHA,PR,PO,M,NI)

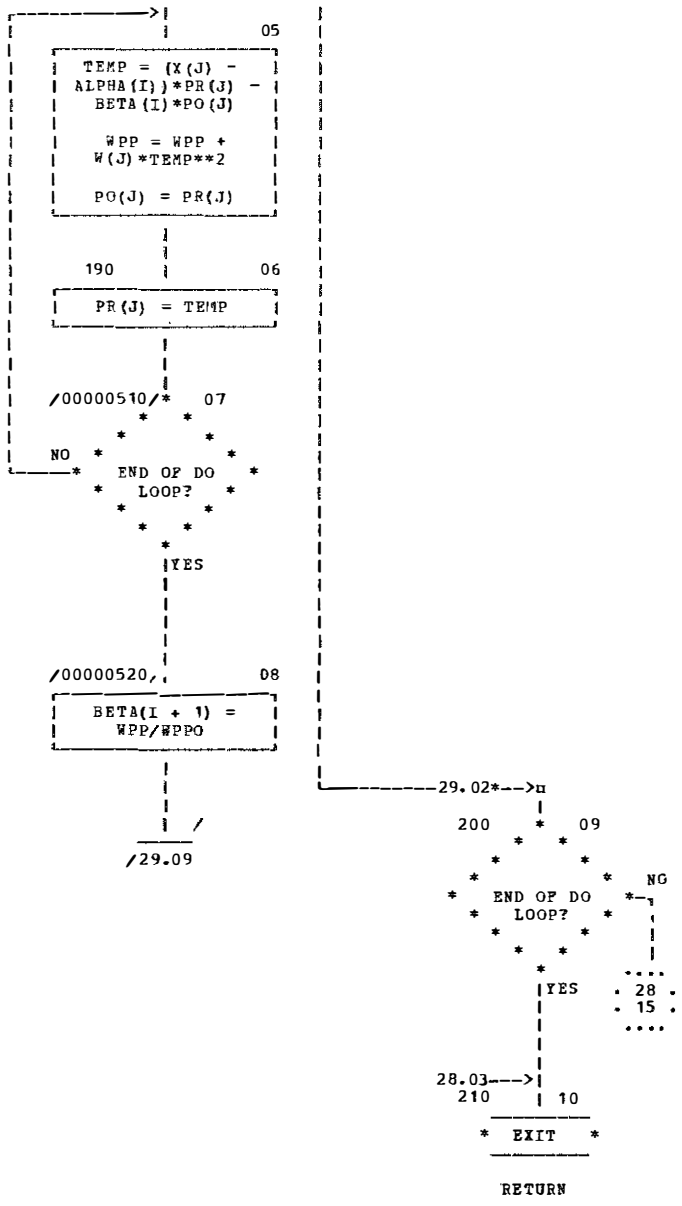



(-)
20
03
PRINT 1000
.29.10.
... 210
40
06
LXACT = 1
50
NOTE 07
BEGIN DO LOOP
80 J = 1, M
08
PR(J) = 1.
PO(J) = 0.
60
09
WPP = WPP + W(J)
/00000190/
10
(-/+)
LXACT
(0)
70
11
DSQ = DSQ +
W(J)*Y(J)*Y(J)
80
12
NO
END OF DO
LOOP?
YES
/00000280/
NOTE 16
BEGIN DO LOOP
120 J = 1, M
17
TEMP = W(J)*PR(J)
/00000300/
18
(0/+)
I - NN
(-)
90
19
WXPP = WXPP +
TEMP*X(J)*PR(J)
100
20
LREEDO
(-)
(0/+)
110
21
WYP = WYP +
TEMP*Y(J)
/28.22
28.20
120
22
NO
END OF DO
LOOP?
YES
/00000350/
23
LREEDO
(-)
(0/+)
130
24
S(I) = WYP/WPP
140
25
LXACT
(-/+)
(0)
.29.
.01.
160
150
26
DSQ = DSQ -




S(I)*S(I)*WPP
BR = LREEDO
SGMSQ(I) = DSQ/BR
...
.29.02.
... 170


160
28.25
01
SGMSQ(I) = 0.
28.26
170
02
I - NN
(0/+)
(-)
180
03
ALPHA(I) = WXPP/WPP
WPPO = WPP
WPP = 0.
/00000470/
NOTE 04
BEGIN DO LOOP
190 J = 1, M


05
TEMP = (X(J) -
ALPHA(I))*PR(J) -
BETA(I)*PO(J)
WPP = WPP +
W(J)*TEMP**2
PO(J) = PR(J)
190
06
PR(J) = TEMP
/00000510/*
07
NO
END OF DO
LOOP?
YES
/00000520/
08
BETA(I + 1) =
WPP/WPPO
/29.09
29.02*-->u
200
09
NO
END OF DO
LOOP?
YES
28
15
28.03--->
210
10
EXIT
RETURN

```
      DIMENSION X(M),Y(M),BETA(NI),ALPHA(NI),S(NI),SGMSQ(NI),PR(M),
     PO(M),W(M)
1000  FORMAT(32H  THERE IS AN ERROR IN YOUR DATA)
```

APPENDIX G

UPDATE PROGRAM LISTING

```
//DTRN73D4 JOB (4317,9019),MAYES,MSGLEVEL=(1,1),CLASS=E
/*JOBPARM T=1
//STEPA EXEC FORTGCLG
//FORT.SYSIN DD *
      INTEGER CARD,TAPIN,TAPOUT,PRNT
      INTEGER CSTA,CDIR,CYR,NO,CSTA2,CDIR2,CYR2,NO2,PER1,PER2,OV(24)
      INTEGER BAD,GOOD,S(1000),DI(1000),DY(1000),VOL(1000,24),CTR
      INTEGER V(366,24),YR,STA,DIR,YE(1000),YEAR,DV(366)
      DIMENSION HA(8),HB(140),DA(366,4),DB(366,15),DC(366,13),DD(366,12)
C
C     BAD IS INDICATOR OF ERRONEOUS DATA CORRECTION CARDS. IF NON-ZERO,
C       AT LEAST ONE CARD IS IN ERROR.
C     GOOD CONTAINS NUMBER OF CORRECTIONS TO BE MADE.
C
      BAD = 0
      GOOD = 0
C
C     TAPIN,TAPOUT,PRNT,CARD ARE THE UNIT NUMBERS FOR INPUT TAPE,
C       OUTPUT TAPE, PRINTER, AND CARD READER, RESPECTIVELY
C
      PRNT = 3
      CARD = 1
      TAPIN = 8
      TAPOUT = 9
C
C     PRINT A PROGRAM INITIATION MESSAGE
C
      WRITE(PRNT,2000)
 2000 FORMAT('1',T58,'PROGRAM UPDATE',//,T33,'THE PROCESS OF EDITING DAT
     1A CORRECTION CARDS HAS BEEN INITIATED.',///,T25,'LIST OF DATA CORR
     2ECTION CARDS',T98,'ERROR MESSAGES',/)
C
C     S(I),DI(I),YE(I),DY(I),(VOL(I,K),K=1,24) ARE THE STATION,
C       DIRECTION,YEAR,DAY OF YEAR, AND 24 HOURLY VOLUMES, RESPECTIVELY,
C       FOR THE ITH CORRECTION.
C
      DO 10 I=1,1000
      S(I) = 0
      DI(I) = 0
      YE(I) = 0
      DY(I) = 0
   10 CONTINUE
C
C     READ A DATA CORRECTION CARD INTO STORAGE 1
C
   20 READ(CARD,2010,END=200) CSTA,CDIR,CYR,NO,PER1,(OV(I),I=1,12)
 2010 FORMAT(5I4,12I5)
      WRITE(PRNT,2010) CSTA,CDIR,CYR,NO,PER1,(OV(I),I=1,12)
      IF(PER1.EQ.1) GO TO 30
      WRITE(PRNT,2020)
 2020 FORMAT(T83,'ABOVE CARD SHOULD HAVE PERIOD OF 1')
      BAD = BAD + 1
      GO TO 20
   30 CONTINUE
C
C     READ A DATA CORRECTION CARD INTO STORAGE 2
C
      READ(CARD,2010,END=210) CSTA2,CDIR2,CYR2,NO2,PER2,(OV(I),I=13,24)
      WRITE(PRNT,2010) CSTA2,CDIR2,CYR2,NO2,PER2,(OV(I),I=13,24)
      IF(PER2.EQ.13) GO TO 40
```

```
      WRITE(PRNT,2030)
 2030 FORMAT(T83,'ABOVE CARD SHOULD HAVE PERIOD OF 13')
      BAD = BAD + 1
      GO TO 50
C
C     ASCERTAIN IF INFORMATION IN STORAGE 1 IS COMPATIBLE WITH STORAGE 2
C
   40 IF(CSTA.NE.CSTA2) GO TO 60
      IF(CDIR.NE.CDIR2) GO TO 60
      IF(CYR.NE.CYR2) GO TO 60
      IF(NO.NE.NO2) GO TO 60
      GO TO 70
C
C     TWO STORAGE LOCATIONS ARE INCOMPATIBLE. WRITE ERROR MESSAGE.
C
   60 BAD = BAD + 1
      WRITE(PRNT,2040)
 2040 FORMAT(T83,'ABOVE PAIR OF CARDS DO NOT MATCH')
C
C     TRANSFER CONTENTS OF STORAGE 2 INTO STORAGE 1
C
   50 CSTA = CSTA2
      CDIR = CDIR2
      CYR = CYR2
      NO = NO2
      PER1 = PER2
      DO 80 I=1,12
      J = I + 12
      OV(I) = OV(J)
   80 CONTINUE
      IF(PER1.EQ.1) GO TO 30
      WRITE(PRNT,2020)
      BAD = BAD + 1
      GO TO 20
C
C     SECOND CARD IN TWO-CARD SEQUENCE IS MISSING FROM READ HOPPER
C
  210 BAD = BAD + 1
      WRITE(PRNT,2050)
 2050 FORMAT(T83,'SECOND CARD IN TWO-CARD SEQUENCE IS MISSING')
  200 IF(BAD.EQ.0.AND.GOOD.EQ.0) GO TO 220
      IF(BAD.EQ.0) GO TO 230
C
C     ERROR DETECTED IN DATA CORRECTION CARDS. TERMINATE EXECUTION.
C
      WRITE(PRNT,2060)
 2060 FORMAT(T6,'EXECUTION TERMINATED. ERROR WAS DETECTED IN SET OF DATA
     1 CORRECTION CARDS. CORRECTED TAPE (OUTPUT) WAS NOT PRODUCED.',/,
     2T8,'CORRECT DATA CORRECTION CARDS AND RESUBMIT.')
      GO TO 9000
C
C     NO DATA CORRECTION CARDS WERE SUBMITTED. TERMINATE EXECUTION.
C
  220 WRITE(PRNT,2070)
 2070 FORMAT(T6,'EXECUTION TERMINATED. NO DATA CORRECTION CARDS WERE INP
     1UT TO THIS RUN. CORRECTED TAPE (OUTPUT) WAS NOT PRODUCED.',/,
     2T8,'CHECK TO ASCERTAIN IF CORRECTIONS NEED TO BE MADE. IF SO, PREP
     3ARE DATA CORRECTION CARDS AND RESUBMIT.')
      GO TO 9000
C
```

```
C     A MATCHED PAIR OF DATA CORRECTION CARDS HAS BEEN FOUND.
C
   70 GOOD = GOOD + 1
      IF(GOOD.LE.1000) GO TO 90
      WRITE(PRNT,2080)
 2080 FORMAT(T6,'EXECUTION TERMINATED. OVER 1000 CORRECTIONS HAVE BEEN I
     1DENTIFIED. CORRECTED TAPE (OUTPUT) WAS NOT PRODUCED.')
      GO TO 9000
   90 S(GOOD) = CSTA
      DI(GOOD) = CDIR
      DY(GOOD) = NC
      YE(GOOD) = CYR
      DO 100 K=1,24
      VOL(GOOD,K) = OV(K)
  100 CONTINUE
      GO TO 20
C
C     DATA CORRECTION CARDS HAVE BEEN SUCCESSFULLY EDITED. BEGIN TAPE
C       COPYING ROUTINE.
C
  230 WRITE(PRNT,2090) GOOD
 2090 FORMAT('1',T16,'THE PROCESS OF PRODUCING A CORRECTED TAPE HAS BEEN
     1 INITIATED. NO ERRORS WERE DETECTED IN DATA',/,T35,
     2'CORRECTION CARDS.',I5,1X,'TAPE RECORDS ARE TO BE CORRECTED.')
      WRITE(PRNT,2095)
 2095 FORMAT('0',T41,'THE FOLLOWING DATA SETS HAVE BEEN LOADED ONTO TAPE
     1',/,T52,'YEAR',T62,'STATION',T73,'DIRECTION')
      CTR = 0
  240 CONTINUE
C
C     READ A TAPE HEADER RECORD.
C
      READ(TAPIN,2100,END=250) HA,YR,HB
 2100 FORMAT(8A1,I2,140A1)
      GO TO 400
C
C     ALL RECORDS HAVE BEEN READ FROM TAPIN
C
  250 IF(CTR.NE.0) GO TO 260
C
C     NO TAPE RECORDS WERE SUBMITTED. TERMINATE EXECUTION.
C
      WRITE(PRNT,2110)
 2110 FORMAT(T6,'EXECUTION TERMINATED. NO TAPE RECORDS WERE INPUT. CORRE
     1CTED TAPE (OUTPUT) WAS NOT PRODUCED.')
      GO TO 9000
C
C     CHECK TO ASCERTAIN IF EXECUTION WAS SUCCESSFULLY TERMINATED.
C
  260 IF(GOOD.EQ.0) GO TO 270
C
C     EXECUTION UNSUCCESSFUL. MISMATCH BETWEEN CORRECTION CARDS AND
C       TAPE RECORDS.
C
      WRITE(PRNT,2120)
 2120 FORMAT(T6,'EXECUTION TERMINATED. CORRECTED TAPE (OUTPUT) WAS PRODU
     1CED BUT IS ERRONEOUS. APPROPRIATE MATCHES COULD NOT BE FOUND',/,
     2T8,'BETWEEN ALL DATA CORRECTION CARDS AND TAPE RECORDS. DETERMINE
     3ERROR AND RESUBMIT ALL CORRECTIONS.')
      WRITE(PRNT,2121)
```

```
 2121 FORMAT(T10,'THE FOLLOWING DATA CORRECTION CARDS WERE NOT MATCHED',
     1/,T2,'ST D YR DY',T69,'VOLUMES')
      DO 261 I=1,GOOD
      WRITE(PRNT,2122) S(I),DI(I),YE(I),DY(I),(VOL(I,K),K=1,24)
 2122 FORMAT(T2,2I2,I3,I4,24I5)
  261 CONTINUE
      GO TO 9000
C
C     EXECUTION SUCCESSFULLY TERMINATED.
C
  270 WRITE(PRNT,2125)
 2125 FORMAT(T6,'CORRECTED TAPE (OUTPUT) HAS BEEN SUCCESSFULLY PRODUCED'
     1)
      GO TO 9000
C
C     WRITE TAPE HEADER RECORD ON TAPOUT
C
  400 WRITE(TAPOUT,2100) HA,YR,HB
C
C     CALCULATE NUMBER OF TAPE RECORDS
C
      NR = 365
      X = YR/4.
      I = YR/4
      DIFF = X - I
      DIFF = ABS(DIFF)
      IF(DIFF.LT.0.00001) NR=366
C
C     READ ONE SET OF TAPE RECORDS INTO CORE
C
      DO 410 I=1,NR
      READ(TAPIN,2130,END=415) (DA(I,J),J=1,4),STA,DIR,(DB(I,K),K=1,15),
     1YEAR,(DD(I,MM),MM=1,12),DV(I),
     2(V(I,L),L=1,24),(DC(I,M),M=1,13)
 2130 FORMAT(4A1,I2,I1,15A1,I2,12A1,I5,24I4,13A1)
  410 CONTINUE
      GO TO 416
  415 WRITE(PRNT,2132)
 2132 FORMAT(T6,'EXECUTION TERMINATED. ATTEMPTED TO READ AN INCOMPLETE D
     1ATA SET',/,T8,'CORRECTED TAPE (OUTPUT) WAS PRODUCED BUT IS ERRONEO
     2US')
      GO TO 9000
  416 IF(GOOD.EQ.0) GO TO 440
C
C     ASCERTAIN IF ONE OR MORE RECORDS ARE TO BE CORRECTED IN THIS DATA
C       SET
C
      I = 1
  420 CONTINUE
      IF(S(I).EQ.STA.AND.DI(I).EQ.DIR.AND.YEAR.EQ.YE(I)) GO TO 430
      IF(I.EQ.GOOD) GO TO 440
      I = I + 1
      GO TO 420
C
C     ALL RECORDS IN THIS DATA SET HAVE BEEN CORRECTED. WRITE DATA SET
C       ON TAPOUT
C
  440 DO 450 I=1,NR
      WRITE(TAPOUT,2130) (DA(I,J),J=1,4),STA,DIR,(DB(I,K),K=1,15),
     1YEAR,(DD(I,MM),MM=1,12),DV(I),
```

```
     2(V(I,L),L=1,24),(DC(I,M),M=1,13)
  450 CONTINUE
      CTR = CTR + 1
      WRITE(PRNT,2135) YR,STA,DIR
 2135 FORMAT(T53,I2,T65,I2,T77,I1)
      GO TO 240
C
C     CORRECT A TAPE RECORD
C
  430 J = DY(I)
      DV(J)=0
      DO 460 K=1,24
      V(J,K) = VOL(I,K)
      DV(J)=DV(J)+VOL(I,K)
  460 CONTINUE
C
C     ASCERTAIN IF ADDITIONAL CORRECTIONS ARE TO BE MADE
C
      IF(I.NE.GOOD) GO TO 470
      GOOD = GOOD - 1
      GO TO 440
C
C     ADDITIONAL CORRECTIONS ARE TO BE MADE
C
  470 J = I
  480 CONTINUE
      S(J) = S(J+1)
      DI(J) = DI(J+1)
      YE(J) = YE(J + 1)
      DY(J) = DY(J+1)
      DO 490 K=1,24
      VOL(J,K) = VOL(J+1,K)
  490 CONTINUE
      JP1 = J + 1
      IF(JP1.EQ.GOOD) GO TO 500
      J = J + 1
      GO TO 480
  500 GOOD = GOOD - 1
      IF(GOOD.EQ.0) GO TO 440
      GO TO 420
 9000 CALL EXIT
      END
/*
//GO.FT08F001 DD UNIT=(TAPE,,DEFER),VOL=SER=E09625,DSN=DTRTEST,
//  LABEL=(1,SL),DISP=(OLD,KEEP),
//  DCB=(RECFM=FB,LRECL=150,BLKSIZE=15000)
//GO.FT09F001 DD UNIT=(TAPE,,DEFER),VOL=SER=E09652,DSN=DTRTEST,
//  LABEL=(2,SL),DISP=(NEW,KEEP),
//  DCB=(RECFM=FB,LRECL=150,BLKSIZE=15000)
//GO.SYSIN DD *
  27   0  76  26   1   10    0   10   10   20    0  250  140  160  110  130  130
  27   0  76  26  13  190  150  150  320  240  160  100   90   60   40   50   30
  27   0  76   4   100000   10   20   10    0   10   10   30   40   80   90  110
  27   0  76   4  13  140  140  170  140  170  140  130  100   70   60   40   20
  27   0  75  26   1   10    0   10   10   20    0  250  140  160  110  130  130
  27   0  75  26  13  190  150  150  320  240  160  100   90   60   40   50   30
/*
```

APPENDIX H

UPDATE FLOWCHART

CHART TITLE - NON-PROCEDURAL STATEMENTS

09/19/77
CHART TITLE - INTRODUCTORY COMMENTS

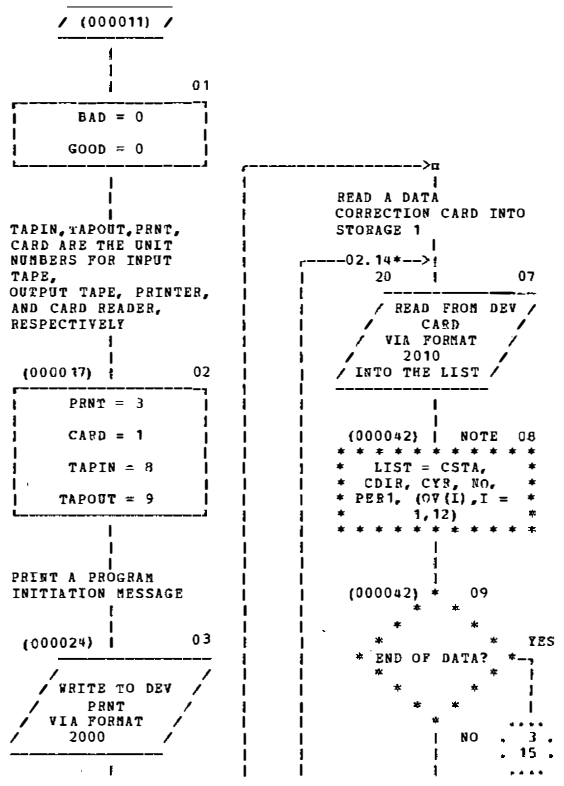
AUTOFLOW CHART SET - PROGRAM

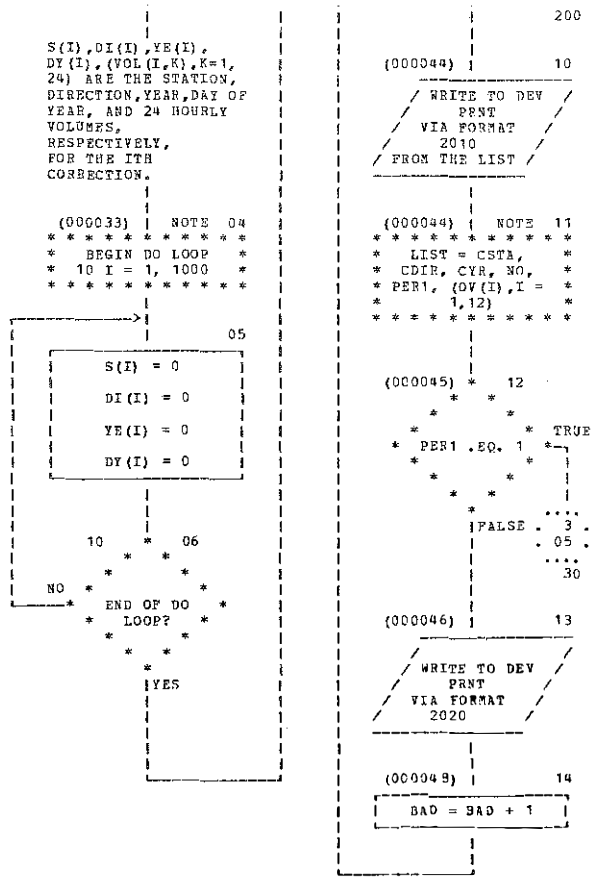
BAD IS INDICATOR OF ERRONEOUS DATA CORRECTION CARDS. IF NON-ZERO,
AT LEAST ONE CARD IS IN ERROR.

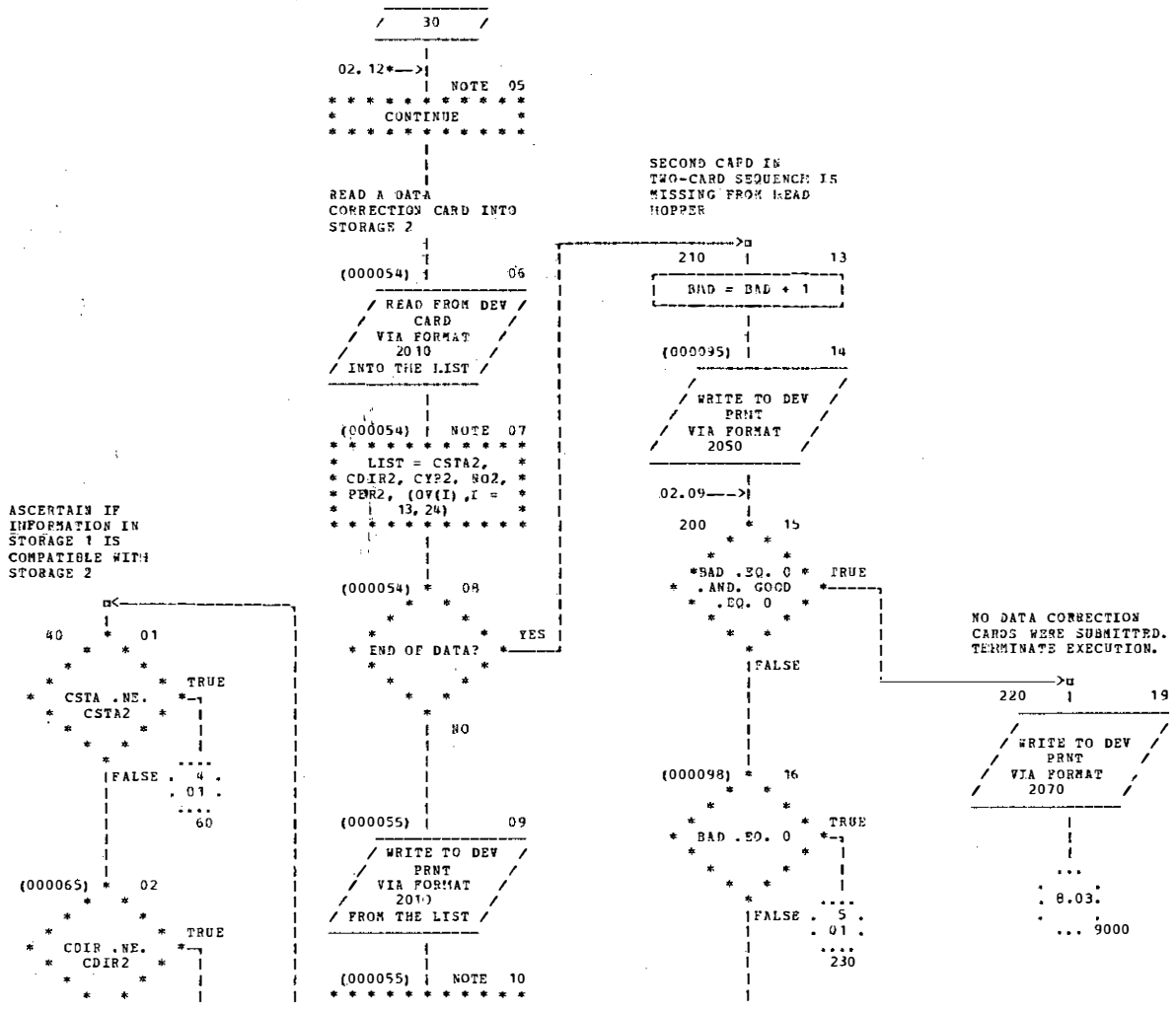
GOOD CONTAINS NUMBER OF CORRECTIONS TO BE MADE.

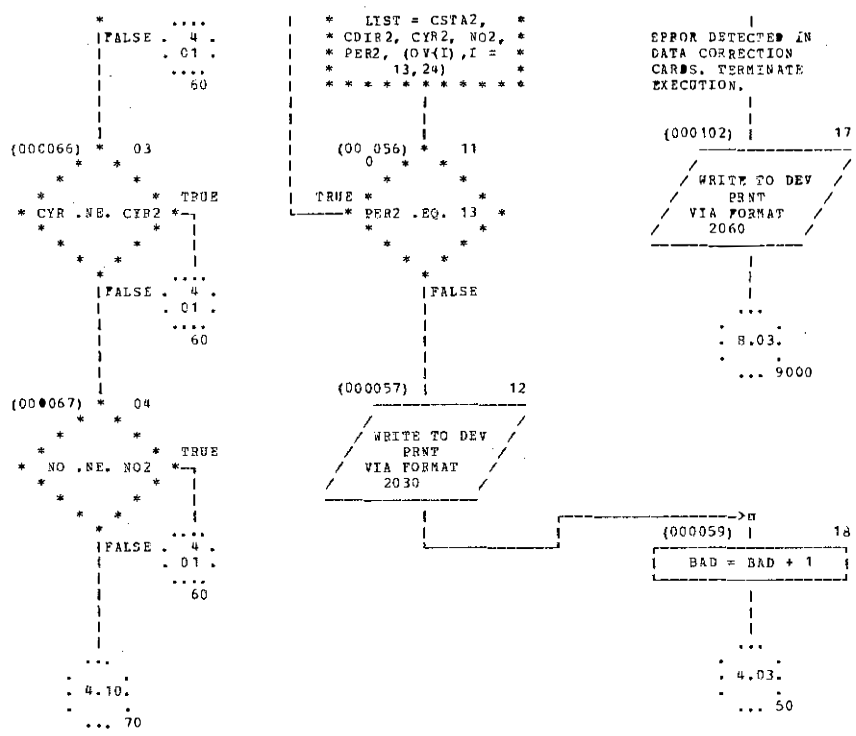
09/19/77
CHART TITLE - PROCEDURES

AUTOFLOW CHART SET - PROGRAM




S(I),DI(I),YE(I),
DY(I),(VOL(I,K),K=1,
24) ARE THE STATION,
DIRECTION,YEAR,DAY OF
YEAR, AND 24 HOURLY
VOLUMES,
RESPECTIVELY,
FOR THE ITH
CORRECTION.
(000033)
NOTE 04
BEGIN DO LOOP
10 I = 1, 1000
05
S(I) = 0
DI(I) = 0
YE(I) = 0
DY(I) = 0
10
06
NO
END OF DO LOOP?
YES
200
(000044)
10
WRITE TO DEV PRNT VIA FORMAT 2010 FROM THE LIST
(000044)
NOTE 11
LIST = CSTA, CDIR, CYR, NO, PER1, (OV(I),I = 1,12)
(000045)
12
PER1 .EQ. 1
TRUE
FALSE
3
05
30
(000046)
13
WRITE TO DEV PRNT VIA FORMAT 2020
(000049)
14
BAD = BAD + 1


30
02. 12
NOTE 05
CONTINUE
READ A DATA CORRECTION CARD INTO STORAGE 2
(000054)
06
READ FROM DEV CARD VIA FORMAT 2010 INTO THE LIST
(000054)
NOTE 07
LIST = CSTA2, CDIR2, CY?2, NO2, PER2, (OV(I),I = 13, 24)
(000054)
08
END OF DATA?
YES
NO
(000055)
09
WRITE TO DEV PRNT VIA FORMAT 2010 FROM THE LIST
(000055)
NOTE 10
ASCERTAIN IF INFORMATION IN STORAGE 1 IS COMPATIBLE WITH STORAGE 2
40
01
CSTA .NE. CSTA2
TRUE
FALSE . 4 . . 01 . 60
(000065)
02
CDIR .NE. CDIR2
TRUE
SECOND CARD IN TWO-CARD SEQUENCE IS MISSING FROM READ HOPPER
210
13
BAD = BAD + 1
(000095)
14
WRITE TO DEV PRNT VIA FORMAT 2050
02.09
200
15
BAD .EQ. 0 .AND. GOOD .EQ. 0
TRUE
FALSE
(000098)
16
BAD .EQ. 0
TRUE
FALSE . 5 . . 01 . 230
NO DATA CORRECTION CARDS WERE SUBMITTED. TERMINATE EXECUTION.
220
19
WRITE TO DEV PRNT VIA FORMAT 2070
. . .
. 8.03.
. . .
... 9000



09/19/77
CHART TITLE - PROCEDURES

AUTOFLOW CHART SET - PROGRAM

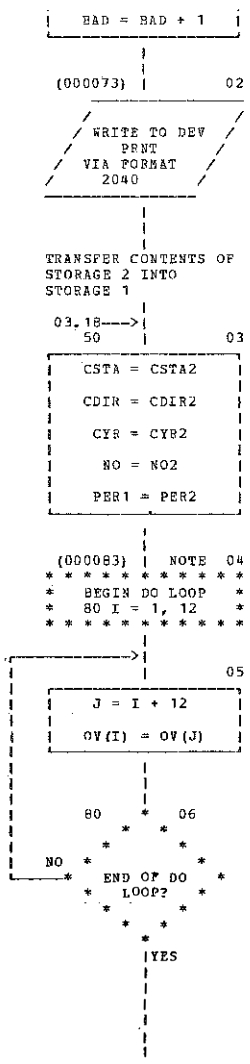
TWO STORAGE LOCATIONS
ARE INCOMPATIBLE.
WRITE ERROR MESSAGE.

03.01 60 → 01

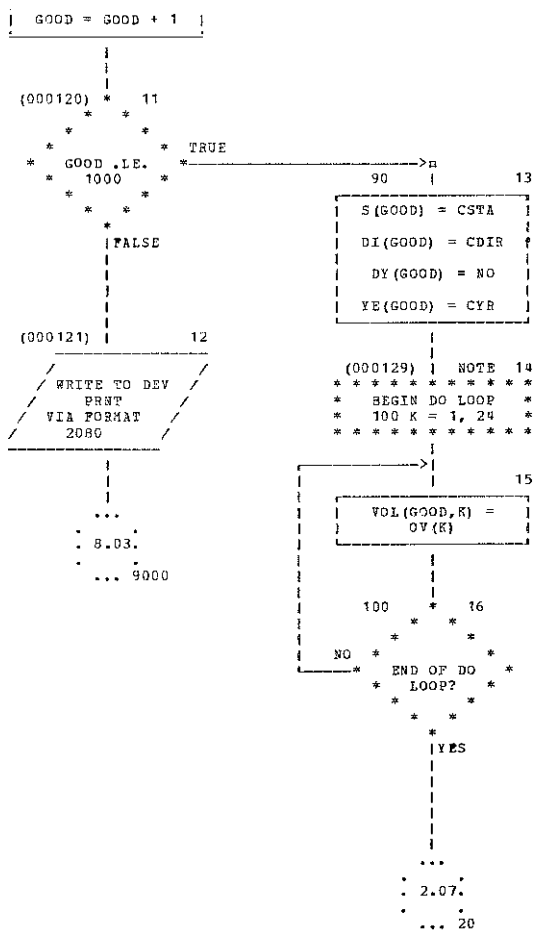
A MATCHED PAIR OF
DATA CORRECTION CARDS
HAS BEEN FOUND.

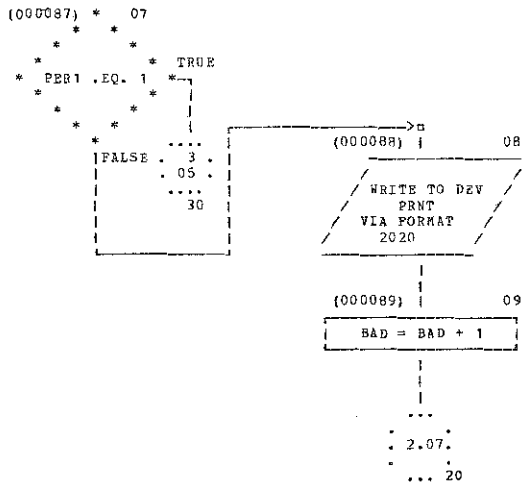
03.04 70 → 10

09/19/77
CHART TITLE - PROCEDURES



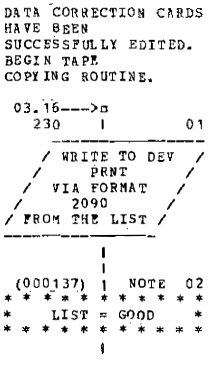
AUTOFLOW CHART SET - PROGRAM

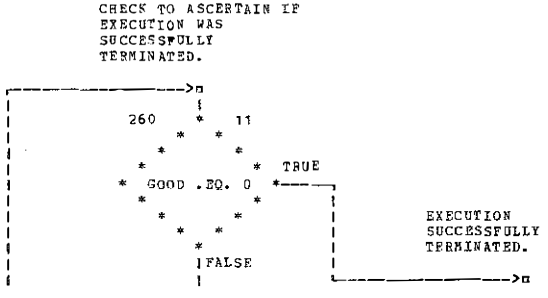


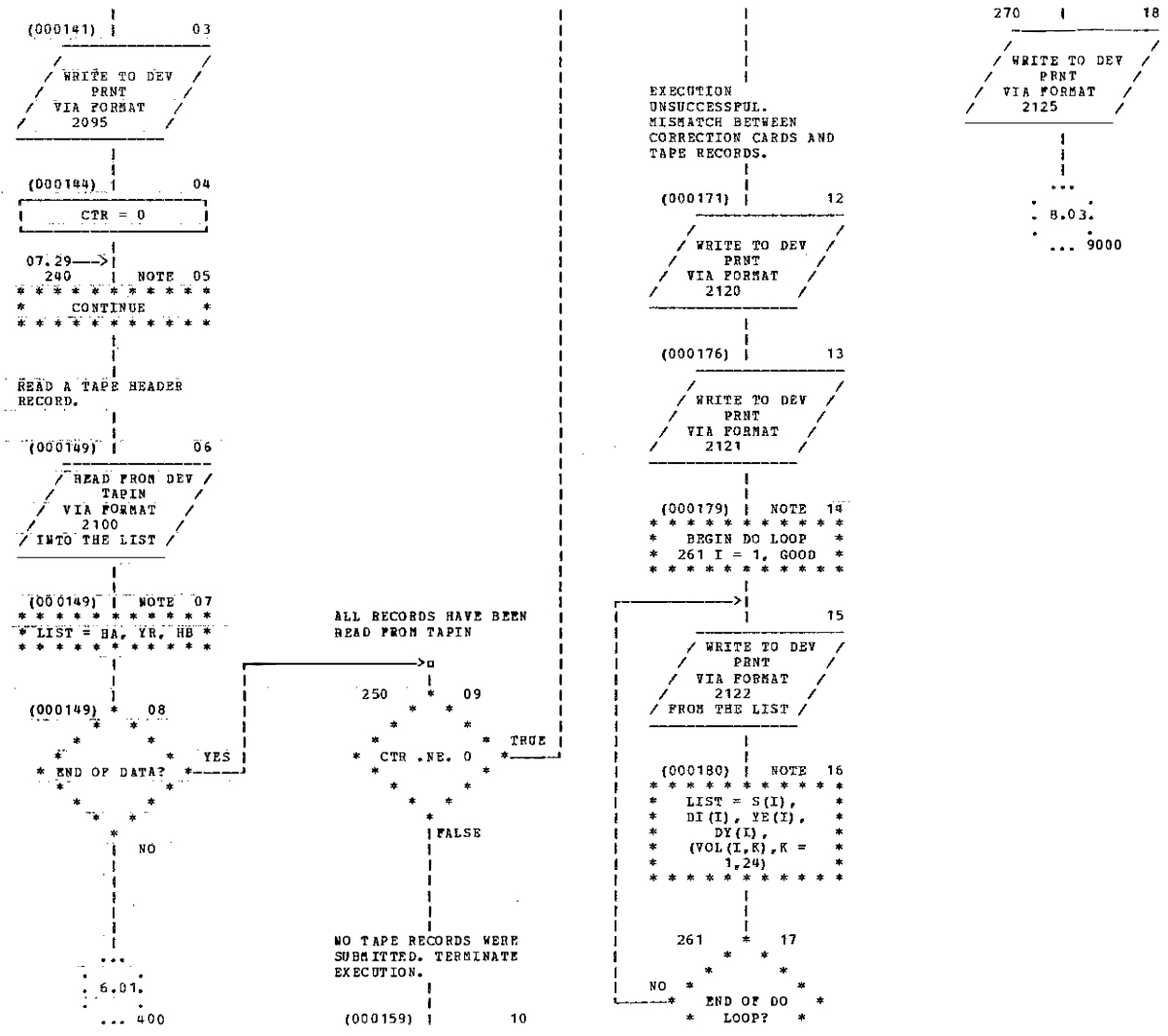


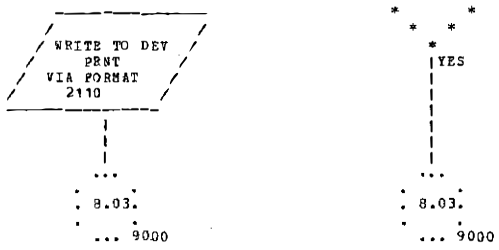
09/19/77
CHART TITLE - PROCEDURES

AUTOFLOW CHART SET - PROGRAM



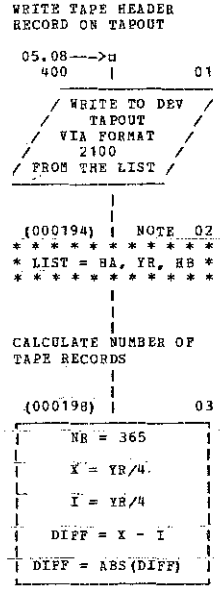


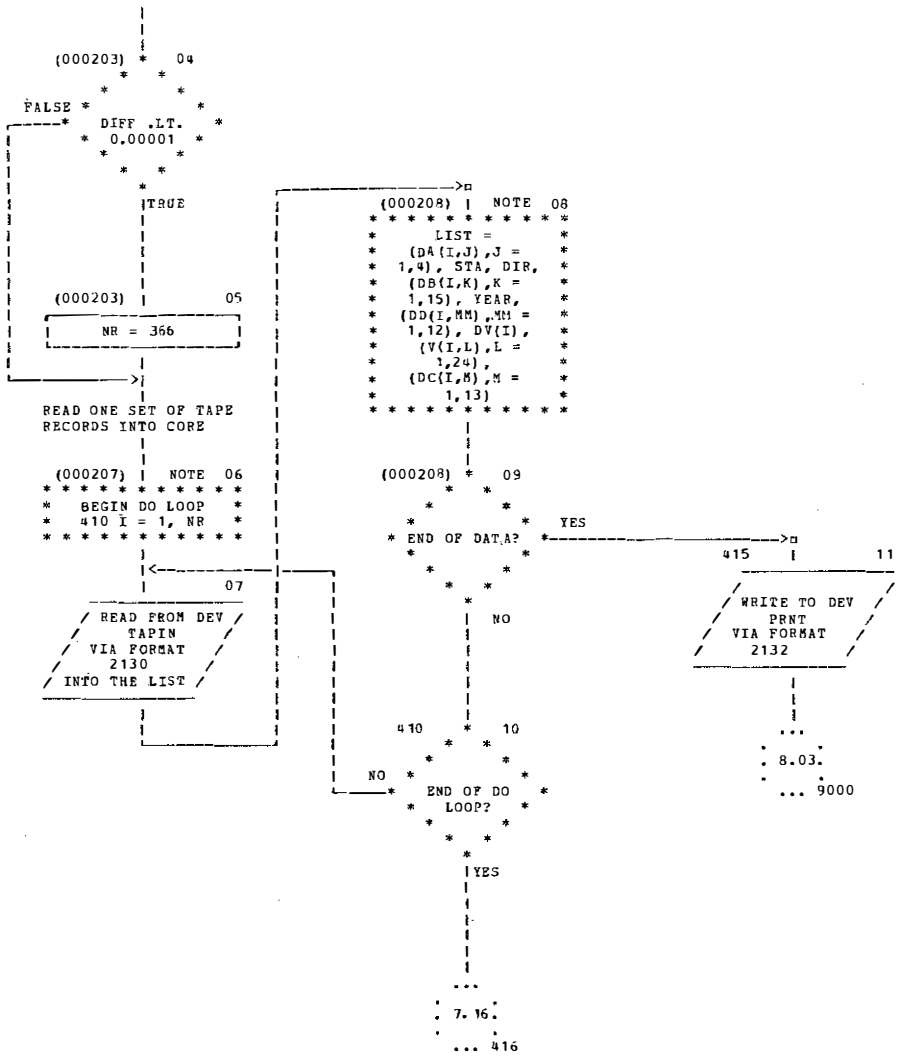

(000141) 03
WRITE TO DEV PRNT VIA FORMAT 2095
(000144) 04
CTR = 0
07.29 240
NOTE 05
CONTINUE
READ A TAPE HEADER RECORD.
(000149) 06
READ FROM DEV TAPIN VIA FORMAT 2100 INTO THE LIST
(000149) NOTE 07
LIST = HA, YR, HB
(000149) 08
END OF DATA?
YES
NO
6.01.
400
ALL RECORDS HAVE BEEN READ FROM TAPIN
250 09
CTR .NE. 0
TRUE
FALSE
NO TAPE RECORDS WERE SUBMITTED. TERMINATE EXECUTION.
(000159) 10
EXECUTION UNSUCCESSFUL. MISMATCH BETWEEN CORRECTION CARDS AND TAPE RECORDS.
(000171) 12
WRITE TO DEV PRNT VIA FORMAT 2120
(000176) 13
WRITE TO DEV PRNT VIA FORMAT 2121
(000179) NOTE 14
BEGIN DO LOOP 261 I = 1, GOOD
15
WRITE TO DEV PRNT VIA FORMAT 2122 FROM THE LIST
(000180) NOTE 16
LIST = S(I), DI(I), YE(I), DY(I), (VOL(I,K),K = 1,24)
261 17
NO
END OF DO LOOP?
270 18
WRITE TO DEV PRNT VIA FORMAT 2125
8.03.
9000

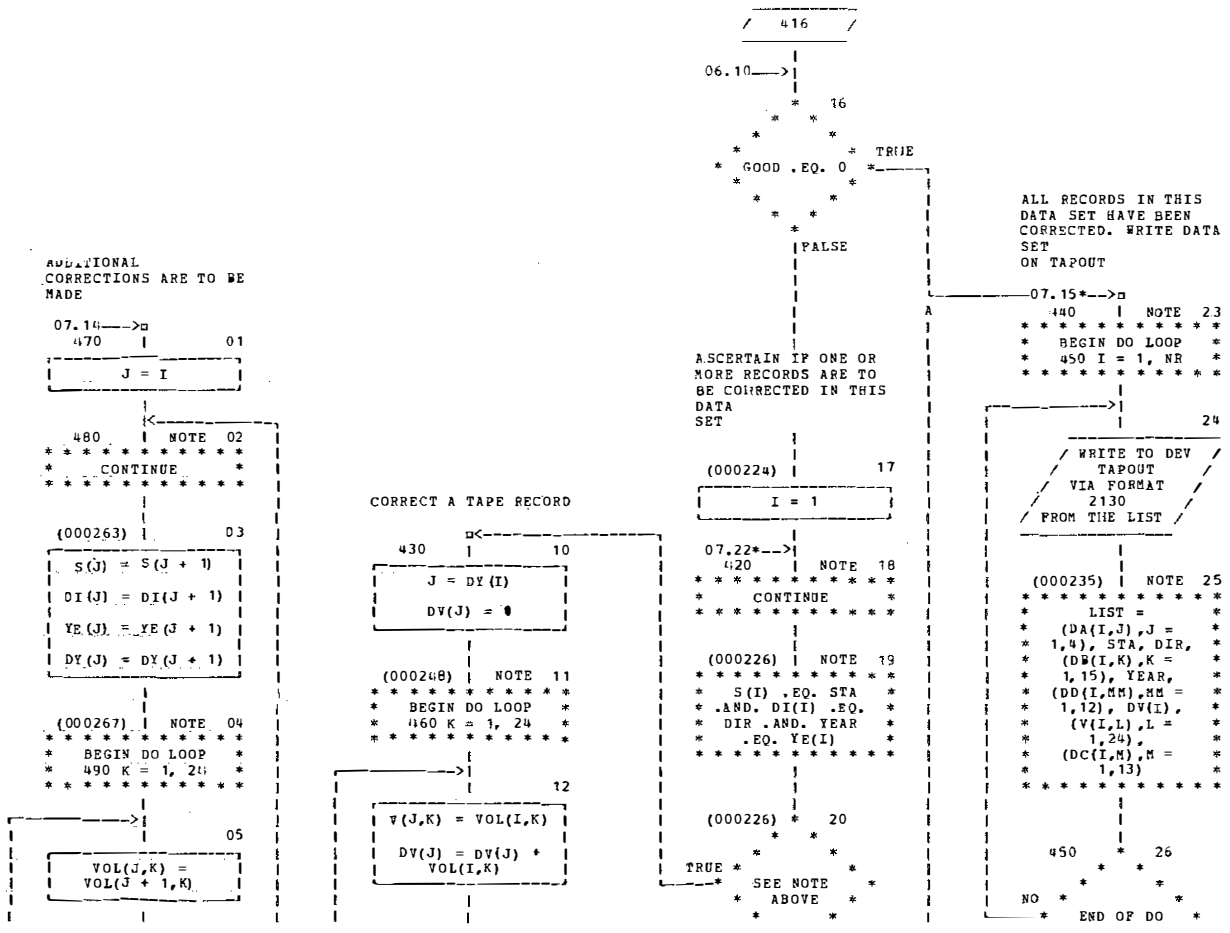


09/19/77
CHART TITLE - PROCEDURES

AUTOFLOW CHART SET - PROGRAM

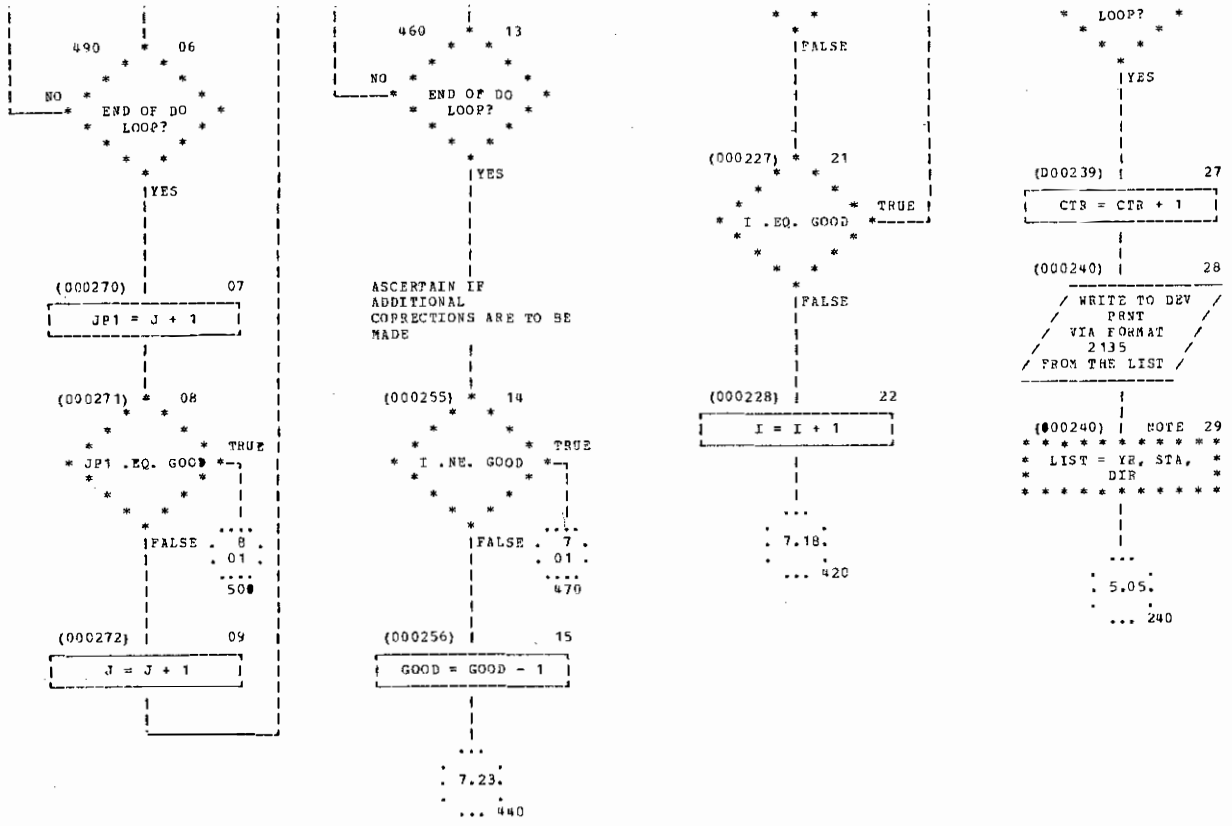



(000203) 04
FALSE
DIFF .LT. 0.00001
TRUE
(000203) 05
NR = 366
READ ONE SET OF TAPE RECORDS INTO CORE
(000207) NOTE 06
BEGIN DO LOOP 410 I = 1, NR
07
READ FROM DEV TAPIN VIA FORMAT 2130 INTO THE LIST
(000208) NOTE 08
LIST = (DA(I,J),J = 1,4), STA, DIR, (DB(I,K),K = 1,15), YEAR, (DD(I,MM),MM = 1,12), DV(I), (V(I,L),L = 1,24), (DC(I,M),M = 1,13)
(000208) 09
END OF DATA?
YES
415 11
WRITE TO DEV PRNT VIA FORMAT 2132
8.03.
... 9000
NO
410 10
END OF DO LOOP?
NO
YES
7.16.
... 416


/ 416 /
06.10
16
TRUE
GOOD .EQ. 0
FALSE
ASCERTAIN IF ONE OR MORE RECORDS ARE TO BE CORRECTED IN THIS DATA SET
(000224) 17
I = 1
07.22
420 NOTE 18
CONTINUE
(000226) NOTE 19
S(I) .EQ. STA .AND. DI(I) .EQ. DIR .AND. YEAR .EQ. YE(I)
(000226) 20
TRUE
SEE NOTE ABOVE
NO
ALL RECORDS IN THIS DATA SET HAVE BEEN CORRECTED. WRITE DATA SET ON TAPOUT
07.15
440 NOTE 23
BEGIN DO LOOP 450 I = 1, NR
24
WRITE TO DEV TAPOUT VIA FORMAT 2130 FROM THE LIST
(000235) NOTE 25
LIST = (DA(I,J),J = 1,4), STA, DIR, (DB(I,K),K = 1,15), YEAR, (DD(I,MM),MM = 1,12), DV(I), (V(I,L),L = 1,24), (DC(I,M),M = 1,13)
450 26
END OF DO
ADDITIONAL CORRECTIONS ARE TO BE MADE
07.16
470 01
J = I
480 NOTE 02
CONTINUE
(000263) 03
S(J) = S(J + 1)
DI(J) = DI(J + 1)
YE(J) = YE(J + 1)
DY(J) = DY(J + 1)
(000267) NOTE 04
BEGIN DO LOOP 490 K = 1, 24
05
VOL(J,K) = VOL(J + 1,K)
CORRECT A TAPE RECORD
430 10
J = DY(I)
DV(J) = 0
(000248) NOTE 11
BEGIN DO LOOP 460 K = 1, 24
12
V(J,K) = VOL(I,K)
DV(J) = DV(J) + VOL(I,K)

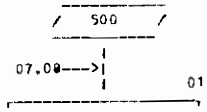
09/19/77
CHART TITLE - NON-PROCEDURAL STATEMENTS

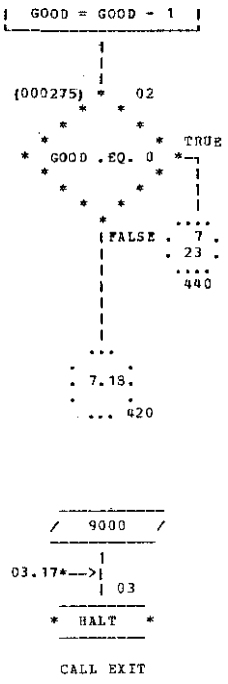
AUTOFLOW CHART SET - PROGRAM



09/19/77
CHART TITLE - PROCEDURES

AUTOFLOW CHART SET - PROGRAM




GOOD = GOOD - 1
(000275)
02
GOOD .EQ. 0
TRUE
FALSE
7
23
440
7.18.
420

9000
03.17
03
HALT
CALL EXIT

```
      INTEGER CARD,TAPIN,TAPOUT,PRNT
      INTEGER CSTA,CDIR,CYR,NO,CSTA2,CDIR2,CYR2,NO2,PER1,PER2,OV(24)
      INTEGER BAD,GOOD,S(1000),DI(1000),DY(1000),VOL(1000,24),CTR
      INTEGER V(366,24),YR,STA,DIR,YE(1000),YEAR,DV(366)
      DIMENSION HA(8),HB(140),DA(366,4),DB(366,15),DC(366,13),DD(366,12)
2000  FORMAT('1',T58,'PROGRAM UPDATE',//,T33,'THE PROCESS OF EDITING DAT
     A CORRECTION CARDS HAS BEEN INITIATED.',///,T25,'LIST OF DATA CORR
     ECTION CARDS',T98,'ERROR MESSAGES',/)
2010  FORMAT(5I4,12I5)
2020  FORMAT(T83,'ABOVE CARD SHOULD HAVE PERIOD OF 1')
2030  FORMAT(T83,'ABOVE CARD SHOULD HAVE PERIOD OF 13')
2040  FORMAT(T83,'ABOVE PAIR OF CARDS DO NOT MATCH')
2050  FORMAT(T83,'SECOND CARD IN TWO-CARD SEQUENCE IS MISSING')
2060  FORMAT(T6,'EXECUTION TERMINATED. ERROR WAS DETECTED IN SET OF DATA
      CORRECTION CARDS. CORRECTED TAPE (OUTPUT) WAS NOT PRODUCED.',/,
     T8,'CORRECT DATA CORRECTION CARDS AND RESUBMIT.')
2070  FORMAT(T6,'EXECUTION TERMINATED. NO DATA CORRECTION CARDS WERE INP
     UT TO THIS RUN. CORRECTED TAPE (OUTPUT) WAS NOT PRODUCED.',/,
     T8,'CHECK TO ASCERTAIN IF CORRECTIONS NEED TO BE MADE. IF SO, PREP
     ARE DATA CORRECTION CARDS AND RESUBMIT.')
2080  FORMAT(T6,'EXECUTION TERMINATED. OVER 1000 CORRECTIONS HAVE BEEN I
     DENTIFIED. CORRECTED TAPE (OUTPUT) WAS NOT PRODUCED.')
2090  FORMAT('1',T16,'THE PROCESS OF PRODUCING A CORRECTED TAPE HAS BEEN
      INITIATED. NO ERRORS WERE DETECTED IN DATA',/,T35,
     'CORRECTION CARDS.',I5,1X,'TAPE RECORDS ARE TO BE CORRECTED.')
2095  FORMAT('0',T41,'THE FOLLOWING DATA SETS HAVE BEEN LOADED ONTO TAPE
     ',/,T52,'YEAR',T62,'STATION',T73,'DIRECTION')
2100  FORMAT(8A1,I2,140A1)
2110  FORMAT(T6,'EXECUTION TERMINATED. NO TAPE RECORDS WERE INPUT. CORRE
     CTED TAPE (OUTPUT) WAS NOT PRODUCED.')
2120  FORMAT(T6,'EXECUTION TERMINATED. CORRECTED TAPE (OUTPUT) WAS PRODU
```

```
      CED BUT IS ERRONEOUS. APPROPRIATE MATCHES COULD NOT BE FOUND',/,
     T8,'BETWEEN ALL DATA CORRECTION CARDS AND TAPE RECORDS. DETERMINE
     ERROR AND RESUBMIT ALL CORRECTIONS.')
2121  FORMAT(T10,'THE FOLLOWING DATA CORRECTION CARDS WERE NOT MATCHED',
     /,T2,'ST D YR DY',T69,'VOLUMES')
2122  FORMAT(T2,2I2,I3,I4,24I5)
2125  FORMAT(T6,'CORRECTED TAPE (OUTPUT) HAS BEEN SUCCESSFULLY PRODUCED'
     )
2130  FORMAT(4A1,I2,I1,15A1,I2,12A1,I5,24I4,13A1)
2132  FORMAT(T6,'EXECUTION TERMINATED. ATTEMPTED TO READ AN INCOMPLETE D
     ATA SET',/,T8,'CORRECTED TAPE (OUTPUT) WAS PRODUCED BUT IS ERRONEO
     US')
2135  FORMAT(T53,I2,T65,I2,T77,I1)

END OF AUTOFLOW CHART SET          278 INPUT STATEMENTS PROCESSED          EXECUTION TIME -          25 SEC
```

APPENDIX I

SAMPLE UPDATE OUTPUT

TABLE I-1. SAMPLE LIST OF DATA CORRECTION CARDS THAT WERE INPUT TO PROGRAM UPDATE (CONTAINS TWO CARDS WITH INCORRECT YEAR)

```
                                        PROGRAM UPDATE

                THE PROCESS OF EDITING DATA CORRECTION CARDS HAS BEEN INITIATED.

                        LIST OF DATA CORRECTION CARDS                                   ERROR MESSAGES

27  0  76  26   1   10   0   10   10   20    0  250  140  160  110  130  130
27  0  76  26  13  190 150  150  320  240  160  100   90   60   40   50   30
27  0  76   4   1    0  10   20   10    ●   10   10   30   40   80   90  110
27  0  76   4  13  140 140  170  140  170  140  130  100   70   60   40   20
27  0  75  26   1   10   0   10   10   20    0  250  140  160  110  130  130
27  0  75  26  13  190 150  150  320  240  160  100   90   60   40   50   30
```

TABLE I-2. SAMPLE OUTPUT OF UPDATE IF INPUT CORRECTION CARDS CONTAIN ERRONEOUS INFORMATION (SUCH AS INCORRECT YEAR)

```
THE PROCESS OF PRODUCING A CORRECTED TAPE HAS BEEN INITIATED. NO ERRORS WERE DETECTED IN DATA
                CORRECTION CARDS.    3 TAPE RECORDS ARE TO BE CORRECTED.

                        THE FOLLOWING DATA SETS HAVE BEEN LOADED ONTO TAPE
                                YEAR        STATION     DIRECTION
                                 76           22           3
                                 76           22           7
                                 76           27           0
   EXECUTION TERMINATED. CORRECTED TAPE (OUTPUT) WAS PRODUCED BUT IS ERRONEOUS. APPROPRIATE MATCHES COULD NOT BE FOUND
     BETWEEN ALL DATA CORRECTION CARDS AND TAPE RECORDS. DETERMINE ERROR AND RESUBMIT ALL CORRECTIONS.
       THE FOLLOWING DATA CORRECTION CARDS WERE NOT MATCHED
ST D YR DY                                                              VOLUMES
27 0 75  26   10    0   10   10   20    0  250  140  160  110  130  130  190  150  150  320  240  160  100   90   60   40   50   30
```

TABLE I-3 SAMPLE OUTPUT OF PROGRAM UPDATE IF NO DATA CORRECTION CARDS ARE SUBMITTED

```
                                PROGRAM UPDATE

        THE PROCESS OF EDITING DATA CORRECTION CARDS HAS BEEN INITIATED.

                LIST OF DATA CORRECTION CARDS                           ERROR MESSAGES

EXECUTION TERMINATED. NO DATA CORRECTION CARDS WERE INPUT TO THIS RUN. CORRECTED TAPE (OUTPUT) WAS NOT PRODUCED.
  CHECK TO ASCERTAIN IF CORRECTIONS NEED TO BE MADE. IF SO, PREPARE DATA CORRECTION CARDS AND RESUBMIT.
```

APPENDIX J

LIST OF CODES

COUNTY CODES

COUNTY	CODE	COUNTY	CODE	COUNTY	CODE
Adair	001	Grant	041	Mason	081
Allen	002	Graves	042	Meade	082
Anderson	003	Grayson	043	Menifee	083
Ballard	004	Green	044	Mercer	084
Barren	005	Greenup	045	Metcalfe	085
Bath	006	Hancock	046	Monroe	086
Bell	007	Hardin	047	Montgomery	087
Boone	008	Harlan	048	Morgan	088
Bourbon	009	Harrison	049	Muhlenberg	089
Boyd	010	Hart	050	Nelson	090
Boyle	011	Henderson	051	Nicholas	091
Bracken	012	Henry	052	Ohio	092
Breathitt	013	Hickman	053	Oldham	093
Breckinridge	014	Hopkins	054	Owen	094
Bullitt	015	Jackson	055	Owsley	095
Butler	016	Jefferson	056	Pendleton	096
Caldwell	017	Jessamine	057	Perry	097
Calloway	018	Johnson	058	Pike	098
Campbell	019	Kenton	059	Powell	099
Carlisle	020	Knott	060	Pulaski	100
Carroll	021	Knox	061	Robertson	101
Carter	022	Larue	062	Rockcastle	102
Casey	023	Laurel	063	Rowan	103
Christian	024	Lawrence	064	Russell	104
Clark	025	Lee	065	Scott	105
Clay	026	Leslie	066	Shelby	106
Clinton	027	Letcher	067	Simpson	107
Crittenden	028	Lewis	068	Spencer	108
Cumberland	029	Lincoln	069	Taylor	109
Daviess	030	Livingston	070	Todd	110
Edmonson	031	Logan	071	Trigg	111
Elliott	032	Lyon	072	Trimble	112
Estill	033	McCracken	073	Union	113
Fayette	034	McCreary	074	Warren	114
Fleming	035	McLean	075	Washington	115
Floyd	036	Madison	076	Wayne	116
Franklin	037	Magoffin	077	Webster	117
Fulton	038	Marion	078	Whitley	118
Gallatin	039	Marshall	079	Wolfe	119
Garrard	040	Martin	080	Woodford	120

DATA SET IDENTIFIER CODES

DESCRIPTION	CODE
Station and year includes only one set of data (i.e., one-way facility or two-way facility without directional count)	0
This is the first of a two-directional data set	1
This is the second of a two-directional set	2

DAY OF MONTH CODES

DAY	CODE
January 1st	01
.	.
.	.
.	.
January 31st	31
.	.
.	.
.	.
December 1st	01
.	.
.	.
.	.
December 31st	31

DAY OF WEEK CODES

DAY	CODE
Sunday	1
.	.
.	.
.	.
Saturday	7

DAY OF YEAR CODES

DAY	CODE
January 1st	001
.	
.	
.	
January 31st	031
.	
.	
.	
December 31st	365 (366 if leap year)

DIRECTION CODES

DIRECTION	CODE
North	1
South	5
East	3
West	7

HOLIDAY INDICATOR CODES

DESCRIPTION	CODE
Day not under the influence of a holiday	0
Day under the influence of a holiday	1
Holiday	2

MONTH OF YEAR CODES

MONTH	CODE
January	01
.	.
.	.
.	.
December	12

SEASON OF YEAR CODES

SEASON	CODE
Winter (December-February)	1
Spring (March-May)	2
Summer (June-August)	3
Fall (September-November)	4

ROAD SYSTEM CODES

ROAD SYSTEM	CODE
Federal-Aid Interstate	1
Federal-Aid Primary	2
Federal-Aid Secondary	3

WEEK OF YEAR CODES

WEEK	CODE
January 1st - January 7th	01
.	.
.	.
.	.
December 25th - December 31st	52 (53 if leap year)

ROUTE GROUP CODES

This is a two-digit code to be supplied by the user.

ROUTE DESIGNATION CODES

DESCRIPTION	CODE
US 60	US 0060
US 25E	US 0025E
US 25W	US 0025W
US 41A	US 0041A
KY 1973	KY 1973
Mountain Parkway	TR 9000
Western Kentucky Parkway	TR 9001
Bluegrass Parkway	TR 9002
Jackson Purchase Parkway	TR 9003
Pennyrile Parkway	TR 9004
Audubon Parkway	TR 9005
Daniel Boone Parkway	TR 9006
Green River Parkway	TR 9007
Cumberland Parkway	TR 9008
I 65	I 9065
I 75	I 9075
I 64	I 9064
I 71	I 9071
I 264	I 9264
I 275	I 9275
I 471	I 9471