

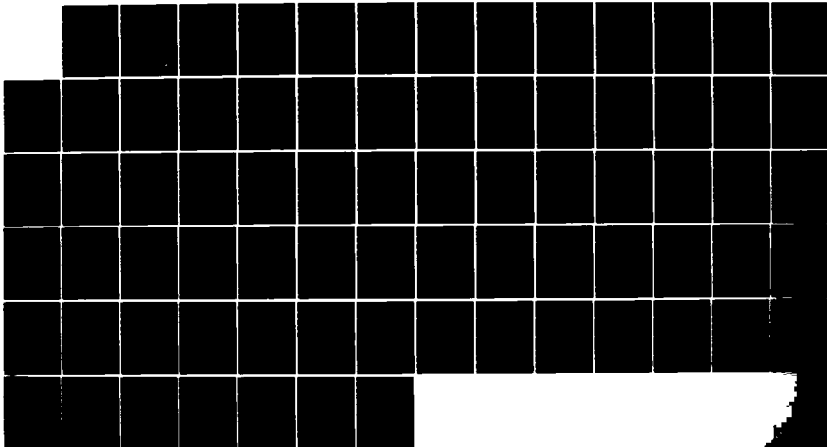
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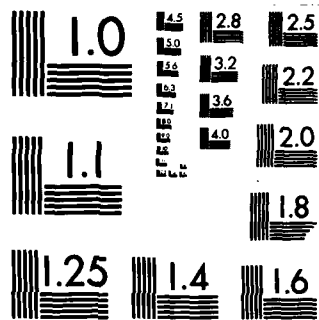
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AFGL-TR-84-0275

PROCEDURE FOR EDITING THE FLUXGATE
MAGNETOMETER DATA OF THE AFGL MAGNETOMETER NETWORK

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AD-A156 331

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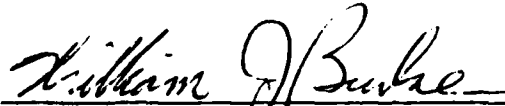
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<p>The procedure for producing the edited data base of the AFGL Magnetometer Network is described in detail. The input to the procedure is the series of archive tapes on which the raw data from the seven network stations are recorded; the output is several series of tapes containing the edited data from the fluxgate magnetometer only. Each series has either a one-second or a one-minute (averaged) sampling interval and is written in a tape format selected for compatibility with one or more specific computer types used at the Air Force Geophysics Laboratory, The World Data Center, and other scientific institutions. Detailed instructions are given for the execution of each of the computer programs employed in the procedure as well as for the basic operation of the network minicomputer on which the procedure is carried out. The procedure is highly automated and the description provided is sufficient to permit its being carried out by an untrained operator.</p>					
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I. GENERAL INFORMATION ON THE VARIAN 72 COMPUTER

I.A Use of this Manual

This manual is divided into two sections. The first is an introduction to the use of the Varian 72 (V72) computer. The second involves the description of the programs used in the process for preparing edited tapes for the Air Force Geophysics Laboratory, the World Data Center, and other institutions.

My recommendations for the use of this manual are as follows. First, if one has no familiarity at all with the V72, then I highly recommend one to read section I, GENERAL INFORMATION ON THE VARIAN 72 COMPUTER, thoroughly. Second, if one does have some knowledge of the operation of the V72 computer, then one should use section I only as a reference. Third, if one desires to process tapes and is not familiar with the procedure, then one should read section II, EDITING MAGNETOMETER NETWORK DATA. Also, in section II.A there is a brief description of the processing procedure along with the features and functions of each program in all of section II. The programs have been explained so that if one wishes to learn about the CMB PROGRAM, then one can just read the part about the CMB PROGRAM and nothing else to execute it. Also, one should read a program thoroughly to learn about all the possible options that are available, and possible situations in which the program can be used. Fourth, I recommend any user of the V72 computer to read this entire manual to learn what kinds of programs and commands are available, because they might be helpful to whatever operation one is conducting on the computer although indirectly related.

I.B Types of Commands: OPCOM and JCP

There are basically two types of commands (requests) to operate the V72 computer. A request to the Operator Communicator (OPCOM) begins with a semicolon (;). A request to the Job Control Processor (JCP) begins with a forward slash (/). OPCOM is generally more powerful than JCP. For example whenever requesting most background programs a JCP command is used, and to abort background programs an OPCOM command is used. All the programs discussed are background programs.

The OPCOM command runs foreground programs and the JCP command runs background programs. More than one foreground program can be run at a time, whereas only one background program can be run at a time. Foreground programs have higher priority than background programs. Section I of this manual will deal with OPCOM Commands (ABORT, ASSIGN, DEVDN, DEVUP, and IOLIST, TSTAT), and the rest of the manual will deal with JCP commands.

One important function by an operator of the V72 computer is pressing the return. One assumes that to send a keyboard input to the computer one must press the return. For example to communicate with the computer one must press the return to enter a command, press the return after entering a response to a question so the computer receives the information, and press the return after all the questions of a program so the computer can begin execution. Thus, throughout this manual whenever a communication occurs with the computer pressing the return will be assumed, and thus not mentioned. Also, when a question is asked which requires a number as the response and no response is entered from the teletype terminal followed by a return, the response to the question would be the same as if a \emptyset was entered from the teletype terminal. Finally, when a question is asked which requires a letter as the response one should answer it, otherwise when one proceeds by pressing the return the question will be filled with a blank response.

Another important fact about using the V72 computer is that whenever a (/) is typed followed by a return or a (/) is typed and a program name followed by a return, then one will hear a beep sound. This beep sound will also be heard whenever the return is pressed after a question in a program or when a plot has been completed on the teletype screen. The beep sound is an indication that the computer is either ready or waiting for input. One should always wait to hear the beep after a return; one should not press the return again until the beep sound occurs first. Otherwise, a problem may occur where the JCP becomes hung up and then nothing can be executed from the teletype terminal. To solve this problem one can type ;ABORT,JCP this may put the computer into a form again where one can execute programs from the teletype terminal. However, sometimes this solution will not correct the problem and then one will have to reboot the system, which will be discussed in section I.F.

The programs are stored on disk in various libraries. Some are in the background library (BL) and the rest are in alternate libraries as shown in figure 1. The easiest type of program to request is one located in the background library. The following would be conducted to request a program on the background library

```
/(NAME OF PROGRAM)
```

For example

```
/WA5                or                /PM
```

If a program is located in one of the alternate libraries then the procedure is slightly different as follows

```
/ALTLIB,(NAME OF LIBRARY)  
  JC** <-- Computer Response  
/(NAME OF PROGRAM)
```

For example

```
/ALTLIB,D2  
  JC** <-- Computer Response  
/CV2
```

To abort a program the OPCOM command ABORT is used

```
;ABORT,(NAME OF PROGRAM)  
  JC** <-- Computer Response
```

For example

```
;ABORT,WA5                or                ;ABORT,CV2  
  JC** <-- Computer Response                JC** <-- Computer Response
```

FILE DIRECTORY FOR LUN BL			
FILE NAME	START	END	CURRENT
FMAIN	3	103	103
IOUTIL	103	144	144
USORT	144	223	223
EDIT	223	262	262
DUMP2T	262	472	472
D	262	472	472
PROTEC	472	475	475
TAPLOG	475	624	624
TAPDUP	624	723	723
LINCHK	723	1116	1116
DISKNU	1116	1162	1162
SBOOT	1162	1175	1175
RELINK	1175	1214	1214
LMGEN	1214	1314	1314
DASMR	1314	1442	1442
JCP	1442	1477	1477
FORT	1477	1776	1776
USACT3	1776	2002	2002
USACT1	1776	2002	2002
USACT2	1776	2002	2002
ASM	2002	2064	2064
FTN	2002	2064	2064
MUFIL	2064	2216	2216
ARCOPY	2216	2222	2222
FC3	2222	2652	2652
PS	2652	3242	3242
PM	3242	3535	3535
WAS	3535	4155	4155

UNAS 4155 5121

FILE DIRECTORY FOR LUN D2			
FILE NAME	START	END	CURRENT
IMP	2	114	101
KPR	114	222	222
KPS	222	352	352
CMB	352	467	467
TCV	467	643	643
RGN	643	1033	1033
CU2	1033	1165	1165
IMC	1165	1321	1321

FILE DIRECTORY FOR LUN D5			
FILE NAME	START	END	CURRENT
MAGINT	2	271	271
CHANGE	271	274	274
ARCOPY	274	330	330
ARCHIV	330	342	342
DUMP2	342	517	517
RTCOIL	517	601	600
SHU	601	754	754
WASDS	754	1331	1331
CAT	1331	1751	1751
SXAT40	1751	2021	2012
MZ	2021	2033	2026
AS12	2033	2045	2034
TEST	2045	2071	2062
APP	2071	2242	2242
API	2242	2412	2412
DF1	2412	2556	2516
DP1	2556	2722	2657
DD1	2722	3066	3031

UNAS 3066 3221

FILE DIRECTORY FOR LUN D0			
FILE NAME	START	END	CURRENT
JUNK	3	313	10
PLOTFL	313	1443	710
DSCFL1	313	1443	723
DSCFL2	1443	2263	1766
DSCFL3	2263	3021	2264
DSCFLA	2263	3021	2775
DSCFLB	3021	3557	3021
S1	3557	3615	3573
SI	3615	3653	3632
BLD	3653	3742	3742
DTR	3742	4101	4101
ARMAND	4101	4543	4540
FIND	4543	4707	4707
ACC	4707	4776	4776
SSS	4776	5435	5435
SPRINT	5435	5660	5660
FPRINT	5660	6102	6102
TEMP	6102	6302	6302
LACE	6302	6401	6401
FILT	6401	6617	6617
PLGT	6617	7066	7066
SCREEN	7066	7172	7172
MAGH	7172	7334	7334
READ	7334	7755	7755
HODO	7755	10303	10303
REXP	10303	10542	10542
SHS	10542	10756	10756
AP4	10756	11116	11116

UNAS 11116 11301

FILE DIRECTORY FOR LUN D4			
FILE NAME	START	END	CURRENT
S1	2	64	54
NTR	64	227	227
DATA	227	356	356
UA	356	443	443
XFR	443	526	526
SH4	526	732	732
TCK	732	1043	1043
TUCK	1043	1162	1162

UNAS 1162 1321

FILE DIRECTORY FOR LUN FL			
FILE NAME	START	END	CURRENT
MAGNT2	2	5	5
AID	5	20	20
USOPCM	20	71	71
JPCUMP	71	100	100
RADI	100	144	144
PATCH	144	170	170
BTPTCH	170	175	175
PTCHIM	175	207	207
DEBUG	207	221	221
ARCTAP	221	253	253
MAGINT	253	306	306
FR	306	356	353

UNAS 356 1701

Figure 1: A listing of the programs on various libraries as of September 1984.

I.C Types of Error Messages: I030, I000, and I014

At this point in this manual three types of error messages, which come from the computer operating system (I030, I000, and I014), that commonly occur will be discussed.

The parity error (labeled as I030 on the teletype screen) is the most frequent error of the three types. A parity error is an error which may occur while reading or writing a tape. This error can best be explained by the following example. A tape may have written on it an illegible record because there may be a bad spot on the tape, or dirt on the tape head, or some malfunction by the computer. Whenever this tape is read the parity error will appear as an I030 on the teletype screen. This is a peculiar error because it does not always show up on the teletype screen or on the Taplog. For example a tape may be read on a tape unit and there would be no sign of a parity error on the teletype screen or on the Taplog; but then at some other time, possibly when reading the tape on a different tape drive, a parity error will appear on the teletype screen and/or on the Taplog. An important point is that when the computer is executing a program and it encounters a parity error then the I030 message will appear on the teletype screen; and in some cases the program itself will give a message on the teletype screen in addition to the message from the operating system.

The I000 error indicates that a device is not available, which could happen when the tape unit is not put on line and/or by checking the IOLIST (discussed in section I.D) one may see that the device is down. This error will continue to occur because the computer will always try to input/output until it succeeds. An example of this error and its solution is discussed on page and shown in figure 3.

The I014 error occurs usually when the computer tries to write on a tape and it cannot, because the write ring has been removed from the tape. Thus, to eliminate this error one can place a write ring in the groove of the back of the tape and then proceed. There are other causes of this error but they will not be discussed because these causes occur rarely.

I.D Checks of Computer Status: IOLIST, TSTAT, and (/)

Three important checks one should do whenever one begins and finishes working with the V72 Computer are:

<u>CHECK #1</u>	<u>CHECK #2</u>	<u>CHECK #3</u>
<u>;IOLIST</u>	<u>;TSTAT</u>	
DD (060)• UC00	USCPT P30 5047401, 000000	JC01
P1 (015)• LP00	USAL P26 5047401, 000000	JC11
M3 (023)• MT00	UZDB P24 5047401, 000000	
M2 (022)• MT01	USTYA P23 5047411, 000000	
M1 (021)• MT02	UZUCA P22 5047511, 000000 TM 077777 TS 077555	
SX (007)• D01B	UZSPOA P22 5047401, 000000	
S0 (190)• LP00	USCLPS P22 5047401, 000000	
PL (050)• D01E	UZATA P22 5047401, 000000	
DU (039)• MT00	USPLP P21 5047511, 000100 TM 077777 TS 077337	
LS (024)• TY00	USOPCM P10 5005405, 020000	
D7 (037)• D01C	JCP P01 5044400, 000000	
D6 (036)• D01F		
D5 (035)• D00J		
D4 (034)• D01D		
D3 (033)• D00L		
D2 (032)• D01C		
D1 (031)• D00K		
D0 (030)• D01A		
OC (001)• TY00		
SI (002)• TY00		
S0 (003)• TY00		
PI (004)• D00L		
LO (005)• TY00		
BI (006)• D00I		
BO (007)• D00I		
SS (008)• D00H		
CO (009)• D00C		
PO (010)• D00H		
DI (011)• TY00		
DO (012)• TY00		
CU (101)• D00E		
SU (102)• D00F		
CL (103)• D00A		
OM (104)• D00D		
BL (105)• D00C		
FL (106)• D00B		

The IOLIST (input/output list from computer to peripheral units: teletype screen, tape unit, etc.) can be used for three purposes: to check whether the devices are up or down, whether DU is assigned to the proper device, and whether LS is assigned to the proper output unit.

There are three devices MT00, MT01, and MT02, each of which is a tape unit. The IOLIST in column 1 of figure 2 has listed the various devices. One needs to check whether the devices are up or down; if a device is down then any tape mounted on that tape unit cannot be read from or written to. Comparing the IOLIST in the first column to that in the second column of figure 2, one can see that in the second column MT02 is down by noticing the D (DOWN) printed next to it. To bring the device back up for use one should type

```
;DEVUP,MT02
```

```

;IOLIST
DD (060)= UC00
PI (015)= LP00
M3 (023)= MT00
M2 (022)= MT01
M1 (021)= MT02
SX (107)= D01B
S0 (180)= LP00
PL (050)= D01E
DU (039)= MT00
LS (024)= TY00
D7 (037)= D01G
D6 (036)= D01F
D5 (035)= D00J
D4 (034)= D01D
D3 (033)= D00L
D2 (032)= D01C
D1 (031)= D00K
D0 (030)= D01H
OC (001)= TY00
SI (002)= TY00
S0 (003)= TY00
PI (004)= D00L
LO (005)= TY00
BI (006)= D00I
BO (007)= D00I
SS (008)= D00H
GO (009)= D00G
PO (010)= D00H
DI (011)= TY00
DO (012)= TY00
CU (101)= D00E
SU (102)= D00F
CL (103)= D00A
OM (104)= D00D
BL (105)= D00C
FL (106)= D00B

```

```

;IOLIST
DD (060)= UC00
PI (015)= LP00
M3 (023)= MT00
M2 (022)= MT01
M1 (021)= MT02
SX (107)= D01B
S0 (180)= LP00
PL (050)= D01E
DU (039)= MT00
LS (024)= TY00
D7 (037)= D01G
D6 (036)= D01F
D5 (035)= D00J
D4 (034)= D01D
D3 (033)= D00L
D2 (032)= D01C
D1 (031)= D00K
D0 (030)= D01H
OC (001)= TY00
SI (002)= TY00
S0 (003)= TY00
PI (004)= D00L
LO (005)= TY00
BI (006)= D00I
BO (007)= D00I
SS (008)= D00H
GO (009)= D00G
PO (010)= D00H
DI (011)= TY00
DO (012)= TY00
CU (101)= D00E
SU (102)= D00F
CL (103)= D00A
OM (104)= D00D
BL (105)= D00C
FL (106)= D00B

```

```

;IOLIST
DD (060)= UC00
PI (015)= LP00
M3 (023)= MT00
M2 (022)= MT01
M1 (021)= MT02
SX (107)= D01B
S0 (180)= LP00
PL (050)= D01E
DU (039)= MT00
LS (024)= TY00
D7 (037)= D01G
D6 (036)= D01F
D5 (035)= D00J
D4 (034)= D01D
D3 (033)= D00L
D2 (032)= D01C
D1 (031)= D00K
D0 (030)= D01H
OC (001)= TY00
SI (002)= TY00
S0 (003)= TY00
PI (004)= D00L
LO (005)= TY00
BI (006)= D00I
BO (007)= D00I
SS (008)= D00H
GO (009)= D00G
PO (010)= D00H
DI (011)= TY00
DO (012)= TY00
CU (101)= D00E
SU (102)= D00F
CL (103)= D00A
OM (104)= D00D
BL (105)= D00C
FL (106)= D00B

```

Figure 2

which stands for DEVICE UP MT02. Then if one checks the IOLIST again one can see that device MT02 is now up as shown in column 3 of figure 2; thus, it can now be used again from the teletype terminal.

In general the devices should always be up and ready for use. However, there is an exception. Sometimes when one tries to execute a program a problem may arise and one method to solve the problem is by bringing the device down by typing

```
;DEVDN,MT02
```

which stands for DEVICE DOWN MT02. For example, if one tries to read a blank tape with a program like TAPLOG a problem will result because the computer will fail to read to any device and simply typing ;ABORT,TAPLOG will not suffice; one must bring the device down to abort the program and then bring the device up again. The procedure for this example is shown in figure 3.

```
^TAPLOG  
ENTER INPUT UNIT: 1,2,3 FOR M1,M2,M3.  
3  
  
SIGN FOR SINGLE PRINT SS3 FOR ALL PRINT, SS2 TO LOG GAPS.  
  
1000, MT00  
1000, MT00  
1000, MT00  
;DEVDN,MT00  
1000, MT00  
1000, MT00  
1001, TAPLOG  
JC14  
  
;DEVUP,MT00
```

Figure 3

Many programs ask which tape units to read from and/or write on which can easily be answered by typing in the number of the tape unit as requested usually (M1, M2, or M3); however, some programs assume the tape is on device DU and do not ask which tape unit. In this case the tape is read on whatever tape unit DU is assigned to, MT00 usually. Looking at the IOLIST in column 1 of figure 4 one notices that DU is assigned to its appropriate tape unit, MT00. If one desires to read a tape on a device where DU is not assigned, then one can assign DU to the device of one's choice. For example to read a tape on MT01 one should type

```
;ASSIGN,DU,MT01
```



```

;IOLIST
DD (060) = UC00
PI (015) = LP00
M3 (023) = MT00
M2 (022) = MT01
M1 (021) = MT02
SX (107) = D01B
S0 (180) = LP00
PL (050) = D01E
DU (039) = MT00
LS (024) = TY00
D7 (037) = D01G
D6 (036) = D01F
D5 (035) = D00J
D4 (034) = D01D
D3 (033) = D00L
D2 (032) = D01C
D1 (031) = D00K
D0 (030) = D01A
OC (001) = TY00
SI (002) = TY00
S0 (003) = TY00
PI (004) = D01F
LO (005) = TY00
BI (006) = D00I
BO (007) = D00I
SS (008) = D00H
GO (009) = D00G
PO (010) = D00H
DI (011) = TY00
DO (012) = TY00
CU (013) = D00E
SU (012) = D00F
CL (013) = D00A
OM (014) = D00D
BL (015) = D00C
FL (016) = D00B

```

```

;IOLIST
DU (060) = UC00
PI (015) = LP00
M3 (023) = MT00
M2 (022) = MT01
M1 (021) = MT02
SX (107) = D01B
S0 (180) = LP00
PL (050) = D01E
DU (039) = MT01
LS (024) = TY00
D7 (037) = D01G
D6 (036) = D01F
D5 (035) = D00J
D4 (034) = D01D
D3 (033) = D00L
D2 (032) = D01C
D1 (031) = D00K
D0 (030) = D01A
OC (001) = TY00
SI (002) = TY00
S0 (003) = TY00
PI (004) = D01F
LO (005) = TY00
BI (006) = D00I
BO (007) = D00I
SS (008) = D00H
GO (009) = D00G
PO (010) = D00H
DI (011) = TY00
DO (012) = TY00
CU (013) = D00E
SU (012) = D00F
CL (013) = D00A
OM (014) = D00D
BL (015) = D00C
FL (016) = D00B

```

```

;IOLIST
DD (060) = UC00
PI (015) = LP00
M3 (023) = MT00
M2 (022) = MT01
M1 (021) = MT02
SX (107) = D01B
S0 (180) = LP00
PL (050) = D01E
DU (039) = MT00
LS (024) = TY00
D7 (037) = D01G
D6 (036) = D01F
D5 (035) = D00J
D4 (034) = D01D
D3 (033) = D00L
D2 (032) = D01C
D1 (031) = D00K
D0 (030) = D01A
OC (001) = TY00
SI (002) = TY00
S0 (003) = TY00
PI (004) = D00L
LO (005) = TY00
BI (006) = D00I
BO (007) = D00I
SS (008) = D00H
GO (009) = D00G
PO (010) = D00H
DI (011) = TY00
DO (012) = TY00
CU (013) = D00E
SU (012) = D00F
CL (013) = D00A
OM (014) = D00D
BL (015) = D00C
FL (016) = D00B

```

Figure 4

Then checking the IOLIST in column 2 of figure 4 one notes that DU is now assigned to MT01. Remember that whenever dealing with a program that reads from DU check the IOLIST before requesting the program, and whenever finishing with a program that reads from or writes on DU check the IOLIST to make sure that DU is assigned to the usual device MT00, and if it is not then assign it to that device by typing

```
;ASSIGN,DU,MT00
```

then checking the IOLIST in column 3 of figure 4 one notes that DU is assigned back to its usual device. Also, whenever the system is rebooted (discussed in section I.F) DU is assigned to its usual device MT00.

Some programs depend on the assignment of LS for data printout to a certain unit. Looking at the IOLIST in column one of figure 5 one notices that LS is assigned to its appropriate unit, TY00. When LS is assigned to TY00 the printout for certain programs, for example DUMP2, are printed on the on the teletype screen. Also, such programs can be printed on the line printer and to do so one should type

```
;ASSIGN,LS,SP00
```

then checking the IOLIST in column 2 of figure 5 one notes that LS is assigned to SP00. Remember that whenever dealing with a program whose printout depends on LS assignment check the IOLIST before requesting the program, and whenever finishing with a program that prints out according to LS assignment check the IOLIST to make sure that LS is assigned back to its usual printout unit TY00, and if it is not then assign it to that unit by typing.

```
;ASSIGN,LS,TY00
```

then checking the IOLIST in column 3 of figure 5 one notes that LS is assigned back to its usual unit. Also, whenever the system is rebooted (discussed in section I.F) LS is not returned to its usual unit but to SP00; thus, LS has to be assigned to its usual unit.

In summary, when using the IOLIST check to see that all the devices are up before and after using the computer. Use the IOLIST to check where DU is before using a program that reads from or writes on DU, and when finished assign DU back to MT00 if it is not already there. Finally, check LS before using a program whose printout depends on the assignment of LS.

```

;IOLIST
DD (060) = UC00
PI (015) = LP00
M3 (023) = MT00
M2 (022) = MT01
M1 (021) = MT02
SX (107) = D01B
S0 (180) = LP00
PL (050) = D01E
DU (039) = MT00
LS (024) = TY00
D7 (037) = D01G
D6 (036) = D01F
D5 (035) = D00J
D4 (034) = D01D
D3 (033) = D00L
D2 (032) = D01C
D1 (031) = D00K
D0 (030) = D01A
OC (001) = TY00
SI (002) = TY00
SO (003) = TY00
PI (004) = D01F
LO (005) = TY00
BI (006) = D00I
BO (007) = D00I
SS (008) = D00H
GO (009) = D00G
PO (010) = D00H
DI (011) = TY00
DO (012) = TY00
CU (101) = D00E
SU (102) = D00F
CL (103) = D00A
OM (104) = D00D
BL (105) = D00C
FL (106) = D00B

```

```

;IOLIST
DD (060) = UC00
PI (015) = LP00
M3 (023) = MT00
M2 (022) = MT01
M1 (021) = MT02
SX (107) = D01B
S0 (180) = LP00
PL (050) = D01E
DU (039) = MT00
LS (024) = SP00
D7 (037) = D01G
D6 (036) = D01F
D5 (035) = D00J
D4 (034) = D01D
D3 (033) = D00L
D2 (032) = D01C
D1 (031) = D00K
D0 (030) = D01A
OC (001) = TY00
SI (002) = TY00
SO (003) = TY00
PI (004) = D00L
LO (005) = TY00
BI (006) = D00I
BO (007) = D00I
SS (008) = D00H
GO (009) = D00G
PO (010) = D00H
DI (011) = TY00
DO (012) = TY00
CU (101) = D00E
SU (102) = D00F
CL (103) = D00A
OM (104) = D00D
BL (105) = D00C
FL (106) = D00B

```

```

;IOLIST
DD (060) = UC00
PI (015) = LP00
M3 (023) = MT00
M2 (022) = MT01
M1 (021) = MT02
SX (107) = D01B
S0 (180) = LP00
PL (050) = D01E
DU (039) = MT00
LS (024) = TY00
D7 (037) = D01G
D6 (036) = D01F
D5 (035) = D00J
D4 (034) = D01D
D3 (033) = D00L
D2 (032) = D01C
D1 (031) = D00K
D0 (030) = D01A
OC (001) = TY00
SI (002) = TY00
SO (003) = TY00
PI (004) = D01F
LO (005) = TY00
BI (006) = D00I
BO (007) = D00I
SS (008) = D00H
GO (009) = D00G
PO (010) = D00H
DI (011) = TY00
DO (012) = TY00
CU (101) = D00E
SU (102) = D00F
CL (103) = D00A
OM (104) = D00D
BL (105) = D00C
FL (106) = D00B

```

Figure 5

The TSTAT indicates the task status of the computer. For example when no program has been requested, the TSTAT appears as it does in the upper-half of figure 6. There are eleven lines; the first ten begin with a 'V' and the last line with JCP. When a program like IMC is being executed the TSTAT will appear as it does in the lower-half of figure 6, where the first eleven lines are the same as before, but now there is a twelfth line which is the name of the program being executed. Thus, the TSTAT can be used to see whether a program is being executed or not.

The forward slash (/) can also be used to check whether or not a background program is being executed. For example if a program is not being executed then when one types

```

/
JCØ1  <-- Computer Response
JC**  <--      "      "

```

If the JCP is busy, for example when a background program is being executed, then when one types

```

/

```

there will be no response from the computer.

As a useful method, the (/) can sometimes be used to abort a background program, only. When a question of a background program is being asked responding with the (/) key will abort the program. Once the question(s) have been asked and the program is running a (/) cannot be used to abort it, only by typing ;ABORT,(NAME OF PROGRAM) will the program abort. An example of this procedure is illustrated in figure 7.

```

/TMPLOG
ENTER INPUT UNIT: 1,2,3 FOR M1,M2,M3.
/
1013, TMPLOG
JCØ1
JCØØ

/TMPLOG
ENTER INPUT UNIT: 1,2,3 FOR M1,M2,M3.
]
SIGN FOR SINGLE PRINT 553 FOR ALL PRINT, 552 TO LOG GAPS.
SEQ 8159 20:20:50 FOLLOWS 0 0 01 01 0 0

SEQ 8159 20:50:30 FOLLOWS 8159 20:50:1 0 39
SEQ 8159 21: 0:10 FOLLOWS 8159 20:50:10 55
;ABORT,TMPLOG
JCØØ

```

Figure 7

```

;TSTAT
U$SCPT P30 S047401, 000000
U$SAL P26 S047401, 000000
UZDE P24 S047401, 000000
UITYH P23 S047411, 000000
UZUCH P22 S047511, 000000 TH 077777 TS 077445
UZSPOH P22 S047401, 000000
U$CLPS P22 S047401, 000000
UZMTA P22 S047401, 000000
U$SPLP P21 S047511, 000100 TH 077777 TS 077774
U$OPCM P10 S005405, 020000
JCP P01 S044400, 000000

```

```

;TSTAT
U$SCPT P30 S047401, 000000
U$SAL P26 S047401, 000000
UZDE P24 S047401, 000000
UITYH P23 S047411, 000000
UZUCH P22 S047511, 000000 TH 077777 TS 077713
UZSPOH P22 S047401, 000000
U$CLPS P22 S047401, 000000
UZMTA P22 S047401, 000000
U$SPLP P21 S047511, 000100 TH 077777 TS 077471
U$OPCM P10 S005405, 020000
JCP P01 S044400, 000000
IMC P00 S100001, 000000

```

Figure 6

One final item of importance to be mentioned is that whenever a program has completed running or whenever a program is aborted the following will be printed on the teletype screen

JC** <-- Computer Response

and this message is accompanied by a beep sound.

I.E Correcting Keyboard Entry Errors: (\) and Rub-out key

Another type of slash, the back slash (\), can be used to discard the line that was just typed. For example a line has been typed and before pressing the return key one notices a typing mistake. One can just type a (\) to cancel that line and start over. Whenever the (\) key is pressed there always is a line feed and if one uses the (\) when answering questions in a program then there also will be a return to the left margin. Examples of using the (\) are shown in figure 8.

```

/ALTKIB,D2\
/ALTLIB,D2
JC**

CV2 PROGRAM - MAKES IN FROM IS TAPES
REVISION CV2.1      22 MAR 83      D.J.KNECHT
-----
1. MOUNT THE IS-SERIES TAPE ON ANY TAPE UNIT
2. PRESS RETURN TO START THE RUN, WHEN READY
-----
IS TAPE NUMBER: (VDD)
3022\
3033
2 INPUT TAPE UNIT (1,2,3)
-----
                SETUP COMPLETE
PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN
```

Figure 8

Another technique to correct a typographical error is to enter a rub-out, but this can only be used to correct the last character typed, and the next to the last and so on. Each rub-out removes one character, working backwards from the end of the line. A rub-out is entered by depressing the shift key and then the rub-out key, and it appears on the screen as an underscore. Examples of using the rub-out are shown in figure 9.

```

/WAH_5
/WSS__A5
/WS2__A5
/QAS___WAS
```

Figure 9

I.F V72 Front Panel: Sign Switch and Sense Switches

Many of the programs that are run require the use of four buttons on the V72 panel besides answering the questions. The sign switch is the button labeled 15 on the panel in figure 10, which is a diagram of the V72 panel, and it is used frequently in executing programs. The sign switch is momentary: that is, it is on by pressing and holding (the light above it will turn on); when one stops pressing it, it is off (the light above it will turn off). The sign switch when pressed sends a signal to the computer to do a certain function, which is dependent on the logic of a particular program. The sign switch can be used in a variety of ways to send a message, for example one common use is often when a new tape has to be mounted during the middle of a program. During execution of the WA5 program the archive tape being read reaches its end and begins to rewind. To continue the process the next archive tape read has to be mounted and the sign switch pressed as the statement indicates in figure 11. Also, the sign switch can be pressed to signal the computer that a blank IM tape has been mounted and is ready to be written as in figure 11.

Many programs rely on the sense switches located on the V72 panel. There are three sense switches: sense switch 1 (SS1), sense switch 2 (SS2), and sense switch 3 (SS3) as shown in figure 10. A sense switch is turned on by pressing and releasing the button (the red light above it will turn on). To turn off the sense switch one presses it and releases the button (the light above it will turn off). A sense switch, like the sign switch when pressed sends a signal to the computer to do a certain function, which is dependent on the logic of a particular program. The sense switch(es) can be used in a variety of ways to send a message, for example during execution of the WA5 program a sense switch (in this case SS1) can be used to fill out the day with blank frames as indicated in figure 11. Also, SS2 can be used to omit the IM tape after an IS tape has been written as shown in figure 11. Also, more than one sense switch can be turned on at a time during an execution of a program. Finally, if a sense switch is not used by a program, then it has no effect on the program whether it is on or off. Generally all sense switches should be turned off when not needed by the program being executed and when one has finished using the V72 computer.



varian data machines

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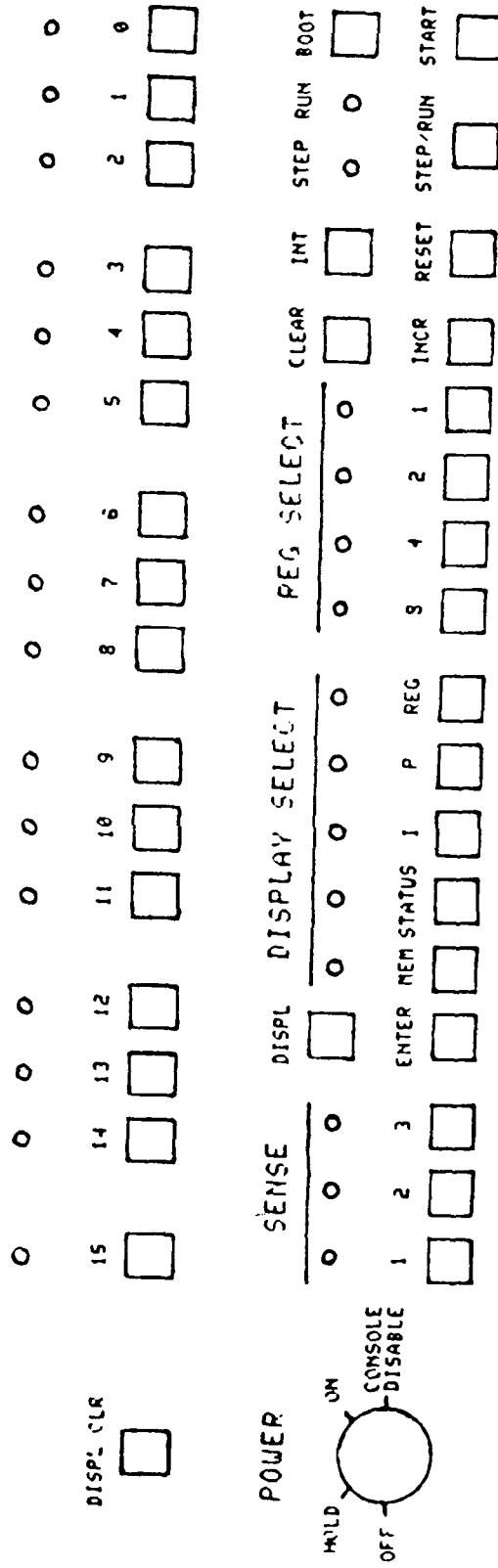


Figure 10

UHS PROGRAM TO EDIT FLUXGATE DATA

INTERIM 1-SEC TAPE, INTERIM 1-MIN TAPE, WITH NO PLOTS
 REVISION 04.1 (1 MAR 82) B.J.KNECHT

- 1. PRINT THE ARCHIVE TAPE ON ANY TAPE UNIT
- 2. PRINT A BLANK TAPE ON ANOTHER TAPE UNIT
- 3. CHILL SENSE SWITCHES OFF TAPES ON LINE
- 4. SET MARGIN CONTROL TO 8 COLUMNS AUTOPRINT
- 5. PRESS RETURN TO START THE RUN WHEN READY

-----OPTION SELECTION-----
 YOUR OWN NAME AND DATE OF RUN [EXAMPLE] SMITH 85 FEB 82

USE PREVIOUS DATA? (1=YES) ARCHIVE TAPE IS READ OTHERWISE

ONE-SECOND TAPE? (1=YES) INTERIM FOR THE AFOL CDC TAPE

ONE-MINUTE TAPE? (1=YES) INTERIM FOR THE UDC-A TAPE

INPUT TAPE UNIT? (U) 1, 2, 3 FOR UNIT #1, #2, #3

OUTPUT TAPE UNIT? (U) 1, 2, 3, BUT NOT THE INPUT

JULIAN DATE? (YDDD) YEAR AND DAY

DISABLE TIME SEARCH? (1=YES) 0=MISSING DAY (NO TAPE)

-----SETUP COMPLETE-----
 PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN

-----DATA EDITOR LOG-----
 PROBLEM COUNT IS 106 INLY TIME LABEL

START HOUR 0	0	1845	1845	01	30141103140	
START HOUR 1	1	0	0005	8045	01	58122183140
START HOUR 2	1	5	767	767	212561217150	
START HOUR 3	1	0	987	987	61	28124183140
START HOUR 4	2	0	1144	1147	61	3212153140
START HOUR 5	3	0	1297	1297	61	36120153140
START HOUR 6	4	0	1407	1407	61	40123183140
START HOUR 7	5	0	1845	1845	01	30141103140
START HOUR 8	6	0	0005	8045	01	58122183140
START HOUR 9	7	0	808	808	61	7814183140
START HOUR 10	8	0	8748	8748	61	7711153140
START HOUR 11	8	0	888	888	61	80120183140
START HOUR 12	10	0	888	888	61	8110183140
START HOUR 13	8	0	3808	3808	61	100188183140
START HOUR 14	11	0	3707	3707	61	108143183140
START HOUR 15	12	1	3767	3767	01	0101010
START HOUR 16	1	1	3847	3847	01	0101010
START HOUR 17	2	3	4854	4884	2125611117120	
START HOUR 18	1	0	4198	4198	61	117118183140
START HOUR 19	1	7	4528	6231	81864117124170	

DAY	2	0	4528	6231	21256117124170	
DAY	1	4528	24	01	0101010	
DAY	2	4528	24	01	0101010	
DAY	3	4528	24	01	0101010	
DAY	4	4528	24	01	0101010	
DAY	5	4528	24	01	0101010	
DAY	6	4528	24	01	0101010	
DAY	7	4528	24	01	0101010	
DAY	8	4528	24	01	0101010	
START HOUR 13	3	1	4900	4900	01	0101010
START HOUR 14	14	0	5155	5155	61143110153140	
START HOUR 15	11	1	5273	5273	21256114318150	
START HOUR 16	15	0	5386	5386	61150142153140	
START HOUR 17	16	0	5765	5765	61161118153140	
START HOUR 18	1	7	5965	5971	21256116134170	
START HOUR 19	0	1	5965	24	0101010	
START HOUR 20	2	2	5965	24	0101010	
START HOUR 21	3	3	5965	24	0101010	
START HOUR 22	7	7	5965	24	0101010	
START HOUR 23	17	0	6307	6307	61176119153140	
START HOUR 24	2	3	6416	6416	21256117140120	
START HOUR 25	1	-5	6722	6722	21256118140120	
START HOUR 26	18	0	6982	6982	6119212153140	
START HOUR 27	1	-6	6958	6958	2125611919140	
START HOUR 28	19	0	7069	7069	6119711163140	
START HOUR 29	20	0	7116	7116	81198130153140	
START HOUR 30	1	-7	7209	7209	2125612011150	
START HOUR 31	1	-1	7211	7211	2125612011150	
START HOUR 32	2	-7	7212	7212	212561201210	
START HOUR 33	2	-1	7212	7212	212561201210	
START HOUR 34	3	-7	7213	7213	212561201210	
START HOUR 35	3	-1	7213	7213	212561201210	
START HOUR 36	4	-1	7214	7214	212561201210	
START HOUR 37	21	0	7484	7484	61200140153140	
START HOUR 38	1	-3	7495	7495	21256120140110	
START HOUR 39	5	-1	7506	7506	2125612015110	
START HOUR 40	21	1	8408	8408	01	0101010
START HOUR 41	22	4	8408	8408	01	0101010
START HOUR 42	23	4	8408	8408	01	0101010

-----LABEL THIS TAPE 15255-----
 ONE-SECOND TAPE COMPLETE-----
 MOUNT A BLANK TAPE AND PRESS SIGN SWITCH
 OR TURN SW ON TO ONLY THE ONE-MINUTE TAPE
 -----ONE-MINUTE TAPE-----
 -----LABEL THIS TAPE 15255-----
 ONE-MINUTE TAPE COMPLETE-----
 -----END OF RUN-----

Figure 11

I.G Rebooting The System

Rebooting the system can be used as a last resort to solve many problems that cannot be solved by one of the earlier methods discussed. For example one problem that occurs sometimes is the V72 computer becomes hung up and one cannot type anything at the terminal so the system will have to be rebooted.

To reboot the system one should refer to figure 10 which is a diagram of the V72 panel. The first step in rebooting the system is to turn the key to the ON position. The second step is to press the RESET button, then the STEP/RUN button (to create a flashing run light), and then the BOOT button, in that order only. The third step is to answer the questions that will appear within 10 seconds of pressing the BOOT button.

The first question will ask whether archiving is desired and, if so, on which tape unit. If archiving is desired then either a 1 or a 2 must be entered for the appropriate tape unit. If archiving is not desired then a 0 is entered. If archiving was begun then a second question will appear asking whether or not an end of file is needed. If archiving was not begun then the second question will not appear. After the question(s) have been answered the V72 computer should be functional again from the teletype terminal. The easiest way to check whether or not it is, is to type

```
 /
JC01 <-- Computer response
JC** <--      "           "
```

If there is no computer response then there is a problem.

Finally, whenever the V72 computer is rebooted all of the physical units are reassigned to their originally programmed logical units. For example as mentioned earlier D1 is reassigned to MT00 and LS is reassigned to SP00.

II. EDITING MAGNETOMETER NETWORK DATA

II.A Description of steps for editing Magnetometer Data

This is a brief description of the editing process where archive tapes are edited in various steps until the final World Data Center (WDC) tape is made. At this writing the following procedure was used.

1. The WAS program was used to write IS and IM tapes from the archive data tapes.
2. The CMB program was used to combine the IM tapes of one month into one RM tape.
3. The IMP program was used to salvage a hard-to-read IM tape by copying it.
4. The TCY program was used to make a copy of the RM tape.
5. The PM program was used to write a CM tape from the RM tape copy.
6. The WDCTAPE program on the CDC 6600 computer was used to write a WDC tape from the CM tapes for 3 months.

The following is a brief description of each program in this section.

WAS PROGRAM is used for basic editing of archive tapes into IS and/or IM tapes. This program takes about 36 minutes to execute.

CV2 PROGRAM creates the data needed for an IM tape from an IS tape. Also, this program checks whether or not a tape is an IS tape, the date on an IS tape, and whether or not there is a parity error on an IS tape. This program takes about 10 minutes to execute.

IMP PROGRAM is used to attempt (5 times) to salvage a hard-to-read IM tape by copying it, hoping that you might get one pass of the program to make a successful read. Also, this program checks whether or not there is a parity error on an IM tape. This program takes about 2 minutes to execute.

IMC PROGRAM is capable of printing on the teletype screen the results of several checks made on the IM tape. This program checks the IM tape for the number of missing data points for the X, Y, and Z components for each station. Also, this program checks whether or not a tape is an IM tape, the date on an IM tape, and whether or not there is a parity error on an IM tape. This program takes about 30 seconds to execute.

CMB PROGRAM writes a RM tape from one month of IM tapes by combining them one after another. Also, this program checks whether or not a tape is an IM tape, the date on an IM tape, and whether or not there is a parity error on an IM tape. This program takes about 35 minutes to execute. Note, to check a single IM tape for something the IMC program should be used, not the CMB program.

RGN PROGRAM writes a RM tape from one month of IS tapes by reading, computing, reformatting the results, and writing them onto the RM tape. This program checks whether or not a tape is an IS tape, the date on an IS tape, and whether or not there is a parity error on an IS tape. This program takes about 5 hours to execute.

TCY PROGRAM can make a copy of different kinds of tapes. This program can check what type of tape it is and whether or not there is a parity error on the tape read. The time required to execute this program is dependent on the number and length of records to be copied.

PM PROGRAM writes a CM tape from a RM tape. This program makes a number of checks on a RM tape whether or not it writes a CM tape and prints the results on the teletype screen: the number of missing data points for each component of each station for every day of the month. Also, this program checks whether or not a tape is a RM tape, the year and month on a RM tape, and whether or not there is a parity error on a RM tape. This program takes about 35 minutes to execute.

PS PROGRAM writes a FS tape from an IS tape. This program makes a number of checks on the IS tape whether or not it writes a CM tape and prints the results on the teletype screen: the number of missing data points for each component of every station for the whole day. Also, this program checks whether or not a tape is an IS tape, the date on an IS tape, and whether or not there is a parity error on an IS tape. This program takes about 45 minutes to execute.

II.B WAS PROGRAM

The WAS program is used for basic editing of archive tape data into one second data (IS tape) and/or one-minute data (IM tape). This program takes about 36 minutes to execute.

At the start of the program a header appears on the teletype screen as shown in figure 12. The header includes 5 instructions: mount the archive tape on any tape unit, mount the output tape on another tape unit, check that both tape units are on line and sense switches off, set the margin control to 2 and the copy switch to autoprint on the teletype terminal, and press the return when ready to proceed.

The first question will appear asking for the name of the person executing the program and the date of execution, which should be answered so that if a problem arises, who and when the program was executed will be known. The second question will ask whether or not to use previous data stored on disk. This question usually should be answered with a [0] whenever one wants to write an IS tape only, or an IS and IM tape as in figure 12. Previous data can be used when the last execution on the computer was to convert IS data to IM data and store it on disk. Thus, a [1] can be entered for this question to use IS data stored on disk to make an IM tape as in figure 13. Under these conditions the program takes much less than 36 minutes (probably 2 minutes) to execute since the program only has to write an IM tape compared to writing an IS tape (takes about 34 minutes) and an IM tape. The third question asks whether or not to write an IS tape. If one wants to write an IS tape, then a [1] should be entered for this question as in figure 12. The fourth question asks whether or not to write an IM tape, then a [1] should be entered for this question as in figures 12 & 13. The fifth question asks which is the input tape unit, that is, where the archive tape will be read (2 in the example of figure 12). Note (figure 13) that when one uses previous data stored on disk the third and fifth question do not appear. The sixth question asks which is the output tape unit, that is, where the IS and/or IM tape will be written ([1] in the examples of figures 12 & 13). The seventh question asks for the Julian date. For October 16, 1983, the 289th day of the year, the correct response would be 3289 as in figure 12. The eighth question asks whether or not to disable the time search. When a [0] is entered for this question as in figure 12 the program will read forward on the archive tape and position it 10 minutes before the day one wants to edit with WAS. If the tape has already been positioned at the day one wants to edit, for example after a WAS execution is complete the archive tape is already positioned, then this question can be answered with a [1] to disable the time search as in figure 14. Also, if one learns from the Taplog that there are no data for the particular day one wants to edit, then the IS and/or IM tape can be filled with blank frames by answering this question with a [9] as in figure 15. Under these conditions the program will take much less than 36 minutes (probably 20 min-

WAS PROGRAM TO EDIT FLUXGATE DATA

INTERIM 1-SEC TAPE, INTERIM 1-MIN TAPE, WITH NO PLOTS
 REVISION DMS.1 21 MAR 83 D.J.KNECHT

1. MOUNT THE ARCHIVE TAPE ON ANY TAPE UNIT
2. MOUNT A BLANK TAPE ON ANOTHER TAPE UNIT
3. CHECK SENSE SWITCHES OFF, TAPES ON LINE
4. SET MARGIN CONTROL TO 2 COLUMNS AUTOPRINT
5. PRESS RETURN TO START THE RUN WHEN READY

YOUR OWN NAME AND DATE OF RUN EXAMPLE: SMITH 25 FEB 82
 APR 26 SEP 84

- USE PREVIOUS DATA? (1=YES) ARCHIVE TAPE IS READ OTHERWISE
- (ONE-MINUTE TAPE) (1=YES) INTERIM FOR THE AFGL CDC TAPE
- (ONE-MINUTE TAPE) (1=YES) INTERIM FOR THE UDC-A TAPE
- INPUT TAPE UNIT: (U) 1, 2, 3 FOR UNIT M1, M2, M3
- OUTPUT TAPE UNIT: (U) 1, 2, 3, BUT NOT THE INPUT
- JULIAN DATE: (YDDD) YEAR AND DAY
- DISABLE TIME SEARCH? (1=YES) 9=MISSING DAY (NO TAPE)

-----SETUP COMPLETE-----
 PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN

DATA START TIME TO BE FOUND IS 289 01 01 0

TAPE TIME IS NOW 3 288 21 17 130
 TAPE TIME IS NOW 3 288 22 01 0
 END SEARCH: START DATA READING 3 288 23 01 0

PROBLEM COUNT 1STN TOLD INEW TIME LABEL

START HOUR 0	1	0	168	168	91	51	0153140
STN							
START HOUR 1							
STN							
START HOUR 2							
STN							
START HOUR 3							
STN							
START HOUR 4							
STN							
START HOUR 5							
STN							
START HOUR 6							
STN							
START HOUR 7							
STN							
START HOUR 8							
STN							
START HOUR 9							
STN							
START HOUR 10							
STN							
START HOUR 11							
STN							
START HOUR 12							
STN							
START HOUR 13							
STN							

Figure 12: Continued from the bottom of the 1st column.

WAS PROGRAM TO EDIT FLUXGATE DATA

INTERIM 1-SEC TAPE, INTERIM 1-MIN TAPE, WITH NO PLOTS
 REVISION DMS.1 21 MAR 83 D.J.KNECHT

1. MOUNT THE ARCHIVE TAPE ON ANY TAPE UNIT
2. MOUNT A BLANK TAPE ON ANOTHER TAPE UNIT
3. CHECK SENSE SWITCHES OFF, TAPES ON LINE
4. SET MARGIN CONTROL TO 2 COLUMNS AUTOPRINT
5. PRESS RETURN TO START THE RUN WHEN READY

YOUR OWN NAME AND DATE OF RUN EXAMPLE: SMITH 25 FEB 82
 RIC 25 MAR 84

- USE PREVIOUS DATA? (1=YES) ARCHIVE TAPE IS READ OTHERWISE
- (ONE-MINUTE TAPE) (1=YES) INTERIM FOR THE UDC-A TAPE
- OUTPUT TAPE UNIT: (U) 1, 2, 3, BUT NOT THE INPUT
- SETUP COMPLETE-----
 PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN
- MOUNT A BLANK TAPE AND PRESS SIGN SWITCH
 OR TURN 552 ON TO OBIT THE ONE-MINUTE TAPE
- LABEL THIS TAPE 1M355 ONE-MINUTE TAPE
- ONE-MINUTE TAPE COMPLETE-----
 -----END OF RUN-----

Figure 12: Continued to the top of the 2nd column.

Figure 13

WAS PROGRAM TO EDIT FLUXGATE DATA

INTERIM 1-SEC TAPE, INTERIM 1-MIN TAPE, WITH NO PLOTS
 REVISION WAS: 1 21 MAR 83 D.J.KRECHT

1. MOUNT THE ARCHIVE TAPE ON ANY TAPE UNIT
2. MOUNT A BLANK TAPE ON ANOTHER TAPE UNIT
3. CHECK SENSE SWITCHES OFF TAPES ON LINE
4. SET MARGIN CONTROL TO 2 COLUMNS AUTOPRINT
5. PRESS RETURN TO START THE RUN WHEN READY

YOUR OWN NAME AND DATE OF RUN EXAMPLE: SMITH 25 FEB 82

USE PREVIOUS DATA? (1=YES) ARCHIVE TAPE IS READ OTHERWISE

ONE-SECOND TAPE? (1=YES) INTERIM FOR THE AFOL CDC TAPE

ONE-MINUTE TAPE? (1=YES) INTERIM FOR THE UDC-A TAPE

INPUT TAPE UNIT? (U) 1, 2, 3 FOR UNIT R1, R2, R3

OUTPUT TAPE UNIT? (U) 1, 2, 3, BUT NOT THE INPUT

JULIAN DATE? (YDDD) YEAR AND DAY

DISABLE TIME SEARCH? (1=YES) 9-MISSING DAY (NO TAPE)

-----SETUP COMPLETE-----
 PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN

PROBLEM COUNT 15TH IOLD INEW TIME LABEL

START HOUR 0 1 -3 28 28 313341 01 4140
 STN 1 1 -9 288 298 313341 0148140
 START HOUR 1 1 5 387 387 313341 11 4130
 START HOUR 2 1 1 1221 1221 01 01 01 01 0
 START HOUR 3 1 0 1388 1388 41 40110153140
 ZTL 1 1 2 1551 1551 01 01 01 01 0
 START HOUR 4 2 0 2129 2129 41 60125153140
 ZTL 1 1 0 3476 3476 41 97110153140
 START HOUR 5 2 0 3526 3526 41 98142153140
 STN 3 1 -7 4059 4059 3133411116130
 START HOUR 6 1 0 4064 4064 4111214153140
 STN 4 1 0 4478 4478 41124130153140
 START HOUR 7 0 4714 4714 41130133153140
 STN 5 1 0 4714 4714 41130133153140
 START HOUR 8 1 0 4714 4714 41130133153140
 STN 6 1 0 4714 4714 41130133153140
 START HOUR 9 1 0 4714 4714 41130133153140
 STN 7 1 0 4714 4714 41130133153140
 START HOUR 10 1 0 4714 4714 41130133153140
 STN 8 1 0 4714 4714 41130133153140
 START HOUR 11 1 0 4714 4714 41130133153140
 STN 9 1 0 4714 4714 41130133153140
 START HOUR 12 1 0 4714 4714 41130133153140
 STN 10 1 0 4714 4714 41130133153140
 START HOUR 13 1 0 4714 4714 41130133153140
 STN 11 1 0 4714 4714 41130133153140
 START HOUR 14 1 0 4714 4714 41130133153140
 STN 12 1 0 4714 4714 41130133153140
 START HOUR 15 1 0 4714 4714 41130133153140
 STN 13 1 0 4714 4714 41130133153140

START HOUR 16 3 1 5820 5820 01 01 01 01 0
 ZTL 1 0 7361 7361 31334120126150
 START HOUR 17 1 1 7501 7501 01 01 01 01 0
 START HOUR 18 1 1 7501 7501 31334120150120
 START HOUR 19 1 1 7653 7653 01 01 01 01 0
 BND 1 0 8358 8358 41232110153140
 ZTL 1 0 8440 8440 31334123126140
 START HOUR 20 1 0 8454 8454 313341231291 0
 STN 1 0 8459 8459 313341231301 0
 ZTL 1 0 8558 8558 31334123146130
 START HOUR 21 1 0 8664 8664 31334123147120
 STN 1 0 8664 8664 31334123147120

-----ONE-MINUTE TAPE COMPLETE-----
 MOUNT A BLANK TAPE AND PRESS SIGN SWITCH
 OR TURN 552 ON TO ORIT THE ONE-MINUTE TAPE
 -----ONE-MINUTE TAPE-----
 LABEL THIS TAPE 19334
 -----ONE-MINUTE TAPE COMPLETE-----
 END OF RUN

Figure 14

-----END OF RUN-----

WAS PROGRAM TO EDIT FLUXGATE DATA

INTERIM 1-SEC TAPE, INTERIM 1-MIN TAPE, WITH NO PLOTS
REVISION WAS:1 - 41 MAR 83 - D.J.KMECHT

- 1. MOUNT THE ARCHIVE TAPE ON ANY TAPE UNIT
- 2. MOUNT A BLANK TAPE ON ANOTHER TAPE UNIT
- 3. CHECK SEMSL SWITCHES ON TAPES ON LINE
- 4. SET MARGIN CONTROL TO 2 COLUMNS AUTOPHINT
- 5. PRESS RETURN TO START THE RUN WHEN READY

OPTION SELECTION-----
YOUR OWN NAME AND DATE OF RUN EXAMPLE: SMITH 25 FEB 82
PIC 01 JUL 84

USE PREVIOUS DATA? (1=YES) ARCHIVE TAPE IS READ OTHERWISE

1 ONE-SECOND TAPE? (1=YES) INTERIM FOR THE AFOL CDC TAPE

1 ONE-MINUTE TAPE? (1=YES) INTERIM FOR THE WDC-A TAPE

2 INPUT TAPE UNIT: (U) 1, 2, 3 FOR UNIT M1, M2, M3

3 OUTPUT TAPE UNIT: (U) 1, 2, 3, BUT NOT THE INPUT

4 JULIAN DATE: (YDDD) YEAR AND DAY

5 DISABLE TIME SEARCH? (1=YES) 9=MISSING DAY (NO TAPE)

6 PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN

DATA EDITOR LOG-----
PROBLEM COUNTY 15TH TOLD INEW TIME LABEL

START HOUR 0
START HOUR 1
START HOUR 2
START HOUR 3
START HOUR 4
START HOUR 5
START HOUR 6
START HOUR 7
START HOUR 8
START HOUR 9
START HOUR 10
START HOUR 11
START HOUR 12
START HOUR 13
START HOUR 14
START HOUR 15
START HOUR 16
START HOUR 17
START HOUR 18
START HOUR 19
START HOUR 20
START HOUR 21
START HOUR 22
START HOUR 23

LABEL THIS TAPE 18308B
MOUNT A BLANK TAPE AND PRESS SIGN SWITCH
OR TURN 562 ON TO OILY THE ONE-MINUTE TAPE

LABEL THIS TAPE 18308B ONE-MINUTE TAPE

LABEL THIS TAPE 18308B ONE-MINUTE TAPE COMPLETE-----

Figure 15

utes) to execute since the program is writing blank frames on the IS tape, and if an IM tape is written then blank frames are written on it, too. Also, at this point one has the opportunity to check that all commands were followed and questions answered correctly. If not then a [1] may be entered and the questions will be erased and the header will reappear so that one can start over. If everything is correct then one can press the return and the program will be executed.

If the time search was not disabled then it will be executed, where the time to be found, the present time on the tape, and the time every hour on the hour is printed on the teletype screen as in figure 12. The program will stop searching when the tape is 10 minutes before the beginning of the day as in figure 12. If the time search was disabled, then this entire section will not be printed on the teletype screen as in figure 14.

As the program edits the data and writes an IS tape, it prints each hour of the day on the teletype screen as in figures 12 & 14. Also, with this printout of every hour a line is printed each time the program corrects an error in the data. These errors are listed and explained below, and some examples of them can be seen in figures 12 & 14.

ERROR MESSAGE	EXPLANATION
DAY (BAD VALUE FOR DAY)	Day value of time label is greater than day sought at start of run or is different during the run.
STN (BAD VALUE FOR STATION ID)	Station value is rejected by routine as wrong or unconfirmed.
ZTL (ZERO TIME LOAD)	DDU has failed to load time properly after a DDU reset.
TIM (ILLEGAL VALUE FOR TIME)	Illegal (impossible) time value.
SEQ (TIME SEQUENCE ERROR)	Time value has jumped backward from last frame processed or stations for a given time are out of order.
GAP (GAP IN THE DATA)	A GAP in the data is found for which there is no indication by an End Of File (EOF) mark or spacer frames.
ISN (ISNUM ERROR)	Frame is received which was recorded as having been previously received.

(This list is continued on the next page)

BND (OUT OF BOUNDS)

Fluxgate value is more than 2500 nT different from the baseline value.

OFL (OVER FLOW)

Fluxgate value is within 2500 nT of baseline, but is exceeding + 2048 after baseline is subtracted, causing an overflow on the IS tape.

After 60 of the same error for a particular station occurs a question will appear asking whether or not to continue the execution as in figure 16. The usual response is a [0] to continue the execution and SS3 must be turned on or otherwise the program will ask the same question again whenever the same error for the same station occurs. To prevent the occurrence of this question completely one can press SS3 on at the beginning of the program. For example in figure 17 more than 60 errors occurred without the appearance of this question because SS3 was pressed on at the beginning of the execution. If the same error for the same station continues they will appear on the teletype screen until 500 of them are encountered; after that number to save paper no more will appear on the teletype screen even though they exist.

During the execution of the WA5 program sometimes a command will appear when the archive tape being read reaches its end and begins to rewind. To continue the process of editing the data for the rest of the day the next archive tape has to be mounted and the sign switch pressed as shown in figures 14 & 18. Also, the command has an option of pressing SS1 on to fill out the day with blank frames. This option would be done when there is no more data for that day.

A question which may appear during an execution is one which asks for the method of GAP TREATMENT as in figure 18. The question of GAP TREATMENT only appears if the program does not understand the possible gap that it has encountered. When the program encounters a gap and understands it, it fills the gap with blank frames and continues editing without asking the question. Whenever this question appears one should check the Taplog for a gap. The Taplog sometimes shows whether or not a gap exists. The following procedure is the best possible solution whenever this question occurs. If one checks the Taplog and notices that there are some records out of order or over-written, then the question should be answered with a [0]. If the question reappears then continue to answer it with a [0] until the gap question asked corresponds to a real gap. For example if there were over-written records then the records which were written over are lost and thus, there is a gap. One must check the time corresponding to each gap question; and when the question which shows the time of a real gap appears, then it should be answered with a [1] as in figure 19. Often the Taplog indicates that there are some missing data, then this question should be answered with a [1]. Sometimes when this question appears and one looks at the Taplog no gap is evident, one should answer the question with a [1] because the Taplog program does not

LINE FROM INPUT TO EDIT FLUORIMETER INTA

INTERIM 1-SEC. TAPE, INTERIM 1-MIN TAPE, WITH NO PLOTS
 REVISION WMS.1 - 21 MAR 83 - D.J.KNECHT

1. MOUNT THE ARCHIVE TAPE ON ANY TAPE UNIT
 2. MOUNT A BLANK TAPE ON ANOTHER TAPE UNIT
 3. CHECK SENSE SWITCHES OFF TAPES ON LINE
 4. SET MARGIN CONTROL TO 2 COLUMNS AUTOPRINT
 5. PRESS RETURN TO START THE RUN WHEN READY

-----OPTION SELECTION-----
 YUKM OUN TIME AND DATE OF RUN EXAMPLE: SMITH 25 FEB 82
 RL 15 AUG 84

- USE PREVIOUS DATA? (1=YES) ARCHIVE TAPE IS READ OTHERWISE
- ONE-SECOND TAPE? (1=YES) INTERIM FOR THE AFCL CDC TAPE
- ONE-MINUTE TAPE? (1=YES) INTERIM FOR THE UDC-A TAPE
- INPUT TAPE UNIT: (U) 1, 2, 3 FOR UNIT M1, M2, M3
- OUTPUT TAPE UNIT: (U) 1, 2, 3, BUT NOT THE INPUT
- JULIAN DATE: (YDDD) YEAR AND DAY
- DISABLE TIME SEARCH? (1=YES) 9-MISSING DAY (NO TAPE)

-----SETUP COMPLETE-----
 PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN

-----DATA EDITOR LOG----- TIME LABEL

START HOUR	PROBLEM COUNT	ISTM	TOLD	INEX	TIME LABEL
BND	1	5	288	288	312611 014810
BND	2	5	289	289	312611 014811
BND	3	5	290	290	312611 014812
BND	4	5	291	291	312611 014813
BND	5	5	292	292	312611 014814
BND	6	5	293	293	312611 014815
BND	7	5	294	294	312611 014910
BND	8	5	295	295	312611 014911
BND	9	5	296	296	312611 014912
BND	10	5	297	297	312611 014913
BND	11	5	298	298	312611 014914
BND	12	5	299	299	312611 014915
BND	13	5	300	300	312611 015010
BND	14	5	301	301	312611 015011
BND	15	5	302	302	312611 015012
BND	16	5	303	303	312611 015013
BND	17	5	304	304	312611 015014
BND	18	5	305	305	312611 015015
BND	19	5	306	306	312611 015110
BND	20	5	307	307	312611 015111
BND	21	5	308	308	312611 015112
BND	22	5	310	310	312611 015114
BND	23	5	311	311	312611 015115
BND	24	5	312	312	312611 015210
BND	25	5	313	313	312611 015211
BND	26	5	314	314	312611 015212
BND	27	5	315	315	312611 015213
BND	28	5	316	316	312611 015214
BND	29	5	317	317	312611 015215
BND	30	5	318	318	312611 015310

STM	START HOUR	PROBLEM COUNT	ISTM	TOLD	INEX	TIME LABEL
BND	1	5	320	320	312611 015314	
BND	31	5	327	327	312611 015315	
BND	32	5	328	328	312611 015316	
BND	33	5	329	329	312611 015317	
BND	34	5	330	330	312611 015318	
BND	35	5	331	331	312611 015319	
BND	36	5	332	332	312611 015320	
BND	37	5	333	333	312611 015321	
BND	38	5	334	334	312611 015322	
BND	39	5	335	335	312611 015323	
BND	40	5	336	336	312611 015324	
BND	41	5	337	337	312611 015325	
BND	42	5	338	338	312611 015326	
BND	43	5	339	339	312611 015327	
BND	44	5	340	340	312611 015328	
BND	45	5	341	341	312611 015329	
BND	46	5	342	342	312611 015330	
BND	47	5	343	343	312611 015331	
BND	48	5	344	344	312611 015332	
BND	49	5	345	345	312611 015333	
BND	50	5	346	346	312611 015334	
BND	51	5	347	347	312611 015335	
BND	52	5	348	348	312611 015336	
BND	53	5	349	349	312611 015337	
BND	54	5	350	350	312611 015338	
BND	55	5	351	351	312611 015339	
BND	56	5	352	352	312611 015340	
BND	57	5	353	353	312611 015341	
BND	58	5	354	354	312611 015342	
BND	59	5	355	355	312611 015343	
BND	60	5	356	356	312611 015344	
BND	61	5	357	357	312611 015345	
BND	62	5	358	358	312611 015346	
BND	63	5	359	359	312611 015347	
BND	64	5	360	360	312611 015348	
BND	65	5	361	361	312611 015349	
BND	66	5	362	362	312611 015350	
BND	67	5	363	363	312611 015351	
BND	68	5	364	364	312611 015352	
BND	69	5	365	365	312611 015353	
BND	70	5	366	366	312611 015354	
BND	71	5	367	367	312611 015355	
BND	72	5	368	368	312611 015356	
BND	73	5	369	369	312611 015357	
BND	74	5	370	370	312611 015358	
BND	75	5	371	371	312611 015359	
BND	76	5	372	372	312611 015400	
BND	77	5	373	373	312611 015401	
BND	78	5	374	374	312611 015402	
BND	79	5	375	375	312611 015403	
BND	80	5	376	376	312611 015404	
BND	81	5	377	377	312611 015405	
BND	82	5	378	378	312611 015406	
BND	83	5	379	379	312611 015407	
BND	84	5	380	380	312611 015408	
BND	85	5	381	381	312611 015409	
BND	86	5	382	382	312611 015410	
BND	87	5	383	383	312611 015411	
BND	88	5	384	384	312611 015412	
BND	89	5	385	385	312611 015413	
BND	90	5	386	386	312611 015414	
BND	91	5	387	387	312611 015415	
BND	92	5	388	388	312611 015416	
BND	93	5	389	389	312611 015417	
BND	94	5	390	390	312611 015418	
BND	95	5	391	391	312611 015419	
BND	96	5	392	392	312611 015420	
BND	97	5	393	393	312611 015421	
BND	98	5	394	394	312611 015422	
BND	99	5	395	395	312611 015423	
BND	100	5	396	396	312611 015424	
BND	101	5	397	397	312611 015425	
BND	102	5	398	398	312611 015426	
BND	103	5	399	399	312611 015427	
BND	104	5	400	400	312611 015428	
BND	105	5	401	401	312611 015429	
BND	106	5	402	402	312611 015430	
BND	107	5	403	403	312611 015431	
BND	108	5	404	404	312611 015432	
BND	109	5	405	405	312611 015433	
BND	110	5	406	406	312611 015434	
BND	111	5	407	407	312611 015435	
BND	112	5	408	408	312611 015436	
BND	113	5	409	409	312611 015437	
BND	114	5	410	410	312611 015438	
BND	115	5	411	411	312611 015439	
BND	116	5	412	412	312611 015440	
BND	117	5	413	413	312611 015441	
BND	118	5	414	414	312611 015442	
BND	119	5	415	415	312611 015443	
BND	120	5	416	416	312611 015444	
BND	121	5	417	417	312611 015445	
BND	122	5	418	418	312611 015446	
BND	123	5	419	419	312611 015447	
BND	124	5	420	420	312611 015448	

CONTINUE THE RUN? (0=CONTINUE 1=TERMINATE)

Figure 16

WAS PROGRAM TO EDIT FLUXGATE DATA

INTERIM 1-SEC TAPE, INTERIM 1-MIN TAPE, WITH NO PLOTS
 REVISION WAS:1 21 MAR 83 D.J.KNECHT

1. MOUNT THE ARCHIVE TAPE ON ANY TAPE UNIT
2. MOUNT A BLANK TAPE ON ANOTHER TAPE UNIT
3. CHECK SENSE SWITCHES OFF, TAPES ON LINE
4. SET MAGNIM CONTROL TO 2 COLUMNS AUTOPRINT
5. PRESS RETURN TO START THE RUN WHEN READY

OPTION SELECTION-

YOUR OWN NAME AND DATE OF RUN EXAMPLE: SMITH 25 FEB 82

RIC 24 MAR 84

USE PREVIOUS DATA?

(1=YES) ARCHIVE TAPE IS READ OTHERWISE

1 ONE-SECOND TAPE? (1=YES) INTERIM FOR THE AFGL CDC TAPE

1 ONE-MINUTE TAPE? (1=YES) INTERIM FOR THE UDC-A TAPE

2 INPUT TAPE UNIT? (U) 1, 2, 3 FOR UNIT #1, #2, #3

1 OUTPUT TAPE UNIT? (U) 1, 2, 3, BUT NOT THE INPUT

1 JULIAN DATE? (YDDD) YEAR AND DAY

1 DISABLE TIME SEARCH? (1=YES) 9=MISSING DAY (NO TAPE)

1 PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN

-----SETUP COMPLETE-----

-----DATA EDITOR LOG-----

-----TIME LABEL-----

PROBLEM COUNT 15TH TOLD INEW TIME LABEL

```

START HOUR 0
START HOUR 1
START HOUR 2
STM 1 -9 944 944 212271 212720
STM 1 0 1018 1018 71 29112153140
START HOUR 3 1 1 1301 1301 01 01 01 01 0
ZTL
START HOUR 4
START HOUR 5
MOUNT NEXT ARCHIVE TAPE AND PRESS SIGN SWITCH
OR TURN SSI ON TO FILL OUT THE DAY WITH BLANKS
START HOUR 6 2 0 2259 2259 71 62133153140
STM
START HOUR 7
START HOUR 8 2 0 3024 3024 71 84120153140
ZTL
STM 2 1 3081 3081 01 01 01 01 0
STM 4 0 3136 3136 71 88114153140
START HOUR 9
START HOUR 10
START HOUR 11 1 -7 4042 4042 3122711113140
STM 1 5 4137 4105 31327111139110
CAP TREATMENT: (0=RETRY 1=FULL 2=FULL ALL)
STM 5 0 4217 4217 71118115153140
START HOUR 12
START HOUR 13
START HOUR 14
STM 1 -2 5185 5185 31327114124110
START HOUR 15
    
```

```

START HOUR 16 0 5765 5765 711601 8153140
START HOUR 17
START HOUR 18
STM 7 0 6665 6665 711861 5153140
START HOUR 19 0 7150 7150 71200112153140
START HOUR 20 0 7434 7434 712071 0153140
START HOUR 21 -2 7851 7851 31327121148130
STM -9 7852 7852 31327121148140
STM -1 7853 7853 313271211491 0
START HOUR 22 1 -5 8087 8087 31327122127150
ZTL 1 8234 8234 01 01 01 01 0
START HOUR 23
LABEL THIS TAPE 153327
-----ONE-SECOND TAPE COMPLETE-----
MOUNT A BLANK TAPE AND PRESS SIGN SWITCH
OR TURN SSI ON TO DRIT THE ONE-MINUTE TAPE
-----ONE-MINUTE TAPE-----
LABEL THIS TAPE 1M3327
-----ONE-MINUTE TAPE COMPLETE-----
END OF RUN
    
```

WAS PROGRAM TO EDIT FLUXGATE DATA

INTERIM 1-SEC TAPE, INTERIM 1-MIN TAPE, WITH NO PLOTS
 REVISION WAS 1 31 MAR 83 D.J.KNECHT

1. MOUNT THE ARCHIVE TAPE ON ANY TAPE UNIT
2. MOUNT A BLANK TAPE ON ANOTHER TAPE UNIT
3. CHECK SENSE SWITCHES OFF TAPES ON LINE
4. SET MARGIN CONTROL TO 2 COLUMNS AUTOPRINT
5. PRESS RETURN TO START THE RUN WHEN READY

-----OPTION SELECTION-----
 YOUR OWN NAME AND DATE OF RUN EXAMPLE: SMITH 25 FEB 82
 PIC 22 MAR 84
 USE PREVIOUS DATAP (1=YES) ARCHIVE TAPE IS READ OTHERWISE
 ONE-SECOND TAPE? (1=YES) INTERIM FOR THE AFGL CDC TAPE
 ONE-MINUTE TAPE? (1=YES) INTERIM FOR THE VDC-A TAPE
 INPUT TAPE UNIT: (U) 1, 2, 3 FOR UNIT #1, #2, #3
 OUTPUT TAPE UNIT: (U) 1, 2, 3, BUT NOT THE INPUT
 JULIAN DATE: (YDDD) YEAR AND DAY
 DISABLE TIME SEARCH? (1=YES) 9=MISSING DAY (NO TAPE)

-----SETUP COMPLETE-----
 PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN

-----TIME SEARCH LOG-----
 DATA START TIME TO BE FOUND IS 385 01 01 0
 TAPE TIME IS NOW 3 384 1119150
 TAPE TIME IS NOW 3 384 121 0120
 TAPE TIME IS NOW 3 384 131 0130
 TAPE TIME IS NOW 3 384 141 0120
 TAPE TIME IS NOW 3 384 151 0110
 TAPE TIME IS NOW 3 384 161 01 0
 TAPE TIME IS NOW 3 384 171 0130
 TAPE TIME IS NOW 3 384 181 01 0
 TAPE TIME IS NOW 3 384 191 0130
 TAPE TIME IS NOW 3 384 201 0110
 TAPE TIME IS NOW 3 384 211 01 0
 TAPE TIME IS NOW 3 384 221 01 0
 TAPE TIME IS NOW 3 384 231 01 0
 END SEARCH: START DATA READING 3 384 23150110

-----DATA EDITOR LOG-----
 PROBLEM COUNT ISHM TOLD INEW TIME LABEL

START HOUR	0	1	2	3	4	5	6	7	8
START HOUR	0	1	2	3	4	5	6	7	8
START HOUR	0	1	2	3	4	5	6	7	8
STM	0	1183	1183	51	32139153140				
STM	0	1258	1258	51	35112153140				
ZTL	1	1426	1426	01	01 01 01 0				
STM	1	-9	1426	1426	313051 3157150				
START HOUR	4	2	1	1787	1787	01	01	01	01 0
ZTL	2	1	1787	1787	01	01	01	01	01 0
START HOUR	5	2	1	1787	1787	01	01	01	01 0
START HOUR	6	2	1	1787	1787	01	01	01	01 0
START HOUR	7	2	1	1787	1787	01	01	01	01 0
START HOUR	8	2	1	1787	1787	01	01	01	01 0
START HOUR	8	2	1	1787	1787	01	01	01	01 0

START HOUR 10
 MOUNT NEXT ARCHIVE TAPE AND PRESS SIGN SWITCH
 OR TURN SSI ON TO FILL OUT THE DAY WITH BLANKS
 GAP TREATMENT: 1 3872 7378 31305120120110
 GAP TREATMENT: (0=RETRY 1=FILL 2=FILL ALL)
 GAP TREATMENT: 2 1 3872 7379 31305120120110
 GAP TREATMENT: (0=RETRY 1=FILL 2=FILL ALL)
 GAP TREATMENT: 3 2 3872 7379 31305120120110
 GAP TREATMENT: (0=RETRY 1=FILL 2=FILL ALL)
 GAP TREATMENT: 4 3 3872 7379 31305120120110
 GAP TREATMENT: (0=RETRY 1=FILL 2=FILL ALL)
 GAP TREATMENT: 5 7 3872 7379 31305120120110
 GAP TREATMENT: (0=RETRY 1=FILL 2=FILL ALL)
 GAP TREATMENT: 6 9 3872 7379 31305120120110
 GAP TREATMENT: (0=RETRY 1=FILL 2=FILL ALL)
 GAP TREATMENT: 7 1 3872 7380 31305120120110
 GAP TREATMENT: (0=RETRY 1=FILL 2=FILL ALL)
 GAP TREATMENT: 8 2 3872 7380 31305120120110
 GAP TREATMENT: (0=RETRY 1=FILL 2=FILL ALL)
 GAP TREATMENT: 9 3 3872 7380 31305120120110
 GAP TREATMENT: (0=RETRY 1=FILL 2=FILL ALL)
 GAP TREATMENT: 10 7 3872 7380 31305120120110
 GAP TREATMENT: (0=RETRY 1=FILL 2=FILL ALL)
 GAP TREATMENT: 11 9 3872 7380 31305120120110
 GAP TREATMENT: (0=RETRY 1=FILL 2=FILL ALL)
 GAP TREATMENT: 12 1 3872 7381 31305120120110
 GAP TREATMENT: (0=RETRY 1=FILL 2=FILL ALL)
 GAP TREATMENT: 13 2 3872 7381 31305120120110
 GAP TREATMENT: (0=RETRY 1=FILL 2=FILL ALL)
 GAP TREATMENT: 14 3 3872 7381 31305120120110
 GAP TREATMENT: (0=RETRY 1=FILL 2=FILL ALL)
 GAP TREATMENT: 15 7 3872 7381 31305120120110
 GAP TREATMENT: (0=RETRY 1=FILL 2=FILL ALL)
 GAP TREATMENT: 16 9 3872 7381 31305120120110
 GAP TREATMENT: (0=RETRY 1=FILL 2=FILL ALL)
 GAP TREATMENT: 17 1 3872 7382 31305120120120
 GAP TREATMENT: (0=RETRY 1=FILL 2=FILL ALL)
 GAP TREATMENT: 18 2 3872 7382 31305120120120
 GAP TREATMENT: (0=RETRY 1=FILL 2=FILL ALL)
 GAP TREATMENT: 19 3 3872 7382 31305120120120
 GAP TREATMENT: (0=RETRY 1=FILL 2=FILL ALL)
 GAP TREATMENT: 20 7 3872 7382 31305120120120
 GAP TREATMENT: (0=RETRY 1=FILL 2=FILL ALL)

Figure 19: First of three pages.

GAP TREATMENT:	21	9	3872 7382	31305120130120	GAP TREATMENT:	42	2	3872 7389	31305120131130
GAP			1-FILL 2-FILL ALL		GAP TREATMENT:			1-FILL 2-FILL ALL	
GAP TREATMENT:	22	1	3872 7385	31305120130150	GAP TREATMENT:	43	3	3872 7389	31305120131130
GAP			1-FILL 2-FILL ALL		GAP TREATMENT:			1-FILL 2-FILL ALL	
GAP TREATMENT:	23	2	3872 7385	31305120130150	GAP TREATMENT:	44	7	3872 7389	31305120131130
GAP			1-FILL 2-FILL ALL		GAP TREATMENT:			1-FILL 2-FILL ALL	
GAP TREATMENT:	24	3	3872 7385	31305120130150	GAP TREATMENT:	45	9	3872 7389	31305120131130
GAP			1-FILL 2-FILL ALL		GAP TREATMENT:			1-FILL 2-FILL ALL	
GAP TREATMENT:	25	9	3872 7385	31305120130150	GAP TREATMENT:	46	1	3872 7390	31305120131140
GAP			1-FILL 2-FILL ALL		GAP TREATMENT:			1-FILL 2-FILL ALL	
GAP TREATMENT:	26	1	3872 7386	31305120131110	GAP TREATMENT:	47	2	3872 7390	31305120131140
GAP			1-FILL 2-FILL ALL		GAP TREATMENT:			1-FILL 2-FILL ALL	
GAP TREATMENT:	27	2	3872 7386	31305120131110	GAP TREATMENT:	48	3	3872 7390	31305120131140
GAP			1-FILL 2-FILL ALL		GAP TREATMENT:			1-FILL 2-FILL ALL	
GAP TREATMENT:	28	3	3872 7386	31305120131110	GAP TREATMENT:	49	7	3872 7390	31305120131140
GAP			1-FILL 2-FILL ALL		GAP TREATMENT:			1-FILL 2-FILL ALL	
GAP TREATMENT:	29	7	3872 7386	31305120131110	GAP TREATMENT:	50	9	3872 7390	31305120131140
GAP			1-FILL 2-FILL ALL		GAP TREATMENT:			1-FILL 2-FILL ALL	
GAP TREATMENT:	30	9	3872 7386	31305120131110	GAP TREATMENT:	51	1	3872 7391	31305120131150
GAP			1-FILL 2-FILL ALL		GAP TREATMENT:			1-FILL 2-FILL ALL	
GAP TREATMENT:	31	1	3872 7387	31305120131110	GAP TREATMENT:	52	2	3872 7391	31305120131150
GAP			1-FILL 2-FILL ALL		GAP TREATMENT:			1-FILL 2-FILL ALL	
GAP TREATMENT:	32	2	3872 7387	31305120131110	GAP TREATMENT:	53	3	3872 7391	31305120131150
GAP			1-FILL 2-FILL ALL		GAP TREATMENT:			1-FILL 2-FILL ALL	
GAP TREATMENT:	33	3	3872 7387	31305120131110	GAP TREATMENT:	54	7	3872 7391	31305120131150
GAP			1-FILL 2-FILL ALL		GAP TREATMENT:			1-FILL 2-FILL ALL	
GAP TREATMENT:	34	7	3872 7387	31305120131110	GAP TREATMENT:	55	9	3872 7391	31305120131150
GAP			1-FILL 2-FILL ALL		GAP TREATMENT:			1-FILL 2-FILL ALL	
GAP TREATMENT:	35	9	3872 7387	31305120131110	GAP TREATMENT:	56	1	3872 7392	31305120132110
GAP			1-FILL 2-FILL ALL		GAP TREATMENT:			1-FILL 2-FILL ALL	
GAP TREATMENT:	36	1	3872 7388	31305120131120	GAP TREATMENT:	57	2	3872 7392	31305120132110
GAP			1-FILL 2-FILL ALL		GAP TREATMENT:			1-FILL 2-FILL ALL	
GAP TREATMENT:	37	2	3872 7388	31305120131120	GAP TREATMENT:	58	3	3872 7392	31305120132110
GAP			1-FILL 2-FILL ALL		GAP TREATMENT:			1-FILL 2-FILL ALL	
GAP TREATMENT:	38	3	3872 7388	31305120131120	GAP TREATMENT:	59	7	3872 7392	31305120132110
GAP			1-FILL 2-FILL ALL		GAP TREATMENT:			1-FILL 2-FILL ALL	
GAP TREATMENT:	39	7	3872 7388	31305120131120	GAP TREATMENT:	60	9	3872 7392	31305120132110
GAP			1-FILL 2-FILL ALL		GAP TREATMENT:			1-FILL 2-FILL ALL	
GAP TREATMENT:	40	9	3872 7388	31305120131120	GAP TREATMENT:	61	1	3872 7393	31305120132110
GAP			1-FILL 2-FILL ALL		GAP TREATMENT:			1-FILL 2-FILL ALL	
GAP TREATMENT:	41	1	3872 7389	31305120131130	GAP TREATMENT:	62	2	3872 7393	31305120132110
GAP			1-FILL 2-FILL ALL		GAP TREATMENT:			1-FILL 2-FILL ALL	
GAP TREATMENT:					GAP	63	3	3872 7393	31305120132110

Figure 19: Second of three pages.

CAP TREATMENT: (0-RETRY 1-FILL 2-FILL ALL)
 CAP 64 7 3872 2202 31305120128110
 CAP TREATMENT: (0-RETRY 1-FILL 2-FILL ALL)
 CAP 85 9 3872 4065 3130511117120
 CAP TREATMENT: (0-RETRY 1-FILL 2-FILL ALL)
 START HOUR 11
 START HOUR 12 4 1 4348 4348 01 01 01 01 0
 ZTL
 STM 3 0 4351 4351 51120130153140
 START HOUR 13
 START HOUR 14
 START HOUR 15
 START HOUR 16 4 0 6044 6044 51168141153140
 START HOUR 17 1 -7 6178 6178 313051171 9140
 STM 2 -7 6179 6179 313051171 9150
 STM 3 -7 6180 6180 313051171 01 0
 STM 4 -7 6181 6181 313051171 01 0
 STM 5 -7 6182 6182 313051171 01 0
 START HOUR 18 5 1 6572 6572 01 01 01 01 0
 ZTL
 STM 5 0 7012 7012 611951 4153140
 START HOUR 20
 START HOUR 21
 START HOUR 22
 START HOUR 23 6 0 8433 8433 61234131153140
 STM
 LABEL THIS TAPE 153305
 -----ONE-SECOND TAPE COMPLETE-----
 MOUNT A BLANK TAPE AND PRESS SIGN SWITCH
 OR TURN S52 ON TO OILY THE ONE-MINUTE TAPE
 -----ONE-MINUTE TAPE-----
 LABEL THIS TAPE 1M3305
 -----ONE-MINUTE TAPE COMPLETE-----
 -----END OF RUN-----

Figure 19: Third of three pages.

always show a gap when it exists. Finally, if one discovers that there are many gaps and anticipates the question being asked many times, then a [2] may be entered for this question. Now whenever a gap is encountered it will automatically be filled with blank frames without asking the question. A word of advice to the operator, avoid using the [2] option for this question, because data which actually exist may be filled with blank frames which when occur WA5 will print many ISN error messages. To elaborate when there are out of order or overwritten records and the GAP QUESTION is answered by filling it with blank frames, then when this spot on the tape is passed and the program finds the actual data it will print ISN errors, because it has already encountered these times when it filled this particular period with blank frames as shown in figure 20.

When the program finishes writing an IS tape it will state so and state to label the IS tape appropriately. Then a statement will appear instructing one to mount a blank tape and press the sign switch to write an IM tape, or press SS2 on to omit the IM tape and end the execution. When an IM tape is written the computer will state so and state to label the IM tape appropriately. Finally, the program will state that it has completed the execution and automatically copies the output which is usually 1 page.

WAS PROGRAM TO EDIT FLUXGATE DATA

INTERIM 1-SEC TAPE, INTERIM 1-MIN TAPE, WITH NO PLOTS
 REVISION WAS:1 - 21 MAR 83 - D.J.KNECHT

1. MOUNT THE ARCHIVE TAPE ON ANY TAPE UNIT
2. MOUNT A BLANK TAPE ON ANOTHER TAPE UNIT
3. CHECK SENSE SWITCHES OFF TAPES ON LINE
4. SET MARGIN CONTROL TO 2 COLUMNS AUTOPOINT
5. PRESS RETURN TO START THE RUN WHEN READY

-----OPTION SELECTION-----
 YOUR CAN TALK AND DATE OF RUN EXAMPLE: SMITH 25 FEB 82
 AKA IS A01E4
 USE PREVIOUS DATA? (Y=YES) ARCHIVE TAPE IS READ OTHERWISE

1 ONE-SECOND TAPE? (Y=YES) INTERIM FOR THE AFGL CDC TAPE

1 ONE-MINUTE TAPE? (Y=YES) INTERIM FOR THE UDC-A TAPE

2 INPUT TAPE UNIT? (U) 1, 2, 3 FOR UNIT #1, #2, #3

3 OUTPUT TAPE UNIT? (U) 1, 2, 3, BUT NOT THE INPUT

3 JULIANI D-TEN (YDDD) YEAR AND DAY

1 DISABLE TIME SEARCH? (Y=YES) 9-MISSING DAY (NO TAPE)

1 PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN

-----SETUP COMPLETE-----

-----DATA EDITOR LOG----- TIME LABEL

PROBLEM COUNT ISM TOLD INKEY

START HOUR 0 1 0 186 186 21 61 8153140

START HOUR 1 2 0 682 682 21 18: 2153140

START HOUR 2 3 0 677 677 21 201153140

START HOUR 3

START HOUR 4

MOUNT NEXT ARCHIVE TAPE AND PRESS SIGN SWITCH

OR TURN SSI ON TO FILL OUT THE DAY WITH BLANKS

GAP 1 1 1778 5146 3127211417140

GAP TREATMENT? (0=RETRY 1-FILL 2-FILL ALL)

START HOUR 5

START HOUR 6

START HOUR 7

START HOUR 8

START HOUR 9

START HOUR 10

START HOUR 11

START HOUR 12

START HOUR 13

START HOUR 14

DAY 1 3 5168 8274 9117912159140

ISM 1 7 5168 1798 312721 4159140

ISM 2 8 5168 1798 312721 4159140

ISM 3 9 5168 1799 312721 4159140

ISM 4 1 5168 1799 312721 4159150

ISM 5 2 5168 1799 312721 4159150

ISM 6 3 5168 1799 312721 4159150

ISM 7 7 5168 1799 312721 4169150

ISM	8	5168	1799	312721	4159150
ISM	9	5168	1799	312721	4159150
ISM	10	5168	1806	312721	51 01 0
ISM	11	5168	1806	312721	51 01 0
ISM	12	5168	1806	312721	51 01 0
ISM	13	5168	1806	312721	51 01 0
ISM	14	5168	1806	312721	51 01 0
ISM	15	5168	1806	312721	51 01 0
ISM	16	5168	1801	312721	51 0110
ISM	17	5168	1801	312721	51 0110
ISM	18	5168	1801	312721	51 0110
ISM	19	5168	1801	312721	51 0110
ISM	20	5168	1801	312721	51 0110
ISM	21	5168	1801	312721	51 0110
ISM	22	5168	1802	312721	51 0120
ISM	23	5168	1802	312721	51 0120
ISM	24	5168	1802	312721	51 0120
ISM	25	5168	1802	312721	51 0120
ISM	26	5168	1802	312721	51 0120
ISM	27	5168	1802	312721	51 0120
ISM	28	5168	1802	312721	51 0120
ISM	29	5168	1802	312721	51 0120
ISM	30	5168	1803	312721	51 0130
ISM	31	5168	1803	312721	51 0130
ISM	32	5168	1803	312721	51 0130
ISM	33	5168	1803	312721	51 0130
ISM	34	5168	1804	312721	51 0140
ISM	35	5168	1804	312721	51 0140
ISM	36	5168	1804	312721	51 0140
ISM	37	5168	1804	312721	51 0140
ISM	38	5168	1804	312721	51 0140
ISM	39	5168	1804	312721	51 0140
ISM	40	5168	1805	312721	51 0150
ISM	41	5168	1805	312721	51 0150
ISM	42	5168	1805	312721	51 0150
ISM	43	5168	1805	312721	51 0150
ISM	44	5168	1805	312721	51 0150
ISM	45	5168	1805	312721	51 0150
ISM	46	5168	1806	312721	51 11 0
ISM	47	5168	1806	312721	51 11 0
ISM	48	5168	1806	312721	51 11 0
ISM	49	5168	1806	312721	51 11 0
ISM	50	5168	1806	312721	51 11 0
ISM	51	5168	1806	312721	51 11 0
ISM	52	5168	1807	312721	51 1110
ISM	53	5168	1807	312721	51 1110
ISM	54	5168	1807	312721	51 1110
ISM	55	5168	1807	312721	51 1110
ISM	56	5168	1808	312721	51 1120
ISM	57	5168	1808	312721	51 1120
ISM	58	5168	1808	312721	51 1120
ISM	59	5168	1808	312721	51 1120
ISM	60	5168	1808	312721	51 1120
ISM	61	5168	1808	312721	51 1120
ISM	62	5168	1809	312721	51 1130
ISM	63	5168	1809	312721	51 1130
ISM	64	5168	1809	312721	51 1130
ISM	65	5168	1809	312721	51 1130
ISM	66	5168	1809	312721	51 1130
ISM	67	5168	1809	312721	51 1130
ISM	68	5168	1810	312721	51 1140
ISM	69	5168	1810	312721	51 1140
ISM	70	5168	1810	312721	51 1140
ISM	71	5168	1810	312721	51 1140

Figure 20

II.C CV2 PROGRAM

The CV2 program creates the data needed for an IM tape by reading and computing from an IS tape. It is used when an IM tape has to be re-made because the original either had an error and/or had not been retained. The CV2 program checks whether or not a tape is an IS tape, the date on an IS tape, and whether or not there is a parity error on an IS tape. This program takes about 10 minutes to execute.

At the start of the program a header appears on the screen as shown in figure 21. The header includes 2 instructions: mount the IS tape on any tape unit and press the return when ready to proceed.

The first question asks for the IS tape number. For February 9, 1979, the 40th day of the year, the correct response would be 9040 as shown in figure 21. The second question asks which is the input tape unit, that is, where the IS tape will be read ([3] in the example of figure 21). Also, at this point one has the opportunity to check that all commands were followed and questions answered correctly. If not then a [1] may be entered and the questions will be erased and the header will reappear so that one can start over. If everything is correct then one can press the return and the program will be executed. As the program is executing the IS tape is read and the data created is stored on disk. When the program is complete it will appear as in figure 21, where the last statement instructs one to request the WA5 program and select the previous data option. Finally, the WA5 program takes about 2 minutes to write the IM tape from the disk.

If a tape is not an IS tape, then when it is read the program aborts itself as in figure 22. The date entered for the IS tape number question in the example of figure 21 was the actual date on the IS tape, thus the program was able to read the tape correctly and give a positive response. For example if for some reason one was not sure whether or not the tape was labeled with the correct date, then the CV2 program could be used to check this problem. In figure 23 an incorrect date was entered for the IS tape number question, and the program states that there is a DATE PROBLEM and had to be aborted manually, otherwise the program will continue until it reaches the end of the IS tape and then aborts itself. Finally, if a parity error exists on the IS tape, then the program states that there is a TAPE READ ERROR - IST= -3 and aborts itself as in figure 24.

```

CU2 PROGRAM - MAKES IM FROM IS TAPES
-----
REVISION CU2.1      22 MAR 83      D.J.KNECHT
-----
1. MOUNT THE IS-SERIES TAPE ON ANY TAPE UNIT
2. PRESS RETURN TO START THE RUN, WHEN READY
OPTION SELECTION
-----
9040 IS TAPE NUMBER(1YDDD)
3 INPUT TAPE UNIT (1,2,3)
-----
SETUP COMPLETE
PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN
-----
NEXT CALL THE WAS PROGRAM AND REQUEST THE PREVIOUS-DATA OPTION
JC88

```

Figure 21

```

CU2 PROGRAM - MAKES IM FROM IS TAPES
-----
REVISION CU2.1      22 MAR 83      D.J.KNECHT
-----
1. MOUNT THE IS-SERIES TAPE ON ANY TAPE UNIT
2. PRESS RETURN TO START THE RUN, WHEN READY
OPTION SELECTION
-----
9040 IS TAPE NUMBER(1YDDD)
3 INPUT TAPE UNIT (1,2,3)
-----
SETUP COMPLETE
PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN
-----
ABORT: IRF(0) 5759
JC88

```

Figure 22

```

CU2 PROGRAM - MAKES IM FROM IS TAPES
-----
REVISION CU2.1      22 MAR 83      D.J.KNECHT
-----
1. MOUNT THE IS-SERIES TAPE ON ANY TAPE UNIT
2. PRESS RETURN TO START THE RUN, WHEN READY
OPTION SELECTION
-----
9145 IS TAPE NUMBER(1YDDD)
3 INPUT TAPE UNIT (1,2,3)
-----
SETUP COMPLETE
PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN
-----
DATE PROBLEM
DATE PROBLEM
DATE PROBLEM
DATE PROBLEM
ABORT CU2
DATE PROBLEM
JC88

```

Figure 23

```

CU2 PROGRAM - MAKES IM FROM IS TAPES
-----
REVISION CU2.1      22 MAR 83      D.J.KNECHT
-----
1. MOUNT THE IS-SERIES TAPE ON ANY TAPE UNIT
2. PRESS RETURN TO START THE RUN, WHEN READY
OPTION SELECTION
-----
9040 IS TAPE NUMBER(1YDDD)
3 INPUT TAPE UNIT (1,2,3)
-----
SETUP COMPLETE
PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN
-----
1030 MT00
ABORT: TAPE READ ERROR - IST--3
JC88

```

Figure 24

II.D IMP PROGRAM

The IMP program is used to attempt (5 times) to salvage a hard-to-read IM tape by copying it, hoping that you might get one pass of the program to make a successful read. Also, the IMP program checks whether or not there is a parity error on an IM tape. This program takes about 2 minutes to execute.

The first question asks which is the input tape unit, that is, where the IM tape will be read ([3] in the example of figure 25). The second question asks whether to omit the copy tape or not. If one wants to write a new IM tape, then this question should be answered with a [0] as in figure 25. If one only wants to check the IM tape then a [1] should be entered as in figure 26, and the program will only read the IM tape. Under these conditions the program will take less than 2 minutes (probably 30 seconds) to execute since the program does not have to read a tape and write a tape, but only read a tape. The next question will ask which is the output tape unit, that is, where the IM tape will be written ([1] in the example of figure 25). Note (figure 26) that when one does not want to write a new IM tape then the question asking which is the output tape unit does not appear. If one succeeds in reading an IM tape without encountering a parity error, then the program will stop and state a successful read as in figure 26. Also, when the program cannot successfully read the IM tape on the first try, then the IM tape will be rewound and read again. This will occur up to 5 times, and if after the fifth attempt the program is unsuccessful, the program will give up the attempt.

If a tape is not an IM tape, then when it is read a message indicating the number of actual words per record will be printed as in figure 27, because the number is different from the expected 1680 words per record for an IM tape, and the program aborts itself. Also, if a parity error exists on the IM tape, then the program states BAD RECORD IS NUMBER 17 as in figure 25.

To correct a parity error on an IM tape one can use the IMP program. The IMP program can write a new IM tape and the program will respond by stating a successful read as in figure 25. Also, writing a new IM tape will be attempted 5 times and if the program fails after the fifth time, then one has to write a new IM tape from the IS tape using the CV2 program.

Finally, when a new IM tape is written with IMP, both old and new IM tapes are rewound automatically upon completion. Also, when an IM tape has been read alone it is rewound automatically upon completion.

```

PARITY CHECKER FOR IM TAPES
INPUT TAPE UNIT: (1,2,3 FOR M1,M2,M3)
OMIT COPY TAPE? (1=OMIT)
-----TRY NUMBER 1-----
SUCCESSFUL READ ON TRY NUMBER 1
RETAIN THE ORIGINAL IM TAPE
-----END OF RUN-----
JC11

```

Figure 26

```

PARITY CHECKER FOR IM TAPES
INPUT TAPE UNIT: (1,2,3 FOR M1,M2,M3)
OMIT COPY TAPE? (1=OMIT)
-----TRY NUMBER 1-----
SUCCESSFUL READ ON TRY NUMBER 1
RETAIN THE ORIGINAL IM TAPE
-----END OF RUN-----
JC11

```

Figure 25

```

PARITY CHECKER FOR IM TAPES
INPUT TAPE UNIT: (1,2,3 FOR M1,M2,M3)
OMIT COPY TAPE? (1=OMIT)
-----TRY NUMBER 1-----
1030, M101
PARITY FAILURE ON TRY NUMBER 1
BAD RECORD IS NUMBER 17
-----TRY NUMBER 2-----
1030, M101
PARITY FAILURE ON TRY NUMBER 2
BAD RECORD IS NUMBER 17
-----TRY NUMBER 3-----
1030, M101
PARITY FAILURE ON TRY NUMBER 3
BAD RECORD IS NUMBER 17
-----TRY NUMBER 4-----
1030, M101
PARITY FAILURE ON TRY NUMBER 4
BAD RECORD IS NUMBER 17
-----TRY NUMBER 5-----
1030, M101
PARITY FAILURE ON TRY NUMBER 5
BAD RECORD IS NUMBER 17
---RUN ENDED AFTER FIVE TRIES---
JC11

```

Figure 28

```

PARITY CHECKER FOR IM TAPES
INPUT TAPE UNIT: (1,2,3 FOR M1,M2,M3)
OMIT COPY TAPE? (1=OMIT)
-----TRY NUMBER 1-----
INPUT RECORD HAS 1300 WORDS
-----TRY NUMBER 2-----
INPUT RECORD HAS 1300 WORDS
-----TRY NUMBER 3-----
INPUT RECORD HAS 1300 WORDS
-----TRY NUMBER 4-----
INPUT RECORD HAS 1300 WORDS
-----TRY NUMBER 5-----
INPUT RECORD HAS 1300 WORDS
---RUN ENDED AFTER FIVE TRIES---
JC11

```

Figure 27

II.E IMC PROGRAM

The IMC program is capable of printing on the teletype screen the results of several checks made on an IM tape. This program checks the IM tape and tallies the number of missing data points for the X, Y, and Z components for each station. Also the IMC program checks whether or not a tape is an IM tape, the date on an IM tape, and whether or not there is a parity error on an IM tape. This program takes about 30 seconds to execute.

The first question asks for the Julian date. For December 27, 1983, the 361th day of the year, the correct response would be 3361 as shown in figure 29. The second question asks which is the input tape unit, that is, where the IM tape will be read ([3] in the example of figure 29). Then after the tape is read there is a printout for the X, Y, and Z components for every station giving a count of the number of missing data points. Then the program states (if true) that the IM tape is a good tape with no errors. Finally, the program automatically copies the output and rewinds the tape.

If a tape is not an IM tape, then when it is read an error of NWDS (number of words) will occur and the program aborts itself as in figure 30. The error NWDS indicates that the tape being read does not have 1680 words per record, as a good IM tape does. In figure 30 there is a pair of parentheses after the ERROR: NWDS and inside the parentheses is the actual number of words per record on the tape. The date entered for the Julian date question in the example of figure 29 was the actual date on the IM tape, thus the program was able to read the tape correctly and give a positive response. However, there might be some situations where there is a negative response. For example if for some reason one was not sure whether or not the IM tape was labeled with the correct date, then the IMC program could be used to check this problem. There are 4 possible errors associated with the Julian date that could occur as follows:

ERROR: YEAR - Year value incorrect
ERROR: NMON - Month value incorrect
ERROR: JDAY - Day of year value incorrect
ERROR: DOMN - Day of the month value incorrect

One of these errors, more than one, or all of these errors could occur at a time. Examples of these errors can be seen in figure 31. In these examples one can see that after the error message on each line there is a pair of parentheses which contains the actual number found on the tape

IM-SERIES TAPE CHECK PROGRAM

REVISION IMC3 22 MAR 83 D.J.KNECHT
 JULIAN DATE: (YDDD)

3361 INPUT TAPE UNIT: (1,2,3)
 3

TAPE CHECK LOG

COUNT OF MISSING DATA POINTS
 STN 11 259 (X) 259 (Y)
 STN 21 242 (X) 242 (Y)
 STN 31 242 (X) 242 (Y)
 STN 51 1440 (X) 1440 (Y)
 STN 71 1440 (X) 1440 (Y)
 STN 81 1440 (X) 1440 (Y)
 STN 91 241 (X) 241 (Y)

GOOD TAPE - NO ERRORS

-----CHECK COMPLETE-----

Figure 29

IM-SERIES TAPE CHECK PROGRAM

REVISION IMC3 22 MAR 83 D.J.KNECHT
 JULIAN DATE: (YDDD)

3361 INPUT TAPE UNIT: (1,2,3)
 3

TAPE CHECK LOG

TRACE 1 HOUR -1 ERROR: MUDS (1300)
 TAPE READ PROBLEM - END OF CHECK
 JC18

Figure 30

IM-SERIES TAPE CHECK PROGRAM

REVISION IMC3 22 MAR 83 D.J.KNECHT
 JULIAN DATE: (YDDD)

2309 INPUT TAPE UNIT: (1,2,3)
 3

TAPE CHECK LOG

TRACE 1	HOUR	0	ERROR: YEAR	(	83)
TRACE 1	HOUR	0	ERROR: MMON	(	12)
TRACE 1	HOUR	0	ERROR: DOMN	(	27)
TRACE 1	HOUR	0	ERROR: JDAY	(	361)
TRACE 1	HOUR	1	ERROR: YEAR	(	83)
TRACE 1	HOUR	1	ERROR: MMON	(	12)
TRACE 1	HOUR	1	ERROR: DOMN	(	27)
TRACE 1	HOUR	1	ERROR: JDAY	(	361)
TRACE 1	HOUR	2	ERROR: YEAR	(	83)
TRACE 1	HOUR	2	ERROR: MMON	(	12)
TRACE 1	HOUR	2	ERROR: ABORT, IFC	(
TRACE 1	HOUR	2	ERROR: DOMN	(	27)
TRACE 1	HOUR	2	ERROR: JDAY	(	361)
TRACE 1	HOUR	3	ERROR: YEAR	(	83)
TRACE 1	HOUR	3	ERROR: MMON	(	12)
TRACE 1	HOUR	3	ERROR: DOMN	(	27)

JC18

Figure 31

for either the year, month, or day. When a bad tape is encountered, one usually will want to abort the program manually after a few printed lines; otherwise the program will continue to print every error for each trace of the day page after page until it reaches the end of tape and aborts itself stating a BAD TAPE - NUMBER OF ERRORS: as in figure 32. Finally, if a parity error exists on the IM tape, then the program states that there is a TAPE READ PROBLEM and aborts itself as in figure 33.

```

TRACE 21 HOUR 18 ERROR: YEAR ( 83)
TRACE 21 HOUR 18 ERROR: NMON ( 12)
TRACE 21 HOUR 18 ERROR: DOMN ( 27)
TRACE 21 HOUR 18 ERROR: JDAY ( 361)
TRACE 21 HOUR 19 ERROR: YEAR ( 83)
TRACE 21 HOUR 19 ERROR: NMON ( 12)
TRACE 21 HOUR 19 ERROR: DOMN ( 27)
TRACE 21 HOUR 19 ERROR: JDAY ( 361)
TRACE 21 HOUR 20 ERROR: YEAR ( 83)
TRACE 21 HOUR 20 ERROR: NMON ( 12)
TRACE 21 HOUR 20 ERROR: DOMN ( 27)
TRACE 21 HOUR 20 ERROR: JDAY ( 361)
TRACE 21 HOUR 21 ERROR: YEAR ( 83)
TRACE 21 HOUR 21 ERROR: NMON ( 12)
TRACE 21 HOUR 21 ERROR: DOMN ( 27)
TRACE 21 HOUR 21 ERROR: JDAY ( 361)
TRACE 21 HOUR 22 ERROR: YEAR ( 83)
TRACE 21 HOUR 22 ERROR: NMON ( 12)
TRACE 21 HOUR 22 ERROR: DOMN ( 27)
TRACE 21 HOUR 22 ERROR: JDAY ( 361)
TRACE 21 HOUR 23 ERROR: YEAR ( 83)
TRACE 21 HOUR 23 ERROR: NMON ( 12)
TRACE 21 HOUR 23 ERROR: DOMN ( 27)
TRACE 21 HOUR 23 ERROR: JDAY ( 361)

```

```

COUNT OF MISSING DATA POINTS
STN 1: 259 (X) 259 (Y) 259 (Z)
STN 2: 242 (X) 242 (Y) 242 (Z)
STN 3: 242 (X) 242 (Y) 242 (Z)
STN 5: 1440 (X) 1440 (Y) 1440 (Z)
STN 7: 1440 (X) 1440 (Y) 1440 (Z)
STN 8: 1440 (X) 1440 (Y) 1440 (Z)
STN 9: 241 (X) 241 (Y) 241 (Z)

```

BAD TAPE - NUMBER OF ERRORS: 2016

-----CHECK COMPLETE-----

Figure 32

IM-SERIES TAPE CHECK PROGRAM

REVISION IM3

22 MAR 83

D.J.KNECHT

JULIAN DATE: (YDDD)

3361
INPUT TAPE UNIT: (1,2,3)

3

-----TAPE CHECK LOG-----

```

1030. M100
TRACE 3 HOUR 11 ERROR: READ ( -3)
TAPE HEAD PROBLEM - END OF CHECK
JC48

```

Figure 33

II.F CMB PROGRAM

The CMB program writes a RM tape. The RM tape is a one month tape made from all the IM tapes of a given month. The CMB program combines the IM tapes by copying one after another to make an RM tape. Also, the CMB program checks whether or not a tape is an IM tape, the date on an IM tape, and whether or not there is a parity error on an IM tape. Note, when a single IM tape is to be checked for something the IMC program should be used, not the CMB program. This program takes about 35 minutes to execute.

At the start of the program a header appears on the screen as shown in figure 34. The header includes a group of 5 instructions: mount the first IM tape on any tape unit, mount the output tape on another tape unit, check that both tape units are on line and sense switches off, set the margin control to 2 and the copy switch to autoprint on the teletype terminal, and press the return when ready to proceed.

The first question will appear asking for the name of the person executing the program and the date of execution, which should be answered so that if a problem arises, who and when the program was executed will be known. The next question will ask which is the input tape unit, that is, where the IM tapes will be read ([3] in the example of figure 34). The next question will ask which is the output tape unit, that is, where the RM tape will be written ([2] in the example of figure 34). The following question will ask for the year and month. For April 1981, the fourth month of the year, the correct response will be 8104 as shown in figure 34. The next question will ask to resume a prior run. If one does not want to resume a prior run, usually when executing the program starting with the first day of the month, then a [0] should be entered for this question as in figure 34. This question will be discussed further in the next paragraph. Next, a statement indicating how the RM tape should be labeled appears. Also, at this point one has the opportunity to check that all commands were followed and questions answered correctly. If not then a [1] may be entered and the questions will be erased and the header will reappear so that one can start over. If everything is correct then one can press the return and the program will be executed.

A statement will appear to mount the first IM tape and press the sign switch. The entire IM tape will be copied onto the RM tape and then the IM tape will be rewound automatically. While this is occurring there will be a beep sound about every 10 seconds. On the teletype screen will appear another command to mount the next IM tape and to press the sign switch, once this command is followed the beep sound will stop and now this IM tape will be copied onto the RM tape. This procedure will occur again and again until the entire month of IM tapes has been copied onto the RM tape. Also, at an IM tape request, the program can be aborted by pressing SSI.

ONE-MINUTE TAPE COMBINER PROGRAM

REVISION CR1.2 - 08 MAY 82 - D.J.KRECHT

1. MOUNT THE FIRST TAPE ON ANY TAPE UNIT
2. CHECK THE OUTPUT TAPE FOR ANOTHER TAPE UNIT
3. CHECK LINES ON LINE SENSE SWITCHES OFF
4. SET MARBUTH CONTROL TO 2 COLUMNS AUTOPRINT
5. PRESS RETURN TO START THE RUN, WHEN READY

-----OPTION SELECTION-----

YOUR OWN NAME AND DATE OF RUN EXAMPLE: ADAMS 01 MAY 82

ARMAND 27 AUG 83

3 INPUT TAPE UNIT: (U) 1, 2, 3, FOR UNIT #1, #2, #3

2 OUTPUT TAPE UNIT: (U) 1, 2, 3, BUT NOT THE INPUT

YEAR AND MONTH: (YYMM) EXAMPLE: 7904 FOR APR 79

8104 RESUME PRIOR RUN? ((YES)) TO ADD TO A PARTIAL TAPE

THE OUTPUT TAPE WILL BE RB104

-----SETUP COMPLETE-----

PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN

```

-----MOUNT TAPE IN1001 AND PRESS SIGN-----
DAY 1 APR 81 HAS BEEN ADDED
-----MOUNT TAPE IN1002 AND PRESS SIGN-----
DAY 2 APR 81 HAS BEEN ADDED
-----MOUNT TAPE IN1003 AND PRESS SIGN-----
DAY 3 APR 81 HAS BEEN ADDED
-----MOUNT TAPE IN1004 AND PRESS SIGN-----
DAY 4 APR 81 HAS BEEN ADDED
-----MOUNT TAPE IN1005 AND PRESS SIGN-----
DAY 5 APR 81 HAS BEEN ADDED
-----MOUNT TAPE IN1006 AND PRESS SIGN-----
DAY 6 APR 81 HAS BEEN ADDED
-----MOUNT TAPE IN1007 AND PRESS SIGN-----
DAY 7 APR 81 HAS BEEN ADDED
-----MOUNT TAPE IN1008 AND PRESS SIGN-----
DAY 8 APR 81 HAS BEEN ADDED
-----MOUNT TAPE IN1009 AND PRESS SIGN-----
DAY 9 APR 81 HAS BEEN ADDED
-----MOUNT TAPE IN1100 AND PRESS SIGN-----
DAY 10 APR 81 HAS BEEN ADDED
-----MOUNT TAPE IN1101 AND PRESS SIGN-----
DAY 11 APR 81 HAS BEEN ADDED
-----MOUNT TAPE IN1102 AND PRESS SIGN-----
DAY 12 APR 81 HAS BEEN ADDED
-----MOUNT TAPE IN1103 AND PRESS SIGN-----
DAY 13 APR 81 HAS BEEN ADDED
-----MOUNT TAPE IN1104 AND PRESS SIGN-----
DAY 14 APR 81 HAS BEEN ADDED
-----MOUNT TAPE IN1105 AND PRESS SIGN-----
DAY 15 APR 81 HAS BEEN ADDED
-----MOUNT TAPE IN1106 AND PRESS SIGN-----
DAY 16 APR 81 HAS BEEN ADDED
-----MOUNT TAPE IN1107 AND PRESS SIGN-----
DAY 17 APR 81 HAS BEEN ADDED
-----MOUNT TAPE IN1108 AND PRESS SIGN-----
DAY 18 APR 81 HAS BEEN ADDED
-----MOUNT TAPE IN1109 AND PRESS SIGN-----
DAY 19 APR 81 HAS BEEN ADDED
-----MOUNT TAPE IN1110 AND PRESS SIGN-----
DAY 20 APR 81 HAS BEEN ADDED

```

```

-----MOUNT TAPE IN1111 AND PRESS SIGN-----
DAY 21 APR 81 HAS BEEN ADDED
-----MOUNT TAPE IN1112 AND PRESS SIGN-----
DAY 22 APR 81 HAS BEEN ADDED
-----MOUNT TAPE IN1113 AND PRESS SIGN-----
DAY 23 APR 81 HAS BEEN ADDED
-----MOUNT TAPE IN1114 AND PRESS SIGN-----
DAY 24 APR 81 HAS BEEN ADDED
-----MOUNT TAPE IN1115 AND PRESS SIGN-----
DAY 25 APR 81 HAS BEEN ADDED
-----MOUNT TAPE IN1116 AND PRESS SIGN-----
DAY 26 APR 81 HAS BEEN ADDED
-----MOUNT TAPE IN1117 AND PRESS SIGN-----
DAY 27 APR 81 HAS BEEN ADDED
-----MOUNT TAPE IN1118 AND PRESS SIGN-----
DAY 28 APR 81 HAS BEEN ADDED
-----MOUNT TAPE IN1119 AND PRESS SIGN-----
DAY 29 APR 81 HAS BEEN ADDED
-----MOUNT TAPE IN1120 AND PRESS SIGN-----
DAY 30 APR 81 HAS BEEN ADDED
-----COMBINED TAPE COMPLETE-----
LABEL THIS TAPE RB104
-----RUN COMPLETE-----
JOB#

```

If a tape that is not an IM tape is mounted and the sign switch is pressed, then the program states there is a TAPE READ PROBLEM and aborts itself as in figure 35. If an IM tape out of sequence is mounted and the sign switch is pressed, then the program states that there is an INDEXING ERROR and aborts itself as in figure 36. Finally, if there is a parity error on the IM tape, then the program states that there is a TAPE READ PROBLEM and aborts itself as in figure 37. When the program is complete it reminds one to label the RM tape and states that the run is complete as in figures 34 & 38. An important fact about this program is that when the program is complete and the teletype screen is not filled, then a copy is not made automatically; one will have to obtain a copy manually.

The case just described as shown in figure 34 is when the program is executed correctly and no problems arise. However, sometimes a problem occurs and the program aborts itself. Whenever this happens the most frequent problem is a parity error occurs in reading the IM tape as shown in figure 37. To solve this problem the IM tape should be remade. Then the CMB program is used to add the remaining IM tapes of the month to the original RM tape that was aborted. For example in figure 37 the CMB program aborted itself on day 2215, so this day had to be remade. After it is remade the CMB program is requested and all the questions are answered exactly as before, except for the question asking whether or not to resume the prior run. In this case a response of [1] is used to resume the prior run. Then another question will appear asking which day to start copying and in this case it would be day 2215 as shown in figure 38. Note (figure 34) that when one does not resume a prior run then the question asking which day to start copying does not appear. The program will read the partially complete RM tape and print all the days already written on the RM tape on the teletype screen, then will appear the command to mount the next IM tape and to press the sign switch. Thus, one can continue as before to process the month of IM tapes to complete the RM tape as shown in figure 38. For this program there will be one page of output as in figures 34 & 38.

ONE-MINUTE TAPE COMBINER PROGRAM

REVISION CMI-2 - 03 MAY 82 - D.J.KNECHT
 1. MOUNT THE FIRST IN TAPE ON ANY TAPE UNIT
 2. MOUNT THE OUTPUT TAPE ON ANOTHER TAPE UNIT
 3. CHECK TAPES ON LINE SENSE SWITCHES OFF
 4. SET MARGIN CONTROL TO 2 COLUMNS AUTOPRINT
 5. PRESS RETURN TO START THE RUN, WHEN READY

-----OPTION SELECTION-----
 YOUR OWN NAME AND DATE OF RUN EXAMPLE: ADAMS 01 MAY 82
 1 INPUT TAPE UNIT (U) 1, 2, 3, FOR UNIT M1, M2, M3
 2 OUTPUT TAPE UNIT (U) 1, 2, 3, BUT NOT THE INPUT
 3 YEAR AND MONTH (YYMM) EXAMPLE: 7904 FOR APR 79
 4 RESUME PRIOR RUN? (1=YES) TO ADD TO A PARTIAL TAPE

THE OUTPUT TAPE WILL BE RM209
 -----SETUP COMPLETE-----
 PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN
 -----MOUNT TAPE IM2244 AND PRESS SIGN-----
 RUN ENDED: TAPE READ PROBLEM
 JUNE

Figure 35

ONE-MINUTE TAPE COMBINER PROGRAM

REVISION CMI-2 - 03 MAY 82 - D.J.KNECHT
 1. MOUNT THE FIRST IN TAPE ON ANY TAPE UNIT
 2. MOUNT THE OUTPUT TAPE ON ANOTHER TAPE UNIT
 3. CHECK TAPES ON LINE SENSE SWITCHES OFF
 4. SET MARGIN CONTROL TO 2 COLUMNS AUTOPRINT
 5. PRESS RETURN TO START THE RUN, WHEN READY

-----OPTION SELECTION-----
 YOUR OWN NAME AND DATE OF RUN EXAMPLE: ADAMS 01 MAY 82
 1 INPUT TAPE UNIT (U) 1, 2, 3, FOR UNIT M1, M2, M3
 2 OUTPUT TAPE UNIT (U) 1, 2, 3, BUT NOT THE INPUT
 3 YEAR AND MONTH (YYMM) EXAMPLE: 7904 FOR APR 79
 4 RESUME PRIOR RUN? (1=YES) TO ADD TO A PARTIAL TAPE

THE OUTPUT TAPE WILL BE RM209
 -----SETUP COMPLETE-----
 PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN
 -----MOUNT TAPE IM2244 AND PRESS SIGN-----
 RUN ENDED: INDEXING ERROR
 JUNE

Figure 36

ONE-MINUTE TAPE COMBINER PROGRAM

REVISION CMI-2 - 08 MAY 82 - D.J.KNECHT
 1. MOUNT THE FIRST IN TAPE ON ANY TAPE UNIT
 2. MOUNT THE OUTPUT TAPE ON ANOTHER TAPE UNIT
 3. CHECK TAPES ON LINE SENSE SWITCHES OFF
 4. SET MARGIN CONTROL TO 2 COLUMNS AUTOPRINT
 5. PRESS RETURN TO START THE RUN, WHEN READY

-----OPTION SELECTION-----
 YOUR OWN NAME AND DATE OF RUN EXAMPLE: ADAMS 01 MAY 82
 1 INPUT TAPE UNIT (U) 1, 2, 3, FOR UNIT M1, M2, M3
 2 OUTPUT TAPE UNIT (U) 1, 2, 3, BUT NOT THE INPUT
 3 YEAR AND MONTH (YYMM) EXAMPLE: 7904 FOR APR 79
 4 RESUME PRIOR RUN? (1=YES) TO ADD TO A PARTIAL TAPE

THE OUTPUT TAPE WILL BE RM208
 -----SETUP COMPLETE-----
 PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN
 -----MOUNT TAPE IM2213 AND PRESS SIGN-----
 DAY 1 AUG 82 HAS BEEN ADDED
 -----MOUNT TAPE IM2214 AND PRESS SIGN-----
 DAY 2 AUG 82 HAS BEEN ADDED
 -----MOUNT TAPE IM2215 AND PRESS SIGN-----
 1000 MTR
 RUN ENDED: TAPE HEAD PROBLEM
 JUNE

Figure 37

ONE-MINUTE TAPE COMBINE PROGRAM

MEUSUM CMI.2 - 08 MAY 82 - D.J.KNECHT

1. MOUNT THE FIRST TAPE ON ANY TAPE UNIT
2. MOUNT THE OUTPUT TAPE ON ANOTHER TAPE UNIT
3. CHECK TAPES ON LINE SENSE SWITCHES OFF
4. SET MARGIN CONTROL TO 2 COLUMNS AUTOMATIC
5. PRESS RETURN TO START THE RUN, UNCH READY

YOUR OWN NAME AND DATE OF RUN EXAMPLE: ADAMS 01 MAY 82
 INPUT TAPE UNIT: (U) I, J, K, FOR UNIT #1, #2, #3
 OUTPUT TAPE UNIT: (U) I, P, J, BUT NOT THE INPUT
 YEAR AND MONTH: (YYMM) EXAMPLE: 7904 FOR APR 79
 RESUME PRIOR RUN? (Y/N) TO ADD TO A PARTIAL TAPE
 FIRST IN TAPE NUMBER: (YDDD) YEAR AND DAY
 THE OUTPUT TAPE WILL BE RM200
 SETUP COMPLETE

PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN

DAY 1 AUG 82 IS ON THE TAPE
 DAY 2 AUG 82 IS ON THE TAPE
 MOUNT TAPE IM2215 AND PRESS SIGN
 DAY 3 AUG 82 HAS BEEN ADDED
 MOUNT TAPE IM2216 AND PRESS SIGN
 DAY 4 AUG 82 HAS BEEN ADDED
 MOUNT TAPE IM2217 AND PRESS SIGN
 DAY 5 AUG 82 HAS BEEN ADDED
 MOUNT TAPE IM2218 AND PRESS SIGN
 DAY 6 AUG 82 HAS BEEN ADDED
 MOUNT TAPE IM2219 AND PRESS SIGN
 DAY 7 AUG 82 HAS BEEN ADDED
 MOUNT TAPE IM2220 AND PRESS SIGN
 DAY 8 AUG 82 HAS BEEN ADDED
 MOUNT TAPE IM2221 AND PRESS SIGN
 DAY 9 AUG 82 HAS BEEN ADDED
 MOUNT TAPE IM2222 AND PRESS SIGN
 DAY 10 AUG 82 HAS BEEN ADDED
 MOUNT TAPE IM2223 AND PRESS SIGN
 DAY 11 AUG 82 HAS BEEN ADDED
 MOUNT TAPE IM2224 AND PRESS SIGN
 DAY 12 AUG 82 HAS BEEN ADDED
 MOUNT TAPE IM2225 AND PRESS SIGN
 DAY 13 AUG 82 HAS BEEN ADDED
 MOUNT TAPE IM2226 AND PRESS SIGN
 DAY 14 AUG 82 HAS BEEN ADDED
 MOUNT TAPE IM2227 AND PRESS SIGN
 DAY 15 AUG 82 HAS BEEN ADDED
 MOUNT TAPE IM2228 AND PRESS SIGN
 DAY 16 AUG 82 HAS BEEN ADDED
 MOUNT TAPE IM2229 AND PRESS SIGN
 DAY 17 AUG 82 HAS BEEN ADDED
 MOUNT TAPE IM2230 AND PRESS SIGN
 DAY 18 AUG 82 HAS BEEN ADDED
 MOUNT TAPE IM2231 AND PRESS SIGN
 DAY 19 AUG 82 HAS BEEN ADDED
 MOUNT TAPE IM2232 AND PRESS SIGN
 DAY 20 AUG 82 HAS BEEN ADDED

MOUNT TAPE IM2233 AND PRESS SIGN
 DAY 21 AUG 82 HAS BEEN ADDED
 MOUNT TAPE IM2234 AND PRESS SIGN
 DAY 22 AUG 82 HAS BEEN ADDED
 MOUNT TAPE IM2235 AND PRESS SIGN
 DAY 23 AUG 82 HAS BEEN ADDED
 MOUNT TAPE IM2236 AND PRESS SIGN
 DAY 24 AUG 82 HAS BEEN ADDED
 MOUNT TAPE IM2237 AND PRESS SIGN
 DAY 25 AUG 82 HAS BEEN ADDED
 MOUNT TAPE IM2238 AND PRESS SIGN
 DAY 26 AUG 82 HAS BEEN ADDED
 MOUNT TAPE IM2239 AND PRESS SIGN
 DAY 27 AUG 82 HAS BEEN ADDED
 MOUNT TAPE IM2240 AND PRESS SIGN
 DAY 28 AUG 82 HAS BEEN ADDED
 MOUNT TAPE IM2241 AND PRESS SIGN
 DAY 29 AUG 82 HAS BEEN ADDED
 MOUNT TAPE IM2242 AND PRESS SIGN
 DAY 30 AUG 82 HAS BEEN ADDED
 MOUNT TAPE IM2243 AND PRESS SIGN
 DAY 31 AUG 82 HAS BEEN ADDED
 COMBINED TAPE COMPLETE
 LABEL THIS TAPE RM200
 RUN COMPLETE
 JC88

Figure 38

II.G RGN PROGRAM

The RGN program writes a RM tape, too. However, this program does not make an RM tape from IM tapes; it makes a RM tape directly from IS tapes by reading, computing minute averages, reformatting the results, and writing them on a RM tape. To make a RM tape using the RGN program takes about 5 hours compared to 35 minutes using the CMB program. One may ask why then use the RGN program? The answer is in some cases IM tapes may not be available and rather than making all the IM tapes again from the IS tapes using the CV2 program and making the RM tape using the CMB program, one can directly make an RM tape from the IS tapes. In effect, the RGN program is a combination of the CV2 and CMB programs. Also, the RGN program checks whether or not a tape is an IS tape, the date on an IS tape, and whether or not there is a parity error on an IS tape.

At the start of the program a header appears on the screen as shown in figure 39. The header includes a group of seven instructions: mount the first IS tape on any tape unit, mount the output tape on another tape unit, check that both tape units are on line and sense switches off, press SS3 on tolerates parity errors on IS tapes so the program will not abort itself, press SS1 on ends a run at an IS tape request, set the margin control to 2 and the copy switch to autoprnt on the teletype terminal, and press the return when ready to proceed.

The first question will appear asking for the name of the person executing the program and the date of execution, which should be answered so that if a problem arises, who and when the program was executed will be known. The next question will ask which is the input tape unit, that is, where the IS tapes will be read ([2] in the example of figure 39). The next question will ask which is the output tape unit, that is, where the RM tape will be written ([3] in the example of figure 39). The following question will ask for the year and month. For January 1979, the first month of the year, the correct response will be 7901 as in figure 39. The next question will ask for the start day of the month. For example if one is beginning at the start of an RM tape, then one will answer the question with [01] for the first day of the month as in figure 39. If for some reason a RM tape has already been partially made then one can answer this question with the next day that should be added, for example one can answer this question with [16], the sixteenth day of the month, and go on from there as in figure 40. Also, if one has a partially made RM tape and wants to complete it, then one can answer this question with [00] which will find the end of the tape and then the next day can be added as in figure 41. Also, at this point one has the opportunity to check that all commands were followed and questions answered correctly. If not then a [1] may be entered and the questions will be erased and the header will reappear so that one can start over. If everything is correct then one can press the return and the program will be executed.

RGN PROGRAM TO REGENERATE RM TAPES

```

PRECISION PGMI.2 17 MAR 83 D. J. KNECHT
-----
1. MOUNT THE FIRST IS-TAPE ON ANY TAPE UNIT
2. MOUNT THE OUTPUT TAPE ON ANOTHER TAPE UNIT
3. CHECK TAPES ON LINE. SENSE SWITCHES OFF
4. SENSE SWITCH 3 ON TOLERATES PARITY ERRORS
5. SENSE SWITCH 1 ENDS RUN AT IS-TAPE REQUEST
6. RST MARGIN CONTROL TO 8 COLUMNS AUTOMATIC
7. PRESS RETURN TO START THE RUN. WHEN READY

----- OPTION SELECTION -----
YOUR NAME AND DATE OF RUN EXAMPLE: SMITH 16 MAR 83
[INPUT TAPE UNIT]: (M) 1,2,3 FOR M1,M2,M3
2 OUTPUT TAPE UNIT: (N) 1,2,3, BUT NOT THE INPUT
3 YEAR AND MONTH: (VVMM) EXAMPLE: 7004 FOR APR 70
7901 START DAY (OF MONTH): (DD) 01-31, 00=FIND END OF TAPE
01 PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN

----- SETUP COMPLETE -----
DAY 1 (1 JAN 70) AND PRESS SIGN SWITCH -----
DAY 2 (2 JAN 70) AND PRESS SIGN SWITCH -----
DAY 3 (3 JAN 70) AND PRESS SIGN SWITCH -----
DAY 4 (4 JAN 70) AND PRESS SIGN SWITCH -----
DAY 5 (5 JAN 70) AND PRESS SIGN SWITCH -----
DAY 6 (6 JAN 70) AND PRESS SIGN SWITCH -----
DAY 7 (7 JAN 70) AND PRESS SIGN SWITCH -----
DAY 8 (8 JAN 70) AND PRESS SIGN SWITCH -----
DAY 9 (9 JAN 70) AND PRESS SIGN SWITCH -----
DAY 10 (10 JAN 70) AND PRESS SIGN SWITCH -----
DAY 11 (11 JAN 70) AND PRESS SIGN SWITCH -----
DAY 12 (12 JAN 70) AND PRESS SIGN SWITCH -----
DAY 13 (13 JAN 70) AND PRESS SIGN SWITCH -----
DAY 14 (14 JAN 70) AND PRESS SIGN SWITCH -----
DAY 15 (15 JAN 70) AND PRESS SIGN SWITCH -----
DAY 16 (16 JAN 70) AND PRESS SIGN SWITCH -----
DAY 17 (17 JAN 70) AND PRESS SIGN SWITCH -----
DAY 18 (18 JAN 70) AND PRESS SIGN SWITCH -----
DAY 19 (19 JAN 70) AND PRESS SIGN SWITCH -----
DAY 20 (20 JAN 70) AND PRESS SIGN SWITCH -----
DAY 21 (21 JAN 70) AND PRESS SIGN SWITCH -----
DAY 22 (22 JAN 70) AND PRESS SIGN SWITCH -----
DAY 23 (23 JAN 70) AND PRESS SIGN SWITCH -----
DAY 24 (24 JAN 70) AND PRESS SIGN SWITCH -----
DAY 25 (25 JAN 70) AND PRESS SIGN SWITCH -----
DAY 26 (26 JAN 70) AND PRESS SIGN SWITCH -----
DAY 27 (27 JAN 70) AND PRESS SIGN SWITCH -----
DAY 28 (28 JAN 70) AND PRESS SIGN SWITCH -----
DAY 29 (29 JAN 70) AND PRESS SIGN SWITCH -----
DAY 30 (30 JAN 70) AND PRESS SIGN SWITCH -----
DAY 31 (31 JAN 70) AND PRESS SIGN SWITCH -----
1030 MTO1
ABORT? 1-ABORT, 0-CONTINUE

----- MOUNT COMPLETE -----
M1M 3451 18-TAPE PARITY ERROR - CONTINUE WITHOUT A BEEP
1030, MTO1
M1M 3451 15-TAPE PARITY ERROR - CONTINUE WITHOUT A BEEP
M1M 3451 15-TAPE PARITY ERROR - CONTINUE WITHOUT A BEEP
M1M 3451 TAPES LEADS 1 MINUTES - WRITE A BLANK
DAY 17 (17 JAN 70) HAS BEEN ADDED
DAY 18 (18 JAN 70) AND PRESS SIGN SWITCH -----
DAY 19 (19 JAN 70) AND PRESS SIGN SWITCH -----
DAY 20 (20 JAN 70) AND PRESS SIGN SWITCH -----
DAY 21 (21 JAN 70) AND PRESS SIGN SWITCH -----
DAY 22 (22 JAN 70) AND PRESS SIGN SWITCH -----
DAY 23 (23 JAN 70) AND PRESS SIGN SWITCH -----
DAY 24 (24 JAN 70) AND PRESS SIGN SWITCH -----
DAY 25 (25 JAN 70) AND PRESS SIGN SWITCH -----
DAY 26 (26 JAN 70) AND PRESS SIGN SWITCH -----
DAY 27 (27 JAN 70) AND PRESS SIGN SWITCH -----
DAY 28 (28 JAN 70) AND PRESS SIGN SWITCH -----
DAY 29 (29 JAN 70) AND PRESS SIGN SWITCH -----
DAY 30 (30 JAN 70) AND PRESS SIGN SWITCH -----
DAY 31 (31 JAN 70) AND PRESS SIGN SWITCH -----
1030, MTO1
M1M 3321 15-TAPE PARITY ERROR - CONTINUE WITHOUT A BEEP
M1M 3321 TAPES LEADS 1 MINUTES - WRITE A BLANK
DAY 30 (30 JAN 70) HAS BEEN ADDED
DAY 31 (31 JAN 70) AND PRESS SIGN SWITCH -----
1030, MTO1
ABORT? 1-ABORT, 0-CONTINUE

----- MOUNT COMPLETE -----
M1M 8781 15-TAPE PARITY ERROR - CONTINUE WITHOUT A BEEP
M1M 8781 TAPES LEADS 1 MINUTES - WRITE A BLANK
1030, MTO1

```

Figure 39

RGN PROGRAM TO REGENERATE RM TAPES

```
-----
REVISION RGM1.2  17 MAR 83  D.J.KNECHT
1. MOUNT THE FIRST IS-TAPE ON ANY TAPE UNIT
2. MOUNT THE OUTPUT TAPE ON ANOTHER TAPE UNIT
3. CHECK TAPES ON LINE SENSE SWITCHES OFF
4. SENSE SWITCH 3 /A1 TO (EQUALS) PARITY ERROR
5. SENSE SWITCH 1 LEADS RUN AT IS-TAPE BLOW ST
6. SET PARITY CONTROL TO 2 COLUMNS AUTOMATIC
7. PRESS RETURN TO START THE RUN, WHEN READY
-----
YOUR NAME AND DATE OF RUN    EXAMPLE: SMITH 15 MAR 83
UNIT NUMBER 18 MAR 83
INPUT TAPE UNIT(S) (M)      1,2,3 FOR M1,M2,M3
2 OUTPUT TAPE UNIT(S) (M)    1,2,3, BUT NOT THE INPUT
3 YEAR AND MONTH (YYMM)     EXAMPLE: 1984 FOR APR 79
7982 START DAY (OF MONTH) (DD) 01-31 00-FIND END OF TAPE
01 PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN
-----
----- SETUP COMPLETE -----
----- TAPE IS POSITIONED TO ADD DAY 16 -----
DAY 32 1 FEB 79 HAS BEEN ADDED
DAY 33 2 FEB 79 HAS BEEN ADDED
-----
1038 MTR
MTR: 861 IS-TAPE PARITY ERROR - CONTINUE WITHOUT A SKIP
MTR: 861 TAPE LEADS 1 MINUTES - WRITE A BLANK
DAY 34 3 FEB 79 HAS BEEN ADDED
DAY 35 4 FEB 79 HAS BEEN ADDED
DAY 36 5 FEB 79 HAS BEEN ADDED
DAY 37 6 FEB 79 HAS BEEN ADDED
DAY 38 7 FEB 79 HAS BEEN ADDED
DAY 39 8 FEB 79 HAS BEEN ADDED
DAY 40 9 FEB 79 HAS BEEN ADDED
DAY 41 10 FEB 79 HAS BEEN ADDED
DAY 42 11 FEB 79 HAS BEEN ADDED
DAY 43 12 FEB 79 HAS BEEN ADDED
DAY 44 13 FEB 79 HAS BEEN ADDED
DAY 45 14 FEB 79 HAS BEEN ADDED
DAY 46 15 FEB 79 HAS BEEN ADDED
-----
----- TAPE TERMINATED -----
-----
JCSB
```

RGN PROGRAM TO REGENERATE RM TAPES

```
-----
REVISION RGM1.2  17 MAR 83  D.J.KNECHT
1. MOUNT THE FIRST IS-TAPE ON ANY TAPE UNIT
2. CHECK TAPES ON LINE SENSE SWITCHES OFF
3. SENSE SWITCH 3 /A1 TO (EQUALS) PARITY ERROR
4. SENSE SWITCH 1 LEADS RUN AT IS-TAPE BLOW ST
5. SET PARITY CONTROL TO 2 COLUMNS AUTOMATIC
7. PRESS RETURN TO START THE RUN, WHEN READY
-----
YOUR NAME AND DATE OF RUN    EXAMPLE: SMITH 15 MAR 83
UNIT NUMBER 18 MAR 83
INPUT TAPE UNIT(S) (M)      1,2,3 FOR M1,M2,M3
2 OUTPUT TAPE UNIT(S) (M)    1,2,3, BUT NOT THE INPUT
3 YEAR AND MONTH (YYMM)     EXAMPLE: 1984 FOR APR 79
7982 START DAY (OF MONTH) (DD) 01-31 00-FIND END OF TAPE
16 PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN
-----
----- SETUP COMPLETE -----
----- TAPE IS POSITIONED TO ADD DAY 16 -----
DAY 47 116 FEB 79 HAS BEEN ADDED
DAY 48 117 FEB 79 HAS BEEN ADDED
DAY 49 118 FEB 79 HAS BEEN ADDED
DAY 50 119 FEB 79 HAS BEEN ADDED
DAY 51 120 FEB 79 HAS BEEN ADDED
-----
DAY 52 121 FEB 79 HAS BEEN ADDED
DAY 53 122 FEB 79 HAS BEEN ADDED
DAY 54 123 FEB 79 HAS BEEN ADDED
DAY 55 124 FEB 79 HAS BEEN ADDED
DAY 56 125 FEB 79 HAS BEEN ADDED
DAY 57 126 FEB 79 HAS BEEN ADDED
-----
1038 MTR
MTR: 861 IS-TAPE PARITY ERROR - CONTINUE WITHOUT A SKIP
MTR: 861 TAPE LEADS 1 MINUTES - WRITE A BLANK
DAY 58 127 FEB 79 HAS BEEN ADDED
DAY 59 128 FEB 79 HAS BEEN ADDED
-----
----- MONTH COMPLETE -----
-----
JCSB
```

Figure 40

RGN PROGRAM TO REGENERATE RM TAPES

```

REVISION 0011.2 17 MAR 83 D.-J.-ANECHT
-----
1. MOUNT THE FIRST 15-TAPE ON ANY TAPE UNIT
2. MOUNT THE OUTPUT TAPE ON ANOTHER TAPE UNIT
3. CHECK TAPES ON LINE. SENSE SWITCHES OFF
4. SENSE SWITCH 3 WILL TOLERATE PARITY ERRORS
5. SENSE SWITCH 1 ENDS RUN AT 15-TAPE REQUEST
6. SET MARGIN CONTROL TO 2 COLUMNS. AUTOPRINT
7. PRESS RETURN TO START THE RUN, WHEN READY
-----
YOUR NAME AND DATE OF RUN EXAMPLE: SAITH 15 MAR 83
PAULICA 1 APR 83
INPUT TAPE UNIT: (M) 1,2,3 FOR M1,M2,M3
1 OUTPUT TAPE UNIT: (M) 3,2,3, BUT NOT THE INPUT
3 YEAR AND MONTH: (YYMM) EXAMPLE: 7904 FOR APR 79
7804 START DAY (OF MONTH): (DD) 01-31, 00-FIND END OF TAPE
01 PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN
-----
1. MOUNT 158001 AND PRESS SIGN SWITCH
DAY 91 ( 1 APR 78) HAS BEEN ADDED
2. MOUNT 158002 AND PRESS SIGN SWITCH
DAY 92 ( 2 APR 78) HAS BEEN ADDED
3. MOUNT 158003 AND PRESS SIGN SWITCH
DAY 93 ( 3 APR 78) HAS BEEN ADDED
4. MOUNT 158004 AND PRESS SIGN SWITCH
DAY 94 ( 4 APR 78) HAS BEEN ADDED
5. MOUNT 158005 AND PRESS SIGN SWITCH
DAY 95 ( 5 APR 78) HAS BEEN ADDED
6. MOUNT 158006 AND PRESS SIGN SWITCH
DAY 96 ( 6 APR 78) HAS BEEN ADDED
7. MOUNT 158007 AND PRESS SIGN SWITCH
DAY 97 ( 7 APR 78) HAS BEEN ADDED
8. MOUNT 158008 AND PRESS SIGN SWITCH
DAY 98 ( 8 APR 78) HAS BEEN ADDED
9. MOUNT 158009 AND PRESS SIGN SWITCH
DAY 99 ( 9 APR 78) HAS BEEN ADDED
10. MOUNT 158010 AND PRESS SIGN SWITCH
DAY 100 (10 APR 78) HAS BEEN ADDED
11. MOUNT 158011 AND PRESS SIGN SWITCH
DAY 101 (11 APR 78) HAS BEEN ADDED
12. MOUNT 158012 AND PRESS SIGN SWITCH
DAY 102 (12 APR 78) HAS BEEN ADDED
13. MOUNT 158013 AND PRESS SIGN SWITCH
DAY 103 (13 APR 78) HAS BEEN ADDED
14. MOUNT 158014 AND PRESS SIGN SWITCH
DAY 104 (14 APR 78) HAS BEEN ADDED
15. MOUNT 158015 AND PRESS SIGN SWITCH
DAY 105 (15 APR 78) HAS BEEN ADDED
16. MOUNT 158016 AND PRESS SIGN SWITCH
DAY 106 (16 APR 78) HAS BEEN ADDED
17. MOUNT 158017 AND PRESS SIGN SWITCH
DAY 107 (17 APR 78) HAS BEEN ADDED
18. MOUNT 158018 AND PRESS SIGN SWITCH
DAY 108 (18 APR 78) HAS BEEN ADDED
19. MOUNT 158019 AND PRESS SIGN SWITCH
DAY 109 (19 APR 78) HAS BEEN ADDED
20. MOUNT 158020 AND PRESS SIGN SWITCH
-----

```

```

DAY 110 (20 APR 78) HAS BEEN ADDED
1. MOUNT 158021 AND PRESS SIGN SWITCH
DAY 111 (21 APR 78) HAS BEEN ADDED
2. MOUNT 158022 AND PRESS SIGN SWITCH
DAY 112 (22 APR 78) HAS BEEN ADDED
3. MOUNT 158023 AND PRESS SIGN SWITCH
DAY 113 (23 APR 78) HAS BEEN ADDED
4. MOUNT 158024 AND PRESS SIGN SWITCH
DAY 114 (24 APR 78) HAS BEEN ADDED
5. MOUNT 158025 AND PRESS SIGN SWITCH
DAY 115 (25 APR 78) HAS BEEN ADDED
6. MOUNT 158026 AND PRESS SIGN SWITCH
DAY 116 (26 APR 78) HAS BEEN ADDED
7. MOUNT 158027 AND PRESS SIGN SWITCH
DAY 117 (27 APR 78) HAS BEEN ADDED
8. MOUNT 158028 AND PRESS SIGN SWITCH
-----
RUN TERMINATED
-----

```

RGN PROGRAM TO REGENERATE RM TAPES

```

REVISION 0011.2 17 MAR 83 D.-J.-ANECHT
-----
1. MOUNT THE FIRST 15-TAPE ON ANY TAPE UNIT
2. MOUNT THE OUTPUT TAPE ON ANOTHER TAPE UNIT
3. CHECK TAPES ON LINE. SENSE SWITCHES OFF
4. SENSE SWITCH 3 WILL TOLERATE PARITY ERRORS
5. SENSE SWITCH 1 ENDS RUN AT 15-TAPE REQUEST
6. SET MARGIN CONTROL TO 2 COLUMNS. AUTOPRINT
7. PRESS RETURN TO START THE RUN, WHEN READY
-----
YOUR NAME AND DATE OF RUN EXAMPLE: SAITH 15 MAR 83
WHITTAKER 1 APR 83
INPUT TAPE UNIT: (M) 1,2,3 FOR M1,M2,M3
1 OUTPUT TAPE UNIT: (M) 1,2,3, BUT NOT THE INPUT
3 YEAR AND MONTH: (YYMM) EXAMPLE: 7904 FOR APR 79
7804 START DAY (OF MONTH): (DD) 01-31, 00-FIND END OF TAPE
PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN
-----
TAPE IS POSITIONED TO ADD DAY 28
DAY 118 (28 APR 78) HAS BEEN ADDED
DAY 119 (29 APR 78) HAS BEEN ADDED
DAY 120 (30 APR 78) HAS BEEN ADDED
-----
MONTH COMPLETE
-----

```

FIGURE 41

A statement will appear to mount the first IS tape and press the sign switch. The entire IS tape will be processed and rewound, then the IM data will be written on the RM tape. While this is occurring there will be a beep sound about every 10 seconds. On the teletype screen will appear another command to mount the next IS tape and to press the sign switch, once this command is followed the beep sound will stop and now this IS tape will be processed. This procedure will occur again and again until the entire month of IS tapes has been processed into IM data and thus written onto the RM tape.

If a tape that is not an IS tape is mounted and the sign switch is pressed, then the program states that IRF (*) IS IN ERROR and aborts itself as in figure 42. If an IS tape out of sequence is mounted and the sign switch is pressed, then the program states that the JULIAN DAY IS 100 and aborts itself as in figure 43. Finally, if there is a parity error on the IS tape and SS3 is off, then the program asks whether or not to abort as in figure 44. When this program is complete it states MONTH COMPLETE as in figures 39 & 40. An important fact about this program is that when the program is complete and the teletype screen is not filled then a copy is not made automatically; one will have to obtain a copy manually. For this program there will be 1 page of output as in figure 39, however, in some rare cases (when there are many parity errors) there could be more than 1 page.

```

      RGN PROGRAM TO REGENERATE RM TAPES
      REVISION RGN1.2   17 MAR 63   D.J.KNECHT
-----
      1. MOUNT THE FIRST IS-TAPE ON ANY TAPE UNIT.
      2. MOUNT THE OUTPUT TAPE ON ANOTHER TAPE UNIT
      3. CHECK: TAPES ON LINE, SENSE SWITCHES OFF
      4. SENSE SWITCH 3 ON TOLERATES PARITY ERRORS
      5. SENSE SWITCH 1 ENDS RUN AT IS-TAPE REQUEST
      6. SET MARGIN CONTROL TO 2 COLUMNS MUTOPTINT
      7. PRESS RETURN TO START THE RUN, WHEN READY
-----
      ----- OPTION SELECTION -----
      YOUR NAME AND DATE OF RUN      EXAMPLE: SMITH 15 MAR 63
      ARMAND 04 SEP 64
      INPUT TAPE UNIT: (N)           1,2,3 FOR M1,M2,M3
      3
      OUTPUT TAPE UNIT: (N)          1,2,3, BUT NOT THE INPUT
      2
      YEAR AND MONTH: (YYMM)         EXAMPLE: 7904 FOR APR 79
      8210
      START DAY (OF MONTH): (DD)     01-31; 00-FIND END OF TAPE
      01
      ----- SETUP COMPLETE -----
      PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN
      ----- MOUNT IS2274 AND PRESS SIGN SWITCH -----
      ABORT: IRF(*) IS IN ERROR
      JC88
  
```

Figure 42

RGH PROGRAM TO REGENERATE RM TAPES

REVISION RGH1.2 17 MAR 63 D.J.KNECHT

1. MOUNT THE FIRST IS-TAPE ON ANY TAPE UNIT
2. MOUNT THE OUTPUT TAPE ON ANOTHER TAPE UNIT
3. CHECK TAPES ON LINE, SENSE SWITCHES OFF
4. SENSE SWITCH 3 ON TOLERATES PARITY ERRORS
5. SENSE SWITCH 1 ENDS RUN AT IS-TAPE REQUEST
6. SET MARGIN CONTROL TO 2 COLUMNS AUTOPRINT
7. PRESS RETURN TO START THE RUN, WHEN READY

OPTION SELECTION

YOUR NAME AND DATE OF RUN EXAMPLE: SMITH 15 MAR 63
 ARMAND 07 SEP 64
 INPUT TAPE UNIT: (N) 1,2,3 FOR M1,M2,M3
 3
 OUTPUT TAPE UNIT: (N) 1,2,3, BUT NOT THE INPUT
 2
 YEAR AND MONTH: (YYMM) EXAMPLE: 7904 FOR APR 79
 7905
 START DAY (OF MONTH): (DD) 01-31, 00-FIND END OF TAPE
 01
 ----- SETUP COMPLETE -----
 PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN
 ----- MOUNT IS9121 AND PRESS SIGN SWITCH -----
 ABORT: JULIAN DAY IS 100
 JC11

Figure 43

RGH PROGRAM TO REGENERATE RM TAPES

REVISION RGH1.2 17 MAR 63 D.J.KNECHT

1. MOUNT THE FIRST IS-TAPE ON ANY TAPE UNIT
2. MOUNT THE OUTPUT TAPE ON ANOTHER TAPE UNIT
3. CHECK TAPES ON LINE, SENSE SWITCHES OFF
4. SENSE SWITCH 3 ON TOLERATES PARITY ERRORS
5. SENSE SWITCH 1 ENDS RUN AT IS-TAPE REQUEST
6. SET MARGIN CONTROL TO 2 COLUMNS AUTOPRINT
7. PRESS RETURN TO START THE RUN, WHEN READY

OPTION SELECTION

YOUR NAME AND DATE OF RUN EXAMPLE: SMITH 15 MAR 63
 ARMAND 04 SEP 64
 INPUT TAPE UNIT: (N) 1,2,3 FOR M1,M2,M3
 3
 OUTPUT TAPE UNIT: (N) 1,2,3, BUT NOT THE INPUT
 2
 YEAR AND MONTH: (YYMM) EXAMPLE: 7904 FOR APR 79
 7904
 START DAY (OF MONTH): (DD) 01-31, 00-FIND END OF TAPE
 01
 ----- SETUP COMPLETE -----
 PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN
 ----- MOUNT IS9091 AND PRESS SIGN SWITCH -----
 1030, RT00
 ABORT? 1-ABORT, 0-CONTINUE
 0
 MIN- 10: IS-TAPE PARITY ERROR - CONTINUE WITHOUT A SKIP
 MIN- 10: TAPE LEADS 1 MINUTES - WRITE A BLANK
 1030, RT00
 ABORT? 1-ABORT, 0-CONTINUE
 1
 ABORT: PARITY ERROR ON UNIT 23
 JC11

Figure 44

II.H TCY PROGRAM

The TCY program can make a copy of several different kinds of tapes. Also, this program can check what type of tape it is and whether or not there is a parity error on the tape read. The time required to execute this program is dependent on the number and length of records to be copied.

A question will appear asking for the format of the tape that is being read which will be copied onto a copy tape. Tape formats could be any of the following:

GE = Any number of words per record; 2 or 3 bytes per word
AR = 2560 maximum words per record; 2 bytes per word
IS = 1300 words per record; 3 bytes per word
FS = 6500 words per record; 2 bytes per word
IM = 1680 words per record; 3 bytes per word
RM = 1680 words per record; 3 bytes per word
CM = 4200 words per record; 2 bytes per word

For example in figure 45 GE is entered for this question, where any type of tape can be read. Then the following question asks for the number of words per record as in figure 45. The next question asks whether or not the record length varies. This question should usually be answered with a [Y] in all cases as in figure 45 except when an archive tape is to be copied. Of the common tapes only archive tapes have variable length records, but GE might be used for other tapes of this type. The following question asks for the number of bytes per word ([3] in the example of figure 45). Thus, in this example of a GE tape format the tape read and copied is an IM tape with 1680 words per record, nonvariable length records, and 3 bytes per word. Note (figure 46) that whenever any tape format other than GE is requested, then the questions asking for the number of words per record, variable length records, and number of bytes per word do not appear. For example in figure 46 [RM] is entered to copy an RM tape. The second question asks for the number of records to be copied, where the total number that can be copied is 32000. Also, a [0] can be entered as in figure 46 to copy an entire tape. The next question will ask which is the input tape unit, that is, where the original tape will be read ([3] in the examples of figures 45 & 46). The next question will ask which is the output tape unit, that is, where the copy tape will be written ([2] in the examples of figures 45 & 46).

TAPE COPIER PROGRAM

UAPIHELE FORMAT - 6500 MAX WORDS - 2- OR 3-BYTE BINARY
 REVISION TCY1.2 - 03 MAR 84 - D.J.KNECHT

```

-----
TAPE FORMAT: (FF)          GE - GENERAL (TO BE INPUT)
                           AR - ARCHIVE DATA
                           IS,FS,IN,AM,CM - EDITED DATA
GE
WORDS PER RECORD: (NNNN)  6500 MAXIMUM
1000 VARIABLE LENGTH RECORDS?  ENTER 1 IF VARIABLE
TAPE BYTES PER WORD: (N)  2-BYTE OR 3-BYTE BINARY
3
NUMBER OF RECORDS: (NNNN) 32000 MAX, 0-COMplete TAPE
0007 INPUT TAPE UNIT: (N)  1,2,3 FOR M1,M2,M3
3
OUTPUT TAPE UNIT: (N)     1,2,3, BUT NOT THE INPUT
2
PARITY-ERROR TREATMENT: (T) 0-ABORT, 1-OMIT, 2-ENDFILE
-----
--SETUP COMPLETE--
PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN

RECORD  0 HAS 1680 WORDS
RECORD  1 HAS 1680 WORDS
RECORD  2 HAS 1680 WORDS
RECORD  3 HAS 1680 WORDS
RECORD  4 HAS 1680 WORDS
RECORD  5 HAS 1680 WORDS
RECORD  6 HAS 1680 WORDS
SPECIFIED NUMBER OF RECORDS WRITTEN
TOTAL RECORDS READ (INCL EOF):  8
-----
--COPYING COMPLETE--
JC11
    
```

Figure 45

TAPE COPIER PROGRAM

UAPIHELE FORMAT - 6500 MAX WORDS - 2- OR 3-BYTE BINARY
 REVISION TCY1.2 - 03 MAR 84 - D.J.KNECHT

```

-----
TAPE FORMAT: (FF)          GE - GENERAL (TO BE INPUT)
                           AR - ARCHIVE DATA
                           IS,FS,IN,AM,CM - EDITED DATA
RM
NUMBER OF RECORDS: (NNNN)  32000 MAX, 0-COMplete TAPE
INPUT TAPE UNIT: (N)      1,2,3 FOR M1,M2,M3
3
OUTPUT TAPE UNIT: (N)     1,2,3, BUT NOT THE INPUT
2
PARITY-ERROR TREATMENT: (T) 0-ABORT, 1-OMIT, 2-ENDFILE
-----
--SETUP COMPLETE--
PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN

RECORD  0 HAS 1658 WORDS
RECORD  1 HAS 1665 WORDS
RECORD  2 HAS 1689 WORDS
RECORD  3 HAS 1664 WORDS
RECORD  4 HAS 1694 WORDS
RECORD  5 HAS 1685 WORDS
:ABORT,TCY
RECORD  6 HAS 1637 WORDS
JC11
    
```

Figure 46

The following question asks for the method of PARITY-ERROR TREATMENT with 3 possible responses:

- 0 = ABORT
- 1 = OMIT
- 2 = ENDFILE

If a parity error exists on the original tape and one wants the program to abort itself when it reads a parity error, then a [0] should be entered for this question and the parity error where the tape is read will appear on the teletype screen along with the record number as shown in figure 47. If a parity error exists on the original tape and one wants simply to omit the record containing the parity error from the copy tape, then a [1] should be entered for this question (any parity error will appear on the teletype screen). If a parity error exists on the original tape and one wants to replace the record containing the parity error with an End Of File (EOF) on the copy tape, then a [2] should be entered for this question (any parity error will appear on the teletype screen). Also, at this point one has the opportunity to check that all commands were followed and questions answered correctly. If not then a [1] may be entered and the questions will be erased and the header will reappear so that one can start over. If everything is correct then one can press the return and the program will be executed.

When the program completes its execution of copying an entire tape and finds a double EOF on the input tape it will print on the teletype screen END OF INFORMATION REACHED and the number of records read as in figure 48. When the program completes execution of partially copying a tape it will print on the teletype screen the SPECIFIED NUMBER OF RECORDS WRITTEN and the number of records read as in figure 45. For this program there will be 1 page of output as in figures 45-48, unless many records are copied and the correct tape format was not entered. If a tape read is not of the format as input to the tape format question, then for every record copied the number of actual words per record will be printed on the teletype screen as shown in figure 45.

A final fact about this program is that it rewinds the original tape and the copy tape upon completion of its execution.


```

TAPÉ COPIER PROGRAM
VARIABLE FORMAT - 6500 MAX WORDS - 2- OR 3-BYTE BINARY
REVISION TCY1.2 - 03 MAR 84 - D.J.KNECHT
-----
TAPE FORMAT: (FF) GE - GENERAL (TO BE INPUT)
AR - ARCHIVE DATA
IS,FS,IN,RM,CM - EDITED DATA
AR
NUMBER OF RECORDS: (NNNN) 32000 MAX, 0-COMplete TAPE
0100 INPUT TAPE UNIT: (N) 1,2,3 FOR M1,M2,M3
3 OUTPUT TAPE UNIT: (N) 1,2,3, BUT NOT THE INPUT
2 PARITY ERROR TREATMENT: (T) 0-ABORT, 1-OMIT, 2-ENDFILE
-----SETUP COMPLETE-----
PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN
IN30, MT00
ABORT: READ PARITY, RECORD 22
JC14

```

Figure 47

```

TAPÉ COPIER PROGRAM
VARIABLE FORMAT - 6500 MAX WORDS - 2- OR 3-BYTE BINARY
REVISION TCY1.2 - 03 MAR 84 - D.J.KNECHT
-----
TAPE FORMAT: (FF) GE - GENERAL (TO BE INPUT)
AR - ARCHIVE DATA
IS,FS,IN,RM,CM - EDITED DATA
IM
NUMBER OF RECORDS: (NNNN) 32000 MAX, 0-COMplete TAPE
3 INPUT TAPE UNIT: (N) 1,2,3 FOR M1,M2,M3
3 OUTPUT TAPE UNIT: (N) 1,2,3, BUT NOT THE INPUT
2 PARITY-ERROR TREATMENT: (T) 0-ABORT, 1-OMIT, 2-ENDFILE
-----SETUP COMPLETE-----
PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN
END OF INFORMATION REACHED
TOTAL RECORDS READ (INCL EOF): 44
-----COPYING COMPLETE-----
JC14

```

Figure 48

I. PM PROGRAM (Process One Minute Data)

The PM program writes a CM tape, which is readable on the CDC Cyber computer, from a RM tape. The PM program makes a number of checks on the RM tape whether or not it writes a CM tape and prints the results on the teletype screen: the number of missing data points for each component of each station for every day of the month. Also, the PM program checks whether or not a tape is a RM tape, the year and month on a RM tape, and whether or not there is a parity error on a RM tape. This program takes about 35 minutes to execute.

At the start of the program a header appears on the screen as shown in figure 49. The header includes a group of five instructions: mount the RM tape on any tape unit, mount the output tape on another tape unit, check that both tape units are on line and SS1 on if recycling, set the margin control to 2 and the copy switch to autoprnt on the teletype terminal, and press the return when ready to proceed.

The first question will appear asking for the name of the person executing the program and the date of execution, which should be answered so that if a problem arises, who and when the program was executed will be known. The next question will ask whether or not to omit the output tape (the CM tape). If one does not want to make a CM tape and only wants to check the RM tape, then a [1] should be entered for this question as in figure 50. Under these conditions the program will take much less than 35 minutes (probably 15 minutes) to execute since the program does not have to read a tape and write a tape, but only read a tape. If one wants to check the RM tape and also write a CM tape, then the question should be answered with a [0] as in figure 49. The next question will ask which is the input tape unit, that is, where the RM tape will be read ([2] in the example of figures 49 & 50). The next question will ask which is the output tape unit, that is, where the CM tape will be written ([3] in the example of figure 49). Note (figure 50) that when one does not want to write a CM tape then the question asking which is the output tape unit does not appear. The following question will ask for the year and month. For January 1981, the first month of the year, the correct response will be 8101 as shown figure 49. Next, a statement indicating how the CM tape should be labeled appears. Also, at this point one has the opportunity to check that all commands were followed and questions answered correctly. If not then a [1] may be entered and the questions will be erased and the header will reappear so that one can start over. If everything is correct then one can press the return and the program will be executed. When the program completes a good run it states the end of a good run and automatically copies. A minor problem with this program occurs when it is used for the twelfth month of the year; it appears to fail as indicated in figure 51. However, the run is assumed to be good and the problem is with the software rather than with the RM tape checked and the CM tape written. For this program there will be about 2 1/2 pages of output as in figure 49.

PM PROGRAM - TO PROCESS RM TAPES

REVISION PRG.1 - 28 MAR 83 - D.J.KNECHT

1. POINT THE RM-SERIES TAPE ON ANY TAPE UNIT
2. POINT THE BLANK TAPE ON ANOTHER TAPE UNIT
3. CHECK TAPES ON LINE, 331 ON IF RECYCLING
4. SET MARGIN CONTROL TO 2 COLUMNS AUTOPRINT
5. PRESS RETURN TO START THE RUN, WHEN READY

OPTION SELECTION

YOUR OWN NAME AND DATE OF RUN EXAMPLE: SMITH 01 APR 82
 APPROXD 13 AUG 83

- UNIT THE OUTPUT TAPE? (1=YES) FOR JR-SERIES TAPE CHECK ONLY
- INPUT TAPE UNIT: (U) 1, 2, 3, FOR UNIT #1, #2, #3
- OUTPUT TAPE UNIT: (U) 1, 2, 3, BUT NOT THE INPUT
- YEAR AND MONTH: (YYDD) YEAR AND DAY

810 LABEL THE OUTPUT TAPE RM#101

SETUP COMPLETE

PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN

CHECK DAY 1001

COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)

STM 11 22 (X) 22 (Z)

STM 21 22 (X) 22 (Z)

STM 31 22 (X) 22 (Z)

STM 41 22 (X) 22 (Z)

STM 51 23 (X) 23 (Z)

STM 61 22 (X) 22 (Z)

STM 71 23 (X) 23 (Z)

STM 81 22 (X) 22 (Z)

STM 91 23 (X) 23 (Z)

GOOD INPUT DATA - NO ERRORS

COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)

STM 11 3 (X) 3 (Z)

STM 21 0 (X) 0 (Z)

STM 31 0 (X) 0 (Z)

STM 41 0 (X) 0 (Z)

STM 51 0 (X) 0 (Z)

STM 61 0 (X) 0 (Z)

STM 71 0 (X) 0 (Z)

STM 81 0 (X) 0 (Z)

STM 91 0 (X) 0 (Z)

GOOD INPUT DATA - NO ERRORS

CHECK DAY 1003

COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)

STM 11 2 (X) 2 (Z)

STM 21 0 (X) 0 (Z)

STM 31 0 (X) 0 (Z)

STM 41 1 (X) 1 (Z)

STM 51 0 (X) 0 (Z)

STM 61 0 (X) 0 (Z)

STM 71 0 (X) 0 (Z)

STM 81 0 (X) 0 (Z)

STM 91 0 (X) 0 (Z)

GOOD INPUT DATA - NO ERRORS

CHECK DAY 1004

COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)

STM 11 0 (X) 0 (Z)

STM 21 2 (X) 2 (Z)

STM 31 1 (X) 1 (Z)

STM 41 2 (X) 2 (Z)

STM 51 0 (X) 0 (Z)

STM 61 0 (X) 0 (Z)

STM 71 0 (X) 0 (Z)

STM 81 0 (X) 0 (Z)

STM 91 0 (X) 0 (Z)

GOOD INPUT DATA - NO ERRORS

CHECK DAY 1005

COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)

STM 11 18 (X) 18 (Z)

STM 21 17 (X) 17 (Z)

STM 31 16 (X) 16 (Z)

STM 41 49 (X) 49 (Z)

STM 51 356 (X) 356 (Z)

STM 61 17 (X) 17 (Z)

STM 71 16 (X) 16 (Z)

GOOD INPUT DATA - NO ERRORS

CHECK DAY 1006

COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)

STM 11 35 (X) 35 (Z)

STM 21 38 (X) 38 (Z)

STM 31 36 (X) 36 (Z)

STM 41 35 (X) 35 (Z)

STM 51 728 (X) 728 (Z)

STM 61 30 (X) 30 (Z)

STM 71 30 (X) 30 (Z)

STM 81 30 (X) 30 (Z)

STM 91 30 (X) 30 (Z)

GOOD INPUT DATA - NO ERRORS

CHECK DAY 1007

COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)

STM 11 5 (X) 5 (Z)

STM 21 1 (X) 1 (Z)

STM 31 10 (X) 10 (Z)

STM 41 4 (X) 4 (Z)

STM 51 5 (X) 5 (Z)

STM 61 5 (X) 5 (Z)

STM 71 4 (X) 4 (Z)

STM 81 5 (X) 5 (Z)

STM 91 4 (X) 4 (Z)

GOOD INPUT DATA - NO ERRORS

CHECK DAY 1008

COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)

STM 11 3 (X) 3 (Z)

STM 21 1 (X) 1 (Z)

STM 31 1 (X) 1 (Z)

STM 41 1 (X) 1 (Z)

STM 51 47 (X) 47 (Z)

STM 61 5 (X) 5 (Z)

STM 71 5 (X) 5 (Z)

STM 81 0 (X) 0 (Z)

STM 91 0 (X) 0 (Z)

GOOD INPUT DATA - NO ERRORS

CHECK DAY 1009

COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)

STM 11 3 (X) 3 (Z)

STM 21 0 (X) 0 (Z)

STM 31 0 (X) 0 (Z)

STM 41 0 (X) 0 (Z)

STM 51 0 (X) 0 (Z)

STM 61 0 (X) 0 (Z)

STM 71 13 (X) 13 (Z)

STM 81 0 (X) 0 (Z)

STM 91 0 (X) 0 (Z)

GOOD INPUT DATA - NO ERRORS

CHECK DAY 1010

COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)

STM 11 6 (X) 6 (Z)

STM 21 2 (X) 2 (Z)

STM 31 2 (X) 2 (Z)

STM 41 1 (X) 1 (Z)

STM 51 3 (X) 3 (Z)

STM 61 0 (X) 0 (Z)

STM 71 0 (X) 0 (Z)

STM 81 0 (X) 0 (Z)

STM 91 0 (X) 0 (Z)

GOOD INPUT DATA - NO ERRORS

CHECK DAY 1011

COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)

STM 11 7 (X) 7 (Z)

STM 21 2 (X) 2 (Z)

Figure 49: First of three pages.

```

STM 71 0 (X) 0 (V) 0 (Z)
STM 81 0 (X) 0 (V) 0 (Z)
STM 91 1 (X) 1 (V) 1 (Z)
GOOD INPUT DATA - NO ERRORS
COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)
CHECK DAY 1818
STM 11 0 (X) 0 (V) 0 (Z)
STM 21 0 (X) 0 (V) 0 (Z)
STM 31 1 (X) 1 (V) 1 (Z)
STM 41 0 (X) 0 (V) 0 (Z)
STM 51 0 (X) 0 (V) 0 (Z)
STM 61 0 (X) 0 (V) 0 (Z)
STM 71 0 (X) 0 (V) 0 (Z)
STM 81 0 (X) 0 (V) 0 (Z)
STM 91 1 (X) 1 (V) 1 (Z)
GOOD INPUT DATA - NO ERRORS
COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)
CHECK DAY 1819
STM 11 0 (X) 0 (V) 0 (Z)
STM 21 0 (X) 0 (V) 0 (Z)
STM 31 0 (X) 0 (V) 0 (Z)
STM 41 0 (X) 0 (V) 0 (Z)
STM 51 0 (X) 0 (V) 0 (Z)
STM 61 0 (X) 0 (V) 0 (Z)
STM 71 0 (X) 0 (V) 0 (Z)
STM 81 0 (X) 0 (V) 0 (Z)
STM 91 0 (X) 0 (V) 0 (Z)
GOOD INPUT DATA - NO ERRORS
COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)
CHECK DAY 1820
STM 11 1 (X) 1 (V) 1 (Z)
STM 21 0 (X) 0 (V) 0 (Z)
STM 31 0 (X) 0 (V) 0 (Z)
STM 41 0 (X) 0 (V) 0 (Z)
STM 51 1 (X) 1 (V) 1 (Z)
STM 61 0 (X) 0 (V) 0 (Z)
STM 71 0 (X) 0 (V) 0 (Z)
STM 81 2 (X) 2 (V) 2 (Z)
STM 91 0 (X) 0 (V) 0 (Z)
GOOD INPUT DATA - NO ERRORS
COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)
CHECK DAY 1821
STM 11 6 (X) 6 (V) 6 (Z)
STM 21 29 (X) 29 (V) 29 (Z)
STM 31 3 (X) 3 (V) 3 (Z)
STM 41 2 (X) 2 (V) 2 (Z)
STM 51 1 (X) 1 (V) 1 (Z)
STM 61 0 (X) 0 (V) 0 (Z)
STM 71 7 (X) 7 (V) 7 (Z)
GOOD INPUT DATA - NO ERRORS
COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)
CHECK DAY 1822
STM 11 35 (X) 35 (V) 35 (Z)
STM 21 1437 (X) 1437 (V) 1437 (Z)
STM 31 39 (X) 39 (V) 39 (Z)
STM 41 40 (X) 40 (V) 40 (Z)
STM 51 32 (X) 32 (V) 32 (Z)
STM 61 35 (X) 35 (V) 35 (Z)
STM 71 169 (X) 169 (V) 169 (Z)
GOOD INPUT DATA - NO ERRORS
COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)
CHECK DAY 1823
STM 11 5 (X) 5 (V) 5 (Z)
STM 21 1161 (X) 1161 (V) 1161 (Z)
STM 31 8 (X) 8 (V) 8 (Z)
STM 41 1 (X) 1 (V) 1 (Z)
STM 51 0 (X) 0 (V) 0 (Z)
STM 61 0 (X) 0 (V) 0 (Z)
STM 71 0 (X) 0 (V) 0 (Z)
STM 81 0 (X) 0 (V) 0 (Z)
STM 91 0 (X) 0 (V) 0 (Z)
GOOD INPUT DATA - NO ERRORS

```

```

STM 31 2 (X) 2 (Y) 2 (Z)
STM 41 2 (X) 2 (Y) 2 (Z)
STM 51 0 (X) 0 (Y) 0 (Z)
STM 61 2 (X) 2 (Y) 2 (Z)
GOOD INPUT DATA - NO ERRORS
COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)
CHECK DAY 1812
STM 11 17 (X) 17 (Y) 17 (Z)
STM 21 15 (X) 15 (Y) 15 (Z)
STM 31 16 (X) 16 (Y) 16 (Z)
STM 41 14 (X) 14 (Y) 14 (Z)
STM 51 15 (X) 15 (Y) 15 (Z)
STM 61 14 (X) 14 (Y) 14 (Z)
STM 71 5 (X) 5 (Y) 5 (Z)
GOOD INPUT DATA - NO ERRORS
COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)
CHECK DAY 1813
STM 11 12 (X) 12 (Y) 12 (Z)
STM 21 7 (X) 7 (Y) 7 (Z)
STM 31 7 (X) 7 (Y) 7 (Z)
STM 41 7 (X) 7 (Y) 7 (Z)
STM 51 7 (X) 7 (Y) 7 (Z)
STM 61 7 (X) 7 (Y) 7 (Z)
STM 71 8 (X) 8 (Y) 8 (Z)
GOOD INPUT DATA - NO ERRORS
COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)
CHECK DAY 1814
STM 11 19 (X) 19 (Y) 19 (Z)
STM 21 16 (X) 16 (Y) 16 (Z)
STM 31 16 (X) 16 (Y) 16 (Z)
STM 41 14 (X) 14 (Y) 14 (Z)
STM 51 15 (X) 15 (Y) 15 (Z)
STM 61 15 (X) 15 (Y) 15 (Z)
STM 71 15 (X) 15 (Y) 15 (Z)
GOOD INPUT DATA - NO ERRORS
COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)
CHECK DAY 1815
STM 11 20 (X) 20 (Y) 20 (Z)
STM 21 7 (X) 7 (Y) 7 (Z)
STM 31 8 (X) 8 (Y) 8 (Z)
STM 41 5 (X) 5 (Y) 5 (Z)
STM 51 6 (X) 6 (Y) 6 (Z)
STM 61 2 (X) 2 (Y) 2 (Z)
STM 71 3 (X) 3 (Y) 3 (Z)
GOOD INPUT DATA - NO ERRORS
COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)
CHECK DAY 1816
STM 11 6 (X) 6 (Y) 6 (Z)
STM 21 9 (X) 9 (Y) 9 (Z)
STM 31 8 (X) 8 (Y) 8 (Z)
STM 41 7 (X) 7 (Y) 7 (Z)
STM 51 7 (X) 7 (Y) 7 (Z)
STM 61 20 (X) 20 (Y) 20 (Z)
GOOD INPUT DATA - NO ERRORS
COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)
CHECK DAY 1817
STM 11 1 (X) 1 (Y) 1 (Z)
STM 21 1 (X) 1 (Y) 1 (Z)
STM 31 2 (X) 2 (Y) 2 (Z)
STM 41 0 (X) 0 (Y) 0 (Z)

```

Figure 49: Second of three pages.

```

COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)
STM 11 4 (X) 4 (Y) 4 (Z)
STM 21 5 (X) 5 (Y) 5 (Z)
STM 31 4 (X) 4 (Y) 4 (Z)
STM 41 6 (X) 6 (Y) 6 (Z)
STM 51 6 (X) 6 (Y) 6 (Z)
STM 61 6 (X) 6 (Y) 6 (Z)
STM 71 4 (X) 4 (Y) 4 (Z)
GOOD INPUT DATA - NO ERRORS
CHECK DAY 1024
COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)
STM 11 3 (X) 3 (Y) 3 (Z)
STM 21 0 (X) 0 (Y) 0 (Z)
STM 31 0 (X) 0 (Y) 0 (Z)
STM 41 0 (X) 0 (Y) 0 (Z)
STM 51 0 (X) 0 (Y) 0 (Z)
STM 61 0 (X) 0 (Y) 0 (Z)
STM 71 0 (X) 0 (Y) 0 (Z)
GOOD INPUT DATA - NO ERRORS
OUTPUT TAPE COMPLETE
END OF GOOD RUN

```

Figure 49: Third of three pages,
Continued from the bottom
of the 1st column.

```

COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)
STM 11 5 (X) 5 (Y) 5 (Z)
STM 21 156 (X) 156 (Y) 156 (Z)
STM 31 6 (X) 6 (Y) 6 (Z)
STM 41 6 (X) 6 (Y) 6 (Z)
STM 51 6 (X) 6 (Y) 6 (Z)
STM 61 6 (X) 6 (Y) 6 (Z)
STM 71 6 (X) 6 (Y) 6 (Z)
GOOD INPUT DATA - NO ERRORS
CHECK DAY 1026
COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)
STM 11 3 (X) 3 (Y) 3 (Z)
STM 21 1 (X) 1 (Y) 1 (Z)
STM 31 1440 (X) 1440 (Y) 1440 (Z)
STM 41 1 (X) 1 (Y) 1 (Z)
STM 51 0 (X) 0 (Y) 0 (Z)
STM 61 0 (X) 0 (Y) 0 (Z)
STM 71 0 (X) 0 (Y) 0 (Z)
GOOD INPUT DATA - NO ERRORS
CHECK DAY 1028
COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)
STM 11 11 (X) 11 (Y) 11 (Z)
STM 21 10 (X) 10 (Y) 10 (Z)
STM 31 1092 (X) 1092 (Y) 1092 (Z)
STM 41 19 (X) 19 (Y) 19 (Z)
STM 51 4 (X) 4 (Y) 4 (Z)
STM 61 12 (X) 12 (Y) 12 (Z)
STM 71 154 (X) 154 (Y) 154 (Z)
GOOD INPUT DATA - NO ERRORS
CHECK DAY 1027
COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)
STM 11 10 (X) 10 (Y) 10 (Z)
STM 21 11 (X) 11 (Y) 11 (Z)
STM 31 11 (X) 11 (Y) 11 (Z)
STM 41 10 (X) 10 (Y) 10 (Z)
STM 51 7 (X) 7 (Y) 7 (Z)
STM 61 7 (X) 7 (Y) 7 (Z)
STM 71 8 (X) 8 (Y) 8 (Z)
GOOD INPUT DATA - NO ERRORS
CHECK DAY 1028
COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)
STM 11 4 (X) 4 (Y) 4 (Z)
STM 21 1 (X) 1 (Y) 1 (Z)
STM 31 4 (X) 4 (Y) 4 (Z)
STM 41 1 (X) 1 (Y) 1 (Z)
STM 51 1 (X) 1 (Y) 1 (Z)
STM 61 1 (X) 1 (Y) 1 (Z)
STM 71 1 (X) 1 (Y) 1 (Z)
GOOD INPUT DATA - NO ERRORS
CHECK DAY 1020
COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)
STM 11 4 (X) 4 (Y) 4 (Z)
STM 21 2 (X) 2 (Y) 2 (Z)
STM 31 6 (X) 6 (Y) 6 (Z)
STM 41 0 (X) 0 (Y) 0 (Z)
STM 51 2 (X) 2 (Y) 2 (Z)
STM 61 3 (X) 3 (Y) 3 (Z)
STM 71 3 (X) 3 (Y) 3 (Z)
GOOD INPUT DATA - NO ERRORS
CHECK DAY 1020
COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)

```

Figure 49: Third of three pages,
Continued to the top of the 2nd column.

PN PROGRAM - TO PROCESS PN TAPES

```

REVISION PRG.1 - 28 MAR 83 - 212 CHECKY
1. POINT THE ON-SERIES TAPE ON ANY TAPE UNIT
2. POINT THE FLANK TAPE ON ANOTHER TAPE UNIT
3. CHECK TAPES ON LINE, SECTION 16 REWINDING
4. SET MARGIN CONTROL TO 2 COLUMNS MARGSPRINT
5. PRESS RETURN TO START THE RUN, WHEN READY
OPTION SELECTION:
YOUR OWN NAME AND DATE OF RUN EXAMPLE: SMITH 01 APR 82
APR 01 26 SEP 84
1. OMIT THE OUTPUT TAPE? (I=YES) FOR JM-SERIES TAPE CHECK ONLY
2. INPUT TAPE UNIT: (U) 1, 2, 3, FOR UNIT #1, #2, #3
YEAR AND MONTH: (YYDD) YEAR AND DAY
PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN
CHECK DAY 1001

```

Figure 50

```

COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)
STM 1 1440 (X) 1440 (Y) 1440 (Z)
STM 2 1440 (X) 1440 (Y) 1440 (Z)
STM 3 1440 (X) 1440 (Y) 1440 (Z)
STM 4 1440 (X) 1440 (Y) 1440 (Z)
STM 5 1440 (X) 1440 (Y) 1440 (Z)
STM 6 1440 (X) 1440 (Y) 1440 (Z)
STM 7 1440 (X) 1440 (Y) 1440 (Z)
STM 8 1440 (X) 1440 (Y) 1440 (Z)
STM 9 1440 (X) 1440 (Y) 1440 (Z)
GOOD INPUT DATA - NO ERRORS
CHECK DAY 1365
COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)
STM 1 1440 (X) 1440 (Y) 1440 (Z)
STM 2 1440 (X) 1440 (Y) 1440 (Z)
STM 3 1440 (X) 1440 (Y) 1440 (Z)
STM 4 1440 (X) 1440 (Y) 1440 (Z)
STM 5 1440 (X) 1440 (Y) 1440 (Z)
STM 6 1440 (X) 1440 (Y) 1440 (Z)
STM 7 1440 (X) 1440 (Y) 1440 (Z)
STM 8 1440 (X) 1440 (Y) 1440 (Z)
STM 9 1440 (X) 1440 (Y) 1440 (Z)
GOOD INPUT DATA - NO ERRORS
CHECK DAY 1366
TRACE 1 HOUR 0 ERROR READ -2
-----RUN ENDED - TAPE READ PROBLEM-----

```

Figure 31: Continued from the bottom of the 1st column.

PM PROGRAM - TO PROCESS PM TAPES

REVISION PRG.1 - 28 MAR 83 - D.J.KNECAT

1. MOUNT THE PM-SERIES TAPE ON ANY TAPE UNIT
2. MOUNT THE BLANK TAPE ON ANOTHER TAPE UNIT
3. CHECK TAPES ON LINE, SSI ON IF RECYCLING
4. SET MARGIN CONTROL TO 2 COLUMNS, AUTOPRINT
5. PRESS RETURN TO START THE RUN, WHEN READY

-----OPTION SELECTION-----

YOUR OWN NAME AND DATE OF RUN EXAMPLE: SMITH 01 APR 82
 ARMAND 11 FEB 84
 OMIT THE OUTPUT TAPE? (1=YES) FOR JM-SERIES TAPE CHECK ONLY

```

1 INPUT TAPE UNIT: (U) 1, 2, 3, FOR UNIT M1, M2, M3
3 YEAR AND MONTH: (YYDD) YEAR AND DAY
8209
PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN
TRACE 1 HOUR 0 ERROR: MUDS ( 1300)
-----RUN ENDED - TAPE READ PROBLEM-----

```

Figure 32

```

COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)
STM 1 1440 (X) 1440 (Y) 1440 (Z)
STM 2 1440 (X) 1440 (Y) 1440 (Z)
STM 3 1440 (X) 1440 (Y) 1440 (Z)
STM 4 1440 (X) 1440 (Y) 1440 (Z)
STM 5 1440 (X) 1440 (Y) 1440 (Z)
STM 6 1440 (X) 1440 (Y) 1440 (Z)
STM 7 1440 (X) 1440 (Y) 1440 (Z)
STM 8 1440 (X) 1440 (Y) 1440 (Z)
STM 9 1440 (X) 1440 (Y) 1440 (Z)
GOOD INPUT DATA - NO ERRORS
CHECK DAY 1367
COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)
STM 1 1440 (X) 1440 (Y) 1440 (Z)
STM 2 1440 (X) 1440 (Y) 1440 (Z)
STM 3 1440 (X) 1440 (Y) 1440 (Z)
STM 4 1440 (X) 1440 (Y) 1440 (Z)
STM 5 1440 (X) 1440 (Y) 1440 (Z)
STM 6 1440 (X) 1440 (Y) 1440 (Z)
STM 7 1440 (X) 1440 (Y) 1440 (Z)
STM 8 1440 (X) 1440 (Y) 1440 (Z)
STM 9 1440 (X) 1440 (Y) 1440 (Z)
GOOD INPUT DATA - NO ERRORS
CHECK DAY 1368
TRACE 1 HOUR 0 ERROR READ -2
-----RUN ENDED - TAPE READ PROBLEM-----

```

```

COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)
STM 1 1440 (X) 1440 (Y) 1440 (Z)
STM 2 1440 (X) 1440 (Y) 1440 (Z)
STM 3 1440 (X) 1440 (Y) 1440 (Z)
STM 4 1440 (X) 1440 (Y) 1440 (Z)
STM 5 1440 (X) 1440 (Y) 1440 (Z)
STM 6 1440 (X) 1440 (Y) 1440 (Z)
STM 7 1440 (X) 1440 (Y) 1440 (Z)
STM 8 1440 (X) 1440 (Y) 1440 (Z)
STM 9 1440 (X) 1440 (Y) 1440 (Z)
GOOD INPUT DATA - NO ERRORS
CHECK DAY 1369
COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)
STM 1 1440 (X) 1440 (Y) 1440 (Z)
STM 2 1440 (X) 1440 (Y) 1440 (Z)
STM 3 1440 (X) 1440 (Y) 1440 (Z)
STM 4 1440 (X) 1440 (Y) 1440 (Z)
STM 5 1440 (X) 1440 (Y) 1440 (Z)
STM 6 1440 (X) 1440 (Y) 1440 (Z)
STM 7 1440 (X) 1440 (Y) 1440 (Z)
STM 8 1440 (X) 1440 (Y) 1440 (Z)
STM 9 1440 (X) 1440 (Y) 1440 (Z)
GOOD INPUT DATA - NO ERRORS
CHECK DAY 1370
TRACE 1 HOUR 0 ERROR READ -2
-----RUN ENDED - TAPE READ PROBLEM-----

```

```

COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)
STM 1 1440 (X) 1440 (Y) 1440 (Z)
STM 2 1440 (X) 1440 (Y) 1440 (Z)
STM 3 1440 (X) 1440 (Y) 1440 (Z)
STM 4 1440 (X) 1440 (Y) 1440 (Z)
STM 5 1440 (X) 1440 (Y) 1440 (Z)
STM 6 1440 (X) 1440 (Y) 1440 (Z)
STM 7 1440 (X) 1440 (Y) 1440 (Z)
STM 8 1440 (X) 1440 (Y) 1440 (Z)
STM 9 1440 (X) 1440 (Y) 1440 (Z)
GOOD INPUT DATA - NO ERRORS
CHECK DAY 1371
COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)
STM 1 1440 (X) 1440 (Y) 1440 (Z)
STM 2 1440 (X) 1440 (Y) 1440 (Z)
STM 3 1440 (X) 1440 (Y) 1440 (Z)
STM 4 1440 (X) 1440 (Y) 1440 (Z)
STM 5 1440 (X) 1440 (Y) 1440 (Z)
STM 6 1440 (X) 1440 (Y) 1440 (Z)
STM 7 1440 (X) 1440 (Y) 1440 (Z)
STM 8 1440 (X) 1440 (Y) 1440 (Z)
STM 9 1440 (X) 1440 (Y) 1440 (Z)
GOOD INPUT DATA - NO ERRORS
CHECK DAY 1372
TRACE 1 HOUR 0 ERROR: MUDS ( 1300)
-----RUN ENDED - TAPE READ PROBLEM-----

```

Figure 33: Continued from the top of the 1st column.

If a tape is not an RM tape then when it is read an error of NWDS (number of words) will occur and the program aborts itself as in figure 52. The error NWDS indicates that the tape being read is not 1680 words per record, where 1680 words per record is the form of the RM tape. An important consideration is that the IM tape is also of the form of 1680 words per record so that if the PM program is used to read an IM tape it will partially work; it will read an entire IM tape of the first day of the month, but then it will fail to continue onto the next day and abort itself. The date entered for the year and month question in the example of figure 49 was the actual date on the RM tape, thus the program was able to read the tape correctly and give a positive response. However, there might be some situations where there is a negative response. For example if for some reason one was not sure whether or not the RM tape was labeled with the correct date, then the PM program could be used to check this problem. There are 3 possible errors associated with the date that could occur as follows:

ERROR: YEAR = Year value incorrect
ERROR: NMON = Month value incorrect
ERROR: JDAY = Day of year value incorrect

One of these errors, more than one, or all of these errors could occur at a time. An example of these errors can be seen in figure 53. In these examples one can see that after the error message on each line there is a pair of parentheses which contains the actual number on the tape for either the year, month, or day. Also, when an error dealing with the date occurs the program has to be aborted manually, otherwise the program will continue to print every error for each trace of the day for the first day of the month, then states a BAD TAPE NUMBER OF ERRORS: and aborts itself as in figure 54. Finally, if a parity error exists on the RM tape, then the program states that there is a TAPE READ PROBLEM and aborts itself as in figure 55.

PN PROGRAM - TO PROCESS PN TAPES

REVISION PR2.1 - 28 MAR 83 - D.J. NECHT

1. MOUNT THE PN-SERIES TAPE ON ANY TAPE UNIT
2. MOUNT THE JMW TAPE ON ANOTHER TAPE UNIT
3. CHECK TAPES ON LINE. SET ON IF MISSING
4. SET MTRMTR CONTROL TO 2 COLUMNS MTRMTR
5. PRESS RETURN TO START THE RUN, WHEN READY

-----OPTION SELECTION-----
 YOUR OWN NAME AND DATE OF RUN EXAMPLE: SMITH 01 APR 82
 MRAND 24 SEP 84
 OMIT THE OUTPUT TAPE? (1=YES) FOR JM-SERIES TAPE CHECK ONLY
 1 INPUT TAPE UNIT: (U) 1, 2, 3, FOR UNIT M1, M2, M3
 2 YEAR AND MONTH: (YYDD) YEAR AND DAY
 8104
 -----SETUP COMPLETE-----
 PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN

-----CHECK DAY 1091-----
 TRACE 1 HOUR 0 ERROR YEAR (80)
 TRACE 1 HOUR 0 ERROR MTRM (3)
 TRACE 1 HOUR 0 ERROR JDAY (61)
 TRACE 1 HOUR 1 ERROR YEAR (80)
 TRACE 1 HOUR 1 ERROR MTRM (3)
 TRACE 1 HOUR 2 ERROR JDAY (61)
 TRACE 1 HOUR 2 ERROR YEAR (80)
 TRACE 1 HOUR 3 ERROR MTRM (3)
 TRACE 1 HOUR 3 ERROR JDAY (61)
 TRACE 1 HOUR 3 ERROR YEAR (80)
 TRACE 1 HOUR 4 ERROR MTRM (3)
 TRACE 1 HOUR 4 ERROR JDAY (61)
 TRACE 1 HOUR 4 ERROR YEAR (80)
 TRACE 1 HOUR 4 ERROR MTRM (3)
 TRACE 1 HOUR 4 ERROR JDAY (61)
 JCBF

FIGURE 53

TRACE 21 HOUR 15 ERROR JDAY (61)
 TRACE 21 HOUR 15 ERROR YEAR (80)
 TRACE 21 HOUR 15 ERROR MTRM (3)
 TRACE 21 HOUR 15 ERROR JDAY (61)
 TRACE 21 HOUR 20 ERROR YEAR (80)
 TRACE 21 HOUR 20 ERROR MTRM (3)
 TRACE 21 HOUR 20 ERROR JDAY (61)
 TRACE 21 HOUR 21 ERROR YEAR (80)
 TRACE 21 HOUR 21 ERROR MTRM (3)
 TRACE 21 HOUR 21 ERROR JDAY (61)
 TRACE 21 HOUR 22 ERROR YEAR (80)
 TRACE 21 HOUR 22 ERROR MTRM (3)
 TRACE 21 HOUR 22 ERROR JDAY (61)
 TRACE 21 HOUR 23 ERROR YEAR (80)
 TRACE 21 HOUR 23 ERROR MTRM (3)
 TRACE 21 HOUR 23 ERROR JDAY (61)
 COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)
 STM 11 105 (X) 105 (Y) 105 (Z)
 STM 21 153 (X) 153 (Y) 153 (Z)
 STM 31 89 (X) 89 (Y) 89 (Z)
 STM 41 74 (X) 74 (Y) 74 (Z)
 STM 51 412 (X) 412 (Y) 412 (Z)
 STM 61 45 (X) 45 (Y) 45 (Z)
 STM 71 670 (X) 670 (Y) 670 (Z)
 BAD INPUT DATA - NUMBER OF ERRORS: 1512
 -----RUN ENDED - INPUT DATA PROBLEM-----

FIGURE 54

PN PROGRAM - TO PROCESS PN TAPES

REVISION PR2.1 - 25 MAR 83 - D.J. NECHT

1. MOUNT THE PN-SERIES TAPE ON ANY TAPE UNIT
2. MOUNT THE JMW TAPE ON ANOTHER TAPE UNIT
3. CHECK TAPES ON LINE. SET ON IF MISSING
4. SET MTRMTR CONTROL TO 2 COLUMNS MTRMTR
5. PRESS RETURN TO START THE RUN, WHEN READY

-----OPTION SELECTION-----
 YOUR OWN NAME AND DATE OF RUN EXAMPLE: SMITH 01 APR 82
 MRAND 24 SEP 84
 OMIT THE OUTPUT TAPE? (1=YES) FOR JM-SERIES TAPE CHECK ONLY
 1 INPUT TAPE UNIT: (U) 1, 2, 3, FOR UNIT M1, M2, M3
 2 YEAR AND MONTH: (YYDD) YEAR AND DAY
 8003
 -----SETUP COMPLETE-----
 PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN

-----CHECK DAY 0061-----
 TRACE 9 HOUR 11 ERROR READ (-3)
 TRACE 9 HOUR 11 ERROR ENDED - TAPE READ PROBLEM-----

FIGURE 55

II.J PS PROGRAM (Process One-Second Data)

The PS program writes a FS tape, which is readable on the CDC Cyber computer, from an IS tape. This program makes a number of checks on the IS tape whether or not it writes a CM tape and prints the results on the teletype screen: the number of missing data points for each component of every station for the whole day. Along with this output faults (errors) may occur for various minutes of the day, and these faults will be discussed in the following paragraphs. Also, the PS program checks whether or not a tape is an IS tape, the date on an IS tape, and whether or not there is a parity error on an IS tape. This program takes about 45 minutes to execute.

At the start of the program a header appears on the screen as shown in figure 56. The header includes a group of five instructions: mount the IS tape on any tape unit, mount the output tape on another tape unit, check that both tape units are on line and SS1 on if recycling, set the margin control to 2 and the copy switch to autoprint on the teletype terminal, and press the return when ready to proceed.

The first question will appear asking for the name of the person executing the program and the date of execution, which should be answered so that if a problem arises who and when the program was executed will be known. The next question will ask whether or not to omit the output tape (the FS tape). If one does not want to make a FS tape and only wants to check the IS tape, then a [1] should be entered for this question as in figure 57. Under these conditions the program will take much less than 45 minutes (probably 20 minutes) to execute since the program does not have to read a tape and write a tape, but only read a tape. If one wants to check the IS tape and also write a FS tape, then the question should be answered with a [0] as in figure 56. The next question will ask which is the input tape unit, that is, where the IS tape will be read ([3] in the example of figures 56 & 57). The next question will ask which is the output tape unit, that is, where the FS tape will be written ([2] in the example of figure 56). Note (figure 57) that when one does not want to write a FS tape then the question asking which output tape unit does not appear. The following question will ask for the Julian date. For April 17, 1981, the 107th day of the year, the correct response would be 8107 as in figures 56 & 57. Also, at this point one has the opportunity to check that all commands were followed and questions answered correctly. If not then a [1] may be entered and the questions will be erased and the header will reappear so that one can start over. If everything is correct then one can press the return and the program will be executed. When the program completes its execution it states that the FS tape is a good tape with no errors; thus, the IS tape is a good tape because it was checked, and it automatically copies.

In the data output a common fault that occurs, even when a good IS tape is checked and/or a good FS tape is written, is the fault CONT as

ONE-SECOND TAPE PROCESSOR PROGRAM

REVISION PS1.1 - 14 MAR 82 - D.J.KNECHT

1. MOUNT THE IS-SERIES TAPE ON ANY TAPE UNIT
2. MOUNT THE BLANK TAPE ON ANOTHER TAPE UNIT
3. CHECK TAPES ON LINE, SSI ON IF RECYCLING
4. SET MARGIN CONTROL TO 2 COLUMNS AUTOPRINT
5. PRESS RETURN TO START THE RUN, WHEN READY

OPTION SELECTION
 YOUR OWN NAME AND DATE OF RUN EXAMPLE: JONES 15 MAR 82
 ARRANO 14 FEB 83

OMIT THE OUTPUT TAPE? (1=YES) FOR IS-SERIES TAPE CHECK ONLY
 INPUT TAPE UNIT: (U) 1, 2, 3, FOR UNIT M1, M2, M3
 OUTPUT TAPE UNIT: (U) 1, 2, 3, BUT NOT THE INPUT
 JULIAN DATE: (YDDD) YEAR AND DAY
 810?

SETUP COMPLETE
 PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN

TAPE CHECK LOG

MINUTE 69	STATION 5	X COMP	FAULT: COM	(3)
MINUTE 93	STATION 5	X COMP	FAULT: COM	(3)
MINUTE 249	STATION 5	X COMP	FAULT: COM	(4)
MINUTE 249	STATION 5	Y COMP	FAULT: COM	(3)
MINUTE 332	STATION 3	Y COMP	FAULT: COM	(3)
MINUTE 570	STATION 5	X COMP	FAULT: COM	(4)
MINUTE 632	STATION 5	X COMP	FAULT: COM	(4)
MINUTE 683	STATION 7	Y COMP	FAULT: COM	(3)
MINUTE 695	STATION 1	Y COMP	FAULT: COM	(2)
MINUTE 710	STATION 0	Y COMP	FAULT: COM	(4)
MINUTE 821	STATION 5	X COMP	FAULT: COM	(4)
MINUTE 841	STATION 8	X COMP	FAULT: COM	(6)
MINUTE 976	STATION 9	X COMP	FAULT: COM	(9)
MINUTE 976	STATION 9	Y COMP	FAULT: COM	(2)
MINUTE 1000	STATION 9	Y COMP	FAULT: COM	(4)
MINUTE 1001	STATION 9	X COMP	FAULT: COM	(5)
MINUTE 1001	STATION 9	Y COMP	FAULT: COM	(3)
MINUTE 1146	STATION 3	Y COMP	FAULT: COM	(4)
MINUTE 1164	STATION 2	Y COMP	FAULT: COM	(3)
MINUTE 1314	STATION 1	Y COMP	FAULT: COM	(3)
MINUTE 1350	STATION 5	X COMP	FAULT: COM	(3)
MINUTE 1428	STATION 2	X COMP	FAULT: COM	(2)

COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)

STM 11	6340 (X)	6340 (Y)	6340 (Z)
STM 21	4410 (X)	4410 (Y)	4410 (Z)
STM 31	5070 (X)	5070 (Y)	5070 (Z)
STM 51	9340 (X)	9340 (Y)	9340 (Z)
STM 71	3200 (X)	3200 (Y)	3200 (Z)
STM 81	9300 (X)	9300 (Y)	9300 (Z)
STM 91	4120 (X)	2690 (Y)	4120 (Z)

GOOD TAPE - NO ERRORS
 LABEL THIS TAPE PS107
 PROCESSING COMPLETE
 END OF RUN

Figure 58

ONE-SECOND TAPE PROCESSOR PROGRAM

REVISION PS1.1 - 14 MAR 82 - D.J.KNECHT

1. MOUNT THE IS-SERIES TAPE ON ANY TAPE UNIT
2. MOUNT THE BLANK TAPE ON ANOTHER TAPE UNIT
3. CHECK TAPES ON LINE, SSI ON IF RECYCLING
4. SET MARGIN CONTROL TO 2 COLUMNS AUTOPRINT
5. PRESS RETURN TO START THE RUN, WHEN READY

OPTION SELECTION
 YOUR OWN NAME AND DATE OF RUN EXAMPLE: JONES 15 MAR 82
 ARRANO 25 SEP 84

OMIT THE OUTPUT TAPE? (1=YES) FOR IS-SERIES TAPE CHECK ONLY
 INPUT TAPE UNIT: (U) 1, 2, 3, FOR UNIT M1, M2, M3
 JULIAN DATE: (YDDD) YEAR AND DAY
 810?

SETUP COMPLETE
 PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN

TAPE CHECK LOG

Figure 57

ONE-SECOND TAPE PROCESSOR PROGRAM

REVISION PS1.1 - 14 MAR 82 - D.J.KNECHT

1. MOUNT THE IS-SERIES TAPE ON ANY TAPE UNIT
2. MOUNT THE BLANK TAPE ON ANOTHER TAPE UNIT
3. CHECK TAPES ON LINE, SSI ON IF RECYCLING
4. SET MARGIN CONTROL TO 2 COLUMNS AUTOPRINT
5. PRESS RETURN TO START THE RUN, WHEN READY

OPTION SELECTION
 YOUR OWN NAME AND DATE OF RUN EXAMPLE: JONES 15 MAR 82
 ARRANO 25 SEP 84

OMIT THE OUTPUT TAPE? (1=YES) FOR IS-SERIES TAPE CHECK ONLY
 INPUT TAPE UNIT: (U) 1, 2, 3, FOR UNIT M1, M2, M3
 JULIAN DATE: (YDDD) YEAR AND DAY
 810?

SETUP COMPLETE
 PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN

TAPE CHECK LOG
 MINUTE 0 STATION 0 COMP FAULT: MUDS (1680)
 TAPE READ FAILURE - END THE RUN
 JC88

Figure 58

in figure 56. This CONT fault is a cautionary warning only, and refers to the continuity of the data. For example if the data were plotted magnetic field (nanotesla) vs time (sec) and the slope were greater than ± 5 nt/sec, then the CONT fault would be output. In figure 56 there is a pair of parentheses after FAULT: CONT, and inside the parentheses is the number of times the slope was greater than ± 5 nt/sec for that minute. On a magnetically active day, many CONT faults may occur. For this program there will be anywhere from 1-10 pages of output, depending on the number of CONT faults that occur, as in figure 56. Only the CONT fault is legal; all other faults are fatal.

If a tape is not an IS tape, then when it is read a fault of NWDS (number of words) will occur and the program aborts itself as in figure 58. This fault of NWDS indicates that the tape being read is not 1300 words per record, where 1300 words per record is the form of the IS tape. In figure 58 there is a pair of parentheses after FAULT: NWDS and inside the parentheses is the actual number of words per record. The date entered for the Julian date question in the example of figure 56 was the actual date on the IS tape, thus the program was able to read the tape correctly and give a positive response. However, there might be some situations where there is a negative response. For example if for some reason one was not sure whether or not the IS tape was labeled with the correct date, then the PS program could be used to check this problem. There are 4 possible faults associated with the Julian date that could occur as follows:

FAULT: IYR = Year value incorrect
FAULT: NMO = Month value incorrect
FAULT: IDA = Day of year value incorrect
FAULT: NDA = Day of month value incorrect

One of these faults, more than one, or all of these faults could occur at a time. An example of these faults can be seen in figure 59. In these examples one can see that after the fault message on each line there is a pair of parentheses which contains the actual number that is on the tape for either the year, month, or day. Also, when a fault dealing with the Julian date occurs the program has to be aborted manually, otherwise the program will continue to print every fault for each minute of the day until it reaches the end, then states a BAD TAPE - NUMBER OF ERRORS: and aborts itself as in figure 60. Finally, if a parity error exists on the IS tape, then the program states that there is a TAPE READ PROBLEM and aborts itself as in figure 61.

ONE-SECOND TAPE PROCESSOR PROGRAM

```

REVISION PSI-1 - 14 MAR 82 - D.J.VNECHT
1. MOUNT THE IS-SERIES TAPE ON ANY TAPE UNIT
2. MOUNT THE FLANK TAPE ON ANOTHER TAPE UNIT
3. CHECK TAPES ON LINE, $$$ ON IF RECYCLING
4. SET MARGIN CONTROL TO 2 COLUMNS AUTOPRINT
5. PRESS RETURN TO START THE RUN, WHEN READY

-----OPTION SELECTION-----
YOUR OWN NAME AND DATE OF RUN EXAMPLE: JONES 15 MAR 82
ARMAND 25 SEP 84
OMIT THE OUTPUT TAPE? (I=YES) FOR IS-SERIES TAPE CHECK ONLY
1 INPUT TAPE UNIT: (U) 1, 2, 3, FOR UNIT M1, M2, M3
3 JULIAN DATE: (YDDD) YEAR AND DAY
9354
-----SETUP COMPLETE-----
PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN

```

```

-----TAPE CHECK LOG-----
MINUTE 0 STATION 0 COMP FAULT: IYR ( 78)
MINUTE 0 STATION 0 COMP FAULT: IDA ( 107)
MINUTE 0 STATION 0 COMP FAULT: MRO ( 4)
MINUTE 0 STATION 0 COMP FAULT: NDA ( 17)
JADORT,PS
MINUTE 1 STATION 0 COMP FAULT: IYR ( 78)
MINUTE 1 STATION 0 COMP FAULT: IDA ( 107)
MINUTE 1 STATION 0 COMP FAULT: MRO ( 4)
MINUTE 1 STATION 0 COMP FAULT: NDA ( 17)
JC88

```

Figure 59

ONE-SECOND TAPE PROCESSOR PROGRAM

```

REVISION PSI-1 - 14 MAR 82 - D.J.VNECHT
1. MOUNT THE IS-SERIES TAPE ON ANY TAPE UNIT
2. MOUNT THE FLANK TAPE ON ANOTHER TAPE UNIT
3. CHECK TAPES ON LINE, $$$ ON IF RECYCLING
4. SET MARGIN CONTROL TO 2 COLUMNS AUTOPRINT
5. PRESS RETURN TO START THE RUN, WHEN READY

-----OPTION SELECTION-----
YOUR OWN NAME AND DATE OF RUN EXAMPLE: JONES 15 MAR 82
ARMAND 25 SEP 84
OMIT THE OUTPUT TAPE? (I=YES) FOR IS-SERIES TAPE CHECK ONLY
1 INPUT TAPE UNIT: (U) 1, 2, 3, FOR UNIT M1, M2, M3
3 JULIAN DATE: (YDDD) YEAR AND DAY
8107
-----SETUP COMPLETE-----
PRESS RETURN TO CONTINUE OR ENTER 1 TO SCRATCH AND START AGAIN
-----TAPE CHECK LOG-----
IO30, MT00
MINUTE 11 STATION 0 COMP FAULT: READ ( -3)
TAPE READ FAILURE - END THE RUN
JC88

```

Figure 61

```

MINUTE 1436 STATION 0 COMP FAULT: IYR ( 78)
MINUTE 1436 STATION 0 COMP FAULT: IDA ( 107)
MINUTE 1436 STATION 0 COMP FAULT: MRO ( 4)
MINUTE 1436 STATION 0 COMP FAULT: NDA ( 17)
MINUTE 1437 STATION 0 COMP FAULT: IYR ( 78)
MINUTE 1437 STATION 0 COMP FAULT: IDA ( 107)
MINUTE 1437 STATION 0 COMP FAULT: MRO ( 4)
MINUTE 1437 STATION 0 COMP FAULT: NDA ( 17)
MINUTE 1438 STATION 0 COMP FAULT: IYR ( 78)
MINUTE 1438 STATION 0 COMP FAULT: IDA ( 107)
MINUTE 1438 STATION 0 COMP FAULT: MRO ( 4)
MINUTE 1439 STATION 0 COMP FAULT: IYR ( 78)
MINUTE 1439 STATION 0 COMP FAULT: IDA ( 107)
MINUTE 1439 STATION 0 COMP FAULT: MRO ( 4)
MINUTE 1439 STATION 0 COMP FAULT: NDA ( 17)

```

```

COUNT OF MISSING DATA POINTS (OF 86400 TOTAL)
STN 11 6340 (X) 6340 (Y)
STN 21 4410 (X) 4410 (Y)
STN 31 5070 (X) 5070 (Y)
STN 51 9340 (X) 9340 (Y)
STN 71 3200 (X) 3200 (Y)
STN 81 9300 (X) 9300 (Y)
STN 91 4120 (X) 4120 (Y)

```

BAD TAPE - NUMBER OF ERRORS: 5760
-----END OF RUN-----

Figure 60

END

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