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PROGRAMS FOR THE ANALYSIS
OF MAGNETO-TELLURIC DATA
PART II : TAPE EDITING

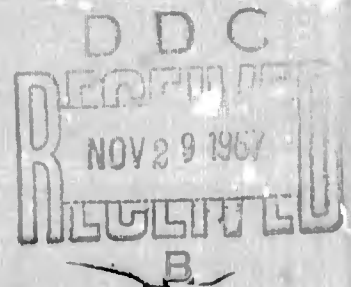
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GEOSCIENCE INCORPORATED

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Programs for the Analysis of
Magneto-telluric Data

Part II: Tape Editing

By

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Programs for the Analysis of Magneto-telluric Data

Part II: Tape Editing

An editing program (DGEDT1) has been prepared to accept data tapes generated on the magneto-telluric digital field system and correct all digitizer-caused errors and generate demultiplexed data tapes which can be read by the analysis program.

The field digitizer which Geoscience has used for these experiments has one to six input channels of data which are sequentially sampled. The sampling rate is a variable. The digitized data are written on a 7-track Kennedy incremental tape recorder. A single sample from one of the input channels has 10 bits of precision. The ten bits are divided into two groups of five and recorded in two successive characters on the tape. The high order bit in each of these characters is zero, except for the high order bit of the second character corresponding to the last channel sampled. Each time the last channel is sampled, a one bit is inserted in this character. The following types of errors may occur:

- 1) A character may be dropped.
- 2) A scan bit (the above mentioned 1 bit) may be dropped.
- 3) A character may be added.
- 4) A scan bit may be added.
- 5) A tape parity check may occur.

There are no other detectable errors due solely to digitizer malfunction. It is important to compensate for errors of this sort, since they can affect the time base, and hence distort the spectrum by introducing spurious lines. Parity errors are isolated to a single word by using a special tape reading routine. The tape format selected allows scan bits to be searched for and detected. Errors of either sort are corrected for by linearly interpolating the data across the gap introduced by them. No attempt is made to use data from the questionable area.

The merge program (DGMRG1) was written to reduce the number of data tapes required to hold the edited output. This program merges two or more DGEDT1-format tapes onto a single output tape. A table of contents of the output tape is generated so that the successful operation of the program does not depend on the operator mounting the tapes in any particular order.

The listings of the two main programs, complete with their documentation, and of all special-purpose subroutines used by them, follow below.

----DGEDT1----

A PROGRAM TO READ FIELD DIGITIZER OUTPUT TAPES AND/OR DUMP SELECTIVELY AND/OR EDIT AND OUTPUT A FORTRAN IV (7090/7094) COMPATIBLE BINARY TAPE.

--PROGRAM DESCRIPTION--

DGEDT1 READS THE BINARY TAPES PRODUCED BY THE FIELD DIGITIZER AND PRODUCES (IF REQUESTED) AN EDITED OUTPUT TAPE WHICH IS FORTRAN IV (7090/7094) BINARY COMPATIBLE. SEVERAL DUMP, SKIP AND AUXILIARY OUTPUT OPTIONS ARE OFFERED. THE INPUT RAW DATA TAPE MAY BE POSITIONED BY FILE SKIPPING AND/OR DATA SET SKIPPING (ONE DATA SET = A FILE CONTAINING MINWRD OR MORE WORDS, WHERE MINWRD IS $(NSCMIN * NCHNLS / 3)$ AND NSCMIN IS AN INPUT PARAMETER (SEE BELOW) AS IS NCHNLS). THE RAW INPUT TAPE MAY CONTAIN HEADER INFORMATION FILES AND SEVERAL END OF FILE MARKS IN A ROW. THE END OF THE TAPE IS DENOTED BY MINFIL CONSECUTIVE END OF FILE MARKS, WHERE MINFIL IS AN INPUT PARAMETER. ALL FILES WHICH ARE NOT DATA SETS ARE DUMPED IN OCTAL WITH THE LOCATIONS OF PARITY ERRORS, IF ANY. HEADER INFORMATION ON THE TAPE IS NOT USED. ALL HEADER INFORMATION IS READ FROM CARDS (SEE CARD IMAGE TYPES 4, 5, 6, AND 7).

THE EDIT OF THE DATA SET ATTEMPTS TO CORRECT TAPE ERRORS SUCH AS PARITY ERRORS AND MISSING AND EXTRA CHARACTERS BY INTERPOLATION. THE DATA FILE CONTAINS MULTIPLEXED SAMPLES FROM NCHNLS CHANNELS (NCHNLS = 1 TO 6). EACH SCAN ACROSS NCHNLS CONTAINS ONE SAMPLE FROM EACH CHANNEL. DATA SAMPLES ARE 10 BITS LONG AND ARE CONTAINED IN TWO CONSECUTIVE SIX BIT CHARACTERS. THE HIGH ORDER 5 BITS OF THE SAMPLE IS IN THE LOW ORDER 5 BITS OF THE FIRST OF THE 2 CHARACTERS, AND THE LOW ORDER 5 BITS ARE IN THE LOW ORDER 5 BITS OF THE SECOND. THE HIGH ORDER BIT IN EACH CHARACTER IS ZERO EXCEPT IN THE LAST CHARACTER OF A SCAN IN WHICH CASE IT IS 1. THE OCCURRENCE OF A 1 IN THE HIGH ORDER POSITION OF A CHARACTER DENOTES AN END OF SCAN. NORMALLY THERE ARE $2 * NCHNLS$ CHARACTERS PER SCAN.

THE EDIT OF THE DATA FILE CONSISTS OF CHECKING FOR THE PROPER OCCURRENCE OF SCAN BITS AND CORRECTING FOR ERRORS IN SCAN LENGTH AND PARITY BY INTERPOLATION BETWEEN GOOD SCANS (A SCAN IS GOOD IF IT IS THE PROPER LENGTH AND CONTAINS NO PARITY ERRORS). SCAN ERRORS FALL INTO TWO CLASSES - LONG SCANS, I.E. TOO MANY CHARACTERS, AND SHORT SCANS, I.E. TOO FEW CHARACTERS. THE SHORT SCAN REPRESENTS ONE SCAN AND IS CORRECTED BY INTERPOLATING BETWEEN THE GOOD SCANS PRECEDING AND FOLLOWING. THE LONG SCAN MAY OCCUR IN TWO WAYS. CASE 1 - EXTRA CHARACTERS ARE WRITTEN. CASE 2 - THE CHARACTER CONTAINING THE SCAN BIT IS DROPPED. IN CASE 1 THE SCAN IS 1 SCAN, BUT IN CASE 2 IT IS 2 SCANS. AN ARBITRARY RULE IS USED TO DISTINGUISH BETWEEN THE 2 CASES. IT IS GENERAL ENOUGH TO COVER THE CASES WHERE THE SCAN IS

C LONGER THAN 2 NORMAL SCANS. IF NCHARS IS THE NUMBER OF
C CHARACTERS FOUND IN A SCAN, THEY ARE SAID TO REPRESENT
C N SCANS IF

C $N*(2*NCHNLS).GE.NCHARS.LT.N*(3*NCHNLS)$

C AND N+1 SCANS IF

C $N*(3*NCHNLS).GE.NCHARS.LE.N*(4*NCHNLS)$

C A LINEAR INTERPOLATION IS DONE ACROSS THE N SCANS. IF
C LONG SCANS, SHORT SCANS AND/OR PARITY ERRORS OCCUR
C CONSECUTIVELY, THERE MAY BE MANY SCANS TO INTERPOLATE
C OVER. THE MAXIMUM NUMBER SCANS TO INTERPOLATE OVER IS AN
C INPUT PARAMETER. IF THIS IS EXCEEDED, THE EDITING ON
C THE DATA SET IS STOPPED. THE DATA EDITED TO DATE WILL
C ONLY BE WRITTEN OUT IF ITS LENGTH EQUALS OR EXCEEDS THE
C MINIMUM NUMBER OF SCANS TO WRITE OUT (AN INPUT
C PARAMETER). THE WORDS CONTAINING THE LONG AND SHORT
C SCANS MAY BE DUMPED WITH THE PRECEEDING AND FOLLOWING
C SCANS IF REQUESTED.

C THE EDIT PHASE PARTIALLY DEMULTIPLEXES THE SAMPLES
C AND STORES THEM TRIPLE PACKED SUCH THAT ITEM 1 IN THE
C OUTPUT VECTOR CONTAINS THE FIRST 3 SAMPLES FROM CHANNEL
C 1 (PACKED LEFT TO RIGHT, EACH SAMPLE RIGHT ADJUSTED IN
C 12 BITS), ITEM 2 CONTAINS THE FIRST 3 SAMPLES FROM
C CHANNEL 2, ETC. THE FINAL DEMULTIPLEX IS DONE WHEN THE
C DATA IS WRITTEN OUT. OPTIONS ARE PROVIDED TO DUMP THE
C OUTPUT VECTOR. OPTIONS ARE ALSO PROVIDED TO REORDER
C THE CHANNELS AT OUTPUT TIME.

C --STATISTICS--

C LANGUAGE - FORTRAN II
C EQUIPMENT - IBM 7090/94
C STORAGE - 619 WORDS
C AUTHOR - J.N. GALBRAITH, JR., B.A. WILLEY

C LIBRARY ROUTINES USED -
C SPECIAL ROUTINES USED -
C SYSTEM ROUTINES USED -

C --DEVICE ALLOCATION--

C INPUT FROM - ISYSIN SYSTEM INPUT UNIT
C ITPDIN RAW DATA INPUT TAPE
C OUTPUT ON - ISYSOU SYSTEM OUTPUT UNIT
C ITPDOT EDITED OUTPUT TAPE

C ----INPUT----

C CARD IMAGES FROM ISYSIN
C

C ---TYPE 1. TAPE PARAMETER CARD
C FORMAT (I2,7I6)

C ICDNO CARD NUMBER, MUST BE 1
C
C ITPDIN LOGICAL TAPE NUMBER OF RAW DATA TAPE.
C
C IREWIN REWIND SWITCH FOR ITPDIN.
C IF=0, ITPDIN WILL NOT BE INITIALLY REWOUND.
C IF NOT=0, ITPDIN WILL BE INITIALLY REWOUND.
C
C ISKPIN NUMBER OF FILES TO SKIP ON TAPE ITPDIN (AFTER REWIND, IF
C REQUESTED).
C
C ITPDOT LOGICAL TAPE NUMBER OF EDITED OUTPUT TAPE.
C
C IREWOT REWIND SWITCH FOR ITPDOT
C IF=0, NO INITIAL REWIND
C IF NOT=0, ITPDOT WILL BE INITIALLY REWOUND.
C
C IZFNUD POSITIONING SWITCH FOR ITPDOT (ALLOW FOR ADD ON OF DATA).
C IF=0, NO SKIPPING IS DONE
C IF NOT=0, TAPE WILL BE POSITIONED AFTER LAST DATA SET ON
C TAPE. MUST BE 0.
C
C ISSKIP NUMBER OF DATA SETS TO SKIP ON ITPDIN AFTER POSITIONING
C BY FILE SKIPPING. MUST BE .GE. 0

C ---TYPE 2. OUTPUT OPTION CARD
C FORMAT (I2,9I6)

C ICONO CARD NUMBER, MUST BE 2
C
C IZIFOD SWITCH FOR OCTAL DUMP OF RAW INPUT
C IF = 0 OCTAL DUMP WILL BE PRINTED. DATA WILL BE DUMPED
C FROM WORD ISTRT1 TO WORD IEND1 (INPUTS BELOW).
C IF ISTRT1 = IEND1 AND IZIFOD =0, ENTIRE RECORD
C WILL BE DUMPED.
C IF NOT = 0, NO DUMP.
C
C ISTRT1 STARTING INDEX OF OCTAL DUMP (SEE IZIFOD ABOVE).
C
C IEND1 ENDING INDEX OF OCTAL DUMP (SEE IZIFOD ABOVE).
C
C IZIFCN CONTINUE SWITCH.
C IF =0 REST OF EDIT WILL BE DONE.
C IS NOT =0, NO FURTHER EDITING WILL NOT BE DONE AND NO
C BINARY OUTPUT TAPE WILL BE WRITTEN.
C
C ISCNDP SCAN DUMP SWITCH. =1 IF LONG AND SHORT SCANS ARE TO BE
C DUMPED. =0 IF NO DUMPS WANTED
C
C IZIFEO OUTPUT OCTAL DUMP SWITCH.
C IF =0 OCTAL DUMP OF PARTIALLY DEMULTIPLEXED CHANNELS
C WILL BE DUMPED. DATA IS ARRANGED SO THAT WORD
C 1 CONTAINS FIRST 3 SAMPLES OF CHANNEL 1, WORD 2
C CONTAINS FIRST 3 SAMPLES OF CHANNEL 2, ..., WORD
C NCHNLS CONTAINS FIRST 3 SAMPLES OF CHANNEL NCHNLS
C AND WORD NCHNLS + 1 CONTAINS NEXT 3 SAMPLES OF
C CHANNEL 1, ETC. DUMP IS SELECTIVE FROM ISTRT2 TO
C

C IEND2. IF ISTRT2=IEND2 AND IZIFED = 0, ALL
 C DATA IS DUMPED.
 C
 C ISTRT2 STARTING INDEX OF OCTAL DUMP (SEE IZIFED ABOVE).
 C
 C IEND2 ENDING INDEX OF OCTAL DUMP (SEE IZIFED ABOVE).
 C
 C IENDUP END INDICATOR
 C =0 IF PROCESSING REQUESTED
 C NOT =0 IF END OF PROCESSING IS DESIRED. NO FURTHER DATA
 C CARDS WILL BE READ AND 2 END OF FILES WILL BE WRITTEN
 C ON ITPDOT
 C
 C ---TYPE 3. FILE PROCESSING PARAMETERS CARD
 C FORMAT (I2,7I6)
 C
 C ICDNO CARD NUMBER, MUST BE 3
 C
 C NUMSET NUMBER OF DATA SETS TO PROCESS BEFORE READING ANOTHER SET
 C OF TYPE 2 AND 3 DATA CARDS. MUST BE .GT. 0
 C
 C ISTART SCAN NUMBER AT WHICH PROCESSING STARTS. NORMALLY 1.
 C MUST BE .GT. 0
 C
 C NWANTD NUMBER OF SCANS TO PROCESS, BEGINNING AT ISTART.
 C IF =0 ALL SCANS AFTER ISTART WILL BE PROCESSED.
 C MUST BE .EQ.0 OR .GE.NSCMIN.
 C
 C NSCMIN MINIMUM NUMBER OF SCANS TO BE CONSIDERED A DATA FILE.
 C LESS THAN THIS WILL BE CONSIDERED A SHORT FILE. IF THE
 C EDIT OF A DATA FILE IS TERMINATED DUE TO EXCESSIVE
 C CONSECUTIVE INTERPOLATIONS NO OUTPUT WILL BE WRITTEN FOR
 C THAT FILE UNLESS NSCMIN SCANS HAD ALREADY BEEN
 C PROCESSED. MUST BE .GT. 0
 C
 C NPARTY NUMBER OF DATA PARITY ERRORS WHICH CAN BE TOLERATED.
 C THE DATA SET IS SKIPPED IF ACTUAL NUMBER .GT. NPARTY.
 C MUST BE .GE. 0 (MAX=50)
 C
 C INTMAX NUMBER OF CONSECUTIVE INTERPOLATIONS WHICH CAN BE
 C TOLERATED. EDIT TERMINATED IF ACTUAL NUMBER .GT. INTMAX.
 C IF NSCMIN SCANS HAVE ALREADY BEEN PROCESSED, THEY WILL
 C BE WRITTEN ON ITPDOT, OTHERWISE NO OUTPUT WILL BE
 C WRITTEN FOR THIS DATA SET. MUST BE .GE. 0
 C
 C MINFIL MINIMUM NUMBER OF CONSECUTIVE END OF FILE MARKS TO DENOTE
 C AN END OF TAPE. JOB WILL BE STOPPED WHEN THIS OCCURS.
 C MUST BE .GT. 0
 C
 C ---TYPE 4. HEADER INFORMATION CARD
 C FORMAT (I2,2I6,2X,A6,2X,A4,3I6)
 C
 C ICDNO CARD NUMBER, MUST BE 4
 C
 C NCHNLS NUMBER OF CHANNELS SCANNED. MUST BE 1.LE. NCHNLS .LE. 6
 C
 C ISMRAT INDEX OF SAMPLE RATE. (TO BE USED IN TABLE LOOK UP.)
 C MUST BE 0 .LE. ISMRAT .LE. 15
 C SAMPLING RATE

INDEX	MODEL 0	MODEL 1
0	000.0	000.0
1	000.1	000.1
2	000.2	000.2
3	000.5	000.5
4	001.0	001.0
5	002.0	002.0
6	005.0	005.0
7	010.0	010.0
8	020.0	020.0
9	050.0	025.0
10	100.0	030.0
11	200.0	037.5
12	000.0	050.0
13	000.0	075.0
14	000.0	100.0
15	000.0	000.0

DATE DAY, MONTH, AND YEAR WRITTEN AS 6 CHARACTERS

ISTTIM START TIME, 4 CHARACTERS

IRUNNO RUN NUMBER, 3 DIGITS

ICALI CALIBRATION INDICATOR =0 IF DATA, NOT=0 IF CALIBRATION

MODEL HARDWARE MODEL NO. OF DIGITIZER. MUST BE 0 OR 1

---TYPE 5. CHANNEL ORDER CARD

FORMAT (I2,12(1X,A2))

ICDNO CARD NUMBER, MUST BE 5

CHNORD(I) I=1...2*NCHNLS WHERE NCHNLS= NUMBER OF CHANNELS.
EACH ELEMENT IS TWO HOLEPITH CHARACTERS (E.G. E1,E2,H1,H2
H3) OF CHANNEL IDENTIFICATION. THE FIRST NCHNLS
ELEMENTS REPRESENT THE DESIRED ORDER OF THE CHANNELS AND
THE SECOND NCHNLS ELEMENTS ARE THE ACTUAL ORDER OF THE
CHANNELS ON THE RAW DATA TAPE.

---TYPE 6. SENSITIVITY PARAMETER CARD

FORMAT (I2,6E10.4)

ICDNO CARD NUMBER, MUST BE 6

SENSE(I) I=1...NCHNLS SENSITIVITY FOR EACH OF THE NCHNLS CHANNELS
ORDERED ACCORDING TO THE DESIRED CHANNEL ORDER -SEE
PARAMETER CHNORD(I) ABOVE. MUST BE .GT. 0

---TYPE 7. FILTER INFORMATION CARD

FORMAT (I2,19I3)

ICDNO CARD NUMBER, MUST BE 7

IALIAS,(ILO(I),I=1...NCHNLS),(IHI(I),I=1...NCHNLS),(ICOM(I),
I=1...NCHNLS), ORDERING SAME AS FOR SENSE(I) ABOVE.

C IALIAS INDEX OF ALIAS FILTER USED. MUST BE .GT. 0
C
C ILO(I) INDEX OF LOW PASS FILTER FOR I-TH CHANNEL. MUST BE .GT. 0
C
C IHI(I) INDEX OF HIGH PASS FILTER FOR I-TH CHANNEL MUST BE .GT. 0
C
C ICOM(I) INDEX OF COMPONENT FILTER FOR I-TH CHANNEL MUST BE .GT. 0
C
C

C ---SUMMARY OF CONTROL INFORMATION DECK
C

- C 1. TYPE 1 CARD - TAPE ASSIGNMENT AND POSITIONING
- C 2. TYPE 2 CARD - OPTIONS
- C 3. TYPE 3 CARD - FILE PROCESSING PARAMETERS FOR NUMSET
C DATA SETS.
- C 4. TYPE 4 CARD - HEADER INFORMATION CARD
- C 5. TYPE 5 CARD - CHANNEL ORDER CARD
- C 6. TYPE 6 CARD - SENSITIVITY CARD
- C 7. TYPE 7 CARD - FILTER INFORMATION CARD
- C 8. SETS OF TYPE 4, 5, 6 AND 7 CARDS FOR A TOTAL OF
C NUMSET SETS MUST FOLLOW CARD TYPE 3.
- C 9. SEQUENCE STARTS OVER WITH A TYPE 2 CARD.
- C 10. JOB IS ENDED WITH A TYPE 2 CARD WITH IENDUP = 1.
C JOBS SHOULD BE ENDED IN THIS MANNER TO INSURE
C THAT AN END OF FILE IS WRITTEN ON THE BINARY OUTPUT
C TAPE.
- C
- C

C TAPE BLOCK FROM ITPDIN
C
C

C ---TYPE 1. HEADER FILE
C

C FORMAT (7 TRACK IBM COMPATIBLE BINARY RECORD 3 WORDS LONG
C (36 BIT WORDS) + END OF FILE MARK.)
C

C THE 3 WORD HEADER IS NOT USED BY THE PROGRAM. IT
C CONSISTS OF 3 IDENTICAL WORDS WHICH MAY BE SET BY THE
C OPERATOR TO IDENTIFY THE FILE.
C

C ---TYPE 2. DATA FILE
C

C FORMAT (7 TRACK IBM COMPATIBLE BINARY RECORD 9 TO 20000 WORDS
C (36 BIT WORDS) LONG FOLLOWED BY END OF FILE)
C

C THE DATA FILE CONTAINS MULTIPLEXED SAMPLES FROM NCHNLS
C CHANNELS (NCHNLS =1 TO 6). EACH SCAN ACROSS NCHNLS
C CONTAINS ONE SAMPLE FROM EACH CHANNEL. DATA SAMPLES
C ARE 10 BITS LONG AND ARE CONTAINED IN TWO CONSECUTIVE SIX
C BIT CHARACTERS. THE HIGH ORDER 5 BITS OF THE SAMPLE IS
C IN THE LOW ORDER 5 BITS OF THE FIRST OF THE 2 CHARACTERS,
C AND THE LOW ORDER 5 BITS ARE IN THE LOW ORDER 5 BITS OF
C THE SECOND. THE HIGH ORDER BIT IN EACH CHARACTER IS ZERO
C EXCEPT IN THE LAST CHARACTER OF A SCAN IN WHICH CASE IT
C IS 1. THE OCCURRENCE OF A 1 IN THE HIGH ORDER POSITION
C OF A CHARACTER DENOTES AN END OF SCAN. NORMALLY THERE
C ARE 2*NCHNLS CHARACTERS PER SCAN.
C

C ---TYPE 3. END OF TAPE INDICATOR
C

C FORMAT (MINFIL CONSECUTIVE END OF FILE MARKS - 7 TRACK IBM
C COMPATIBLE.)
C

MINFIL CONSECUTIVE END OF FILE MARKS USED TO DENOTE END OF TAPE. (MINFIL IS AN INPUT PARAMETER.)

---SUMMARY OF ORGANIZATION OF TAPE ITPDIN

EACH TAPE CONTAINS SEVERAL HEADER AND DATA FILES AS FOLLOWS

1. 1 TYPE 1 BLOCK
2. 1 TYPE 2 BLOCK

SETS OF THESE ARE ENDED BY A TYPE 3 BLOCK. VARIATIONS OF THIS FORMAT SUCH AS INTERSPERSED END OF FILE MARKS AND SHORT FILES WILL NOT EFFECT THE EDIT PORTION OF THE PROGRAM UNLESS THE SHORT FILES ARE NSCMIN*NCHNLS/3 WORDS LONG IN WHICH CASE THE FILE IS CONSIDERED TO BE A DATA SET, OR UNLESS THERE ARE MINFIL OR MORE CONSECUTIVE END OF FILE MARKS IN WHICH CASE THEY WILL BE TAKEN AS A TYPE 3 BLOCK AND THE JOB WILL BE STOPPED.

----OUTPUT----

PRINT LINES ON ISYSOU

A LINE OF OUTPUT IS WRITTEN FOR EVERY FILE READ GIVING THE FILE NUMBER RELATIVE TO THE FILE AT WHICH THE TAPE IS POSITIONED BY THE POSITION REQUESTS, AND A NOTE IDENTIFYING THE FILE AS A SHORT FILE OR A DATA SET. ALL SHORT FILES ARE DUMPED IN OCTAL WITH THE LOCATION OF PARITY ERRORS, IF ANY. THE LOCATIONS OF PARITY ERRORS IN THE DATA SET IS ALWAYS GIVEN, AND AN OCTAL DUMP OF THE DATA MAY BE REQUESTED VIA INPUT PARAMETERS. DURING THE EDIT PHASE THE WORDS CONTAINING LONG AND SHORT SCANS CAN BE DUMPED (INPUT PARAMETER). AFTER THE EDIT PHASE THE PARTIALLY DEMULTIPLEXED EDITED DATA MAY BE DUMPED (INPUT PARAMETER).

TAPE BLOCK ON ITPDOT

---TYPE 1. HEADER RECORD.

FORMAT(FORTRAN IV 7090/7094 BINARY TAPE LOGICAL RECORD)

LHEDM1 LENGTH OF HEADER RECORD MINUS 1, I.E. NUMBER OF WORDS IN THE REST OF THE HEADER, SO THAT THE RECORD CAN BE READ USING
READ (ITPIN) LHEDM1,(IHEAD(I),I=1,LHEDM1)
MUST BE .GT. 1 AND .LE. 40.

NOTE THAT, IF THE ABOVE STATEMENT IS USED, THE DATA ITEMS BELOW WILL BE EQUIVALENT TO ELEMENTS OF THE ARRAY IHEAD. THE EQUIVALENCE IS INDICATED AT THE END OF EACH DESCRIPTION.

NWDREC NUMBER OF WORDS OCCUPIED BY THE PACKED DATA FOR

EACH CHANNEL. THE STATEMENT
 READ (ITPIN) (IDATA(I),I=1,NWDREC)
 WILL CORRECTLY READ ALL OF THE DATA IN A TYPE 2
 RECORD. (IHEAD(1))

NSAMP NUMBER OF SAMPLES IN EACH DATA RECORD. WILL BE
 .GT. 3*(NWDREC-1) AND .LE. 3*NWDREC. (IHEAD(2))

NCHNLS NUMBER OF CHANNELS OF DATA FOR EACH DATA RECORD.
 THERE WILL BE NCHNLS TYPE 2 RECORDS BETWEEN TYPE 1
 RECORDS ON THE TAPE. (IHEAD(3))

SRATE SAMPLING RATE FOR DIGITIZATION. THE NYQUIST FREQUENCY
 IS $1./2.*SRATE$. (IHEAD(4))

DATE BCD REPRESENTATION OF THE DATE ON WHICH THE DATA WERE
 TAKEN IN THE FORM MO./DAY/YR (IHEAD(5))

TIME BCD REPRESENTATION OF THE TIME THE EXPERIMENT STARTED.
 MILITARY CONVENTION, 4 CHARACTERS, LEFT ADJUSTED AND
 FILLED OUT WITH BLANKS, (IHEAD(6))

IRUN RUN NUMBER. WILL BE .LE. 999. (IHEAD(7))

MODEL MODEL NUMBER OF DIGITIZER. (IHEAD(8))

ZIFDAT CALIBRATION INDICATOR =0 IF THIS IS A PHYSICAL
 DATA RUN, .NE.0 IF THIS IS A CALIBRATION RUN.(IHEAD(9))

CHNORD(I) I=1,...,NCHNLS CHANNEL IDENTIFICATION VECTOR. EACH
 ELEMENT IS TWO CHARACTERS LEFT ADJUSTED AND FILLED OUT
 WITH BLANKS THESE WILL BE, USUALLY, SELECTED FROM THE
 SET E1,E2,E3,H1,H2,H3. (IHEAD(10)...IHEAD(NCHNLS+9))

SENSE(I) I=1,...,NCHNLS SENSITIVITIES FOR THE NCHNLS OF DATA.
 A DATA SCALE FACTOR. (IHEAD(NCHNLS+10).....
 IHEAD(2*NCHNLS+9))

IALIAS INDEX FOR ALIAS FILTER (IHEAD(2*NCHNLS+10))

IFILT(I,J) I=1,...,3, J=1,...,NCHNLS INDICES FOR FILTERS AND
 COMPONENTS. IFILT(1,J) IS THE INDEX OF THE LOWPASS
 FILTER IN CHANNEL J. IFILT(2,J) IS THE INDEX OF THE
 HIGH PASS FILTER IN CHANNEL 4, IFILT(3,J) DEFINES WHICH
 TYPE OF OVER-ALL CHANNEL TRANSFER FUNCTION SHOULD BE USED
 (IHEAD(2*NCHNLS+11),...,IHEAD(5*NCHNLS+10))

---TYPE 2. DATA RECORD
 FORMAT(FORTRAN IV 7090/7094 BINARY TAPE LOGICAL RECORD)

DATA(I) I=1,...,NWDREC DATA, PACKED THREE SAMPLES PER WORD,
 IN EITHER EXCESS 512 OR SIGNED MAGNITUDE FORM. EACH
 SAMPLE OCCUPIES 12 BITS. SELECTION OF DATA CODING WILL
 BE MADE ON THE BASIS MODEL THE HARDWARE MODEL NO.

---SUMMARY OF ORGANIZATION OF TAPE ITPDOT

EACH TAPE CONTAINS A NUMBER OF DATA BLOCKS. EACH DATA
 BLOCK CONSISTS OF THE FOLLOWING

```

C
C           1. A TYPE 1 HEADER RECORD
C           2. NCHNLS TYPE 2 DATA RECORDS.
C
C           THE LAST BLOCK IS FOLLOWED BY TWO END-OF-FILE MARKS.
C
C DIMENSION SAMPLE(20300), INBUFR(200), IDAT(100), DATA(20000),
1           IDERTB(50), ICHARS(250), CHNORD(12), SENSE(6), ILU(6),
2           IHI(6), ICOM(6), HEAD(40), IHEAD(40), INDCHN(6)
C
C COMMON SAMPLE, INBUFR, IDAT, DATA, HEAD, IHEAD, LDATA, IDERTB, LTAB,
1           LDERTB, ICDNO, ITPDOT, ISSKIP, IZIFOD, ISTRT1, IEND1, ISCNDP,
2           IZIFEO, ISTRT2, IEND2, NUMSET, ISTART, NSCMIN, NPARTY, INTMAX,
3           MINFIL, NCHNLS, ISMRAT, DATE, ISTTIM, IRUNNO, ICALI, MODEL,
4           CHNORD, SENSE, IALIAS, ILO, IHI, ICOM, ISYSOU, NREADS, NEOF5,
5           NINTRP, IXSCNS, IXSCNE, NADDED, IXDAT, IXBLOK, IFINSH, IGOODS,
6           NOFSTS, NGSCNS, ICHARS, IXPKD, LRGSTI, NTOTI, NZFROS, SRATE,
7           IANS, NWDREC, IZFNOU, NWANTD
C
C EQUIVALENCE (INBUFR, SAMPLE), (IDAT, SAMPLE(201)), (DATA, SAMPLE(301)),
1           (IHEAD, HEAD)
C
C           ISYSIN = 4
C           ISYSOU = 2
C
C READ TAPE PARAMETER CARD
C
C READ INPUT TAPE ISYSIN,1001, ICDNO, ITPDIN, IREWIN, ISKPIN,
1           ITPDOT, IREWOT, IZFNUD, ISSKIP
C WRITE OUTPUT TAPE ISYSOU,2001
C WRITE OUTPUT TAPE ISYSOU,3001, ICDNO, ITPDIN, IREWIN, ISKPIN,
1           ITPDOT, IREWOT, IZFNUD, ISSKIP
1001 FORMAT (I2,7I6)
2001 FORMAT (20H1TAPE PARAMETER CARD,/)
3001 FORMAT (6X5HICDNO ITPDIN IREWIN ISKPIN ITPDOT IREWOT IZFNUD
1           8H ISSKIP/1X8I8/)
C CALL INERCH(1)
C
C INITIALIZE TAPES
C
C IF (IREWIN)10,20,10
10 REWIND ITPDIN
20 CALL FSKIP(ITPDIN, ISKPIN)
C IF (IREWOT)30,40,30
30 REWIND ITPDOT
40 IF (IZFNUD)50,60,50
50 CALL FSKIP(ITPDOT,1)
C CALL RSKIP(ITPDOT,-1,DUMMY)
60 NREADS = 0
C NSETS = 0
C IZFNOU = 0
C
C READ OUTPUT OPTION CARD
C
C 70 READ INPUT TAPE ISYSIN,1002, ICDNO, IZIFOD, ISTRT1, IEND1, IZIFCN,
1           ISCNDP, IZIFEO, ISTRT2, IEND2, IENDUP
C WRITE OUTPUT TAPE ISYSOU,2002
C WRITE OUTPUT TAPE ISYSOU,3002, ICDNO, IZIFOD, ISTRT1, IEND1, IZIFCN,
1           ISCNDP, IZIFEO, ISTRT2, IEND2, IENDUP
1002 FORMAT (I2,9I6)
2002 FORMAT (51H1OUTPUT OPTION AND FILE PROCESSING PARAMETERS CARDS,/)

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3002 FORMAT (6X53HICDNO  I7IFOD  ISTRT1  IFEND1  IZIFCN  ISCNDP  IZIFEO
1      24H  ISTRT2  IEND2  IENDUP/1X2I8,2X2I8,I6,2I8,2X2I8,I6//)
      CALL INERCH(2)
      IF (IENDUP)80,100,80
C
C IF END OF JOB, WRITE MESSAGES AND EXIT
C
80  CALL WRTOUT(1)
90  IF (I7FNOU)91,95,91
91  END FILE ITPDOT
      END FILE ITPDOT
      CALL WRTOUT(2)
95  CALL EXIT
C
C READ FILE PROCESSING PARAMETERS CARD
C
100  READ INPUT TAPE ISYSIN,1003,  ICDNO,NUMSET,ISTART,NWANTD,NSCMIN,
1      NPARTY,INTMAX,MINFIL
      WRITE OUTPUT TAPE ISYSOU,3003,  ICCNO,NUMSET,ISTART,NWANTD,NSCMIN,
1      NPARTY,INTMAX,MINFIL
1003 FORMAT (I2,7I6)
3003 FORMAT (6X45HICDNO  NUMSET  ISTART  NWANTD  NSCMIN  NPARTY
1      16H  INTMAX  MINFIL/7X12,1X7I8)
      CALL INERCH(3)
      NSTGRP = 0
C
C READ TYPE 4, 5, 6, AND 7 CARDS
C
110  READ INPUT TAPE ISYSIN,1004,  ICDNO,NCHNLS,ISMRAT,DATE,ISTTIM,
1      IRUNNO,ICALI,MODEL
      WRITE OUTPUT TAPE ISYSOU,2004
      WRITE OUTPUT TAPE ISYSOU,3004,  ICDNO,NCHNLS,ISMRAT,DATE,ISTTIM,
1      IRUNNO,ICALI,MODEL
1004 FORMAT (I2,2I6,2X,A6,2X,A4,3I6)
2004 FORMAT (47H1HEADER, CHANNEL, SENSITIVITY, AND FILTER CARDS,/)
3004 FORMAT (6X53HICDNO  NCHNLS  ISMRAT  DATE  ISTTIM  IRUNNO  ICALI
1      8H  MODEL/1X3I8,4XA6,3XA4,2X2I7,I9//)
      CALL INERCH(4)
      K = 2*NCHNLS
      READ INPUT TAPE ISYSIN,1005,  ICDNO,(CHNORD(I),I=1,K)
      WRITE OUTPUT TAPE ISYSOU,3005,  ICCNO,(CHNORD(I),I=1,K)
1005 FORMAT (I2,12(1X,A2))
3005 FORMAT (6X17HICDNO  CHNORD(I)/7X12,7X12(2XA2)//)
      CALL INERCH(5)
      READ INPUT TAPE ISYSIN,1006,  ICDNO,(SENSE(I),I=1,NCHNLS)
      WRITE OUTPUT TAPE ISYSOU,3006,  ICDNO,(SENSE(I),I=1,NCHNLS)
1006 FORMAT (I2,6E10.4)
3006 FORMAT (6X16HICDNO  SENSE(I)/7X12,5X6E13.4//)
      CALL INERCH(6)
      READ INPUT TAPE ISYSIN,1007,  ICDNO,IALIAS,(ILO(I),IHI(I),ICOM(I),
1      I=1,NCHNLS)
      WRITE OUTPUT TAPE ISYSOU,3007,  ICDNO,IALIAS,(ILO(I),IHI(I),
1      ICOM(I),I=1,NCHNLS)
1007 FORMAT (I2,19I3)
3007 FORMAT (6X50HICDNO.  IALIAS  (ILOW(I),IHI(I),ICOM(I),I=1,NCHNLS)
1      /1X2I8,4X18I4//)
      CALL INERCH(7)
      NOEDFS = 0
      MINWRD = (NSCMIN*NCHNLS+2)/3
C
C READ NEXT DATA FILE

```



```

C
120 CALL FILERD(IITPDIN,20000,50,DATA,LDATA,LTAB)
    NREADS = NREADS+1
C
C TEST FOR LCNG FILE
C
    IF (LDATA-20000)125,121,121
121 CALL FSKIP(IITPDIN,1)
C
C TEST FOR END OF FILE
C
125 IF (LDATA)130,130,150
130 NEOFBS = NEOFBS+1
    CALL WRTOUT(3)
C
C TEST FOR END OF TAPE
C
    IF (NEOFBS-MINFIL)120,140,140
140 CALL WRTOUT(4)
    GO TO 90
150 NEOFBS = 0
C
C TEST FOR SHORT FILE
C
    IF (LDATA-MINWRD)160,170,170
160 CALL WRTOUT(5)
    GO TO 120
170 LDERTB = MINOF(LTAB,50)
    NSETS = NSETS+1
C
C TEST FOR TAPE POSITIONING
C
    IF (NSETS-ISSKIP)180,180,190
180 CALL WRTOUT(6)
    GO TO 120
190 CALL WRTOUT(7)
    NSTGRP = NSTGRP+1
C
C TEST FOR EXCESSIVE PARITY ERRORS
C
    IF (LTAB-NPARTY)220,220,200
200 CALL WRTOUT(8)
C
C TEST FOR LAST SET IN GROUP
C
210 IF (NSTGRP-NUMSET)110,70,70
C
C TEST FOR EDIT
C
220 IF (!IZIFCN)230,240,230
230 CALL WRTOUT(9)
    GO TO 210
240 CALL EDIT
    GO TO 210
    END
* LISTB
* LABEL
CEDIT
    SUBROUTINE EDIT
C
C

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C TITLE-EDIT

C EDIT A DATA FILE FROM DGEDT1

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---ABSTRACT---

EDIT SPREADS OUT THE PACKED DATA INTO CHARACTERS AND EDITS IT ONE SCAN AT A TIME. IF A SCAN IS SHORT, LONG OR CONTAINS A PARITY ERROR, THE DATA IS DISCARDED AND A COUNT IS KEPT OF HOW MANY INTERPOLATIONS ARE NEEDED TO CORRECT FOR THE BAD SCANS. WHEN A GOOD SCAN IS FOUND, CONTROL IS PASSED TO INTPAK TO MAKE THE INTERPOLATIONS AND PACK THE OUTPUT. AFTER THE LAST GOOD SCAN HAS BEEN PACKED, THE OUTPUT IS WRITTEN AND CONTROL IS RETURNED TO DGEDT1 TO GET THE NEXT DATA FILE.

- - ATISTICS--

C LANGUAGE - FORTRAN II
C EQUIPMENT - NC SPECIAL EQUIPMENT
C STORAGE - 413 WORDS
C SPEED -
C AUTHOR - B.A. WILLEY, GEOSCIENCE INC, SEPT. 1966

C LIBRARY ROUTINES USED - MOVE

C SPECIAL ROUTINES USED - INTPAK, CHRSPR, DATAIX, PARCHK, WRTOUT, WRIDT1

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-----USAGE-----

C SAMPLE CALL
C CALL EDIT

C INPUTS (VIA COMMON)

C DATA(I) I=1...LDATA THE PACKED DATA FILE FROM ITPDIN.

C LDATA LENGTH OF THE DATA VECTOR.

C IDERTB(I) I=1...LDERTB VECTOR OF WORD NUMBERS OF DATA CONTAINING
C PARITY ERRORS.

C LDERTB LENGTH OF DATA ERROR TABLE.

C ICHARS(I) I=1...250 VECTOR USED TO SPREAD OUT DATA.

C NCHNLS SEE MAIN PROGRAM.

C ISTART SEE MAIN PROGRAM.

C ISCNDP SEE MAIN PROGRAM.

C INTMAX SEE MAIN PROGRAM.

C IZIFEO SEE MAIN PROGRAM.

C NSCMIN SEE MAIN PROGRAM.

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C      IGOODS   SET =1 BY  INTPAK  WHEN FIRST GOOD SCAN HAS BEEN PACKED.
C
C      IANS     ERROR CODE SET BY  WRIDT1.
C
C      OUTPUTS (SEE INPUTS TO LOWER LEVEL ROUTINES FOR OUTPUTS VIA COMMON)
C
C      PROGRAM FOLLOWS BELOW
C
C      DIMENSION SAMPLE(20300), INBUFR(200), IDAT(100), DATA(20000),
1          IDERTB(50), ICHARS(250), CHNORD(12), SENSE(6), ILO(6),
2          IHI(6), ICOM(6), HEAD(40), IHEAD(40), INDCHN(6)
C
C      COMMON SAMPLE, INBUFR, IDAT, DATA, HEAD, IHEAD, LDATA, IDERTB, LTAB,
1          LDERTB, ICDNO, ITPDOT, ISSKIP, IZIFOD, ISTRT1, IEND1, ISCNDP,
2          IZIFED, ISTRT2, IEND2, NUMSET, ISTART, NSCMIN, NPARTY, INTMAX,
3          MINFIL, NCHNLS, ISMRAT, DATE, ISTTIM, IRUNNO, ICALI, MODEL,
4          CHNORD, SENSE, IALIAS, ILO, IHI, ICOM, ISYSOU, NREADS, NOEofs,
5          NINTRP, IXSCNS, IXSCNE, NADDED, IXDAT, IXBLOK, IFINSH, IGOODS,
6          NOFSTS, NGSCNS, ICHARS, IXPKD, LRGSTI, NTOTI, NZEROS, SRATE,
7          IANS, NWDREC, IZFNOU, NAWNTD
C
C      EQUIVALENCE (INBUFR, SAMPLE), (IDAT, SAMPLE(201)), (DATA, SAMPLE(301)),
1          (IHEAD, HEAD)
C
C      INITIALIZE COUNTERS, ETC.
C
C      IBLOCK = 6*NCHNLS
C      IXBLOK = 1
C      ISCNST = 0
C      NCHPSC = 2*NCHNLS
C      NWPBLK = XMINOF(IBLOCK, LDATA)
C      IGOODS = 0
C      NINTRP = 0
C      NGSCNS = 0
C      IXSCNS = 1
C      NWRLFT = LDATA
C      IXDAT = 1
C      NOSCN = 0
C      NOFSTS = 0
C      IFINSH = 0
C
C      SPREAD OUT NEXT BLCK OF CHARACTERS
C
10     NWSPR = XMINOF(NWRLFT, NWPBLK)
        CALL CHRSPR(NWSPR, DATA(IXDAT), ICHARS(IXBLOK))
        NWRLFT = NWRLFT - NWSPR
        IXLBFR = IXBLOK + NWSPR * 6 - 1
20     IF (ISCNST) 40, 30, 40
C
C      INITIALIZE FOR SCAN START
C
30     ISCNST = 1
        IXSCNE = IXSCNS
        NADDED = 0
C
C      COUNT UNTIL SCAN BIT FOUND OR MORE CHARACTERS NEEDED
C
40     IF (STEPCF(ICHARS(IXSCNE))) 50, 110, 50
50     IXSCNE = IXSCNE + 1

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        IF (IXSCNE-IXLBFR)40,40,60
C
C MORE CHARACTERS NEEDED
C
60   NSOFAR = IXSCNE-IXSCNS
    IF (NSCFAR-NCHPSC)80,70,70
70   NADDED = NADDED+NSOFAR
    IXSCNS = 1
    IXSCNF = 1
    IXBLOK = 1
    GO TO 90
80   CALL MCVE(NSOFAR, ICHARS(IXSCNS), ICHARS(1))
    IXBLOK = NSOFAR+1
    IXSCNS = 1
    IXSCNE = NSOFAR
90   IXDAT = IXDAT+NWSPPR
    IF (NWRLFT)100,100,10
100  IF (NGSCNS-NSCMIN)101,105,105
101  CALL WRTOUT(16)
    RETURN
105  IFINSH = 1
    CALL INTPAK
    GO TO 320
C
C SCAN BIT FCUNC, TEST FOR GOOD SCAN
C
110  NOSCN = NOSCN+1
    LSCAN = IXSCNE-IXSCNS+NADDED+1
    IF (LSCAN-NCHPSC)230,120,170
120  CALL DATAIX(IXDAT, IXSCNS, IXSCNE, NADDED, IXBLOK, IXBGSC, IXENSC)
    CALL PARCHK(IXBGSC, IXENSC, IDERTB, LDERTB, PARERR)
    IF (PARERR)250,130,250
130  IF (IGCODS)160,140,160
140  IF (NOSCN-ISTART)260,150,150
150  NOFSTS = NOSCN
160  NGSCNS = NGSCNS+NINTRP+1
    CALL INTPAK
    IF (NWANTD) 165,260,165
165  IF (NGSCNS-NWANTD)260,310,310
C
C LONG SCAN
C
170  IF (ISCNDP)180,190,180
180  CALL WRTOUT(10)
190  IF (IGCODS)200,260,200
C
C COMPUTE NUMBER OF SCANS
C
200  NOCOMP = LSCAN/NCHPSC
    NOREM = LSCAN-NCHPSC*NOCOMP
    IF (NOREM-NCHNLS)220,210,210
210  NOCOMP = NOCOMP+1
220  NINTRP = NINTRP+NOCOMP
    GO TO 290
C
C SHORT SCAN
C
230  IF (ISCNDP)240,250,240
240  CALL WRTOUT(11)
250  IF (IGCODS)280,260,280
260  IXSCNS = IXSCNE+1

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        ISCNST = 0
        IF (IXSCNS-IXLBRF)20,20,270
270    IXBLOK = 1
        IXSCNS = 1
        IXSCNF = 1
        GO TO 90
280    NINTRP = NINIRP+1
290    IF (NINTRP-INTMAX)260,260,300
300    CALL WRTOUT(12)
        IF (NGSCNS-NSCMIN)380,310,310
310    IFINSH = 1
        CALL INTPAK
C
C RETURN FROM INTPAK
C
320    IF (IZIFEO)350,340,350
340    CALL WRTOUT(13)
350    CALL WRIDT1
        IF (IANS)360,370,360
360    CALL WRTOUT(14)
370    CALL WRTOUT(15)
380    RETURN
        END
*      LIST8
*      LABEL
CWRTOUT
        SUBROUTINE WRTOUT(JBND)
C
C
C TITLE-WRTOUT = WRITE OUT
C WRITE PRINTED OUTPUT FOR DGEDT1
C
C
C          ---ABSTRACT---
C
C          WRTOUT WRITES ALL PRINTED OUTPUT FROM DGEDT1, EXCEPT
C          ERROR MESSAGES WHICH ARE WRITTEN BY INERCH. PRINT LINES
C          ARE WRITTEN ON OUTPUT TAPE ISYSOU. THE INPUT PARAMETER
C          JBND SPECIFIES WHICH MESSAGES ARE TO BE WRITTEN. ALL
C          VARIABLES TO BE WRITTEN MUST BE IN COMMON.
C
C
C          --STATISTICS--
C
C LANGUAGE      - FORTRAN II
C EQUIPMENT     - NO SPECIAL REQUIREMENTS
C STORAGE       - 746 WORDS
C SPEED        -
C AUTHOR        - B.A. WILLEY, GEOSCIENCE INC, SEPT. 1966
C
C LIBRARY ROUTINES USED - NONE
C
C
C          ----USAGE----
C
C SAMPLE CALL
C CALL WRTOUT(JBND)
C
C
C INPUTS
C

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C      JRNO  JOB NUMBER.
C
C      THE FOLLOWING VARIABLES MUST BE IN COMMON.
C
C      INPUT PARAMETERS (SEE MAIN PROGRAM)  ITPDOT, IZIFOD, ISTRT1,
C      IEND1, ISTRT2, IEND2, ISTART, NCHNLS.
C
C      FROM MAIN PROGRAM-
C
C      ISYSOU  SYSTEM OUTPUT TAPE.
C
C      NREADS  NO. OF FILES READ FROM ITPDIN.
C
C      NOEIFS  NC. OF CONSECUTIVE EOF'S READ.
C
C      DATA(I)  I=1...LDATA  THE PACKED DATA FROM  ITPDIN.
C
C      LDATA    LENGTH OF THE DATA VECTOR.
C
C      IDERTB(I) I=1...LTAB  VECTOR OF WORD NUMBERS OF DATA CONTAINING
C      PARITY ERRORS.
C
C      LTAB     LENGTH OF THE DATA ERROR TABLE
C
C      FROM  EDIT  SUBROUTINE -
C
C      IXSCNS  INDEX ON  ICHARS  OF BEGINNING OF SCAN.
C
C      IXSCNE  INDEX ON  ICHARS  OF END OF SCAN.
C
C      NADDED  NO. OF CHARACTERS IN LONG SCAN FROM PREVIOUS SPREADS.
C
C      IXDAT   INDEX ON  DATA  OF BEGINNING OF SPREAD.
C
C      IXBLOK  INDEX ON  ICHARS  OF BEGINNING OF SPREAD.
C
C      IGOODS  =1 IF A GOOD SCAN HAS BEEN FOUND, =0 OTHERWISE.
C
C      NOFSTS  NO. OF FIRST GOOD SCAN USED.
C
C      NGSCNS  NO. OF GOOD SCANS.
C
C      FROM  INTPAK  SUBROUTINE -
C
C      IDAT(I)  I=1...20100  VECTOR OF PACKED RESULTS.
C
C      IXPKD   INDEX ON  IDAT  WHERE NEXT SAMPLE WILL BE PACKED.
C
C      LRGSTI  LARGEST NO. OF CONSECUTIVE INTERPOLATIONS.
C
C      NTOTI  TOTAL NO. OF INTERPOLATIONS.
C
C      FROM  WRIDT1  SUBROUTINE
C
C      NWDR'EC  NO. OF WORD PER RECORD IN THE FINAL OUTPUT.
C
C      SRATE    SAMPLING RATE.
C
C      IANS     ERROR INDICATOR.

```


C
C
C PROGRAM FOLLOWS BELOW
C

DIMENSION SAMPLE(20300), INBUFR(200), IDAT(100), DATA(20000),
1 IDERTB(50), ICHARS(250), CHNORD(12), SENSE(6), ILO(6),
2 IHI(6), ICOM(6), HEAD(40), IHEAD(40), INDCHN(6)

C
COMMON SAMPLE, INBUFR, IDAT, DATA, HEAD, IHEAD, LDATA, IDERTB, LTAB,
1 LDERTB, ICDNO, ITPDUT, ISSKIP, IZIFOD, ISTRT1, IEND1, ISCNOP,
2 IZIFEU, ISTRT2, IEND2, NUMSET, ISTART, NSCMIN, NPARTY, INTMAX,
3 MINFIL, NCHNLS, ISMRAT, DATE, ISTTIM, IRUNNO, ICALI, MODEL,
4 CHNCRD, SENSE, IALIAS, ILO, IHI, ICOM, ISYSOU, NREADS, NOEOFs,
5 NINTRP, IXSCNS, IXSCNE, NADDED, IXDAT, IXBLOK, IFINSH, IGOODS,
6 NOFSTS, NGSCNS, ICHARS, IXPKD, LRGSTI, NTOTI, NZFROS, SRATE,
7 IANS, NWDREC, IZFNQU, NWANTD

C
EQUIVALENCE (INBUFR, SAMPLE), (IDAT, SAMPLE(201)), (DATA, SAMPLE(301)),
1 (IHEAD, HEAD)

C
2000 FORMAT (/29H END OF PROCESSING REQUESTED.)
2010 FORMAT (/41H TWO END-CF-FILES WRITTEN ON OUTPUT TAPE ,I2,1H.)
2020 FORMAT (/11H JOB ENDED.)
2030 FORMAT (/5H FILE,I5,15H. END OF FILE.)
2040 FORMAT (/14,54H CONSECUTIVE END OF FILES READ. END OF INPUT ASSUM
1 ED.)
2050 FORMAT (/5H FILE,I5,14H. SHORT FILE.6X8HLENGTH =I6,4X25HNUMBER OF
1 PARITY ERRORS =I6,1H.)
2060 FORMAT (/6X46HWORD NUMBERS OF WORDS CONTAINING PARITY ERRORS,
1 //(20I6))
2070 FORMAT (/6X18HOCTAL DUMP OF FILEI5,1H.//(100I3))
2080 FORMAT (/5H FILEI5,38H. DATA FILE SKIPPED TO POSITION TAPE.)
2090 FORMAT (/5H FILEI5,13H. DATA FILE.7X8HLENGTH =I6,4X25HNUMBER OF P
1 ARITY ERRORS =I6,1H.)
2100 FORMAT (/6X18HOCTAL DUMP OF FILEI5,10H FROM WORDI6,8H TO WORDI6,
1 1H.//(100I3))
2110 FORMAT (/6X44HFILE SKIPPED DUE TO EXCESSIVE PARITY ERRORS.)
2120 FORMAT (/6X19HEDIT NOT REQUESTED.)
2130 FORMAT (//6X20HRELATIVE SCAN NUMBERI6,18H BEGINNING IN WORDI6,
1 16H IS A LONG SCAN.)
2140 FORMAT (//6X20HRELATIVE SCAN NUMBERI6,18H BEGINNING IN WORDI6,
1 17H IS A SHORT SCAN.)
2150 FORMAT (/6X60HEDIT TERMINATED DUE TO EXCESSIVE CONSECUTIVE INTERPO
1 LATIONS.)
2155 FCRMAT (/6X24HNO OUTPUT FOR THIS FILE.)
2160 FORMAT (///6X18HOCTAL DUMP OF FILE,I5,18H OUTPUT, FROM WORD,I6,
1 8H TO WORD,I6,1H.///)
2165 FORMAT (100I3)
2170 FORMAT (///31H **** IMPOSSIBLE ERROR. IANS =I3,6H. ****)
2180 FORMAT (///36H REQUESTED SCAN START AT SCAN NUMBERI6,9H, ACTUAL
1 25HSCAN START AT SCAN NUMBERI6,1H.///)
2182 FORMAT (30H NUMBER OF SCANS REQUESTED WAS,I6,17H, NUMBER OF SCANS
1 11H OUTPUT WAS,I6,1H.)
2184 FORMAT (43H ALL SCANS AFTER SCAN START WERE REQUESTED.,I6,
1 19H SCANS WERE OUTPUT.)
2186 FORMAT (/49H LARGEST NUMBER OF CONSECUTIVE INTERPOLATIONS WAS,I6,
1 36H, TOTAL NUMBER OF INTERPOLATIONS WAS,I6,1H.,//
2 16H SAMPLING RATE =,F6.1//21H NUMBER OF CHANNELS =,I2,
3 34H. NUMBER OF SAMPLES PER CHANNEL =,I6,1H.)
2190 FORMAT (//6X9HLESS THAN,I5,31H GOOD SCANS FOUND AFTER EDIT OF,
1 18H ENTIRE DATA FILE./6X24HNO OUTPUT FOR THIS FILE.)

C

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      GO TO (100,200,300,400,500,600,700,800,900,1000,1100,1200,1300,
1       1400,1500,1600),JRND
100  WRITE OUTPUT TAPE ISYSOU,2000
      RETURN
200  WRITE OUTPUT TAPE ISYSOU,2010, ITPDOT
      WRITE OUTPUT TAPE ISYSOU,2020
      RETURN
300  WRITE OUTPUT TAPE ISYSOU,2030, NREADS
      RETURN
400  WRITE OUTPUT TAPE ISYSOU,2040, NEOFBS
      RETURN
500  WRITE OUTPUT TAPE ISYSOU,2050, NREADS,LDATA,LTAB
      IF (LTAB)520,520,510
510  WRITE OUTPUT TAPE ISYSOU,2060, (ICERTB(I), I = 1,LDERTB)
520  WRITE OUTPUT TAPE ISYSOU,2070, NREADS,(DATA(I), I = 1,LDATA)
      RETURN
600  WRITE OUTPUT TAPE ISYSOU,2080, NREADS
      RETURN
700  WRITE OUTPUT TAPE ISYSOU,2090, NREADS,LDATA,LTAB
      IF (LTAB)720,720,710
710  WRITE OUTPUT TAPE ISYSOU,2060, (ICERTB(I), I = 1,LTAB)
720  IF (IZIFOD)799,730,799
730  IF (IISTR1-IEND1)740,750,760
740  IISTR = IISTR1
      IEND = IEND1
      GO TO 770
750  IISTR = 1
755  IEND = LDATA
      GO TO 790
760  IISTR = IEND1
      IEND = IISTR1
770  IF (IISTR-LDATA)780,780,750
780  IF (IEND-LDATA)790,790,755
790  WRITE OUTPUT TAPE ISYSOU,2100, NREADS, IISTR, IEND, (DATA(I), I=IISTR,
1 IEND)
799  RETURN
800  WRITE OUTPUT TAPE ISYSOU,2110,
      RETURN
900  WRITE OUTPUT TAPE ISYSOU,2120
      RETURN
1000 CALL DATAIX(IXDAT, IXSCNS, IXSCNE, NADDED, IXBLOK, IXBGSC, IXENSC)
      NRELSC = NGSCNS+IGOODS
      WRITE OUTPUT TAPE ISYSOU,2130, NRELSC, IXBGSC
1010 IISTR = IXBGSC-2
      IEND = IXENSC+2
      IF (IISTR)1020,1020,780
1020 IISTR = 1
      GO TO 780
1100 CALL DATAIX(IXDAT, IXSCNS, IXSCNE, NADDED, IXBLOK, IXBGSC, IXENSC)
      NRELSC = NGSCNS+IGOODS
      WRITE OUTPUT TAPE ISYSOU,2140, NRELSC, IXBGSC
      GO TO 1010
1200 WRITE OUTPUT TAPE ISYSOU,2150
      IF (NGSCNS-NSCMIN)1210,1220,1220
1210 WRITE OUTPUT TAPE ISYSOU,2155
1220 RETURN
1300 IF (NWANTD)1301,1302,1301
1301 IEND3 = ((NWANTD+2)/3)*NCHNLS
      GO TO 1305
1302 IEND3 = IXPKD-1
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1305 IF (ISTRT2-IEND2)1310,1320,1330
1310 ISTRT = ISTRT2
      IEND = IEND2
      GO TO 1340
1320 ISTRT = 1
1325 IEND = IEND3
      GO TO 1360
1330 ISTRT = IEND2
      IEND = ISTRT2
1340 IF (ISTRT-IEND3)1350,1350,1320
1350 IF (IEND-IEND3)1360,1360,1325
1360 WRITE CUTPUT TAPE ISYSOU, 2160, NREADS, ISTRT, IEND
      NPLINE = (10/NCHNLS)*NCHNLS
      NTOTAL = IEND-ISTRT+1
      NLINES = (NTOTAL+NPLINE-1)/NPLINE
      J = ISTRT
      DO 1370 I=1, NLINES
      K = J+NPLINE-1
      IF (K-IEND)1365,1365,1362
1362 K = IEND
1365 WRITE CUTPUT TAPE ISYSOU, 2165, (ICAT(L),L=J,K)
      J = J+NPLINE
1370 CONTINUE
      RETURN
1400 WRITE CUTPUT TAPE ISYSOU,2170, IANS
      CALL EXIT
1500 NSMPCH = 3*NWDREC-NZEROS/NCHNLS
      WRITE CUTPUT TAPE ISYSOU,2180, ISTART,NOFSTS
      IF (NWANTD)1510,1510,1520
1510 WRITE CUTPUT TAPE ISYSOU, 2184, NSMPCH
      GO TO 1530
1520 WRITE CUTPUT TAPE ISYSOU,2182, NWANTD,NSMPCH
1530 WRITE CUTPUT TAPE ISYSOU,2186, LRGSTI,NTOTI,SRATE,NCHNLS,NSMPCH
      RETURN
1600 WRITE CUTPUT TAPE ISYSOU,2190, NSCMIN
      RETURN
      END
*      LIST8
*      LABEL
CWRIDT1
      SUBROUTINE WRIDT1
C
C
C TITLE-WRIDT1 = WRITE DATA TAPE FOR DGECT1
C SET UP INPUT FOR AND CALL WRITMT
C
C          ---ABSTRACT---
C
C          WRIDT1 USES VARIABLES IN COMMON TO SET UP THE INPUT
C          FOR WRITMT THEN CALLS IT TO WRITE THE OUTPUT OF
C          DGECT1.
C
C          --STATISTICS--
C
C LANGUAGE - FCRTRAN II
C EQUIPMENT - NO SPECIAL REQUIREMENTS
C STORAGE -
C SPEED -
C AUTHOR - B.A. WILLEY, GEOSCIENCE INC, SEPT. 1966
C

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```

C LIBRARY ROUTINES USED - ITOMLI.
C
C SPECIAL ROUTINES USED - ORDER, SRTAB1, WRITMT.
C
C
C          -----USAGE-----
C
C SAMPLE CALL
C   CALL WRITMT
C
C INPUTS (VIA COMMON)
C
C   INPUT PARAMETERS (SEE MAIN PROGRAM) NCHNLS, CHNORD, MODEL,
C   ISMRAT, DATE, ISTTIM, IRUNNO, ICALI, SENSE, IALIAS,
C   ILO, IHI, ICOM, ITPDOT.
C
C   FROM INTPAK SUBROUTINE -
C
C   IDAT(I)  I=1...20100 VECTOR OF PACKED OUTPUT.
C
C   IXPKD   INDEX ON IDAT OF LAST WORD USED PLUS 1.
C
C   NZEROS  NO. OF ZEROES USED TO PAD LAST PACKED WORD.
C
C PROGRAM FOLLOWS BELOW
C
C   DIMENSION SAMPLE(20300), INBUFR(200), IDAT(100), DATA(20000),
1     IDERTB(50), ICHARS(250), CHNORD(12), SENSE(6), ILO(6),
2     IHI(6), ICOM(6), HEAD(40), IHEAD(40), INDCHN(6)
C
C   COMMON SAMPLE, INBUFR, IDAT, DATA, HEAD, IHEAD, LDATA, IDERTB, LTAB,
1     LDERTB, ICDNO, ITPDOT, ISSKIP, IZIFOD, ISTRT1, IEND1, ISCNPD,
2     IZIFED, ISTRT2, IEND2, NUMSET, ISTART, NSCMIN, NPARTY, INTMAX,
3     MINFIL, NCHNLS, ISMRAT, DATE, ISTTIM, IRUNNO, ICALI, MODEL,
4     CHNORD, SENSE, IALIAS, ILO, IHI, ICOM, ISYSOU, NREADS, NOEOFs,
5     NINTRP, IXSCNS, IXSCNE, NADDEC, IXDAT, IXBLOK, IFINSH, IGOODS,
6     NOFSTS, NGSCNS, ICHARS, IXPKD, LRGSTI, NTOTI, NZEROS, SRATE,
7     IANS, NWDREC, IZFNOU, NWANTD
C
C   EQUIVALENCE (INBUFR, SAMPLE), (IDAT, SAMPLE(201)), (DATA, SAMPLE(301)),
1     (IHEAD, HEAD)
C
C   IANS = 0
C
C SET UP INPUT FOR WRITMT
C
C   NWDREC = (IXPKD-1)/NCHNLS
C   IF (NWANTD)2,7,2
2   NWNTPR = (NWANTD+2)/3
C   IF (NWDREC-NWNTPR)7,7,5
5   NWDREC = NWNTPR
C   NZEROS = 0
7   LHEAD = 5*NCHNLS+10
C   CALL ORDER(NCHNLS, CHNORD, INDCHN, IANS1)
C   IF (IANS1)10,20,10
10  IANS = IANS1
C   RETURN
C

```

```

C SET UP IHEAD
C
20  IHEAD(1) = NWDREC
    IHEAD(2) = 3*NWDREC-NZEROS/NCHNLS
    IHEAD(3) = NCHNLS
    CALL SRTAB1(MODEL, ISMRAT, SRATE, IANS1)
    IF (IANS1)30,40,30
30  IANS = IANS1+10
    RETURN
40  HEAD(4) = SRATE
    HEAD(5) = DATE
    IHEAD(6) = ISTTIM
    IHEAD(7) = IRUNNU
    IHEAD(8) = MODEL
    HEAD(9) = ICALI
    DO 50 I = 1, NCHNLS
50  HEAD(I+9) = CHNORD(I)
    DO 60 I = 1, NCHNLS
    J = NCHNLS+9+I
60  HEAD(J) = SENSE(I)
    IHEAD(2*NCHNLS+10) = IALIAS
    DO 70 I = 1, NCHNLS
    J = 2*NCHNLS+8+3*I
    IHEAD(J) = ILO(I)
    IHEAD(J+1) = IHI(I)
70  IHEAD(J+2) = ICOM(I)
    CALL ITOMLI(IHEAD(1), 3, IHEAD(1), IANS1)
    CALL ITOMLI(IHEAD(7), 2, IHEAD(7), IANS1)
    CALL ITOMLI(IHEAD(2*NCHNLS+10), 3*NCHNLS+1, IHEAD(2*NCHNLS+10),
1      IANS1)

```

```

C
C CALL WRITMT TO WRITE OUTPUT
C
    CALL WRITMT(ITPDOT, NCHNLS, NWDREC, IHEAD, LHEAD, INOCHN, IDAT)
    IZFNOU = 1
    RETURN
    END
* LIST8
* LABEL

```

```

CINTPAK
SUBROUTINE INTPAK

```

```

C
C
C TITLE-INTPAK = INTERPOLATE AND PACK
C INTERPCLATE AND PACK OUTPUT FOR CGEDT1.

```

---ABSTRACT---

WHEN A GOOD SCAN HAS BEEN FOUND BY EDIT, INTPAK FORMS THE CHARACTERS INTO SAMPLES, INTERPOLATES AS MANY SCANS AS NECESSARY BETWEEN THE LAST GOOD SCAN AND THIS ONE, AND PACKS THE RESULTS.

--STATISTICS--

```

C LANGUAGE - FORTRAN II
C EQUIPMENT - NO SPECIAL REQUIREMENTS
C STORAGE - 224 WRDS
C SPEED -
C AUTHOR - B.A. WILLEY, GEOSCIENCE INC, SEPT. 1966

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C
C LIBRARY ROUTINES USED - MOVE
C
C SPECIAL ROUTINES USED - CHTSAM, SCNINT, SCNPAK
C
C
C          -----USAGE-----
C
C SAMPLE CALL
C   CALL INTPAK
C
C
C INPUTS (VIA COMMON)
C
C   ICHARS(I) I=IXSCNS...(IXSCNS+2*NCHNLS-1) THE SCAN SPREAD OUT IN
C             CHARACTERS.
C
C   IXSCNS   INDEX ON ICHARS OF BEGINNING OF SCAN.
C
C   SAMPLE(I) I=1...200 VECTOR USED TO FORM SCAN CHARACTERS INTO
C             SAMPLES BEFORE PACKING.
C
C   IDAT(I)  I=1...20100 VECTOR INTO WHICH RESULTS ARE PACKED.
C
C   NCHNLS   SEE MAIN PROGRAM.
C
C   NINTRP   NUMBER OF INTERPOLATIONS TO BE DONE BETWEEN LAST GOOD
C             SCAN AND THIS ONE.
C
C   IFINSH   SET =1 BY EDIT IF THERE ARE NO MORE SCANS IN THIS
C             DATA FILE.
C
C OUTPUTS (SEE OTHER ROUTINES FOR OUTPUTS VIA COMMON)
C
C PROGRAM FOLLOWS BELOW
C
C   DIMENSION SAMPLE(20300), INBUFR(200), IDAT(100), DATA(20000),
1     IDERTB(50), ICHARS(250), CHNORD(12), SENSE(6), ILO(6),
2     IHI(6), ICOM(6), HEAD(40), IHEAD(40), INDCHN(6)
C
C   COMMON SAMPLE, INBUFR, IDAT, DATA, HEAD, IHEAD, LDATA, IDERTB, LTAB,
1     LDERTB, ICONO, ITPDOT, ISSKIP, IZIFOD, ISTRT1, IEND1, ISCNDP,
2     IZIFEO, ISTRT2, IEND2, NUMSET, ISTART, NSCMIN, NPARTY, INTMAX,
3     MINFIL, NCHNLS, ISMRAT, DATE, ISTTIM, IRUNNO, ICALI, MODEL,
4     CHNORD, SENSE, IALIAS, ILO, IHI, ICOM, ISYSOU, NREADS, NOEofs,
5     NINTRP, IXSCNS, IXSCNE, NADDED, IXDAT, IXBLOK, IFINSH, IGOODS,
6     NOFSTS, NGSCNS, ICHARS, IXPKD, LRGSTI, NTOTI, NZFROS, SRATE,
7     IANS, NWDREC, IZFNOU, NWANTD
C
C   EQUIVALENCE (INBUFR, SAMPLE), (IDAT, SAMPLE(201)), (DATA, SAMPLE(301)),
1     (IHEAD, HEAD)
10  IF (IFINSH)80,10,80
C
C INITIALIZE FIRST TIME THROUGH
C
20  IXPKD = 1
    IXSAMP = 1
    NSISAM = 0

```


C THE VALUES OF SEVERAL INPUT PARAMETERS. IF ERRORS ARE
C FOUND APPROPRIATE DIAGNOSTICS ARE WRITTEN ON ISYSOU
C AND THE JOB IS TERMINATED.

C --STATISTICS--

C LANGUAGE - FORTRAN II
C EQUIPMENT - NO SPECIAL REQUIREMENTS
C STORAGE - 613 WORDS
C AUTHOR - B.A. WILLEY, GEOSCIENCE INC, SEPT. 1966

C LIBRARY ROUTINES USED - NONE

C SPECIAL ROUTINES USED - ORDER

C ----USAGE----

C SAMPLE CALL
C CALL INERCH(JCDNO)

C INPUTS

C JCDNO THE CARD NUMBER EXPECTED IF INPUT IS IN PROPER ORDER.

C THE FOLLOWING INPUT PARAMETERS ARE TESTED AND MUST BE IN COMMON.
C SEE MAIN PROGRAM DOCUMENTATION FOR THEIR DESCRIPTION.

C ICDNO, ISSKIP, NUMSET, ISTART, NSCMIN, NPARTY, INTMAX, MINFIL,
C NCHNLS, ISMRAT, MODEL, (CHNORD(I) I=1,2*NCHNLS), (SENSE(I)
C I=1,NCHNLS), IALIAS, (ILO(I),IHI(I),ICOM(I) I=1,NCHNLS)

C ISYSOU AND ITPDOT MUST ALSO BE IN COMMON.

C OUTPUTS

C PRINT LINES ON ISYSOU AND TWO EOF'S ON ITPDOT IF JOB IS
C TERMINATED. NO OUTPUT IF INPUT IF OK.

C PROGRAM FOLLOWS BELOW

C DIMENSION SAMPLE(20300),INBUFR(200),IDAT(100),DATA(20000),
1 IDERTB(50),ICHARS(250),CHNORD(12),SENSE(6),ILO(6),
2 IHI(6),ICOM(6),HEAD(40),IHEAD(40),INDCHN(6)

C COMMON SAMPLE,INBUFR,IDAT,DATA,HEAD,IHEAD,LDATA,IDERTB,LTAB,
1 LDERTB,ICDNO,ITPDOT,ISSKIP,IZIFOD,ISTR1,IEND1,ISCNDP,
2 IZIFEO,ISTR2,IEND2,NUMSET,ISTART,NSCMIN,NPARTY,INTMAX,
3 MINFIL,NCHNLS,ISMRAT,DATE,ISTTIM,IRUNNO,ICALI,MODEL,
4 CHNORD,SENSE,IALIAS,ILO,IHI,ICOM,ISYSOU,NREADS,NOEofs,
5 NINTRP,IXSCNS,IXSCNE,NADDED,IXDAT,IXBLOK,IFINSH,IGOODS,
6 NOFSTS,NGSCNS,ICHARS,IXPKD,LRGSI,NTOTI,NZEROS,SRATE,
7 IANS,NWDREC,IZFNOU,NWANTD

C EQUIVALENCE (INBUFR,SAMPLE),(IDAT,SAMPLE(201)),(DATA,SAMPLE(301)),
1 (IHEAD,HEAD)
IZIFOK = 0

```

C
C CHECK CARD NUMBER
C
    IF (ICDNO-JCDNO)10,20,10
10  WRITE OUTPUT TAPE ISYSOU,1001, JCDNO
1001 FORMAT (/36H INPUT ERROR - CARD NUMBER SHOULD BE,12)
    IZIFOK = 1
    GO TO 800
20  GO TO (100,200,300,400,500,600,700),JCDNO
C
C CARD 1
C
100  IF (ISSKIP)110,800,800
110  IZIFOK = 1
    WRITE OUTPUT TAPE ISYSOU,1002
1002 FORMAT (/28H INPUT ERROR - ISSKIP .LT. 0)
    GO TO 800
C
C CARD 2 (NO PARAMETERS CHECKED)
C
200  GO TO 800
C
C CARD 3
C
300  IF (NUMSET)305,305,310
305  IZIFOK = 1
    WRITE OUTPUT TAPE ISYSOU,1003
1003 FORMAT (/28H INPUT ERROR - NUMSET .LE. 0)
310  IF (ISTART)312,312,315
312  IZIFOK = 1
    WRITE OUTPUT TAPE ISYSOU,1004
1004 FORMAT (/28H INPUT ERROR - ISTART .LE. 0)
315  IF (NWANTD)317,320,316
316  IF (NWANTD-NSCMIN)317,320,320
317  IZIFOK = 1
    WRITE OUTPUT TAPE ISYSOU,1045
1045 FORMAT (/50H INPUT ERROR - NWANTD NEG. OR .GT.0 BUT .LT.NSCMIN)
320  IF (NSCMIN)325,325,330
325  IZIFOK = 1
    WRITE OUTPUT TAPE ISYSOU,1005
1005 FORMAT (/28H INPUT ERROR - NSCMIN .LE. 0)
330  IF (NPARTY)335,340,340
335  IZIFOK = 1
    WRITE OUTPUT TAPE ISYSOU,1006
1006 FORMAT (/28H INPUT ERROR - NPARTY .LT. 0)
340  IF (INTMAX)345,350,350
345  IZIFOK = 1
    WRITE OUTPUT TAPE ISYSOU,1007
1007 FORMAT (/28H INPUT ERROR - INTMAX .LT. 0)
350  IF (MINFIL)355,355,800
355  IZIFOK = 1
    WRITE OUTPUT TAPE ISYSOU,1008
1008 FORMAT (/28H INPUT ERROR - MINFIL .LE. 0)
    GO TO 800
C
C CARD 4
C
400  IF (NCHNLS)410,410,405
405  IF (NCHNLS-6)420,420,410
410  IZIFOK = 1
    WRITE OUTPUT TAPE ISYSOU,1009

```

```

1009 FORMAT (/38H INPUT ERROR - NCHNLS .LT. 1 OR .GT. 6)
420 IF (ISMRAT)430,440,425
425 IF (ISMRAT-15)440,440,430
430 IZIFOK = 1
WRITE CUTPUT TAPE ISYSOU,1010
1010 FORMAT (/39H INPUT ERROR - ISMRAT .LT. 0 OR .GT. 15)
440 IF (MCDL)450,800,445
445 IF (MCDL-1) 450,800,450
450 IZIFOK = 1
WRITE CUTPUT TAPE ISYSOU,1011
1011 FORMAT (/37H INPUT ERROR - MCDL .LT. 0 OR .GT. 1)
GO TO 800
C
C CARD 5
C
500 CALL ORDER(NCHNLS,CHNORD,INDCHN,IANS1)
IF (IANS1)510,800,510
1013 FORMAT (/21H INPUT ERROR - SENSE(,11,8H) .LE. 0)
620 CONTINUE
GO TO 800
C
C CARD 7
C
700 IF (IALIAS)710,710,720
710 IZIFOK = 1
WRITE CUTPUT TAPE ISYSOU,1014
1014 FORMAT (/28H INPUT ERROR - IALIAS .LE. 0)
720 DO 750 I = 1,NCHNLS
IF (ILC(I))725,725,730
725 IZIFOK = 1
510 IZIFOK = 1
WRITE CUTPUT TAPE ISYSOU,1012
1012 FORMAT (/31H INPUT ERROR - ERROR IN CHNORD)
GO TO 800
C
C CARD 6
C
600 DO 620 I = 1,NCHNLS
IF (SENSE(I))610,610,620
610 IZIFOK = 1
WRITE CUTPUT TAPE ISYSOU,1013, I
WRITE CUTPUT TAPE ISYSOU,1015, I
1015 FORMAT (/19H INPUT ERROR - ILO(,11,8H) .LE. 0)
730 IF (IHI(I))735,735,740
735 IZIFOK = 1
WRITE CUTPUT TAPE ISYSOU,1016, I
1016 FORMAT (/19H INPUT ERROR - IHI(,11,8H) .LE. 0)
740 IF (ICCM(I))745,745,750
745 IZIFOK = 1
WRITE CUTPUT TAPE ISYSOU,1017, I
1017 FORMAT (/20H INPUT ERROR - ICOM(,11,8H) .LE. 0)
750 CONTINUE
C
C EXIT OR RETURN
C
800 IF (IZIFOK)810,820,810
810 IF (IZFNOU)811,815,811
811 END FILE ITPDOT
END FILE ITPDOT
WRITE CUTPUT TAPE ISYSOU,1018, ITPDOT
1018 FORMAT (/46H TWO END OF FILES WRITTEN ON OUTPUT DATA TAPE ,12,

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1      /16H JCB TERMINATED.)
      CALL EXIT
815   WRITE OUTPUT TAPE ISYSOU,1019
1019  FORMAT (/16H JCB TERMINATED.)
      CALL EXIT
820   RETURN
      END
*     LIST8
*     LABEL
C     DATAIX
      SUBROUTINE DATAIX (IXDAT,IXSCNS,IXSCNE,NADDED,IXBLOK,IXBGSC,
1      IXENSC)
C
C
C     TITLE - DATAIX = DATA INDICES
C           FINDS INDICES IN DATA VECTOR OF BEGINNING AND END OF SCAN.
C
C           ---ABSTRACT---
C
C           THE SUBROUTINE FINDS INDICES IN DATA VECTOR OF WORDS
C           CONTAINING THE BEGINNING AND END OF A SCAN.
C
C           THE START OF THE SCAN - IXBGSC - IS COMPUTED AS FOLLOWS.
C
C           1. NADDED =0 (NO EXTRA CHARACTERS WERE ADDED.)
C
C               $IXBGSC = IXDAT + (IXSCNS - IXBLOK + 6)/6 - 1$ 
C
C           2. NADDED .GT. 0 (EXTRA CHARACTERS WERE ADDED)
C
C               $IXBGSC = IXDAT - (ADDED + 5)/6$ 
C
C           THE END OF THE SCAN - IXENSC - SAME FOR BOTH CASES.
C
C               $IXENSC = IXDAT + (IXSCNE - IXBLOK + 6)/6 - 1$ 
C
C           --STATISTICS--
C
C     LANGUAGE   - FORTRAN II
C     EQUIPMENT  - NO SPECIAL REQUIREMENTS
C     STORAGE    - 81 WORDS
C     SPEED      -
C     AUTHOR     - S.BARR, GEOSCIENCE, SEPT 66
C     CATAGORIES -
C     STATUS     -
C
C     LIBRARY ROUTINES USED - NONE
C
C           ----USAGE----
C
C     SAMPLE CALL
C           CALL DATAIX (IXDAT,IXSCNS,IXSCNE,NADDED,IXBLOK,IXBGSC,IXENSC)
C
C
C     INPUT
C
C           IXDAT   INDEX ON DATA OF LAST BLOCK OF CHARACTERS SPREAD OUT
C

```

```

C     IXSCNS   INDEX ON ICHARS OF START OF SCAN.
C
C     IXSCNE   INDEX ON ICHARS OF END OF SCAN
C
C     NADDED   NUMBER OF CHARACTERS IN A LONG SCAN FROM PREVIOUS
C
C     IXBLOK   INDEX ON ICHARS VECTOR OF START OF LAST BLOCK OF CHAR-
C              ACTERS SPREAD OUT.  NADDED.GT. 0  IXBLOK =1
C
C
C OUTPUT
C
C     IXBGSC   INDEX ON DATA OF BEGINNING OF SCAN
C
C     IXENSC   INDEX ON DATA OF END OF SCAN
C
C
C EXAMPLES
C
C 1.  INPUTS - IXDAT=14, IXSCNS= 10, IXSCNE= 15, NADDED= 3, IXBLOK= 1
C
C     OUTPUTS - IXRGSC =13, IXENSC=16
C
C 2.  INPUTS - IXDAT=14, IXSCNS=10, IXSCNE= 15, NADDED= 0, IXBLOK= 3
C
C     OUTPUTS - IXBGSC= 15, IXENSC= 16
C
C
C PROGRAM FOLLOWS BELOW
C
C
C     IF(NADDED)20,20,30
C 20  IXBGSC= IXDAT + (IXSCNS - IXBLOK + 6)/6 -1
C     GO TO 40
C 30  IXBGSC= IXDAT - (NADDED + 5) /6
C 40  IXENSC =IXDAT + (IXSCNE -IXBLOK +6)/6 -1
C     RETURN
C     END
C *   LIST8
C *   LABEL
C ORDER
C     SUBROUTINE ORDER (NCHNLS,CHNORD,INDCHN, IANS)
C
C TITLE - ORDER
C     IT PUTS CHANNEL NUMBERS IN ARRAY INDCHN IN A SPECIFIED ORDER.
C
C
C     -----ABSTRACT-----
C
C     CRDER PREPARES AN ARRAY INDCHN WITH A NEW ORDER OF CHAN-
C     NEL NUMBERS.  IT COMPARES CHNORD(I),I=1,NCHNLS WHICH
C     HOLDS THE DESIRED ORDER OF THE CHANNELS WITH THE NUM-
C     BERS IN CHNORD(I),I=(NCHNLS+1,...2*NCHNLS)
C
C
C     --STATISTICS--
C
C LANGUAGE - FORTRAN II
C EQUIPMENT - NO SPECIAL REQUIREMENTS
C STORAGE - 90 WORDS
C SPEED

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C AUTHOR - S.E. BARR GEOSCIENCE SEPT. 1966
C CATAGORIES -
C STATUS -

C LIBRARY ROUTINES USED - NONE

C SYSTEM ROUTINES - XACTEQF

----USAGE----

C SAMPLE CALL
C CALL ORDER (NCHNLS,CHNORD,INDCHN, IANS)

C INPUTS

C NCHNLS THE NUMBER OF CHANNELS OF DATA.

C CHNORD CHANNEL ORDER ARRAY. CHNORD(I),I=1...NCHNLS CONTAINS
C THE CHANNEL NUMBERS IN THE DESIRED ORDER. CHNORD(I)
C I=(NCHNLS+1)...2*NCHNLS CONTAINS THE CHANNEL NUMBERS
C IN THE ORDER THEY APPEAR IN CORE.

C OUTPUT

C INDCHN INDEX OF CHANNEL NUMBERS. THE ARRAY INDCHN CONTAINS
C THE CHANNEL NUMBERS IN THE DESIRED ORDER

C IANS ERROR CODE. 0 NORMAL RETURN
C -1 IF NCHNLS .LE. 0
C -2 IF AN ENTRY IN CHNORD(I),I=1,...,NCHNLS
C DOES NOT ALSO APPEAR IN CHNORD(I)
C J=NCHNLS+1,...2*NCHNLS)

C PROGRAM FOLLOWS BELOW

C
C DIMENSION CHNORD(2),INDCHN(2)
C IANS=-1
C IF(NCHNLS)16,16,8
8 DO 14 J=1, NCHNLS
DO 10 I=1, NCHNLS
L= NCHNLS + I
IF(XACTEQF(CHNCRD(J),CHNORD(L)))10,12,10
10 CONTINUE
IANS=-2
GO TO 16
12 INDCHN(J)=I
14 CONTINUE
IANS=0
16 RETURN
END
* LIST8
* LABEL
CPARCHK
SUBROUTINE PARCHK (IXBGSC,IXENSC, IDERTB,LDERTB,PARERR)

C
C

C TITLE - PARCHK = PARITY ERROR CHECK
C IT CHECKS FOR A PARITY ERROR IN A SCAN.

C
C
C ---ABSTRACT---

C THE SUBROUTINE READS THE ARRAY IDERTB WHICH CONTAINS
C THE INDICES OF WORDS THAT HAVE PARITY ERRORS. IF THE
C ERROR OCCURED WITHIN THE SCAN, PARERR=1 .

C
C
C --STATISTICS--

C LANGUAGE - FCRTRAN II
C EQUIPMENT - NO SPECIAL REQUIREMENTS
C STORAGE - 77 WORDS
C SPEED -
C AUTHOR - S.E. BARR GEOSCIENCE SEPT. 1966
C CATAGORIES -
C STATUS -

C LIBRARY ROUTINES USED - NONE

C
C
C ----USAGE----

C SAMPLE CALL
C CALL PARCHK (IXBGSC,IXENSC,IDERTB,LDERTB,PARERR)

C
C
C INPUTS

C IXBGSC INDEX ON DATA OF BEGINNING OF SCAN

C IXENSC INDEX ON DATA OF END OF SCAN

C IDERTB(I) TABLE OF INDICES ON DATA OF WORDS THAT CONTAIN PARITY
C ERRORS

C LDERTB LENGTH OF IDERTB (=0 IF NO PARITY ERRORS)

C
C
C OUTPUT

C PARERR = 0 IF NO PARITY ERROR IN SCAN
C .NE. 0 IF PARITY ERROR INSCAN
C = 1 IF PARITY ERROR INSCAN

C
C
C EXAMPLES

C 1. INPUT = IXBGSC=13, IXENSC=16 , IDERTB(1,2)= 11,13, LDERTB= 2

C OUTPUT= PARERR= 1.

C 2. INPUT = IXBGSC=13, IXENSC=16 , IDERTB(1,2)= 11,17, LDERTB= 2

C OUTPUT= PARERR= 0.
C
C

C PROGRAM FOLLOWS BELOW
C
C

```
      DIMENSION IDERTB (2)
      PARERR= 0.
      IF(LDERTB) 50,50,20
20     DO 30 I= 1,LDERTB
      IF(IXRGSC-IDERTB(I)) 25,45,30
25     IF(IXEASC-IDERTB(I)) 30,45,45
30     CONTINUE
      GO TO 50
45     PARERR=1.
50     RETURN
      END
```

* LIST8
* LABEL

CWRITMT

```
      SUBROUTINE WRITMT (ITPOUT,NCHNLS,NWDREC,IHEAD,LHEAD,INDCHN,
1      IDAT)
```

C
C

C TITLE WRITMT = WRITE MAGNETO-TELLURICS
C IT WRITES A BINARY TAPE FOR USE IN SUBROUTINE READMT

C
C

-----ABSTRACT-----

C
C

WRITMT WRITES A BINARY TAPE FOR USE IN THE SUBROUTINE
READMT THE TAPE IS FORTRAN IV BINARY COMPATIBLE, EACH
CALL OF WRITMT WRITES A HEADER RECORD AND NCHNLS PACKED
DATA RECORDS, THIS HEADER RECORD IS (LHEAD,(IHEAD(I),
I=1,LHEAD) WHERE THE INTEGERS ARE SHIFTED TO THE
ADDRESS. SEE DGEDT1 OR DGEDT2 ABSTRACTS FOR
DETAILED FORMAT.

C
C

--STATISTICS--

C
C

C LANGUAGE - FORTRAN II
C EQUIPMENT - NO SPECIAL REQUIREMENTS
C STORAGE - 89 WORDS
C SPEED -
C CATAGORIES -
C AUTHOR - S.E. BARR, GEOSCIENCE, SEPT. 66
C STATUS -

C
C

C LIBRARY ROUTINES USED - NONE

C
C

C SYSTEM ROUTINES - (STB),(WLR)

C
C

-----USAGE-----

C
C

C SAMPLE CALL

C CALL WRITMT (ITPOUT,NCHNLS,NWDREC,IHEAD,LHEAD,INDCHN,IDAT)

C
C

C INPUT

C
C

C ITPOUT TAPE NUMBER

```

C
C   NCHNLS   NUMBER OF CHANNELS OF DATA.
C
C   NWDREC   NUMBER OF WORDS IN EACH CHANNEL
C
C   IDAT     THE ARRAY OF DATA IN CORE.  THE ARRAY IS ORDERED SUCH
C           THAT THE FIRST NCHNLS LOCATIONS CONTAIN THE FIRST WORDS
C           FROM EACH CHANNEL AND THE SECOND NCHNLS LOCATIONS CON-
C           TAIN THE SECOND WORDS FOR EACH CHANNEL ETC.  THE SUB-
C           ROUTINE GROUPS THE DATA BY CHANNELS AND WRITES IT ON
C           TAPE SUCH THAT THE FIRST DATA RECORD CONTAINS ALL THE
C           DATA OF ONE CHANNEL
C
C   IHEAD(I) I=1...LHEAD  ARRAY OF HEADER INFORMATION
C
C   LHEAD    LENTH OF HEADER ARRAY
C
C   INDCHN   ARRAY CONTAINING THE NUMBERS OF THE CHANNEL IN THE
C           ORDER TO BE WRITTEN ON THE TAPE

```

C OUTPUTS

```

C           THE OUTPUT IS A BINARY TAPE CONTAINING A HEADER RECORD
C           WITH THE INFORMATION
C           TAKEN FROM THE ARRAY IHEAD.  THE HEADER RECORD IS FOL-
C           LOWED BY NCHNLS RECORDS OF DATA  EACH DATA RECORD CON-
C           TAINS THE DATA FROM ONE CHANNEL PACKED THREE SAMPLES TO
C           A WORD
C           SEE DGEDT1

```

C PROGRAM FOLLOWS BFLOW

```

C
C   DIMENSION IHEAD(2), ICAT(2), INDCHN(2)
C   CALL ITOMLI(LHEAD,1,LHED1,IANS)
C   WRITE TAPE ITPOUT,LHED1,(IHEAD(I),I=1,LHEAD)
C   LASTWD=NCHNLS*NWDREC
C   IF (2-XMODF(NWDREC,255)) 30,20,10
10  IF (1-XMODF(NWDREC,255)) 30,20,30
20  LASTWD=LASTWD+2*NCHNLS
30  DO 40 I=1,NCHNLS
C   LCHAN=INDCHN(I)
C   WRITE TAPE ITPOUT,(IDAT(J),J=LCHAN,LASTWD,NCHNLS)
40  CONTINUE
C   RETURN
C   END
*   FAP
C   COUNT  50
C   LBL    CHRSPR
C   ENTRY  CHRSPR (NWORDS,WORDS,CHARS)

```

----ABSTRACT----

```

* TITLE - CHRSPR
*   SPREAD OUT VECTOR INTO VECTOR OF CHARACTERS WITH SIGN - BIT 6.
*
*   CHRSPR SPREADS OUT A VECTOR OF 36 BIT WORDS INTO A VECTOR
*   OF 6 BIT CHARACTERS.  THE LOW ORDER 5 BITS OF THE
*   CHARACTER ARE PLACED IN THE LOW ORDER 5 BITS OF THE
*   OUTPUT (RIGHT MOST 5 BITS).  THE HIGH ORDER BIT IS PLACED
*   IN THE SIGN POSITION.  THE OUTPUT VECTOR IS 6 TIMES AS
*   LONG AS THE INPUT VECTOR.

```

*
 * LANGUAGE - FAP,FCRTRAN II COMPATIBLE
 * EQUIPMENT - 7090/7094
 * SPEED -
 * STORAGE - 33 WORDS
 * AUTHOR - J.N. GALBRAITH, JR. JULY 1966

----USAGE----

* TRANSFER VECTOR CONTAINS NO ROUTINES.

* FORTRAN USAGE -
 * CALL CHRSPR(NWORDS,WORDS,CHARS)

* INPUTS

* NWORDS NUMBER OF WORDS TO SPREAD OUT. STRAIGHT RETURN IF .LE.0.

* WORDS(I) I=1...NWORDS WORDS TO BE SPREAD OUT.

* OUTPUTS

* CHARS(I) I=1...6*NWORDS CHARACTERS AS DESCRIBED IN ABSTRACT.

* EXAMPLES

* 1. INPUTS-

* NWORDS =5

* WORDS(I),I=1...5 = 0123456712345, 0717273747576,0172737475767,
 * 0177127723773,0477457756776

* OUTPUTS-(OCTAL DIGITS ASSUMED IN LOW ORDER POSITION OF WORD, SIGN
 * IN SIGN BIT)

* CHAR(I),I===30 = 012,34,-16,-31,23,-5,-31,-32,-33,-34,-35,-36,-17,
 * 27,37,-7,-17,-27,17,-31,27,-32,37,-33,-7,-34,-17,-35,-27,-36

	PZE		
	BCI	1,CHRSPR	
CHRSPR	SXD	*-2,4	
	SXA	RETURN,1	
	SXA	RETURN+1,2	
	CLA*	1,4	NWORDS
	TZE	4,4	RETURN IF ZERO
	TMI	4,4	OR NEGATIVE
	STD	TXL	
	CLA	2,4	WORD VECTOR
	ADD	ONE	WORD+1
	STA	LDQ	
	CLA	3,4	CHAR VECTOR
	ADD	ONE	CHAR+1
	STA	STO	
	AXT	1,2	
	AXT	1,4	
NXWORD	AXT	6,1	
LDQ	LDQ	** ,2	PICK UP NEXT WORD (6 CHARACTERS)
CHRLP	ZAC		AC = 0
	LLS	5	MOVE IN FIRST CHARACTER SIGN(AC)=SIGN(MQ)
STO	STD	** ,4	STORE CHARACTER
	RQL	1	GET RID OF OLD MQ SIGN

```

      TXI      *+1,4,1      INDEX FOR NEXT CHARACTER STORE
      TIX      CHRLP,1,1    DO 6 CHARACTERS PER WORD
      TXI      *+1,2,1      COUNT WORDS
TXL     TXL      NXWORD,2,**  **=NWORDS  SEE IF DONE
RETURN  AXT      **,1      RESTORE I.R.'S
      AXT      **,2
      LXD      CHRSPR-2,4
      TRA      4,4          RETURN
ONE     PZE      1
      END
      FAP

```

```

*
*
*   SUBROUTINE CHTSAM(NCHNLS, ICHARS, SAMPLE)
COUNT  40
ENTRY   CHTSAM
LBL     CHTSAM

```

```

*
*   TITLE-CHTSAM
*   FAP SUBROUTINE TO FORM 10 BIT SAMPLES FROM PARTS OF OTHER WORDS

```

----ABSTRACT----

THIS SUBROUTINE TAKES THE SUCCESSIVE PAIRS OF WORDS IN ICHARS AND STORES THE FIVE LOW ORDER BITS OF EACH WORD INTO THE LOW ORDER BITS OF SAMPLE VECTOR. THIS IS DONE BY SHIFTING THE LOW ORDER BITS OF THE SECOND WORD AGAINST THE FIVE LOW ORDER BITS OF THE FIRST WORD OF THE PAIR.

--STATISTICS--

```

* LANGUAGE - FAP
* EQUIPMENT - IBM 7090/7094
* STORAGE - 29 WORDS
* SPEED -
* AUTHOR - F.E. GRABOSKI, GEOSCIENCE INC., SEPT. 1966
*
* GEOSCIENCE ROUTINES USED - NONE

```

----USAGE----

```

* SAMPLE CALL
*   CALL CHTSAM(NCHNLS, ICHARS, SAMPLE)
*
* INPUTS
*
*   NCHNLS  NUMBER OF CHANNELS
*
*   ICHARS  LOCATION OF VECTOR WHERE EACH CHARACTER OF A CHANNEL
            IS STORED IN THE LOW ORDER FIVE BITS.
*
*   SAMPLE  LOCATION OF VECTOR WHERE EACH SCAN IS TO BE STORED
*
* OUTPUT
*
*   SAMPLE  LOCATION OF VECTOR WHERE EACH SCAN IS TO BE STORED.

```

*
* EXAMPLES

* 1. INPUTS - NCHNLS=3, ICHARS(1...7) = 01,02,03,04,05,0-6,07
* OCTAL NUMBERS RIGHT ADJUSTED EXCEPT SIGN IS IN SIGN BIT.

* OUTPUTS - SAMPLE(1...4)= 042,0144,0246,00, OCTAL NUMBERS RIGHT
* ADJUSTED IN WORD.

```

CHTSAM SXA      SAVE,1          SAVE
        SXA      SAVE+1,2        INDEX
        SXA      SAVE+2,4        REGISTERS
        AXT      0,1
        AXT      1,2
        CLA*     1,4
        STD      A4              SET UP TO RETURN AFTER NCHNLS DCNE
        CLA      2,4
        STA      A1
        STA      A2              ICHARS ADDRESS
        CLA      3,4
        ADD      ONE
        STA      A3              SAMPLE ADDRESS
        AXT      1,4              START COUNT OF NUMBER OF CHANNELS
A1      CLA      **,1            ICHARS ADDRESS
A2      LDQ      **,2
        RQL      31
        LGL      5              BRINGS IN FIVE LOWER BITS
A3      SLW      **,4            SAMPLE ADDRESS +1 IN ADDRESS
        TXI      **+1,1,2        STEP
        TXI      **+1,2,2
        TXI      **+1,4,1
A4      TXL      A1,4,**         UP
        TOV      **+1            INDICES
        AXT      0,1            FALL THROUGH WHEN FINISHED
        AXT      0,2            TURN OFF OVERFLOW IF SET
        AXT      0,4            RESTORE
        TRA      4,4            INDEX
        OCT      1              REGISTERS
        END
        FAP
COUNT  60
ENTRY   SCNINT
LBL     SCNINT

```

* TITLE-SCNINT
* FAP SUBROUTINE TO INTERPOLATE VALUES FOR BAD SCANS

-----ABSTRACT-----

THIS SUBROUTINE WILL INTERPOLATE ACROSS A VOID IN MEMORY
AS MANY STEPS AS INDICATED IN THE VARIABLE NINTRP. IT
WILL ALSO INTERPOLATE BETWEEN NCHNLS PAIRS OF VALUES.

NEW INTERPOLATED VALUE =

(NSTEP*(WORD(NCHNL)OF NEXT SCAN-WORD(NCHNL)OF LAST SCAN))
DIVIDED BY NINTRP+1

---STATISTICS---

* LANGUAGE - FAP
 * EQUIPMENT -
 * STORAGE - 60 WORDS
 * SPEED -
 * AUTHOR - F.E. GRABOSKI, GEOSCIENCE INC., SEPT. 1966

* GEOSCIENCE ROUTINES USED - NONE

----USAGE----

* SAMPLE CALL
 * CALL SCNINT(NCHNLS,NINTRP,SAMPLE)

* INPUTS

* NCHNLS NUMBER OF CHANNELS
 * NINTRP THE NUMBER OF INTERPOLATION NECESSARY FOR EACH SCAN
 * SAMPLE DATA VECTOR ADDRESS WHERE INTERPOLATIONS ARE TO BE STORED

* OUTPUT

* SAMPLE DATA VECTOR ADDRESS WHERE INTERPOLATIONS ARE TO BE STORED

* EXAMPLES

* 1. INPUTS - NCHNLS=3, NINTRP=1, SAMPLE (1...9)=012,014,024,00,00,
 * 00,022,026,027

* OUTPUTS - SAMPLE (1...9) = 012, 014, 024, 016, 021, 025, 022,
 * 026, 027

* 2. INPUTS - NCHNLS=3, NINTRP=3, SAMPLE(1...3)= 012, 014, 024,
 * (4...12)= 00
 * (13...15)= 022, 030, 056

* OUTPUTS - SAMPLE(1...15)= 012, 014, 024, 014, 017, 032, 016,
 * 022, 041, 020, 025, 047, 022, 030,
 * 056

SCNINT	SXA	SAVE,1	SAVE
	SXA	SAVE+1,2	INDEX
	SXA	SAVE+2,4	REGISTERS
	CLA*	1,4	
	STD	A9	
	ARS	18	
	STA	B1	NCHNLS
	SUB	CNE	
	ALS	18	
	STD	A11	NCHNLS-1
	CLA*	2,4	
	STD	A10	

	ARS	18	
	STA	B2	NINTRP
	ADD	ONE	
	STA	B3	NINTRP+1
	LDQ	B1	
	MPY	B2	
	STQ	B5	NCHNLS*NINTRP
	CLA	3,4	
	STA	A8	SAMPLE ADDRESS
	SUR	B5	
	STA	A5	ADDRESS OF NEXT GOOD SCAN
	CLA	3,4	
	ADD	B1	
	STA	A6	ADDRESS OF LAST GOOD SCAN
	STA	A71	
	AXT	0,1	
A4	AXT	1,2	
	AXT	0,4	
A5	CLA	** , 1	FIRST WORD ADDRESS OF NEXT GOOD SCAN
A6	SUB	** , 1	FIRST WORD ADDRESS OF LAST GOOD SCAN
	XCA		
	STQ	B7	
A7	SXA	B6,2	SETS UP AS MULTIPLIER NUMBER OF INTERPOLATIONS
*			
	MPY	B6	
	DVP	B3	
	XCA		
A71	ADD	** , 1	
A8	STO	** , 4	FIRST WORD ADDRESS OF INTERPOLATION
	TXI	**+1,2,1	
A9	TXI	**+1,4,**	DECREMENT CONTAINS NCHNLS
	LDQ	B7	
A10	TXL	A7,2,**	DECREMENT CONTAINS NINTRP
	TXI	**+1,1,1	
	CLA	A8	
	SUB	CNE	
	STA	A8	
A11	TXL	A4,1,**	DECREMENT CONTAINS NCHNLS-1
SAVE	AXT	0,1	
	AXT	0,2	
	AXT	0,4	
	TRA	4,4	
CNE	GCT	1	
B1	BSS	1	NCHNLS
B2	BSS	1	NINTRP
B3	BSS	1	NINTRP+1
B5	BSS	1	NCHNLS*NINTRP
B6	BSS	1	STORAGE FOR INTERP INDEX
B7	BSS	1	STORAGE FOR RESULT FROM SUBTRACTION
	END		
*	FAP		
*			
	COUNT	40	
	ENTRY	SCNPAK	
	LBL	SCNPAK	
*	SUBROUTINE SCNPAK(NCHNLS,NSTPAK,SAMPLE,IDAT)		
*			
*			
*	TITLE-SCNPAK		
*	FAP SUBROUTINE TO REPACK SCANS INTO CHANNEL SAMPLE ORDER		
*			

-----ABSTRACT-----

THIS SUBROUTINE CONVERTS THE SAMPLE VECTOR INTO A PACKED DATA VECTOR IDAT WHERE THE THREE CONSECUTIVE SCANS FROM EACH CONSECUTIVE CHANNEL ARE THEN LOCATED IN THE ORDER S1-CH1,S2-CH1,S3-CH1 IN THE FIRST WORD S1-CH2,S2-CH2,S3-CH2 IN THE SECOND WORD.....S4-CH1, S5-CH1,S6-CH1 IN THE NCHNLS+1 WORD AND SO ON. THE NUMBER OF GROUPS WILL BE I/3 WHERE I COMES FROM S(I) OR I=NSTPAK.

--STATISTICS--

* LANGUAGE - FAP
* EQUIPMENT - IBM 7090/7094
* STORAGE - 49 WORDS
* SPEED -
* AUTHOR - F.E. GRABOSKI, GEOSCIENCE INC., SEPT. 1966
* GEOSCIENCE ROUTINES USED - NONE

-----USAGE-----

* SAMPLE CALL
* CALL SCNPAK(NCHNLS,NSTPAK,SAMPLE,IDAT)

* INPUTS

* NCHNLS NUMBER OF CHANNELS SCANNED.
* NCHNLS.GE.1,.LE.6
* NSTPAK NUMBER OF PACKED WORDS TO FORM FOR EACH CHANNEL
* SAMPLE STARTING LOCATION WHERE FIRST SCAN OF FIRST CHANNEL IS TO BE PICKED UP.
* IDAT STARTING LOCATION WHERE FIRST PACKED SCAN WORD IS TO BE STORED

* OUTPUT

* IDAT STARTING LOCATION WHERE FIRST PACKED SCAN WORD IS TO BE STORED

* EXAMPLES

* 1. INPUTS - NCHNLS=5,NSTPAK=2,SAMPLE(1...31) =01,02,03,04,05,06,07,
* 010,011,012,013, ETC. TO 037. THE OCTAL NUMBERS ARE RIGHT
* ADJUSTED IN THE WORD.
* OUTPUTS - IDAT(1...11) =0000100060013, 0000200070014, 0000300100015
* 0000400110016, 0000500120017, 0002000250032,
* 0002100260033, 0002200270034, 0002300300035,
* 0002400310036, 0000000000000

SCNPAK SXA SAVE,1

SAVE

	SXA	SAVE+1,2	INDEX
	SXA	SAVE+2,4	REGISTERS
	CLA*	1,4	
	STD	A10	LOOP FOR NCHNLS TIMES
	ALS	1	MULTIPLY NCHNLS BY TWO
	STD	A11	
	ARS	19	PUTS NCHNLS INTO ADDRESS PART
	STA	R1	
	CLA*	2,4	
	ARS	18	
	STA	B2	
	CLA	4,4	
	ADD	ONE	
	STA	A4	ADDRESS OF IDAT
	CLA	3,4	
	STA	A1	
A0	SUR	B1	ONE CHANNEL GROUP AWAY
	STA	A2	
	SUR	R1	TWO CHANNEL GROUPS AWAY
	STA	A3	
	AXT	0,1	
	AXT	1,2	
	AXT	1,4	
A1	CLA	** ,1	ADDRESS OF 1ST SAMPLE 1ST CHANNEL
A2	LDQ	** ,1	ADDRESS OF 2ND SAMPLE 1ST CHANNEL
	RQL	24	
	LGL	12	
A3	LDQ	** ,1	ADDRESS OF 3RD SAMPLE 1ST CHANNEL
	RQL	24	
	LGL	12	
A4	SLW	** ,4	ADDRESS OF IDAT
	TXI	**+1,1,1	
	TXI	**+1,2,1	
	TXI	**+1,4,1	
A10	TXL	A1,2,**	
	CLA	B2	
	SUR	ONE	FOR EACH TIME THROUGH
	STD	B2	
	TZE	SAVE	NO MORE TIMES TO GO
	AXT	1,2	
A11	TXI	A1,1,**	DECREMENT HOLDS 2*NCHNLS
SAVE	AXT	0,1	RESTORE
	AXT	0,2	INDEX
	AXT	0,4	REGISTERS
	TRA	5,4	
B1	BSS	1	NCHNLS
B2	BSS	1	NSTPAK COUNTS
ONE	OCT	1	
	END		
*	FAP		
	COUNT	50	
	LBL	SRTAB1	
	ENTRY	SRTAB1 (MODEL, ISMRAT, SRATE, IANS1)	

* TITLE-SRTAB1 = SAMPLING RATE TABLE FOR DGEDT1
 * TABLE LOOKUP FOR SAMPLING RATE

---ABSTRACT---

SRTAB1 USES THE MODEL NO. OF THE DIGITIZER AND THE

* SAMPLING RATE INDEX TO PERFORM A TABLE LOOKUP FOR THE
 * SAMPLING RATE USED. AN ERROR INDICATOR IS SET IF
 * MODEL OR ISMRAT ARE OUTSIDE THE ALLOWABLE RANGES.

* --STATISTICS--

* LANGUAGE - FAP
 * EQUIPMENT - NO SPECIAL REQUIREMENTS
 * STORAGE - 60 WORDS
 * SPEED -
 * AUTHOR - B.A. WILLEY, GEOSCIENCE INC, SEPT. 1966
 * LIBRARY ROUTINES USED - NONE

* ----USAGE----

* SAMPLE CALL
 * CALL SRTAB1(MODEL, ISMRAT, SRATE, IANS1)

* INPUTS

* MODEL MODEL NO. OF THE DIGITIZER USED. MUST BE 0 OR 1.
 * ISMRAT SAMPLING RATE INDEX. MUST BE 0 .LE. ISMRAT .LE. 15.

* OUTPUTS

* SRATE SAMPLING RATE FROM TABLE
 * IANS1 =0 IF OK.
 * =-1 IF MODEL .LT. 0 OR .GT. 1.
 * =-2 IF ISMRAT .LT. 0 OR .GT. 15.

* PROGRAM FOLLOWS BELOW

```

SRTAB1  SXA      RSTR,1          SAVE XR1
        ZAC
        STO*     4,4            ZERO IANS1
        CLA*     1,4            GET AND TEST  MODEL
        TMI      ERR1
        CAS      =1.817
        TRA      ERR1
        NOP
        CLA*     2,4            GET AND TEST  ISMRAT
        TMI      ERR2
        CAS      =15.817
        TRA      ERR2
        NOP
        ALS      1              ISMRAT*2
        ADD*     1,4            +MODEL=
        PDC      ,1            INDEX ON SRTBL
        CLA      SRTBL,1       GET  SRATE
        STO*     3,4            AND STORE
        TRA      RSTR
ERR1    CLS      =1.817        IANS1 = -1 FOR INVALID MODEL
        TRA      IANSTO
  
```

ERR2 CLA =-2.817
IANSTO STO* 4,4
RSTR AXT **,1
TRA 5,4

IANS1 = -2 FOR INVALID ISAMRT

RESTORE XR1
RETURN

* SAMPLING RATE TABLE
SRTBL DEC 000.0,000.0
DEC 000.1,000.1
DEC 000.2,000.2
DEC 000.5,000.5
DEC 001.0,001.0
DEC 002.0,002.0
DEC 005.0,005.0
DEC 010.0,010.0
DEC 020.0,020.0
DEC 050.0,025.0
DEC 100.0,030.0
DEC 200.0,037.5
DEC 000.0,050.0
DEC 000.0,075.0
DEC 000.0,100.0
DEC 000.0,000.0

*
END

C
C NOTAPS TOTAL NUMBER OF DGEDT1 TAPES TO BE MERGED
C
C TAPE BLOCK FROM INTAPE
C
C ---TYPE 1. HEADER RECORD.
C FORMAT(FORTRAN IV 7090/7094 BINARY TAPE LOGICAL RECORD)
C
C LHEDM1 LENGTH OF HEADER RECORD MINUS 1, I.E. NUMBER OF
C WORDS IN THE REST OF THE HEADER, SO THAT THE
C RECORD CAN BE READ USING
C READ (ITPIN) LHEDM1,(IHEAD(I),I=1,LHEDM1)
C MUST BE .GT. 1 AND .LE. 40.
C
C NOTE THAT, IF THE ABOVE STATEMENT IS USED, THE
C DATA ITEMS BELOW WILL BE EQUIVALENT TO ELEMENTS OF
C THE ARRAY IHEAD. THE EQUIVALENCE IS INDICATED AT
C THE END OF EACH DESCRIPTION.
C
C NWDREC NUMBER OF WORDS OCCUPIED BY THE PACKED DATA FOR
C EACH CHANNEL. THE STATEMENT
C READ (ITPIN) (IDATA(I),I=1,NWDREC)
C WILL CORRECTLY READ ALL OF THE DATA IN A TYPE 2
C RECORD. (IHEAD(1))
C
C NSAMP NUMBER OF SAMPLES IN EACH DATA RECORD. WILL BE
C .GT. 3*(NWDREC-1) AND .LE. 3*NWDREC. (IHEAD(2))
C
C NCHNLS NUMBER OF CHANNELS OF DATA FOR EACH DATA RECORD.
C THERE WILL BE NCHNLS TYPE 2 RECORDS BETWEEN TYPE 1
C RECORDS ON THE TAPE. (IHEAD(3))
C
C SRATE SAMPLING RATE FOR DIGITIZATION. THE NYQUIST FREQUENCY
C IS 1./2.*SRATE. (IHEAD(4))
C
C DATE BCD REPRESENTATION OF THE DATE ON WHICH THE DATA WERE
C TAKEN IN THE FORM MO./DAY/YR (IHEAD(5))
C
C TIME BCD REPRESENTATION OF THE TIME THE EXPERIMENT STARTED.
C MILITARY CONVENTION, 4 CHARACTERS, LEFT ADJUSTED AND
C FILLED OUT WITH BLANKS, (IHEAD(6))
C
C IRUN RUN NUMBER. WILL BE .LE. 999. (IHEAD(7))
C
C MODEL MODEL NUMBER OF DIGITIZER. (IHEAD(8))
C
C ZIFDAT CALIBRATION INDICATOR =0 IF THIS IS A PHYSICAL
C DATA RUN, .NE.0 IF THIS IS A CALIBRATION RUN.(IHEAD(9))
C
C CHNORD(I) I=1,...,NCHNLS CHANNEL IDENTIFICATION VECTOR. EACH
C ELEMENT IS TWO CHARACTERS LEFT ADJUSTED AND FILLED OUT
C WITH BLANKS THESE WILL BE, USUALLY, SELECTED FROM THE
C SET E1,E2,E3,H1,H2,H3. (IHEAD(10)...IHEAD(NCHNLS+9))
C
C SENSE(I) I=1,...,NCHNLS SENSITIVITIES FOR THE NCHNLS OF DATA.
C A DATA SCALE FACTOR. (IHEAD(NCHNLS+10).....
C IHEAD(2*NCHNLS+9))
C
C IALIAS INDEX FOR ALIAS FILTER (IHEAD(2*NCHNLS+10))
C

C IFILT(I,J) I=1,...,3, J=1,...,NCHNLS INDICES FOR FILTERS AND
C COMPONENTS. IFILT(1,J) IS THE INDEX OF THE LOWPASS
C FILTER IN CHANNEL J. IFILT(2,J) IS THE INDEX OF THE
C HIGH PASS FILTER IN CHANNEL 4, IFILT(3,J) DEFINES WHICH
C TYPE OF OVER-ALL CHANNEL TRANSFER FUNCTION SHOULD BE USED
C (IHEAD(2*NCHNLS+1),...,IHEAD(5*NCHNLS+10))

C ---TYPE 2. DATA RECORD
C FORMAT(FORTRAN IV 7090/7094 BINARY TAPE LOGICAL RECORD)

C DATA(I) I=1,...,NWDREC DATA, PACKED THREE SAMPLES PER WORD,
C IN EITHER EXCESS 512 OR SIGNED MAGNITUDE FORM. EACH
C SAMPLE OCCUPIES 12 BITS. SELECTION OF DATA CODING WILL
C BE MADE ON THE BASIS OF MODEL THE HARDWARE MODEL NO.

C ---SUMMARY OF ORGANIZATION OF TAPE INTAPE

C EACH TAPE CONTAINS A NUMBER OF DATA BLOCKS. EACH DATA
C BLOCK CONSISTS OF THE FOLLOWING

- C 1. A TYPE 1 HEADER RECORD
- C 2. NCHNLS TYPE 2 DATA RECORDS.

C THE LAST BLOCK IS FOLLOWED BY TWO END-OF-FILE MARKS.

C ----OUTPUT----

C PRINTED ON ISYSOU

C A TABLE OF CONTENTS OF THE MERGE TAPE WHICH CONTAINS
C THE TAPE NUMBER AND DATA SET HEADINGS FOR EACH TAPE
C MERGED.

C TAPE BLOCKS ON MERGTP

C SAME AS INTAPE EXCEPT CONSISTS OF AN ACCUMULATION OF
C TAPE BLOCKS FROM NOTAPS TAPES.

C THE LAST BLOCK IS FOLLOWED BY ONE END-OF-FILE MARK.

C IF AN END-OF-TAPE MARK IS ENCOUNTERED ON MERGTP
C WHILE WRITING - THE LAST RECORD WILL BE INCOMPLETE.

C PROGRAM FOLLOWS BELOW

C INTEGER FILM(18),FILN(18),POULM(2000),POOLN(2000),IHED(100)
C INTEGER H3
C DATA H3/2HH3/
C DATA NBUF/6/,LBUF/256/,NDONE/0/,NSETS/0/,ISYSIN,ISYSOU/5,6/
C DATA (FILM(I),I=12,14)/18H MERGE FILE SETUPS/,FILM(2)/0107/
C DATA (FILN(I),I=12,14)/18H INPUT FILE SETUPS/,FILN(2)/0103/

C READ (ISYSIN,2) MERGTP,INTAPE,NOTAPS
C 2 FORMAT (3I5)


```

FILM(1)=MERGTP
FILN(1)=INTAPE
C
C SET UP TABLE OF CONTENTS HEADING AND OPEN FILES. CHECK IANS.
C
WRITE (ISYSOU,3)
3 FORMAT (1H1,25X,31HTABLE OF CONTENTS OF MERGE TAPE )
C
CALL QCPEN (FILM,POOLM,NBUF,LBUF, IANS)
IF (IANS.NE.0) GO TO 999
5 CONTINUE
CALL QCPEN (FILN,POOLN,NBUF,LBUF, IANS)
IF (IANS.NE.0) GO TO 9993
C
NDS=NDCNE+1
WRITE (ISYSOU,9) NDS
9 FORMAT (///,12H FROM INTAPE,I3)
C
C START READING INTAPE - FIRST THE HEADER
C
10 CONTINUE
CALL QREAD (FILN,IXPLN,NWORDS, IANS)
IF (IANS.NE.0) GO TO 40
C
C WRITE OFF-LINE INFORMATION AFTER MOVE INTO IHED. SET UP INDECES.
C
NCH = POOLN(IXPLN+4)
ILN = NCH*5+10
ICH = NCH+9
IAL = NCH*2+10
ISN1= ICH+1
ISN2= IAL-1
C
C CHECK IF SIX CHANNEL CASE
C
IF(NCH.NE.6) GC TO 100
C
C CHECK IF CHNORD(5) = H3
C
IF(POOLN(IXPLN+15).NE.H3) GO TO 100
C
IF 6 CHANNEL CASE WITH CHANNEL 5 = H3, SET FILTER
INDEX ICOM(5) =21
C
POOLN(IXPLN+40)=21
100 CONTINUE
CALL MCVE (ILN,POOLN(IXPLN+2),IHED)
C
NSETS = NSETS + 1
WRITE (ISYSOU,12) NSETS, IHED(7), IHED(5), IHED(6), IHED(8), IHED(9),
1 IHED(4), IHED(2), IHED(3), (IHED(1), I=10, ICH)
12 FORMAT (//3X,8HDATA SET, I5, //, 8X7HIRUN = I3, 23H, DATE (MO./DAY/YR.
1) = A6, 9H, TIME = A4, 10H, MODEL = I2, 11H, ZIFDAT = I1, /8X7HRATE =
2 F6.2, 15H, NSAMP/CHNL = I5, 11H, NCHNLS = I2, /8X, 14HCHANNEL ORDER
3 (6(2XA2) ) )
WRITE (ISYSOU,13) (IHED(I), I=ISN1, ISN2)
13 FORMAT (8X, 15HSENSITIVITIES =, 6E12.4)
IFL = IAL+1
WRITE (ISYSOU,14) IHED(IAL), NCH, (IHED(I), I=IFL, ILN)
14 FORMAT (8X, 9HIALIAS = I2, 26H, ((IFILT(I, J), I=1, 3), J=1, I1, 3H) ,
1 18I3)

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C
C MOVE POOL AND WRITE HEADER
C
    CALL QWRITE (FILM,IXPLM,NWORDS+MOD(NWORDS,2),IANS)
    CALL MCVE (NWORDS,POOLN(IXPLN),POOLM(IXPLM))
    IF (IANS.NE.0) GO TO 60
C FIND TOTAL NO. OF DATA RECORDS (PHYSICAL)
    NRECS = ((POOLN(IXPLN+2)+254)/255)*POOLN(IXPLN+4)
C
C TIME TO READ, WRITE AND CHECK IANS.
C
    DO 20 I=1,NRECS
    CALL QREAD (FILN,IXPLN,NWORDS,IANS)
    IF (IANS.NE.0) GO TO 40
    CALL QWRITE (FILM,IXPLM,NWORDS+MOD(NWORDS,2),IANS)
    IF (IANS.NE.0) GO TO 60
    CALL MCVE (NWORDS,POOLN(IXPLN),POOLM(IXPLM))
20 CONTINUE
C
C GO BACK FOR NEXT DATA SET
C
    GO TO 10
C
C END-OF-FILE CHECKS FOR INPUT TAPE. (QREAD)
C
40 CONTINUE
    IF (IANS.NE.2) GO TO 9992
    CALL QCLOSE (FILN)
    NDONE = NDONE + 1
    IF (INDCNE.GE.NOTAPS) GO TO 65
C
C TELL OPERATOR TO MOUNT A NEW TAPE
C
    PRINT 55,INTAPE
55 FORMAT (1H1,2X,67H*** OPERATOR *** PLEASE MOUNT ANOTHER INPUT T
1APE ON LOGICAL UNIT,I3,44H AFTER THE PRESENT TAPE REWINDS AND UNLO
2ADS.,///10X,30HPUSH START BUTTON TO CONTINUE. //)
    PAUSE
C
C RETURN TO RE-OPEN INPUT FILE
C
    GO TO 5
C
C CHECK MERGE TAPE IANS. FINISH UP IF = 2.
C
60 CONTINUE
    IF (IANS.NE.2) GO TO 9992
    WRITE (ISYSOU,62) NDONE
62 FORMAT (///,1X,69HPHYSICAL END OF TAPE ENCOUNTERED ON MERGE TAPE W
1HILE CCOPYING TAPE NO.,I5,1H.)
    GO TO 9992
65 WRITE (ISYSOU,66) NDONE
66 FORMAT (///,1X,42HEND OF FILE - LOGICAL END OF MERGE TAPE.,//3X,
1 40H---JOB COMPLETE---NO. OF TAPES MERGED = ,I4,1H.)
C
C CLOSE + WRITE IANS
C
9992 CALL QCLOSE (FILN)
9993 CALL QCLOSE (FILM)
999 WRITE (ISYSOU,9990) IANS

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Security Classification

DOCUMENT CONTROL DATA - R&D		
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13. ABSTRACT		
<p>An editing program (DGEDT1) has been prepared to accept data tapes generated on the magneto-telluric digital field system and correct all digitizer-caused errors and generate demultiplexed data tapes which can be read by the analysis program.</p> <p>The field digitizer which Geoscience has used for these experiments has one to six input channels of data which are sequentially sampled. The sampling rate is a variable. The digitized data are written on a 7-track Kennedy incremental tape recorder. A single sample from one of the input channels has 10 bits of precision. The ten bits are divided into two groups of five and recorded in two successive characters on the tape. The high order bit in each of these characters is zero, except for the high order bit of the second character corresponding to the last channel sampled. Each time the last channel is sampled, a one bit is inserted in this character. The following types of errors may occur:</p> <ol style="list-style-type: none"> 1) A character may be dropped. 2) A scan bit (the above mentioned 1 bit) may be dropped. 3) A character may be added. 4) A scan bit may be added. 5) A tape parity check may occur. <p style="text-align: right;">(Cont' d. on attached sheet)</p>		

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Security Classification

Programs for the Analysis of Magneto-telluric Data, Part II: Tape Editing

Abstract, cont'd.

There are no other detectable errors due solely to digitizer malfunction. It is important to compensate for errors of this sort, since they can affect the time base, and hence distort the spectrum by introducing spurious lines. Parity errors are isolated to a single word by using a special tape reading routine. The tape format selected allows scan bits to be searched for and detected. Errors of either sort are corrected for by linearly interpolating the data across the gap introduced by them. No attempt is made to use data from the questionable area.

The merge program (DGMRG1) was written to reduce the number of data tapes required to hold the edited output. This program merges two or more DGEDT1-format tapes onto a single output tape. A table of contents of the output tape is generated so that the successful operation of the program does not depend on the operator mounting the tapes in any particular order.

The listings of the two main programs, complete with their documentation, and of all special-purpose subroutines used by them, follow below.

14. KEY WORDS	LINK A		LINK B		LINK C	
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Data Editing

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