[redacted]

#615

PIONEER 10 & 11

24 HR. COMPRESSED SUMMARY DATA

72-012A-05F & 73-019A-05G

PIONEER 10

24-HOUR COMPRESSED SUMMARY DATA

72-012A-05F

This data set has been restored. There was originally one 9-track, 1600 BPI tape written in Binary. There is one restored tape. The DR tape is a 3480 cartridge and the DS tape is 9-track, 6250 BPI. The original tape was created on a 360 computer and the restored tape was created on an IBM 9021 computer. The DR and DS numbers along with the corresponding D number are as follows:

DR#	DS#	D#	FILES	TIME SPAN
DR005065	DS005065	D059882	1	03/03/72 - 12/31/88

PIONEER 11

24-HOUR COMPRESSED SUMMARY DATA

73-019A-05G

This data set has been restored. There was originally one 9-track, 1600 BPI tape written in Binary. There is one restored tape. The DR tape is a 3480 cartridge and the DS tape is 9-track, 6250 BPI. The original tape was created on a 360 computer and the restored tape was created on an IBM 9021 computer. The DR and DS numbers along with the corresponding D number are as follows:

DR#	DS#	D#	FILES	TIME SPAN
DR005078	DS005078	D059883	1	04/16/73 - 12/29/88

REQ. AGENT	RAND #	ACQ. AGENT
DAD	V0217	WSC

PIONEER 10 AND 11

24 Hour Compressed Summary Data

72-012A-05F and 73-019A-05G

These data sets consist of 1 tape each. The tapes are 9-track, 1600 bpi, binary, with one file. They were created on a VAX 11/780 and were originally in 48 bit integer format. They have been converted to VAX double precision floating point words. This should be taken into account when reading the accompanying documentation.

D#	C#	Time Span	Satellite
D-59882	C-23467	03/03/72 - 12/31/88	Pioneer 10
D-59883	C-23468	04/16/73 - 12/29/88	Pioneer 11

** Note that these data were updated (extending the timespan) with replacement tapes received April 5, 1989. The Same D and C numbers were used for the replacement tapes.

UNIVERSITY OF CALIFORNIA, SAN DIEGO

BERKELEY • DAVIS • IRVINE • LOS ANGELES • RIVERSIDE • SAN DIEGO • SAN FRANCISCO SANTA BARBARA • SANTA CRUZ

CENTER FOR ASTROPHYSICS AND
SPACE SCIENCES (CASS) C-011

LA JOLLA, CALIFORNIA 92093

April 5, 1989

Data Acquisition Branch
National Space Science Data Center
Code 633
Goddard Space Flight
Greenbelt, MD 20771
Att'n: Mr. Ralph Post

Ref:Contract: NASA NAG 2-153
Principal Investigator: Walker Fillius
Spacecraft: Pioneer 10 & 11
Experiment: UCSD/TRD

Dear Sirs:

Enclosed are two tapes containing data from the UCSD TRD instrument on Pioneers 10 and 11 from launch through December 31, 1988. These tapes are in the Summary Tape format described briefly in the enclosure. This format is identical to that of our previous deposits, and described more thoroughly in the documentation we have sent you before. Each record is a 24 hour summary, of a type that we call "inhomogeneous". Density is 1600 BPI on 9 tracks.

Very truly yours,

Walker Fillius

Walker Fillius

Short format enclosed

cc: Mr. Richard Fimmel
Pioneer Program Manager

Dr. Larry Lasher
Pioneer Program Office

Dr. Palmer Dyal
Pioneer Project Scientist

Dr. Norman Schofield
NSSD

F1

UCSD Pioneer Summary Tape Format
Short Description

Word Number	Name	Definition
1	SAT	Satellite identifier
2	NFMOD	Mode of reduction
3	ISTART	Start time of summary
4	ISTOP	Stop time of summary
5	IDAY	Day of year
6	IYR	Four digit year
7	IDRTAP	Name of source EDR
8	BRTAP	Name of Binary Reduction Tape
9	IFF	Telemetry data format
11	IBR(IB)	Telemetry bit rate
12	RTLT	Round trip light time at ISTART
13	Unused	
14-16	PMIN(I)	Minimum values of 3 housekeeping parameters
17-19	PMAX(I)	Maximum values of 3 housekeeping parameters
20-22	PAVE(I)	Average values of 3 housekeeping parameters
	Pulse Channel Data for 21 Channels	
23-43	AVG(I)	Average number of counts/reading for channel I
44-64	RMS(I)	RMS deviation of readings in summary
65-85	RESMAX(I)	Maximum residue
86-106	RESMIN(I)	Minimum residue
107-127	NREAD(I)	Number of readings in summary
128-148	NCOUNT(I)	Total number of counts in all readings
149-169	TOTIME(I)	Total accumulation time
170-190	AVGCR(I)	Average number of counts/s
191-211	PROBER(I)	Probable error
	Electrometer Channel Data for 6 Channels	
212-217	AVG(I)	Average reading for channel I
218-223	RMS(I)	RMS deviation (current)
224-229	RESMAX(I)	Maximum residue (current)
230-235	RESMIN(I)	Minimum residue (current)
236-241	AVGA(I)	Average current
242-247	EMAX(I)	Maximum current
248-253	EMIN(I)	Minimum current
254-259	MREAD(I)	Number of readings in summary
	Trajectory Data	
260-270		Attitude and trajectory data at time ISTART
271-273		Restart data for use during production
274 RTLT		Round trip light time at time ISTOP
275-287		Attitude and trajectory data at time ISTOP
288-300		Spare

F2

NOTES

1. Each word is a 48 bit integer.

2. Tapes are written in odd parity.

3. Tapes have one file, many records.

4. Each 300 word record contains one complete data summary.

5. Originally tapes were 7-tracks, 556 bpi. Now we use 9 tracks, 800, 1600, and 6250 bpi. Mapping between 9- and 7-track tapes is on a byte-by-byte basis, with 2 bits padded.

6. Time is counted in milliseconds from the beginning of the day, 1/1/72 (We call this Coletime.) Half of the RTLT is subtracted from GRUT to produce SPACECRAFT TIME.

7. The period of the data summary is specified by the operator when the data are processed. Typically, we have used 108 s (the instrument commutate cycle) for encounter data, and 1/2 hour for cruise data. Since the summary format is reentrant, we can combine records to produce summaries for longer intervals. Thus our most used product in cruise mode is 24-hour summary tapes.

8. Summary tapes are called "homogeneous" if all the data in each record were acquired at the same telemetry rate. In this case, all statistical quantities are valid. "Inhomogeneous" summary tapes can be used for average counting rates, but not deviations, residues, etc. Because we cannot control changes in telemetry rate, the records must be "inhomogeneous" whenever we need one – and only one – record per interval.

9. We generally use "homogeneous" summary tapes for editing, and "inhomogeneous" summary tapes for data analysis.

4.1.2 UCSD/TRD Pioneer Summary Tape Format

Pioneer summary tapes are single-file, multi-record tapes, written in odd parity on the VAX 11/780. Each 300 word record contains one complete data summary, along with associated information. All numbers are written on the tape as positive binary integers. The tape format is as follows:

(9 TRACK, 1600 BPI, 48 BIT WORDS)

Word Number	Name	Definition	Bias, Value or Units
1	SAT	Satellite Number	10 or 11
2	NFMOD	Mode of reduction: Earth traversal, Cruise or Jupiter Encounter	1-3
3	ISTART	Start time of summary	Cole time (ms) = 43,200,000 for Jan 1, 1972, 1200
4	ISTOP	Stop time of summary	Cole time (ms)
5	IDAY	Day of year	
6	IYR	4 digit year	
7	IDRTAP	5 digit name of EDR tape which produced the summary	
8	BRTAP	5 digit name of binary reduction tape associated with the summary	
9	IFF	1 digit code for data format, 1 = A, 2 = A/D, 3 = B, 4 = B/D	
10	IB	1 digit code for bit rate	1-8 [$2^4, 2^5 \ldots 2^{11}$ (bits/sec)]
11	IBR(IB)	Bit rate as defined by IB	16-2048
12	RTLT	Round trip Light Time (for ISTART)	milliseconds
13	ICOMAL	Number of commutate alarms; currently unused (-2)	
14-16	PMIN(I),I=1,3	Minimum Pulse Temp., High Voltage Regulator current & Detector C Temp., respectively	PMIN(I)*1.E6+1.E8
17-19	PMAX(I),I=1,3	Maximum values of the above parameters	PMAX(1)*1.E6+1.E8
20-22	PAVE(I),I=1,3	Average values of the above I=2 not currently used.	PAVE(I)*1.E6+1.E8

PULSE DATA

Each parameter for pulse data can be sorted into one of 21 bins, depending on detector ID and high voltage status. Bins are labeled as follows:

I	Detector	I	Detector
1	C1	12	E3U
2	C2	13	M1H
3	C3	14	M2H
4	E1H	15	M3H
5	E2H	16	M1L
6	E3H	17	M2L
7	E1L	18	M3L
8	E2L	19	M1U
9	E3L	20	M2U
10	E1U	21	M3U
11	E2U		

Word Number	Name	Definition*	Bias
23-43	AVG(I)	Average number of counts/ reading	AVG(I)*1.E6
44-64	RMS(I)	RMS Deviation	RMS(I)*1.E6
65-85	RESMAX(I)	Maximum Residue	RESMAX(I)*1.E6+1.E8
86-106	RESMIN(I)	Minimum Residue	RESMIN(I)*1.E6+1.E8
107-127	NREAD(I)	Number of readings	None
128-148	NCOUNT(I)	Total counts	None
149-169	TOTIME(I)	Total time, in seconds	TOTIME*1.E6
170-190	AVGCR(I)	Average number of counts/ second	AVGCR(I)*1.E6
191-211	PROBER(I)	Probable Error (Counts/Second)	PROBER(I)*1.E10

* More extensive definitions are given at the end

ELECTROMETER DATA

Each parameter for electrometer data can be sorted into one of 6 bins, depending on detector ID. Bins are labeled as follows:

I	Detector
1	CDC
2	SEDC
3	SPDC
4	CAL1
5	CAL2
6	CAL3

Word Number	Name	Definition	Bias
212-217	AVG(I)	Average reading	AVG(I)*1.E6
218-223	RMS(I)	RMS Deviation(current)	RMS(I)*1.E18
224-229	RESMAX(I)	Maximum Residue(current)	RESMAX(I)*1.E6+1.E8
230-235	RESMIN(I)	Minimum Residue(current)	RESMIN(I)*1.E6+1.E8
236-241	AVGA(I)	Average Current	AVGA(I)*1.E18
242-247	EMAX(I)	Maximum Current	EMAX(I)*1.E18
248-253	EMIN(I)	Minimum Current	EMIN(I)*1.E18
254-259	MREAD(I)	Number of readings	None

TRAJECTORY DATA

Earth Traversal (NFMOD = 1)

Definitions are given alphabetically at the end

WORD NUMBER		NAME
ISTART	ISTOP	
260	275	ATQCLT
261	276	ATQLONG
262	277	RADPE
263	278	CLTPEE
264	279	ALGPEE
265	280	TLCPEE
265-270 and 281-300		____ (SPARE)

TRAJECTORY DATA

Cruise (NFMOD = 2)

WORD NUMBER		NAME
ISTART	ISTOP	
260	275	ATCCLT
261	276	ATCLONG
262	277	RADPS
263	278	CLTPSC
264	279	ALGPSC
265	280	RADES
266	281	CLTESC
267	282	ALGESC
268	283	RADJS
269	284	CLTJSC
270	285	ALGJSC
286 - 300		____ (SPARE)

TRAJECTORY DATA

Jupiter Encounter (NFMOD = 3)

WORD NUMBER ISTART	ISTOP	NAME
260	275	ATCCLT
261	276	ATCLONG
262	277	RADPJ
263	278	CLTPJJ
264	279	ALGPJJ1R
265	280	TLCPJJ
266	281	RADPJM
267	282	CLTPJM
268	283	TLCPJM
269	284	B
270	285	EL
286	287	ALGPJJ3L
288-300		____ (SPARE)

Word 274 is RTLT corresponding to ISTOP

RESTART DATA

This information is written on the summary tape in order to provide the information necessary to restart the Pioneer data reduction program following any summary.

271	IREC	Physical record number in File 4 of EDR tape at ISTOP
272	NREC	Logical record number on binary reduction tape at ISTOP
273	ISREC	Physical record number on summary tape
274-300	---	Spare

OUTPUT FUNCTION DEFINITIONS

FUNCTION NAME	SYMBOL OR EQUATION	PRINTOUT ACCURACY	PRINTOUT RANGE
Average Count	$\overline{{}_jC}$	0.1%	10^{-4} to 10^{+9}
RMS Deviation	${}_j\sigma = \sqrt{\overline{{}_jC^2} - \left(\overline{{}_jC}\right)^2}$	0.1%	10^{-3} to 10^{+5}
Maximum Residue	$\dfrac{{}_jC\ \max - \overline{{}_jC}}{{}_j\sigma}$	1.0%	-99 to +99
Minimum Residue	$\dfrac{{}_jC\ \min - \overline{{}_jC}}{{}_j\sigma}$	1.0%	-99 to +99
Number of Readings	${}_jN$	Exact integer	0 to 99999
Total Counts	$\sum_{i=1}^{{}_jN} {}_jC_i$	0.1%	0 to 10^9
Total Time, Sec.	$\sum_{i=1}^{{}_jN} {}_jt_i$	½ sec.	0 to 99999.9
Average Count Rate, c/s	$\overline{{}_jCR}$	0.1%	10^{-4} to 10^{+7}
Probable Error, c/s	$\pm .6745 \sqrt{\Sigma_j C} / \Sigma\, t_i$	0.1%	10^{-4} to 10^{+4}

OTHER D' NITIONS

PARAMETER NAME	MODE	PARAMETER	BODY	REF.POINT	REF.PLANE	UNITS
ALGESC	Traversal	Longitude	Earth	Sun	Ecliptic	-
ALGJSC	Cruise	"	Jupiter	Sun	"	Micro-radians
ALGPEE	Traversal	"	Pioneer S/C	Earth	Equator	"
ALGPJJ1R	Encounter	"	"	Jupiter	"	"
ALGPJJ3L	"	"	"	"	"	"
ALGPSC	Cruise	"	"	Sun	Ecliptic	"
ATCCLT	"	Colatitude	Spin Axis	Pioneer S/C	"	"
ATCCLT	Encounter	"	"	"	"	"
ATCLONG	Cruise	Longitude	"	"	"	"
ATCLONG	Encounter	"	"	"	"	"
ATQCLT	Traversal	Colatitude	"	"	E.Equator	"
ATQLONG	"	Longitude	"	"	"	"
B	Encounter	Magnetic Field D2 Model (JGR 79, 3501, 1974)				Micro-gauss
CLTESC	Cruise	Colatitude	Earth	Sun	Ecliptic	Micro-radians
CLTJSC	"	"	Jupiter	Sun	"	"
CLTPEE	Traversal	"	Pioneer S/C	Earth	Equator	"
CLTPJJ	Encounter	"	"	Jupiter	"	"
CLTPJM	"	"	"	"	Mag.Equator	"
CLTPSC	Cruise	"	"	Sun	Ecliptic	"
EL	Encounter	L value - D2 Model (JGR 79, 3501, 1974)				Micro-radii
RADES	Cruise	Radius	Earth	Sun		Micro-AU
RADJS	"	"	Jupiter	Sun		"
RADPE	Traversal	"	Pioneer S/C	Earth		Micro-RE
RADPJ	Encounter	"	"	Jupiter		Micro-RJ
RADPJM	"	"	"	"	Mag.Equator	"
RADPS	Cruise	"	"	Sun		Micro-AU
TLCPEE	Traversal	Local Time	"	Earth	Equator	Micro-hour
TLCPJJ	Encounter	"	"	Jupiter	"	"
TLCPJM	"	"	"	"	Mag.Equator	"

SUBROUTINE INSUM(IDONE)

PURPOSE: To read a record from a summary tape.

OUTPUT: DIN(300), IDONE

DIN(300)= 300 parameters of a record

IDONE= 0 if nothing special occured.
IDONE= 1 if EOF of last input tape occured.
IDONE= 2 if 10 tape reading errors have occured.

INCLUDE IN MAIN PROGRAM:
Necessary for use-

```
REAL*8 DIN(300)
COMMON/DATIN/DIN
```

For some more details-

```
      REAL*8 RINTAP(10), ROUTAP
      INTEGER*4 NTAPES, ICOUNT, IROUT, IRECA(10)
      INTEGER*2 LUN, LUNOUT, CHAN(10)
      COMMON/TSKDF/RINTAP,ROUTAP,NTAPES,ICOUNT,
     1             IROUT, IRECA, LUN, LUNOUT,CHAN
```

```
C                         SUBROUTINE INSUM(IDONE)
                          -----------------------
C 7/14/83- Brian Wake; Vax Version of INSUM.

C Reads a record from summary tape.

C The first time INSUM is called, the tape drive is assigned, the user
C is interogated then a record is read from the summary tape.  Subse-
C quent calls just read a record.

C Record of summary tape consists of 300 parameters, these parameters
C are stored internally in DIN(300).

C Necessary in MAIN program:
C       REAL*8 DIN(300)
C       COMMON/DATIN/DIN
C
C Needed if some more details are desired:
C       REAL*8 RINTAP(10), ROUTAP
C       INTEGER*4 NTAPES, ICOUNT, IROUT, IRECA(10)
C       INTEGER*2 LUN, LUNOUT, CHAN(10)
C       COMMON/TSKDF/RINTAP, ROUTAP, NTAPES, ICOUNT, IROUT, IRECA,
C      1              LUN, LUNOUT, CHAN


C-----------------------------------------------------------------------
C Note:  A double buffering scheme is used. While one buffer is being read,
C       the other buffer is being converted to DEC values (DATCON).
C

C Declarations:
      IMPLICIT COMPLEX (A-Z)      ! Make it necessary to declare all varibles.

      REAL*8 BUFF(600), ISDAT(300)
      REAL*8 RINTAP(10), ROUTAP

      INTEGER*4 NTAPES, ICOUNT, IROUT, IRECA(10)
      INTEGER*4 NERR, IFRST, MSG, IMSG
      INTEGER*4 SYS$QIO, SYS$WAITFR, ISTAT, IDONE, NBYTES
      INTEGER*2 IOSB(4),IEFLG,LUN,LUNOUT,IBUF1,IBUF2,CHAN(10)
      LOGICAL ISTRT

      EXTERNAL IO$_READVBLK
      EXTERNAL SS$_PARITY, SS$_ENDOFTAPE, SS$_ENDOFFILE, SS$_NORMAL

C Common blocks.
      COMMON/DATIN/ISDAT
      COMMON/TSKDF/RINTAP,ROUTAP,NTAPES,ICOUNT,IROUT,IRECA,LUN,
     1 LUNOUT,CHAN
      COMMON/START/ISTRT

      DATA  MSG/5/, NBYTES/2400/, IRECA/10*0/, IFRST/0/,ISTRT/.TRUE./

C  IBUF1 : BUFFER INDEX FOR DATA CONVERSION.      ( CALL TO DATCON )
C  IBUF2 : BUFFER INDEX FOR READING OF RECORD.


!-------------------------------
      IF(ISTRT)CALL SUMASN                  !Assign tape drive.

   10 IF (IFRST .NE. 0)GOTO 30              !IF FIRST RECORD IS ALREADY READ IN
                                            !SKIP THE INITIALIZATION PART
```

```
      IFRST=1          !NO ERRORS YET
      NERR=0           !START THIS GUY IN THE COMPLEMENTED STATE
      IBUF1=301        !START WITH BUFFER NUMBER ONE
      IBUF2=1

   20 CONTINUE          !READ THE FIRST RECORD
      IEFLG=1           !USE EVENT FLAG 1
      ISTAT=SYS$QIO(%VAL(IEFLG), %VAL(CHAN(LUN))
     1       ,%VAL(%LOC(IO$_READVBLK)),%REF(IOSB),,
     3       ,%REF(BUFF(IBUF2)),%VAL(NBYTES),,,,)

C WAIT FOR MOST RECENT I/O TO COMPLETE
   30 IEFLG=1
      ISTAT=SYS$WAITFR(%VAL(IEFLG))
      IF(IOSB(1) .EQ. %LOC(SS$_ENDOFFILE)) GOTO 40
      IF(IOSB(1) .EQ. %LOC(SS$_ENDOFTAPE)) GOTO 40

! Error checking and message giving:
      IF(IOSB(1) .NE. %LOC(SS$_NORMAL))THEN
        IRECA(ICOUNT)=IRECA(ICOUNT)+1
        IF(IOSB(1) .EQ. %LOC(SS$_PARITY))THEN
         WRITE(MSG,1000)IRECA(ICOUNT)
        ELSE
         WRITE(MSG,1100)IRECA(ICOUNT)
        END IF
        NERR=NERR+1
        IF (NERR.LE.10)THEN          ! Keep on going until NERR=10.
         GOTO 20
        ELSE
         IDONE=2
         RETURN
        END IF
      END IF

      IRECA(ICOUNT)=IRECA(ICOUNT)+1          !1st index of buffer to convert.
      IBUF1=302-IBUF1                        !1st index of buffer to which the newly
      IBUF2=302-IBUF2                        !read data is stuffed.


C     READ ANOTHER RECORD
      IEFLG=2          !USE EVENT FLAG 2
      ISTAT=SYS$QIO(%VAL(IEFLG),%VAL(CHAN(LUN))
     1  ,%VAL(%LOC(IO$_READVBLK))
     2  ,%REF(IOSB),,
     3  ,%REF(BUFF(IBUF2)), %VAL(NBYTES),,,, )

      CALL DATCON(300, BUFF(IBUF1), ISDAT(1))   !Convert buffer pointed to by
                                                !IBUF1 and place in ISDAT.

      RETURN

   40 CALL REWIND(CHAN(LUN))      !REWIND THIS DRIVE
      IF(ICOUNT .LT. NTAPES)THEN
       CALL SUMMNT
       IFRST=0
       GOTO 10
      ELSE                        !END OF INPUT DATA
       IDONE=1
       RETURN
      END IF

      ENTRY MESANI(IMSG)
```

ERROR MESSAGES ARE SENT TO THE USER'S CONSOLE, BUT THE MESSAGES CAN BE DIRECTED

```
C   TO THAT FILE BY CALLING THE ENTRY MESANI.
      MSG=IMSG
      RETURN

 1000 FORMAT ('0','INSUM:  I/O PARITY ERROR AT RECORD ',I7,'  RECORD ',
     1       'DISCARDED.')
 1100 FORMAT(1X,'INSUM:  I/O ERROR OTHER THAN PARITY AT REC.  ',I5/1X,
     1'RECORD DISCARDED')
      END


C ***********************************************************************

      SUBROUTINE SUMASN
C     ------------------

C 7/14/83- Brian Wake; Assigns tape drive.

C This subroutine assigns the input tape drive unit, accepts input
C tape names and, when a input tape has finished, rings a bell and asks
C for the next input tape (ENTRY SUMMNT).

C If SUMASN has not already called been called by the MAIN program, INSUM
C will call SUMASN itself.

C Declarations:
      IMPLICIT COMPLEX (A-Z)        !Make it necessary to declar all varibles.

      REAL*8 RINTAP(10), ROUTAP
      INTEGER*4 NTAPES, ICOUNT, IROUT, IRECA(10), SYS$ASSIGN, ISTAT
      INTEGER*2 I,IEFLG, IOSB(4), CHAN(10), LUNIN, LUNOUT
      BYTE BELL,N
      CHARACTER*2 PT
      LOGICAL ISTRT
      COMMON/TSKDF/RINTAP,ROUTAP,NTAPES,ICOUNT,IROUT,IRECA,
     1  LUNIN,LUNOUT,CHAN
      COMMON/START/ISTRT

      DATA LUNIN/2/                          !INPUT DRIVE ASSIGNED TO LUN OF 2.
      DATA PT/'MT'/, ICOUNT/0/, BELL/"7/
      DATA RINTAP/10*'UNUSED'/

C Assign tape drive to logical unit number(LUN) of 2.
      ISTRT=.FALSE.
      ISTAT=SYS$ASSIGN(PT,CHAN(LUNIN),,)

C Interrogation of user for some info.
      TYPE 1000
      ACCEPT *, NTAPES
      DO 200, I=1,NTAPES
        TYPE 1100, I
        ACCEPT 1200, RINTAP(I)
  200 CONTINUE
      TYPE 1300, RINTAP(1)
      GOTO 10


      ENTRY SUMMNT
      TYPE 1400, BELL, BELL, BELL
      TYPE 1500, ICOUNT, RINTAP(ICOUNT), RINTAP(ICOUNT+1)

   10 TYPE 1600
      ACCEPT 1700, N
```

```
      SUBROUTINE REWIND(CHAN)
C     01/20/82 TMG REWINDS THE TAPE ASSIGNED TO UNIT "CHAN"
      EXTERNAL IO$_REWIND
      INTEGER*4 SYS$QIOW
      INTEGER*2 CHAN,IOSBT(4),TIEFLG
      INTEGER*4 ISTAT
C
C     REWIND TAPE ON CHANNEL "CHAN"
C
      ISTAT= SYS$QIOW(,%VAL(CHAN)
     1 ,%VAL( %LOC(IO$_REWIND))
     2 ,%REF(IOSBT),,,,,,,,)
      RETURN
      END
```

```
        .TITLE DATCON
;
; PIONEER SUMMARY TAPES DATA CONVERSION ROUTINE.
;       THIS ROUTINE CONVERTS SETS OF 48-BIT INTEGERS FROM A CDC 3600,
;       STORED ON A 7-TRACK TAPE, TO DOUBLE PRECISION FLOATING POINT
;       NUMBERS FOR USE ON A VAX-11/780
; PROGRAMMER: T. GASAWAY
; DATE: MARCH 21, 1979
;       5/3/80 CEM      VAX VERSION
;
; INVOKING THE PROCEDURE:
;       CALL DATCON (NWORDS,IBUF,IBUF2)
;       PARAMETERS:
;         NWORDS  - INTEGER*2 NUMBER OF SETS OF DATA TO CONVERT
;         IBUF    - WORD BOUNDARY ADDRESS OF WHERE DATA IS STORED
;         IBUF2   - WORD BOUNDARY ADDRESS OF WHERE DATA IS TO BE MOVED
;
; PROCEDURE:
;         CONVERT 8 BYTES OF 6 BITS EACH TO A SINGLE 48-BIT INTEGER,
;         THEN CONVERT THE INTEGER TO A FLOATING POINT NUMBER.
;         STORE THE FLOATING POINT NUMBER IN THE SAME MEMORY
;         LOCATIONS AS THE DATA CAME FROM.  REPEAT UNTIL ALL
;         8-BYTE SETS OF DATA HAVE BEEN CONVERTED.  LASTLY, MOVE
;         THE DATA TO THE AREA SPECIFIED BY IBUF2, IF IBUF2 IS
;         GIVEN (I.E. NON-NULL).
;
;
        .PSECT  $CODE,PIC,CON,REL,LCL,SHR,EXE,RD,NOWRT,LONG
;       .GLOBL  DATCON
;
;
DATCON::
        .WORD   ^M<IV,R11>              ; NEEDED?
        MOVL    @4(AP),CNTR             ;MOVE COUNT TO COUNT REGISTER
        MOVL    8(AP),R4                ;GET ADDRESS OF FIRST 8-BYTE FIELD
CHK:    DECL    CNTR                    ;DECREMENT CNTR BY 1
        BGEQ    MORE                    ;IF <0 MOVE IT TO IBUF2
        JMP     MOVIT
MORE:   MOVL    #6,R9                   ;MOVE 6 BITS EACH INSERT
        MOVL    #-8,R8                  ;SHIFT 8 BITS
        MOVL    R4,R5                   ;REMEMBER POINTER
        MOVQ    (R4)+,R6                        ;MOVE IN NEXT 8 BYTES
;       CLRL    R0                      ; SET R0=0 ( NOT NEEDED, FPCON IS INSERTED)
        INSV    R6,#26,R9,R0            ;8, INSERT SIX BITS ( INCLUDES SIGN BIT)
        ASHL    R8,R6,R6
        INSV    R6,#20,R9,R0            ;7
        ASHL    R8,R6,R6                ;SHIFT RIGHT 8 BITS
        INSV    R6,#14,#2,R1            ;INSERT 2 BITS INTO SECOND WORD OF DOUBLE WORD
                                        ;6B
        ASHL    #-2,R6,R6
        INSV    R6,#16,#4,R0            ;6A
        ASHL    #-6,R6,R6
        INSV    R6,#8,R9,R1             ;5
        INSV    R7,#2,R9,R1             ;4 INSERT 6 BITS
        ASHL    R8,R7,R7                ;SHIFT  8 BITS
        INSV    R7,#28,#4,R1            ;3A INSERT 4 BITS
        ASHL    #-4,R7,R7
        INSV    R7,#0,#2,R1             ;3B INSERT 2 BITS
        ASHL    #-4,R7,R7
        INSV    R7,#22,R9,R1            ;2 INSERT 6 BITS
        ASHL    R8,R7,R7                ;SHIFT  8 BITS
        INSV    R7,#16,R9,R1            ;1 INSERT 6 BITS
        TSTL    R0                      ;IS IT NEGATIVE?
```

```
BRA:    BGEQ    NONNEG          ;BRANCH IF NOT
        MCOML   R0,R0           ;TAKE ONES COMPLEMENT
        MCOML   R1,R1           ;TAKE ONES COMPLEMENT
; CONVERT TO DOUBLE PRECISION FLOATING POINT NUMBER.  CORRECT
; THE VALUE BY SUBTRACTING + OR - 2**55 (FOR THE "HIDDEN" BIT) AND LET
; THE SUBTRACTION NORMALIZE THE FLOATING POINT NUMBER.

        INSV    FPMIN,#0,#16,R0 ; INSERT BIASED CHARACTERISTIC
        SUBD2   FPMIN,R0        ;SUBTRACT THE BIAS
;
;
;       SUBD    FPMIN,R0        ;SUBTRACT THE SCALING FACTOR (-2**55) TO
                                ;NORMALIZE AND OBTAIN THE FLOATING POINT
                                ;VALUE OF THE 48-BIT INTEGER
        JMP     NEXT            ;GO GET NEXT SET OF DATA
;
NONNEG:                         ;CONVERT TO POSITIVE FLOATING POINT
        INSV    FPCON,#0,#16,R0 ; INSERT BIASED CHARACTERISTIC
        SUBD2   FPCON,R0        ;SUBTRACT THE BIAS
;       SUBD2   FPCON,AC0       ;SUBTRACT THE SCALING FACTOR (+2**55) TO
                                ;NORMALIZE AND OBTAIN THE FLOATING POINT
                                ;VALUE OF THE 48-BIT INTEGER
NEXT:   MOVQ    R0,(R5)         ;STORE THE NUMBER BACK WHERE IT BELONGS
;
; SET POINTER TO NEXT SET OF DATA ELEMENTS
;
;       ADD     #8,R4           ;ADD 8 BYTES (DECIMAL) TO POINTER
                                ;TO SELECT THE NEXT SET OF DATA
        JMP     CHK             ;GO BACK TO BEGINNING OF PROGRAM
;
; IF IBUF2 IS SPECIFIED, MOVE THE CONVERTED DATA TO IBUF2.

MOVIT:  MOVL    12(AP),R1       ;GET ADDRESS OF IBUF2
;       CMPL    #-1,R1          ;CHECK IF NULL, I.E. ADDRESS=-1(PDP-11 CONVENTIO
        CMPL    #0,R1           ;CHECK IF NULL, I.E. ADDRESS=0 (VAX CONVENTION)
        BEQL    DONE            ;IF SO, THEN WE ARE DONE ALREADY
                                ;OTHERWISE, PREPARE TO MOVE THE DATA
        MOVL    8(AP),R2        ;GET ADDRESS OF CONVERTED DATA
        MOVL    @4(AP),R3       ;GET COUNT OF HOW MUCH DATA (REAL*8 UNITS) TO MO
MVLOOP: DECL    R3              ;DECREMENT COUNTER BY ONE
        BLSS    DONE            ;IF < 0, THEN WE ARE DONE
        MOVQ    (R2)+,(R1)+     ;MOVE ONE REAL*8 UNIT AT A TIME
        JMP     MVLOOP          ;GO BACK AND SEE IF DONE YET
;
; ALL DONE
;
DONE:   RET                     ;RETURN TO CALLER
;
        .PSECT  $LOCAL,PIC,CON,REL,LCL,NOSHR,NOEXE,RD,WRT,QUAD
; DATA AREA
;
CNTR:   .LONG   0               ;THIS IS THE COUNT REGISTER
; SCALING FACTORS
FPCON:  .WORD   ^0056000                ; .5 * 2**56 = 2**55
        .WORD   0
        .WORD   0
        .WORD   0
FPMIN:  .WORD   ^0156000                ; -.5 * 2**56 = -2**55
        .WORD   0
        .WORD   0
        .WORD   0
;
        .END
```

Note: This description was received from R. W. Fillius as part of his response to the CODMAC exercise, on 10/10/87. It may be of use in understanding the types of data sets he has submitted.

Norm Schofield
3/2/89

RWF-1

PIONEER DATA REDUCTION PROCEDURES AT UCSD

The flow chart shown in the Figure depicts many of the routine procedures we use on the Pioneer data. Tapes, represented by the ovals, are labeled with 5-digit serial numbers. The first, second, and third digits are used to index the type of tape; e.g.: M4XXXX for Pioneer 10, and M5XXXX for Pioneer 11; MX6XXX for SUM tapes, etc.

Pioneer data processing at UCSD was originally performed on a CDC3600 owned and operated by the UCSD Computer Center. This machine was taken out of service in July, 1980, and is no longer available. In 1977 our Space Physics Group acquired its own DEC 11/70, and in 1980, a share of a larger 11/780 VAX. All new programs written since that time have been executed on our own computers. Furthermore, in 1979 we undertook an explicit effort to convert our essential programs from the CDC3600 to our DEC equipment, and for the past several years, we have been trying to do as much as we can exclusively with the VAX, because of the increasingly unreliable performance of the 11/70. However, since the Versatec high-resolution plotter and the 7-track tape drive are attached to the 11/70, we cannot wean ourselves completely from this machine yet.

A residual problem comes from the fact that our tape formats were originally set up for 7-track tapes, but the VAX uses 9-track tape drives exclusively, as do all present day machines. Therefore we copy all 7-track EDR and Trajectory tapes onto 9-track tapes using our 11/70, which has both types of tape drives. It is one of the quirks of this business that there is a lot of arbitrariness in how one can reformat a tape from seven tracks to nine tracks. Our 9-track tapes are written in a "pseudo 7-track" format which we have found convenient. Since 1985-6 we have been receiving our EDR and Trajectory tapes from the Pioneer Project in a 9-track format in order to eliminate this copying operation and its dependence on the 11/70. Unfortunately, the PPO's 9-track format is different from our "pseudo 7-track" format. We accommodate this difference with our reduction program, but it does create an inhomogeneity within our archive. The reader may be further bemused to know that the EDR tapes we receive from NASA were formatted for a Burroughs 6700 computer. Our software, of course, has always unscrambled the bits to make the data legible with whatever machine we are using at the time.

Once on 9-track tape, the initial stages of data reduction essential to the extended Pioneer mission are depicted on the chain down the left-hand side of the figure, from the REDUCTION program through EDIT, SUMMARY COMPRESSION, and the PDH Programs. Going down the left-hand processing chain, then, the SUM tapes contain rates from all channels of the UCSD instrument averaged over a suitable interval, and written out one record

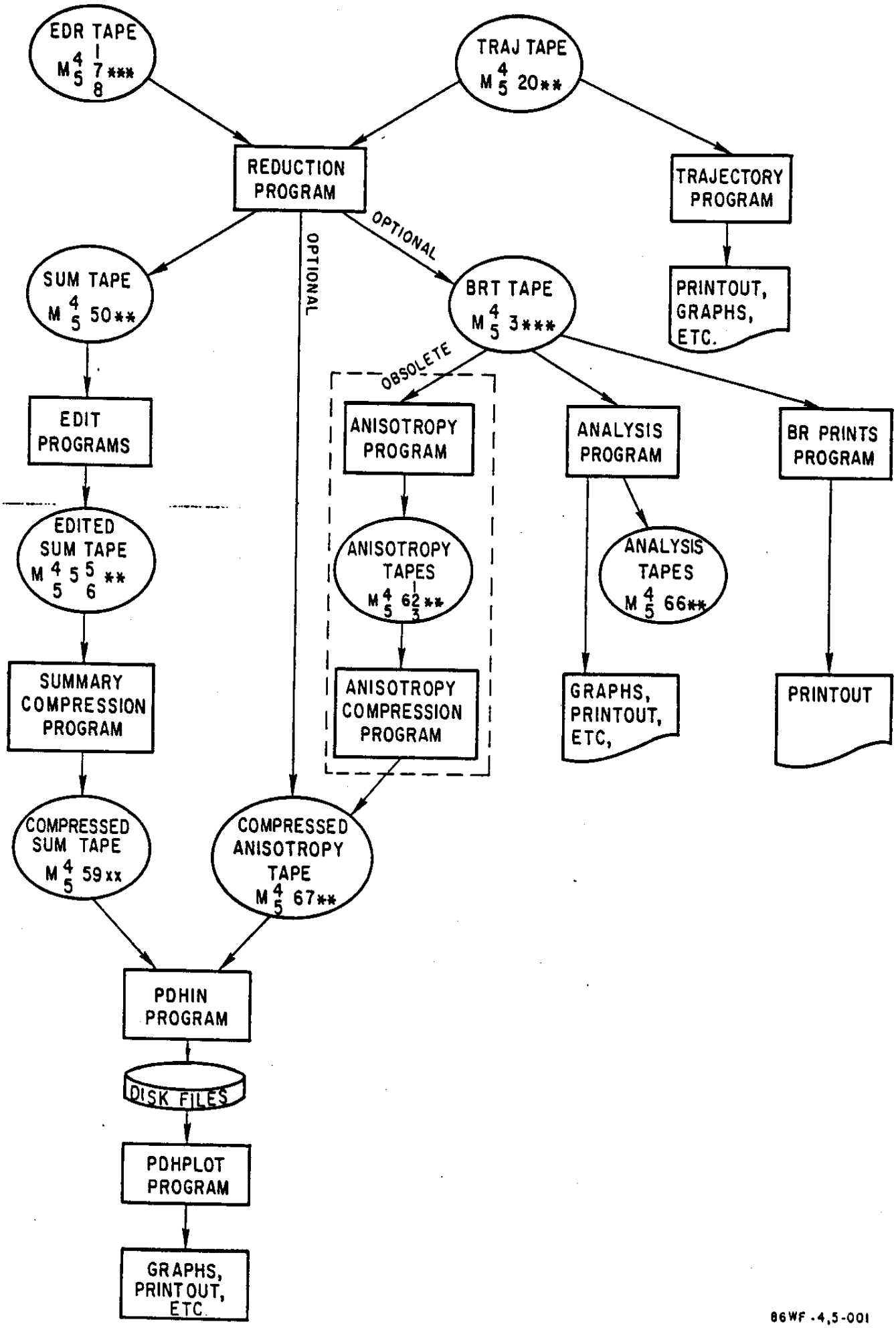
per interval. Half-hour records are standard for interplanetary data, and 108 seconds (the instrument commutation period) for planetary encounter data. Additionally, whenever the spacecraft bit rate and/or format changes, a new record is started in order to keep the record homogeneous (some of the quantities are bit rate and/or format dependent). At a later stage of processing we also create "inhomogeneous" SUM tapes on which any record may contain data taken at several data rates. Ephemeris information from the Trajectory tape is also merged in with these averages. Time is always measured in Spacecraft Time rather than Earth Received Time.

Experience has shown that data bit errors arise, notwithstanding convolutional coding. Therefore a two-pass EDIT procedure is necessary to identify questionable records and delete or modify them after inspection. Edited SUM tapes hold several months to several years of 1/2 hour averages. For many purposes it is more convenient to deal with longer averages spanning all data available. The SUMMARY COMPRESSION program combines the half-hour averages into longer summaries, usually 24 hours. With 24 hour summaries a single tape holds all of our data from one spacecraft. These records are typically "inhomogeneous". All of our output (SUM) tapes down this production chain are written in the same format, and can be processed by the same analysis programs. We call our program for display and analysis the Pioneer Data Handling (PDH) Program, and it is used and shown in two parts, PDHIN, and PDHPLOT. Inhomogeneous Compressed Summary Tapes are the products we deposit annually in the National Space Science Data Center.

Generation of Binary Reduction Tapes (BRT's) by the Reduction Program is optional, and at present the cost of buying, handling, and storing these tapes does not seem worthwhile. When these data are desired in our present mode of operation, we store the data in a disk file until we have accomplished whatever we needed. Then the file is deleted.

Anisotropy processing has been implemented on the VAX, but not in the same way as it was accomplished on the CDC3600. Our present program goes from the BRT disk file straight to a Compressed Anisotropy disk file, which is then copied onto a Compressed Anisotropy Tape identical in format to those written by the 3600.

RWF -3



86WF -4,5-001

D59883

RECORD 1 OF FILE 1
LENGTH = 2400 BYTES

30420000	00000000	00410000	00000000	1752A1DB	00000000	17529AEB	00000000	D4430000	00000000
F64500A0	00000000	4348005B	00000000	4F480009	00000000	40410000	00000000	C0410000	00000000
00450000	00000000	614800F6	00000000	00C10000	00000000	1F4D9D9C	00000000	024EBB22	00000000
1F4D9D9C	00000000	E44D8B5F	00000000	284EF38C	00000000	E84D9A01	00000000	DE4DD32E	00000000
724F98ED	00000000	E14D21AA	00000000	FD4B169E	00000000	504BE8D3	00000000	6F4AE099	00000000
F44A7896	00000000	A94920EA	00000000	53494058	00000000	DF4A8805	00000000	9D4920BE	00000000
15498069	00000000	00000000	00000000	00000000	00000000	00000000	00000000	404900BE	00000000
9A488031	00000000	D0470054	00000000	20490097	00000000	93488091	00000000	1C480040	00000000
00000000	00000000	00000000	00000000	00000000	00000000	414BBC0C	00000000	E44AB84B	00000000
6F4AF0D0	00000000	714AC070	00000000	184A1016	00000000	F149804B	00000000	6C4AC001	00000000
144A9014	00000000	C949C04F	00000000	00000000	00000000	00000000	00000000	00000000	00000000
D14900DD	00000000	8349E0AA	00000000	1D494054	00000000	D549603F	00000000	8949A002	00000000
5449C05C	00000000	00000000	00000000	00000000	00000000	00000000	00000000	C84D95CC	00000000
C74DDC7B	00000000	C64DB589	00000000	C44D8A83	00000000	C94DAAEA	00000000	C54D719E	00000000
C44DD7FE	00000000	CA4D2C4C	00000000	CB4DE2E7	00000000	BE4D20BC	00000000	BE4D20BC	00000000
BE4D20BC	00000000	C64D06BC	00000000	C54DED3F	00000000	CA4D1642	00000000	CB4D5E1E	00000000
CB4DEDD0	00000000	CF4D14ED	00000000	BE4D20BC	00000000	BE4D20BC	00000000	BE4D20BC	00000000
B94D2DB9	00000000	BB4DD73E	00000000	BC4D48D4	00000000	BA4DD5DE	00000000	BD4D5DAB	00000000
BD4D49E6	00000000	BB4D4B21	00000000	BD4D0DB8	00000000	BE4DEC06	00000000	BE4D20BC	00000000
BE4D20BC	00000000	BE4D20BC	00000000	BD4DE7DB	00000000	BE4D2B2D	00000000	BE4D4D6B	00000000
BE4D4504	00000000	BE4DA538	00000000	BE4D4F62	00000000	BE4D20BC	00000000	BE4D20BC	00000000
BE4D20BC	00000000	9B450060	00000000	9B450020	00000000	9A4500A0	00000000	88440080	00000000
88440080	00000000	86440000	00000000	4B4500C0	00000000	4A4500C0	00000000	4C450040	00000000
00000000	00000000	00000000	00000000	00000000	00000000	98430000	00000000	98430000	00000000
96430000	00000000	61440000	00000000	61440000	00000000	61440000	00000000	00000000	00000000
00000000	00000000	00000000	00000000	21470068	00000000	844600B0	00000000	974500C0	00000000
084500C0	00000000	BE430000	00000000	68430000	00000000	BA450020	00000000	83440000	00000000
FA430000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	70420000	00000000
C0410000	00000000	00410000	00000000	14430000	00000000	88420000	00000000	10420000	00000000
00000000	00000000	00000000	00000000	00000000	00000000	DE4F171E	00000000	DD4F99C2	00000000
DD4F9E0B	00000000	C34E7822	00000000	C34E7822	00000000	BF4E8D8F	00000000	914FDEA2	00000000
904FE2EB	00000000	914F5CFE	00000000	00000000	00000000	00000000	00000000	00000000	00000000
D94DF44A	00000000	D94DF44A	00000000	D64D056F	00000000	A04E44D3	00000000	A04E44D3	00000000
A04E44D3	00000000	00000000	00000000	00000000	00000000	00000000	00000000	A94BEE30	00000000
0B4BB44F	00000000	1F4A30D7	00000000	A34AD02A	00000000	624900B4	00000000	0C4980FD	00000000
944AC0C7	00000000	5249C076	00000000	C7488059	00000000	00000000	00000000	00000000	00000000
00000000	00000000	00498094	00000000	4D4800BA	00000000	8A4700FA	00000000	D6480043	00000000
444800E3	00000000	D0470078	00000000	00000000	00000000	00000000	00000000	00000000	00000000
AF4EBA70	00000000	614EC551	00000000	F14DA8BD	00000000	B74EB1D0	00000000	194E1435	00000000
F34D36E3	00000000	4B4EC92C	00000000	AB4D114B	00000000	6A4D10E5	00000000	00000000	00000000
00000000	00000000	00000000	00000000	5A4E84AE	00000000	0A4E744E	00000000	A14DF8D4	00000000
E84D9305	00000000	9D4DB845	00000000	644D68DD	00000000	00000000	00000000	00000000	00000000
00000000	00000000	C04E0B45	00000000	BD4EE17F	00000000	AA4EDEA5	00000000	994E3498	00000000
554E809F	00000000	7B4D20C5	00000000	19494072	00000000	2D4DFE2C	00000000	E254BFEA	00000000
49480053	00000000	00000000	00000000	874B56F9	00000000	E24DCA18	00000000	C74D23AE	00000000
C84D4E1C	00000000	BF4DC468	00000000	BE4D20BC	00000000	BE4D20BC	00000000	BD4D298F	00000000
BE4D170E	00000000	BE4DC858	00000000	B94D0F57	00000000	BE4D20BC	00000000	BE4D20BC	00000000
D04880B1	00000000	774C570C	00000000	B7538114	00000000	5C4BA081	00000000	964EA2C6	00000000
E753B263	00000000	384B8053	00000000	5A4E9E7C	00000000	1156E784	00000000	5D4B5C9E	00000000
964EA2C6	00000000	E753B263	00000000	1C470040	00000000	1C470040	00000000	1C470040	00000000
534BDC9B	00000000	964EA2C6	00000000	E753B263	00000000	87450080	00000000	87450080	00000000
87460040	00000000	10420000	00000000	10420000	00000000	10420000	00000000	BF4A60BF	00000000

RECORD 5053 OF FILE 1
LENGTH = 2400 BYTES

30420000	00000000	00410000	00000000	F753C2BF	00000000	F7537EC2	00000000	B6440000	00000000
F8450080	00000000	63480012	00000000	00000000	00000000	80400000	00000000	40410000	00000000
80430000	00000000	D74C6F12	00000000	00C10000	00000000	A34DFFB0	00000000	034EBEE1	00000000
9A4D3E5A	00000000	A54D48F6	00000000	034EBEE1	00000000	9C4D22E1	00000000	A34D1BBD	00000000
AF4EE87B	00000000	9B4D5389	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
00C10000	00000000	2C430000	00000000	1C430000	00000000	2C430000	00000000	00000000	00000000
00000000	00000000	00000000	00000000	A8420000	00000000	A0420000	00000000	A8420000	00000000
00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
00000000	00000000	1C430000	00000000	1C430000	00000000	28430000	00000000	00000000	00000000
00000000	00000000	00000000	00000000	8747009A	00000000	EC460048	00000000	31460030	00000000
00C10000	00000000	00C10000	00000000	00C10000	00000000	79460080	00000000	AC440000	00000000
47440000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
00C10000	00000000	00C10000	00000000	E4440080	00000000	4A440000	00000000	84430000	00000000
00C10000	00000000	00C10000	00000000	00C10000	00000000	F64FF80A	00000000	DF4FB727	00000000
F64FF80A	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	704F2852	00000000
644F88E0	00000000	704F2852	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
00C10000	00000000	00C10000	00000000	00C10000	00000000	DF4FB727	00000000	DF4FB727	00000000
F04F2852	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	004CE651	00000000
764BA086	00000000	A74A38AC	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
714B40B9	00000000	AE49A0F8	00000000	404940CC	00000000	00C10000	00000000	00C10000	00000000
00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	6E494068	00000000
D24800C2	00000000	FF4700C6	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
CD4EC64C	00000000	954EE565	00000000	254E4FF1	00000000	00C10000	00000000	00C10000	00000000
00C10000	00000000	C94E3B9A	00000000	F84D0B8F	00000000	B44D290C	00000000	00C10000	00000000
00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
924DDDEA	00000000	434D775A	00000000	CF4CC060	00000000	00C10000	00000000	00C10000	00000000
00C10000	00000000	C04E8B36	00000000	C44EC71D	00000000	D64EA493	00000000	9A4EDAF8	00000000
554E809F	00000000	7F4DB095	00000000	C8470034	00000000	00C10000	00000000	00C10000	00000000
00C10000	00000000	00C10000	00000000	00C10000	00000000	CB4DB6FD	00000000	00C10000	00000000
00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	BA4D9552	00000000
00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
BE48000A	00000000	68480078	00000000	1C470040	00000000	404B40FE	00000000	964EA2C6	00000000
DE5391DD	00000000	86490079	00000000	8148000B	00000000	1C470040	00000000	404B40FE	00000000
964EA2C6	00000000	DE5391DD	00000000	14480084	00000000	604800C4	00000000	1C470040	00000000
404B40FE	00000000	964EA2C6	00000000	DE5391DD	00000000	A0420000	00000000	A8420000	00000000
B0420000	00000000	80400000	00000000	80400000	00000000	80400000	00000000	E04A8837	00000000

D59882

FILE 1 RECORD 5744 2400 BYTES

(0)	30420000	00000000	00410000	00000000	F753C28F	00000000	F7537EC2	00000000	B6440000	00000000
(40)	F8450080	00000000	63480012	00000000	00000000	00000000	80400000	00000000	40410000	00000000
(80)	80430000	00000000	D74C6F12	00000000	00C10000	00000000	A34DFFB0	00000000	034EBEE1	00000000
(120)	9A4D3E5A	00000000	A54D48F6	00000000	034EBEE1	00000000	9C4D22E1	00000000	A34D1BBD	00000000
(160)	AF4EE87B	00000000	9B4D5389	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
(200)	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
(240)	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
(280)	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
(320)	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
(360)	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
(400)	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
(440)	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
(480)	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
(520)	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
(560)	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
(600)	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
(640)	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
(680)	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
(720)	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
(760)	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
(800)	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
(840)	00C10000	00000000	2C430000	00000000	1C430000	00000000	2C430000	00000000	00000000	00000000
(880)	00000000	00000000	00000000	00000000	A8420000	00000000	A0420000	00000000	A8420000	00000000
(920)	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
(960)	00000000	00000000	1C430000	00000000	1C430000	00000000	28430000	00000000	00000000	00000000
(1000)	00000000	00000000	00000000	00000000	8747009A	00000000	EC460048	00000000	31460030	00000000
(1040)	00C10000	00000000	00C10000	00000000	00C10000	00000000	79460080	00000000	AC440000	00000000
(1080)	47440000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
(1120)	00C10000	00000000	00C10000	00000000	E4440080	00000000	4A440000	00000000	84430000	00000000
(1160)	00C10000	00000000	00C10000	00000000	00C10000	00000000	F64FF80A	00000000	DF4FB727	00000000
(1200)	F64FF80A	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	704F2852	00000000
(1240)	644F88E0	00000000	704F2852	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
(1280)	00C10000	00000000	00C10000	00000000	00C10000	00000000	DF4FB727	00000000	DF4FB727	00000000
(1320)	F04F2852	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	004CE651	00000000
(1360)	764BA086	00000000	A74A38AC	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
(1400)	714B40B9	00000000	AE49A0F8	00000000	404940CC	00000000	00C10000	00000000	00C10000	00000000
(1440)	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	6E494068	00000000
(1480)	D24800C2	00000000	FF4700C6	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
(1520)	CD4EC64C	00000000	954EE565	00000000	254E4FF1	00000000	00C10000	00000000	00C10000	00000000
(1560)	00C10000	00000000	C94E3B9A	00000000	F84D0B8F	00000000	B44D290C	00000000	00C10000	00000000
(1600)	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
(1640)	924DDDEA	00000000	434D775A	00000000	CF4CC060	00000000	00C10000	00000000	00C10000	00000000
(1680)	00C10000	00000000	C04E8B36	00000000	C44EC71D	00000000	D64EA493	00000000	9A4EDAF8	00000000
(1720)	554E809F	00000000	7F4DB095	00000000	C8470034	00000000	00C10000	00000000	00C10000	00000000
(1760)	00C10000	00000000	00C10000	00000000	00C10000	00000000	CB4DB6FD	00000000	00C10000	00000000
(1800)	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	BA4D9552	00000000
(1840)	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000	00C10000	00000000
(1880)	BE48000A	00000000	68480078	00000000	1C470040	00000000	404B40FE	00000000	964EA2C6	00000000
(1920)	DE5391DD	00000000	86490079	00000000	8148000B	00000000	1C470040	00000000	404B40FE	00000000
(1960)	964EA2C6	00000000	DE5391DD	00000000	14480084	00000000	604800C4	00000000	1C470040	00000000
(2000)	404B40FE	00000000	964EA2C6	00000000	DE5391DD	00000000	A0420000	00000000	A8420000	00000000
(2040)	B0420000	00000000	80400000	00000000	80400000	00000000	80400000	00000000	E04A8837	00000000
(2080)	AC4AE871	00000000	D04CB68F	00000000	9C4A70F5	00000000	8B4BA23B	00000000	704A5012	00000000
(2120)	BF4A68BF	00000000	D04A80E8	00000000	194C3C40	00000000	BE4A900D	00000000	924B8E34	00000000
(2160)	00C10000	00000000	00C10000	00000000	00C10000	00000000	00000000	00000000	E04A8837	00000000
(2200)	AC4AE871	00000000	D04C5E93	00000000	9C4A80F5	00000000	8B4BE83B	00000000	704A0012	00000000
(2240)	BF4A68BF	00000000	D14A187C	00000000	194C3840	00000000	BE4AC00D	00000000	924BA435	00000000
(2280)	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000

LISTING OF 0-59882 FILE 1 RECORD 1

10.	2.	5365001216.	5443198464.	63.	1972.
40000.	43001.	3.	4.	128.	-2.
-2.	119733336.	130964288.	121638096.	119733336.	130964288.
121638096.	119733336.	130964288.	121638096.	6476822.	2594387.
722274.	8603954176.	2135233024.	556095232.	4555103.	313526.
153359.	0.	0.	0.	333333.	133333.
166666.	115799.	42532.	22022.	0.	0.
0.	2896532.	1604907.	856220.	9447487488.	-1953678592.
872621312.	2077604.	574419.	413163.	0.	0.
0.	942807.	339933.	372676.	326674.	211374.
153423.	0.	0.	0.	111228304.	105237440.
106163976.	103240128.	101674616.	102550824.	104064728.	106417728.
106889864.	100000000.	100000000.	100000000.	104949752.	102549512.
102236072.	105767808.	109260608.	112892224.	100000000.	100000000.
100000000.	97763936.	98383464.	99156440.	99195136.	99068008.
99362728.	97807520.	99454184.	99628816.	100000000.	100000000.
100000000.	99646440.	99607768.	99552784.	99645512.	99798776.
99856456.	100000000.	100000000.	100000000.	4293.	4312.
4274.	110.	103.	105.	3684.	3652.
3632.	0.	0.	0.	30.	30.
30.	1019.	1011.	999.	0.	0.
0.	27805.	11187.	3087.	946435.	219929.
58390.	16781.	1145.	557.	0.	0.
0.	10.	4.	5.	118.	43.
22.	0.	0.	0.	6435207168.	2168720640.
6406726144.	164890000.	154397008.	157395008.	5522316288.	5474348032.
5444367872.	0.	0.	0.	44970000.	44970000.
44970000.	1527480960.	1515489024.	1497501056.	0.	0.
0.	4320762.	1730745.	481837.	5739796480.	1424438272.
370977472.	3038761.	209157.	102307.	0.	0.
0.	222370.	88948.	111185.	77251.	28373.
14691.	0.	0.	0.	174775632.	110371864.
58494376.	39795412992.	16192314368.	10355241984.	158223008.	41691960.
29236970.	0.	0.	0.	474306496.	299977760.
335385344.	47967508.	29185248.	21126432.	0.	0.
0.	337635008.	307362528.	332008960.	325576928.	225000000.
60000000.	17432218.	237617414144 0.	89848448.	240848.	2175.
2572439.	149802880.	103955304.	107976456.	100236000.	100000456.
99999992.	99891368.	99746856.	99533464.	94664040.	100000456.
99999992.	2725455.	601508282368.	41927568.	3105159.	302000000.
626605031424.	870899968.	9999999827968.	758600000.	3161999.	302000000.
626605031424.	831799.	10000.	10000.	1820000.	302000000.
626605031424.	3782.	3745.	15032.	31.	34.
33.	1570796.	0.	991484.	1570806.	2838275.
991424.	1570796.	2838221.	5276347.	1564467.	4605404.
-1.	-1.	-1.	-1.	1510663.	1225221.
992006.	1571566.	2858989.	991655.	1570796.	2854049.
5276038.	1564495.	4606678.	-1.	-1.	-1.
-1.	-1.	-1.	-1.	-1.	-1.
-1.	-1.	-1.	-1.	-1.	-1.