JADE Computer Note 15
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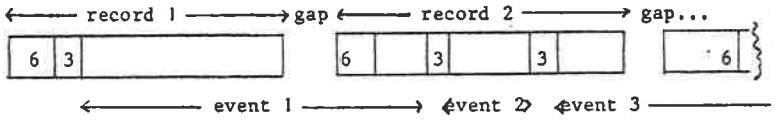
Data Acquisition System: Physical record format on Tape

This note describes the physical record format on tapes written by the data acquisition system, i.e. how the events are compressed into fixed length records. The event format itself will be described in another note. First, we describe the record structure, then FORTRAN subroutines which write and read these tapes.

A. Record structure

Each physical record starts with a header of 6 words, the logical records ("events") with additional 3 words.

In this paragraph: all words are 16-bit words (I * 2), all pointers count 16-bit words!



Word	Mn.	Value	
1	LREC	2048	record length
2	LH	6	record header length
3	NREC		current record number
4	LS		pointer to location before first event in record
	special cases:		
	LS = 0		no event starts in this record
	LS = LH		event starts immediately after record header
5	NRUN		run number
6			for future use
LS+1	LEVT		event length (incl. these 3 words)
	special cases:		
	LEVT = -1		no more events in this record
	LEVT = 0		end of data
+2	ITYP		event identifier
+3	NEVT		current event number

The event following NEVT is formatted according to a future note.

B. Subroutines to read and write the tapes

Write at the NORD: tapes and disc-files are written by the data acquisition system. A user routine to write tapes in the described format can be written on request.

Read at the NORD: SUBROUTINE YREAD on JADE-library. The description is in the Jade-lib folder.

Write at the IBM: SUBROUTINE WNORD, source on F11DIT.JUNK(MCTONORD). The source contains the description. This routine is slow, and used only in special cases, like transfer of M-C-events to the NORD.

Read at the IBM: To read a NORD tape at IBM we need

1. Two libraries:
   F22 YEN.JADE.L and RØ2BUT.CERNLIB
2. JCL for the input tape:
   //GO.FTnnFØØ1 DD DSN=xx,DISP=SHR,UNIT=TAPE,VOL=SER=yy,
   //DCB=(RECFM=F,BLKSIZE=4096,DEN=3),LABEL=(,NL)

   where nn = LUN = input unit
   xx = any name such as F22YEN.NORD1Ø
   yy = Tape name such as F22BØ1
3. The following statements in the main program:

```
INTEGER*2 IARR(N1)
EQUIVALENCE (IARR(5),ID(1))
COMMON/CDATA/LENG,IDDI(2),ID(5000)
COMMON/CMNP/IRUN,IREC,ISTAT,IFLAG,NWPR
```

   where $N_1 = 2^* N_2 + 4$
   N_2 = the maximum length of an event in I*4 words
   ISTAT = the status word
   = 1 normal termination of an event
   = 2 zero event length
   = 3 read error
   = 4 end of file (one end of file)
   = 7 end of tape or end of data (two end of files)

4. to provide values for LUN, IARR(1) and IRUN where

   IARR(1) = N_1 -4

   IRUN = run number (if IRUN ≤ 0 the run number is not checked)

5. CALL AVTIN(LUN,&10), once for each file to initialize the program

6. CALL AVENT(LUN,IARR,&20) to get an event. After each call, the event is stored in array ID and the length of the event is (IARR(2)-3)/2 in I*4 words.

Example:

```
MEMBER EV

C   25/01/79 C9013C01   MEMBER NAME  EV        (S)          FORTRAN      0000000
      INTEGER*2 IARR(10004)                                               0000010
      COMMON/CMNF/IRUN,IREC,ISTAT,IFLAG,NWPR                              0000020
      COMMON/CDATA/LENG,ICD1(2),ID(5000)                                  0000030
      EQUIVALENCE(IARR(5),ID(1))                                          0000040
      DATA LUN/9/                                                         0000050
      DATA NEV/0/                                                         0000060
    1 FORMAT(' READ ERROR IN AVTIN')                                      0000070
    2 FORMAT(' READ ERROR IN AVENT AT NEV = ')                            0000080
      IRUN=9999                                                           0000090
      IARR(1)=10000                                                       0000100
      GO TO 80                                                            0000110
   10 WRITE(6,1)                                                          0000120
      GO TO 300                                                           0000130
   20 WRITE(6,2) NEV                                                      0000140
      GO TO 300                                                           0000150
   80 CALL AVTIN(LUN,&10)                                                 0000160
  100 CALL AVENT(LUN,IARR,&20)                                            0000170
      IF(ISTAT.EQ.4) GO TO 300                                            0000180
      IF(ISTAT.NE.1) GO TO 100                                            0000190
      NEV=NEV+1                                                           0000200
      LENG=(IARR(2)-3)/2                                                  0000210
      CALL YWRITE(2,LENG,ID)                                              0000220
C   THE EVENT IS STORED IN ARRAY ID, THE LENGTH OF THE EVENT              0000230
C   IS EQUAL TO (IARR(2)-3)/2 IN I*4 WORDS                                0000240
      GOTO 100                                                            0000250
  300 CONTINUE                                                            0000260
      STOP                                                                0000270
      END                                                                 0000280
```



```
//F22YEN35 JOB '10218222',YEN,CLASS=A,MSGLEVEL=(1,1)                      000
//*MAIN LINES=(2),ORG=EXT                                                 000
//*  EXEC NEWFAST                                                         000
// EXEC FCLG,PARM.LKED='MAP,LIST',TIME.GO=1                               000
//MACRO EV                                                                000
//LKED.SYSLIB DD                                                          000
// DD                                                                     000
// DD DSN=F22YEN.JADE.L,DISP=SHR,UNIT=FAST                                000
// DD DSN=RC2BLT.CERNLIB,DISP=SHR                                         000
//GO.FT09F001 DD DSN=F22YEN.MCRD10,DISP=SHR,UNIT=TAPE,VOL=SER=F22B01,    000
// DCB=(RECFM=F,BLKSIZE=4096,DEN=3),LABEL=(,NL)                           000
// DD DSN=F22YEN.MCRD10,DISP=SHR,VOL=SER=F22F08,                          000
// DCB=(RECFM=F,BLKSIZE=4096,DEN=3),LABEL=(,NL),UNIT=AFF=FT09F001         000
//GO.FT02F001 DD DSN=F22YEN.MAG.MC90,DISP=(NEW,CATLG,DELETE),            000
// DCB=(RECFM=VBS,BLKSIZE=6240,LRECL=6236),UNIT=TAPE                      000
```