JADE COMPUTER NOTE 66

ADDENDUM

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In the following, recent changes to some of the smearing subroutines are described.

RDALGN:

The preferrable procedure described in the original note (JCN 66) has now been implemented. The variable IPHALG:

```
COMMON /CRDSTA/ NDUM(12),IPHALG
```

is now used as a flag: IPHALG = 0 no deletion of lowenergy blocks
IPHALG <> 0 deletion of lowenergy blocks

BLOCK DATA setting is now IPHALG=1, i.e. low energy lead glass blocks are deleted when the MC data undergo the normal smearing process. The read out threshold is automatically set to the value which corresponds to the period (given by IHIST(3) in COMMON/CTRIGG/). The pulseheights (in MeV) in ALGN are first converted into ADC-counts with help of the average calibration constant (5.32 MeV/count in 1979-80, 4.94 MeV/count in 1981-82) and then all blocks below the readout threshold (5 counts in 1979-80, 6 counts in 1981-82) are rejected. Surviving blocks get their energy in MeV back by a multiplication, count * calibrationconstant. In this way the electronics of the readout is closely simulated.

Note that the 1983-84 lead glass set up is not yet well simulated, the mixture of SF5 and SF6 has not yet been seriously considered in the MC simulation. Thus the 1982 status is still obtained for these latter periods.

Note also that jobs which standardly set IPHALG=20 are not affected, the low energy block cuts are almost the same as with the old algorithmus.

RDRESO:

The smearing process described in the original note gives a momentum resolution comparable to that of the real data. It was however found that the chisquare distribution of the fitted tracks is about a factor 2 higher than in the real data; also the vertex distribution of fitted tracks is not well simulated. This is partly due to the binning with .380 mm, which makes it difficult to tune the smearing with the parameter RJITT. In the new version, RJITT is used without this binning and in addition, RJITT is made dependent on the distance from the drift-wire (the proportionality constant was given by J. Spitzer). With this change, RJITT can be set lower and is now by default .230 mm (previously .270 mm). This is still larger than the single hit resolution in the real data; the chisquare distribution of fitted tracks is therefore still somewhat worse than for real data, although momentum resolution and vertex distribution are now both reasonably described.

WARNING:
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Until a still better recipee for inner detector smearing has been found, great caution has to be exercised if one wants to make a cut in the chisquare distribution of fitted tracks, in the course of a physics analysis.

The following code is now used in RDRESC:

```
      DRIINT = FLOAT(IDR1)*BINMC
C
      Z1 = RN(DUM)
      SQLOG=SQRT(-2.*ALOG(RN(DUM)))
      G1=SIN(PI*2.*Z1)*SQLOG
C G1 IS RANDOM AND GAUSSIAN
      RJITT1 = DRIINT*.677E-3 + RJITT
C
      DRIINT = DRIINT + G1*RJITT1
      IDRI = IFIX(DRIINT/BINMC)
```

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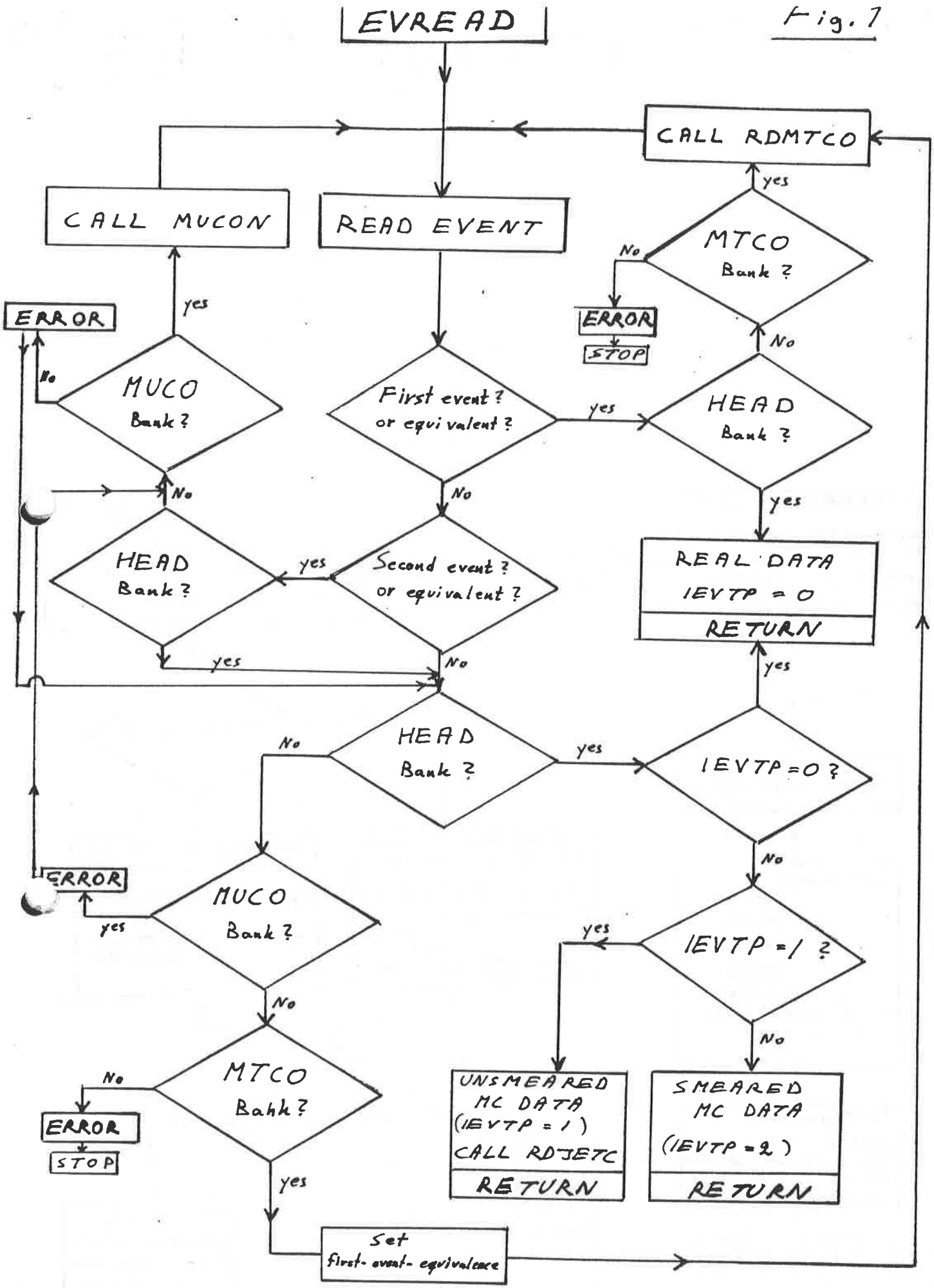
JADEPR.TEXT(JBJCN66A)

Fig. 1


EVREAD
CALL RDMTCO
yes
MTCO Bank ?
No
ERROR
STOP
CALL MUCON
READ EVENT
ERROR
yes
No
MUCO Bank ?
First event ? or equivalent ?
yes
HEAD Bank ?
No
No
yes
HEAD Bank ?
yes
Second event ? or equivalent ?
REAL DATA
IEVTP = 0
RETURN
yes
No
yes
No
HEAD Bank ?
yes
IEVTP = 0 ?
No
ERROR
yes
MUCO Bank ?
yes
IEVTP = 1 ?
No
No
MTCO Bank ?
No
yes
ERROR
STOP
UNSMEARED MC DATA
(IEVTP = 1)
CALL RDJETC
RETURN
SMEARED MC DATA
(IEVTP = 2)
RETURN
Set first-event-equivalence

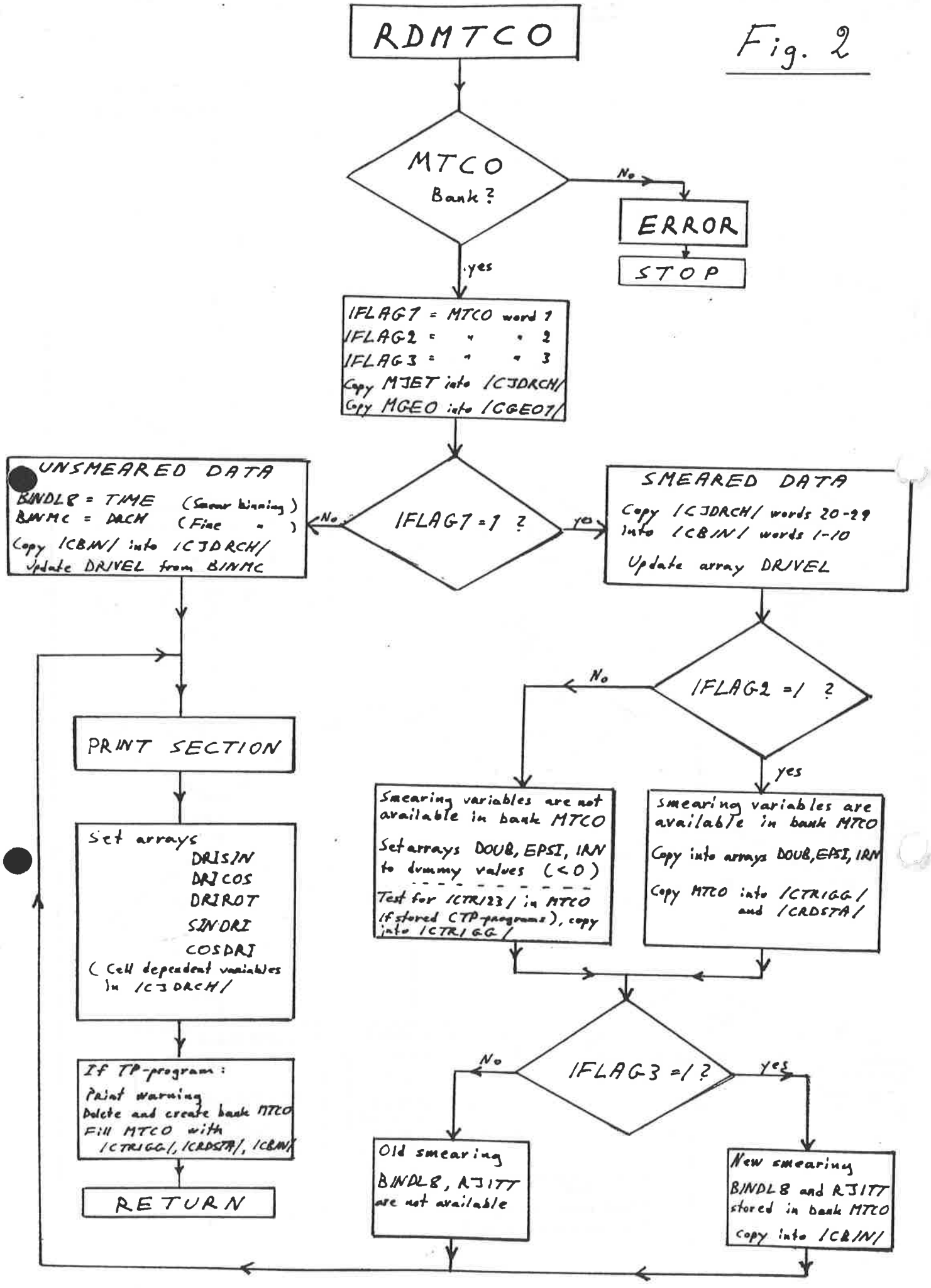
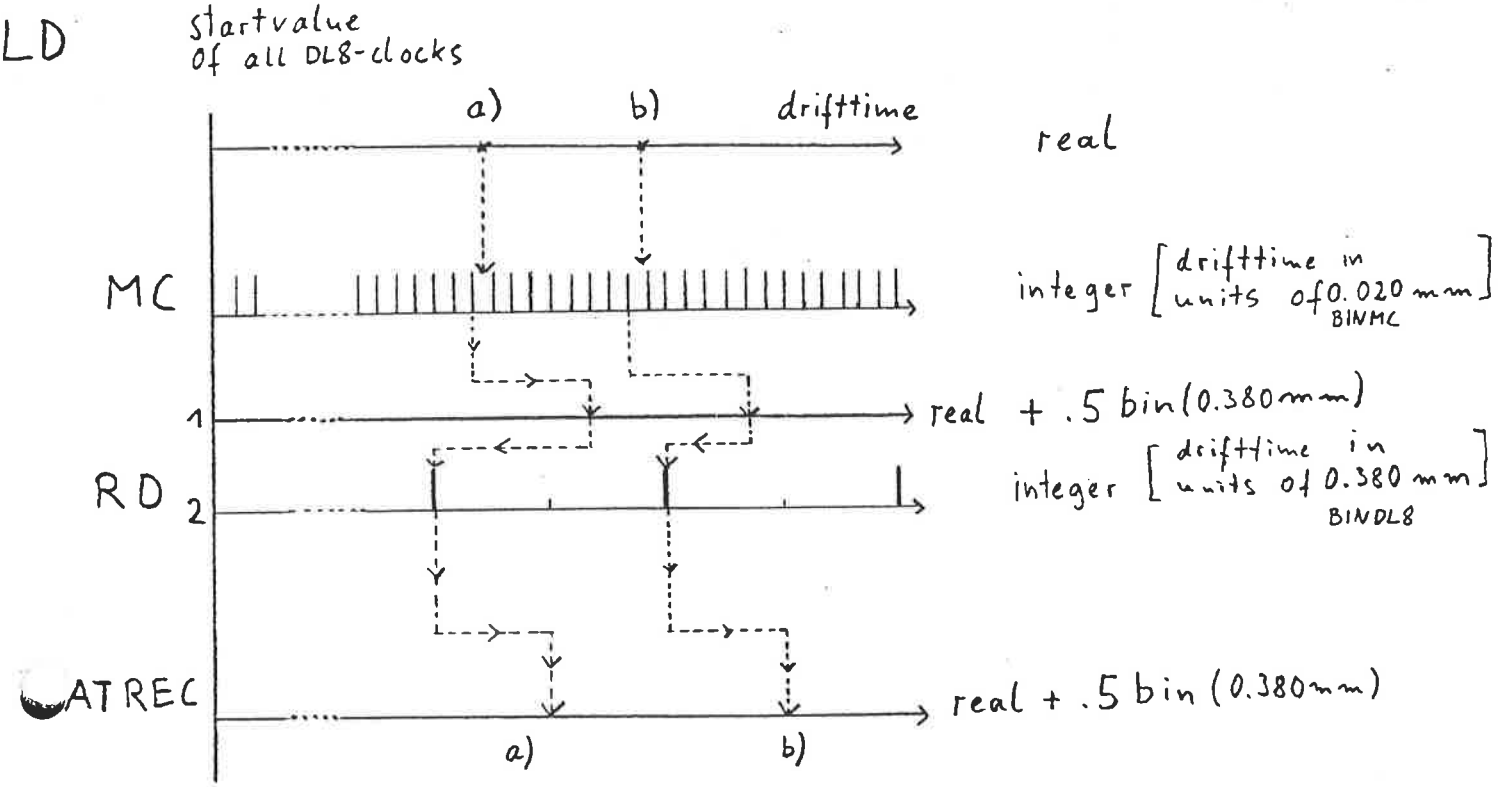

RDMTCO
MTCO Bank?
No
ERROR
STOP
yes
IFLAG1 = MTCO word 1
IFLAG2 = " " 2
IFLAG3 = " " 3
Copy MJET into /CJDRCH/
Copy MGEO into /CGEO7/
IFLAG1 = 1 ?
No
UNSMEARED DATA
BINDLB = TIME (Smear binning)
BINMC = DACH (")
Copy ICBIN/ into /CJDRCH/
Update DRIVEL from BINMC
yes
SMEARED DATA
Copy /CJDRCH/ words 20-29 into /CBIN/ words 1-10
Update array DRIVEL
IFLAG2 = 1 ?
No
yes
PRINT SECTION
Set arrays
DRISIN
DRICOS
DRIROT
SINDRI
COSDRI
(Cell dependent variables) in /CJDRCH/
Smearing variables are not available in bank MTCO
Set arrays DOUB, EPSI, IRN to dummy values (< 0)
Test for /CTRI23/ in MTCO (if stored CTP-programs), copy into /CTRIGG/
smearing variables are available in bank MTCO
Copy into arrays DOUB, EPSI, IRN
Copy MTCO into /CTRIGG/ and /CRDSTA/
If TP-program:
Print warning
Delete and create bank MTCO
Fill MTCO with /CTRIGG/, /CRDSTA/, /CBIN/
IFLAG3 = 1 ?
No
yes
RETURN
Old smearing
BINDLB, RJITT are not available
New smearing
BINDLB and RJITT stored in bank MTCO
copy into /CBIN/

Fig. 2

The Smearing Algorithm in Subroutine KUKESU

OLD



a) o.k.

b) systematic error

NEW