Olsson

JADE - Computer Note No. 16

G. Hughes

H. Wriedt

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# Data Format of the Tagging Banks

(Input and output banks)

Content:



Note: The lay-out of the tagging system and the numbering scheme of drift-chambers, lumonitors, and lead-glass blocks is described in JADE-note no. 35.

## A. Input Data

The tagging system input data are distributed in four different banks:

(i) the latches bank, LATC,
(ii) the scalers bank, SCAL,
(iii) the tagging ADCs bank, ATAG, and
(iv) the tagging drift chambers bank, TAGC.

### A.1 Format of tagging data in the latches bank, LATC (see also JADE note no. 32)

The accidental luminosity coincidences and the luminosity coincidences latches are stored in CAMAC word 19 according to the following scheme:

A.2 Format of tagging data in the scalers bank, SCAL

The contents of 33 scalers are stored in the scalers bank, SCAL, according to the following scheme:

| CAMAC word | contents of scaler |
|---|---|
| (not yet fixed) | L1 = 1A · 1B · 5B · 1S · 5S during data taking |
| | L2 = 2A · 2B · 6B · 2S · 6S " " " |
| | ⋮ |
| | L8 = 8A · 8B · 4B · 8S · 4S " " " |
| | LMZ = L1 + L2 + L3 + L4 " " " |
| | LPZ = L5 + L6 + L7 + L8 " " " |
| | LS = LMZ + LPZ " " " |
| | not yet used |
| | LD1 = 1A · 1B · 5B · 1S · 5S " dead time |
| | LD2 = 2A · 2B · 6B · 2S · 6S " " " |
| | ⋮ |
| | LD8 = 8A · 8B · 4B · 8S · 4S " " " |
| | LDM = LD1 + LD2 + LD3 + LD4 " " " |
| | LDP = LD5 + LD6 + LD7 + LD8 " " " |
| | LDS = LDM + LDP " " " |
| | not yet used |
| | LA1 = 1A · 1B · 1S · (6B · 6S + 7B · 7S + 8B · 8S) during data taking |
| | LA2 = 2A · 2B · 2S · (5B · 5S + 7B · 7S + 8B · 8S) during data taking |
| | ⋮ |
| | LA8 = 8A · 8B · 8S (1B · 1S + 2B · 2S + 3B · 3S) during data taking |
| | LAM = LA1 + ...+ LA4 |
| | LAP = LA5 + ...+ LA8 |
| | LAS = LAM + LAP |
| | not yet used |

A.4 Format of tagging drift chambers bank, TAGC
(see JADE-note no. 32)

| type | word | contents | meaning |
|---|---|---|---|
| I x 4 | INDB-3 | TAGC | name of the bank |
| | -2 | 0 | no. of the bank |
| | -1 | NP | pointer to the next bank of same name |
| | 0 | NW | number of data words in the bank |
| I x 2 | +1 | IB | bank descriptor |
| | | 0 | empty |
| | +2 | | TDC-value and wire address |
| | | | " " " " |
| | : | | |
| | +NW | | TDC-value and wire address |
| | | | " " " " (is 0, if number of CAMAC data words is odd) |

The format of the data words is the following:

| bits | contents |
|---|---|
| 0-3 | drift time |
| 8-15 | address (possible range: 0 to 255) |

B. Output Data

The tagging system output data are stored in 6 different banks, of which 5 have the same name:

the tagging lead-glass cluster bank, ACLS, (77)
and the tagging system bank, TAGG, (76)

which actually consists of 5 banks:

TAGG/0 contains general information,
TAGG/1 " the cluster map,
TAGG/2 " cluster information,
TAGG/3 " lumonitor information,
and TAGG/4 " track information.

| type | word | contents | meaning |
|---|---|---|---|
| I x 2 | 2 | NTRACK | number of tracks |
| | | NTRZMI | " " " in the -Z-part |
| | 3 | NTRZPL | " " " " " +Z-part |
| | | NCLST | " " clusters |
| | 4 | NCLZMI | " " " in the -Z-part |
| | | NCLZPL | " " " " " +Z-part |
| | 5 | NNEUT | " " " with no track nor lumonitors |
| | | ICOL | " " collinear pairs of clusters |
| | 6 | ITYPE | event type: 0, if no decision is made<br>1 for γγ-candidate<br>2 for Bhabha-candidate<br>3 for accidental candidate<br>: |
| | | IER | flag for error messages:<br>0, if no message<br>10, if drift chambers not in use |
| | 7 | ICORR | 1, if detailed energy correction is done |
| | | IPBLAT | 0, if not<br>16 bit word for Pb-glass sums latches |
| | 8 | not yet used | |
| | | " | |
| | 9 : 26 | 33 luminosity trigger scalers plus three unused one yet | (same scheme as in SCAL) |
| | 27 | NWPCL | number of words used per cluster for the cluster information (13, at present) |
| | | NWPTR | number of words used per track for the track information (10, at present) |

| type | word | contents | meaning |
|---|---|---|---|
| I x 2 | +(IB+1) | ICLUS | no. of the cluster |
| | | JPART | -1 for -Z-part, +1 for +Z-part of forward detector |
| | +(IB+2) | IPASS | number of tracks which go through this cluster |
| | | ITRA | no. of the first track which goes through this cluster (0, if no track) |
| | +(IB+3) | ICOLIN | no. of the collinear cluster (0, if none) |
| | | not yet used | |
| | +(IB+4) | not yet used | |
| | | " " " | |
| R x 4 | +(IB+5) | ENERGY | cluster shower energy in GeV |
| | +(IB+6) | SIGEN | expected error of the energy |
| | +(IB+7) | X | position of the cluster |
| | +(IB+8) | Y | |
| | +(IB+9) | SIG X | expected error of the position |
| | +(IB+10) | SIG Y | |
| | +(IB+11) | DX | direction cosines of the cluster, measured from the event vertex |
| | +(IB+12) | DY | |
| | +(IB+13) | DZ | |

B.2.4 Lumonitor information bank, TAGG/3

| type | word | contents | meaning |
|---|---|---|---|
| I x 4 | IND3-3 | TAGG | |
| | -2 | 3 | |
| | -1 | NP3 | |
| | 0 | NW3 | |

| type | word | contents | meaning |
|---|---|---|---|
| | (ID+4) | not yet used | |
| | | " | |
| Rx4 | (ID+5) | X1 | coordinates of the track in the 1st drift chamber plane |
| | (ID+6) | Y1 | |
| | (ID+7) | Z1 | |
| | (ID+8) | X2 | coordinates of the track in the 2nd drift chamber plane |
| | (ID+9) | Y2 | |
| | (ID+10) | Z2 | |

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JADE - Computer Note No. 17

## Bank Created by the Z-Vertex Reconstruction (ZVERTF)

- Name of the bank : 'ZVTX'
- Contents of the bank :

(1) : Z(vertex) in mm
(2) : $\sigma$ of the z-distribution
(3) : $\sigma_z$ = error of z = $\sigma\sqrt{n}$
(4) : number of hits in peak of z-distribution
(5) : number of background hits
(6) : IFLAG = -2 if < 8 hits in ring 1
= 0 if (peak/background < 2.0) .AND. ( < 5 hits in vertex peak)
= 1 if (peak/background > 2.0) .AND. ( < 5 hits in vertex peak)
= 2 if (peak/background < 2.0) .AND. ( > 5 hits in vertex peak)
= 3 if (peak/background > 2.0) .AND. ( > 5 hits in vertex peak)

$$\left.\begin{aligned} Z_v &= 0 \\ \sigma &= \sigma_z = 10^6 \end{aligned}\right\} \quad \text{if IFLAG} < 0.$$

JADE Computer Note 18

J. Allison
P. Dittmann
E. Elsen
L. O'Neill
P. Steffen
S. Yamada

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## How to change existing analysis routines to become fully BOS compatible

The feeling of the JADE collaborators present at the last offline software meetings was that it is now dangerously late to commit the offline software group to a radical changeover of all routines accessing the common block "CDATA" from "fixed pointer" to "bank" coding. The necessary changes would appear to be straightforward, but all routines accessing "CDATA" would have to be changed at the same time, and this would necessarily entail some difficult-to-estimate number of days during which nothing would be accomplished except the debugging of routines which are now working. Furthermore appearances may be deceptive. No one in the JADE collaboration has been working with BOS within real analysis routines or can say with any confidence that no unforeseen difficulties will arise. Finally, a consideration not related to the software development schedule, the use of the BOS as opposed to our current fast read routine will involve some small but probably significant sacrifice of throughput rate at the stage of the first data reduction, probably of the order of 10%. In view of the predictable shortage of CPU time at DESY in the future this should not be considered trivial.

On the other hand the meeting took note of the fact that later stages of data analysis, after the first reduction, will use the BOS system. It was considered very desirable that existing routines, which will be used in the first data reduction, be changed so that they can also be used in programs using BOS. The following recommendations are accordingly made:

1) The standard libraries should be changed so that the common "CDATA" is introduced only via the standard MACRO of the same name. It may be necessary to implement routine specific DIMENSION and EQUIVALENCE statements.

on which reformatting and fixed pointer creation have been done once and for all. This measure will save CPU time if, as seems likely, the reformatting program can become well tested and go into production running very fast, while the program doing the first data reduction will be run many times on the same data before it is considered well tested, i.e. before it generates any output tapes at all.)

6) After 1) - 4) has been done the name of the common in MACRO "CDATA" should be changed to "BCS", the BOS common name, and the first word, NWORD, should be removed.

Consequences of Adopting above Proposals:

1) There is no need to change all affected subroutine at once.

2) Programs can use the existing routines together with the BOS system, provided that the function CLOC (and other BOS functions) gets loaded from the BOS-Library.