

JADE - Computer Note No. 16

G. Hughes

H. Wriedt

26.3.1979

Data Format of the Tagging Banks

(Input and output banks)

Content:

A. Input Data

A.1 Format of tagging data in the latches bank, LATC

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

A.3 Format of tagging ADCs bank, ATAG

A.4 Format of tagging drift chambers bank, TAGC

B. Output Data

B.1 Format of tagging lead-glass cluster bank (reordered ADCs data),
ACLS

B.2 Format of tagging system bank, TAGG

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:

word 19

bit no.	contents
0	accidental coincidence LA1
:	
7	" " LA8
8	coincidence L1
:	
15	" L8

The luminosity scintillator latches are stored in the CAMAC word 20 according to the following scheme:

bit no.	contents
0	counter 1A
:	
7	" 8A
8	" 1B
:	
15	" 8B

The lead glass energy sum latches are stored in the CAMAC word ~~21~~ (which is not yet foreseen in JADE note 32) according to the following scheme:

bit no.	contents
0	lead glass sum 1S above threshold
1	" " " 2S " "
2	" " " AS " "
:	
11	" " " DS " "
12	" " " at -Z (SMZ) above lower threshold
13	" " " " -Z (SMZ) below upper "
14	" " " " +Z (SPZ) above lower "
15	" " " " +Z (SPZ) below upper "

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)	$L1 = 1A \cdot 1B \cdot 5B \cdot 1S \cdot 5S$ during data taking
	$L2 = 2A \cdot 2B \cdot 6B \cdot 2S \cdot 6S$ " " "
	⋮
	$L8 = 8A \cdot 8B \cdot 4B \cdot 8S \cdot 4S$ " " "
	$LMZ = L1 + L2 + L3 + L4$ " " "
	$LPZ = L5 + L6 + L7 + L8$ " " "
	$LS = LMZ + LPZ$ " " "
	not yet used
	$LD1 = 1A \cdot 1B \cdot 5B \cdot 1S \cdot 5S$ " dead time
	$LD2 = 2A \cdot 2B \cdot 6B \cdot 2S \cdot 6S$ " " "
	⋮
	$LD8 = 8A \cdot 8B \cdot 4B \cdot 8S \cdot 4S$ " " "
	$LDM = LD1 + LD2 + LD3 + LD4$ " " "
	$LDP = LD5 + LD6 + LD7 + LD8$ " " "
	$LDS = LDM + LDP$ " " "
	not yet used
	$LA1 = 1A \cdot 1B \cdot 1S \cdot (6B \cdot 6S + 7B \cdot 7S + 8B \cdot 8S)$
	during data taking
	$LA2 = 2A \cdot 2B \cdot 2S \cdot (5B \cdot 5S + 7B \cdot 7S + 8B \cdot 8S)$
	during data taking
	⋮
	$LA8 = 8A \cdot 8B \cdot 8S (1B \cdot 1S + 2B \cdot 2S + 3B \cdot 3S)$
	during data taking
	$LAM = LA1 + \dots + LA4$
	$LAP = LA5 + \dots + LA8$
	$LAS = LAM + LAP$
	not yet used

A.3 Format of tagging ADCs bank, ATAG

(see also JADE-note no. 32)

type	word	contents	meaning
I x 4 ↓ I x 2 ↓ ✓	INDA-3	ATAG	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
	+1	{ IB 0	bank descriptor empty
	+2	{ IPM IPZ	pointer to the first data word in the -Z-part (always +1) pointer to the first data word in the +Z-part
	+3	{ IPL ILAST	pointer to the first data word of the luminosity scintillators pointer to the last data word +1
	+4	{	ADC-address
	⋮	{	ADC-content
	+NW	{	ADC-address ADC-content

ADC-addresses 0 to 95 correspond to the lead glass blocks on the -Z-side (blocks 0, 47, 48, and 95 are fictitious);

ADC-addresses 96 to 191 correspond to the lead glass blocks on the +Z-side (blocks 96, 143, 144, and 191 are fictitious);

ADC-addresses 192 to 207 correspond to the 16 luminosity counter scintillators, 1A, ..., 8A, 1B, ..., 8B;

ADC-addresses 216 to 227 correspond to the 12 tagging lead glass sums, 1S, 2S, AS, ..., 7S, 8S, DS;

ADC-addresses 228 and 229 correspond to the tagging lead glass sums on the -Z-side, SMZ, and on the +Z-side, SPZ, respectively.

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.

B.1 Format of tagging lead-glass cluster bank, ACLS

This bank contains the addresses and energy values in GeV of the lead-glass ADCs, reordered in such a way that blocks belonging to the same cluster are grouped together.

Of each cluster the block with the maximum energy deposited in will be the first in the data belonging to that cluster.

type	word	contents	meaning
I x 4 ↓	INDC-3	ACLS	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 ↓			version no.
	+1	identifier of the program	bank generation date and time, according to: ddmm, e.g. 31129 means: 31.12.79
	+2	IPM	pointer to the first data word in the -Z-part (always +1)
		IPZ	pointer to the first data word in the -Z-part
	+3	0	empty
		IPL	pointer to the last data word +1
	+4		ADC-address
	⋮		ADC-content in GeV
	⋮		ADC-address
	+NW		ADC-content in GeV

B.2 Format of tagging system banks, TAGG

B.2.1 General information bank, TAGG/O

type	word	contents	meaning
I x 4 ↓	INDØ-3	TAGG	name of the bank
	-2	Ø	no. of the bank
	-1	NPØ	pointer to the next bank of same name
	0	NWØ	number of data words in the bank
	1	Identifier of the program	version no. bank generation date and time, according to: ddmm, e.g. 31120 means: 31.12.1980

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 1 for $\gamma\gamma$ -candidate 2 for Bhabha-candidate 3 for accidental candidate ⋮
		{ IER	flag for error messages: 0, if no message 10, if drift chambers not in use
	7	{ ICORR	1, if detailed energy correction is done 0, if not
		{ IPBLAT	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
R x 4 ↓	28	ACOLAN	acollinearity angle (in radian) between tracks (or clusters) with highest energy in each part of the detector (ACOLAN = 2π , if there are tracks/clusters only in one part of the detector)
	29	ETOT	total energy in GeV
	30	ETOTZM	" " in the -Z-part
	31	ETOTZP	" " " " +Z-part
	32	ENTOT	" " of clusters without tracks and lumonitors
	33	ENTOTM	" " " " without tracks and lumonitors in the -Z-part
	34	ENTOTP	" " " " without tracks and lumonitors in the +Z-part

B.2.2 Cluster map bank, TAGG/1

type	word	contents	meaning
↑	IND1-3	TAGG	
I x 4 ↓	-2	1	
	-1	NP1	
	0	NW1	
		1	{ HMAP(1,1) first index of the first cluster in the reordered ADC-data (bank ACLS)
I x 2 ↓		...	{ HMAP(2,1) last index of the first cluster...
		...	{ ...
	NW1		{ HMAP(1,NW1) first index of the last cluster in the reordered ADC-data
	=NCLST		{ HMAP(2,NW1) last index of the last cluster in the reordered ADC-data

B.2.3 Cluster information bank, TAGG/2

type	word	contents	meaning
I x 4 ↓	IND2-3	TAGG	
	-2	2	
	-1	NP2	
	0	NW2	

The cluster information for the n.th cluster can be obtained by means of NWPCL:

$$IB = (N-1) \times NWPCL$$

type	word	contents	meaning
I x 2 ↓	+(IB+1)	{ ICLUS JPART	no. of the cluster - ($\frac{t}{\tau}$ for -Z-part, $\frac{t}{\tau}$ for +Z-part of forward detector
	+(IB+2)	{ IPASS ITRA	number of tracks which go through this cluster no. of the first track which goes through this cluster (0, if no track)
	+(IB+3)	{ ICOLIN not yet used	no. of the collinear cluster (0, if none)
	+(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
↑ I x 2 ↓	1	{	ADC-value of the A-counter #1
			ADC-value of the B-counter #1
	8	{	ADC-value of the A-counter #8
			ADC-value of the B-counter #8
	9	{	IACC 0, if no luminosity trigger 1, if luminosity trigger 2, if accident luminosity trigger
			IL 0, if lumonitors did not fire j, if the jth lumonitor combination had been fired
	10	{	ILULAT 16 bit word for luminosity scintillators latches
			not yet used


B.2.5 Track information bank, TAGG/4

type	word	contents	meaning
↑ I x 4 ↓	IND4-3	TAGG	
	-2	4	
	-1	NP4	
	0	NW4	

The track information for the m-th track can be obtained by means of NWPTR:

$$ID = (M-1) \times NWPTR$$

↑ I x 2 ↓	+(ID+1)	{	ITRACK	no. of the track
			IX	= 1, if track points to intersection region = 0, if track does not
	(ID+2)	{	IC	= 0, if track does not have an associated Pb-glass cluster
			IS	= ICLUS, the number of the associated cluster = 0, if lumonitors did not fire on this track = i, if track should have fired the i-th lumonitor combination
	(ID+3)	{	IF	= 0, if lumonitors did not fire on this track = j, if the j-th lumonitor combination had been fired
			not yet used	

type	word	contents	meaning
	(ID+4)	{ not yet used "	
	(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	

