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Conventions of Jet Chamber Data Formats

for

Pattern Recognition and Related Programs.

A. Nomenclature

LAYER : all wires in the central detector that have the same R (distance from the origin).

RING : 16 layers form a ring.

Ring 1 = layer 1 16
Ring 2 = layer 17 32
Ring 3 = layer 33 48

CELL : The rings are divided in 24 (ring 1,2) or 48 cells. Each cell contains 16 wires of approximately the same ϕ value.

SEGMENT : One cell of ring 1 and of ring 2 and two cells of ring 3 form a segment.

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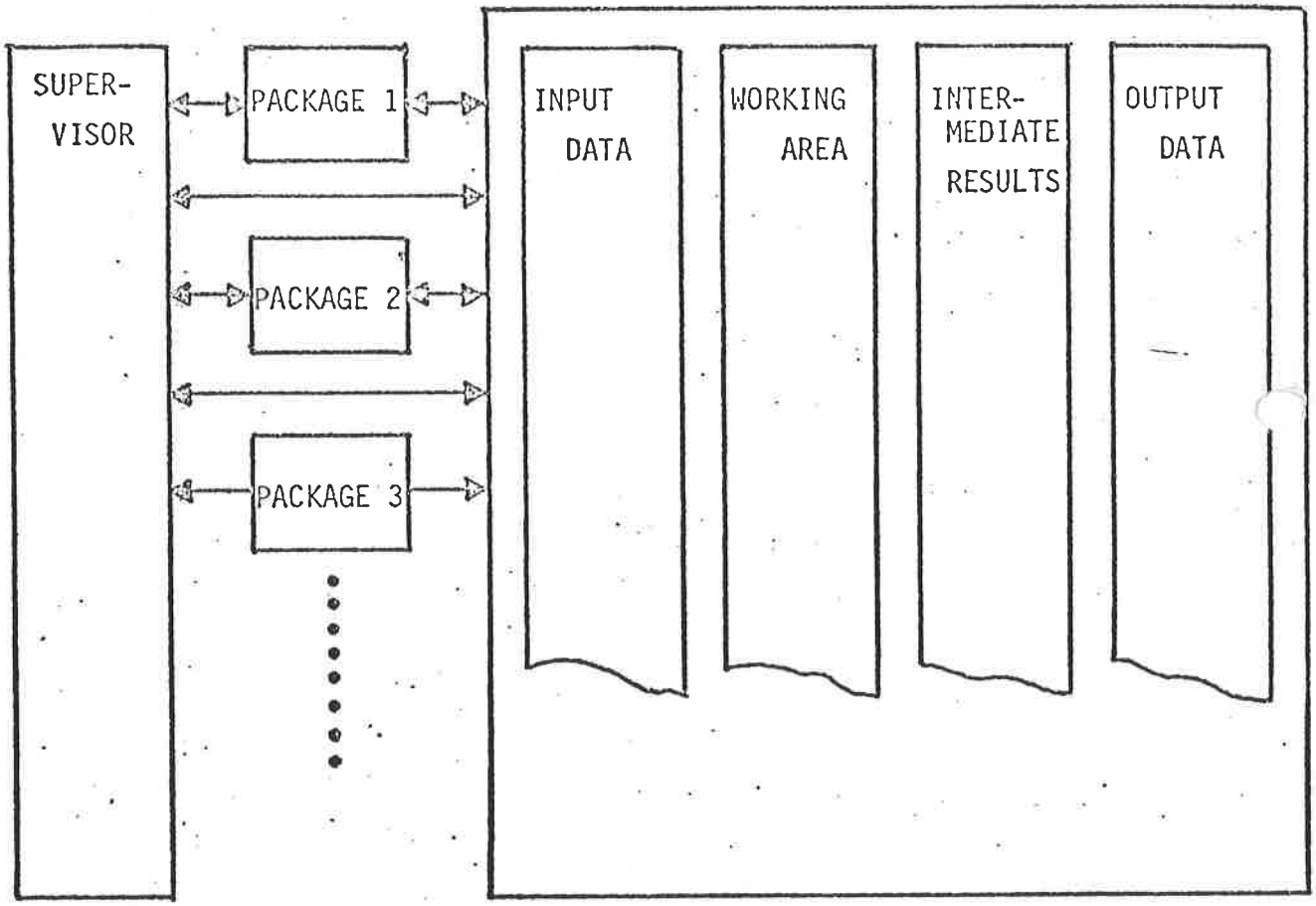
B. Program Structure



SUPERVISOR : program for steering the analysis of one event, replaceable by an operator at an IPS-terminal.

PACKAGE : Package of one or more subroutines for certain tasks in the analysis of an event.
Details are given below.

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C. PACKAGES :

- display on IPS - terminal
- event classification
- cell classification, <h>, <n>, ...
- Z-vertex calculation
- simple track finding within adjacant cells
- track finding for 'complicated cells'
- simple backtracing of tracks through ring 2 and 1
- backtracing of tracks in 'complicated cells'
- track finding for 'complicated segments' using all 3 rings
- simple track fitting
- refined track fitting
- elimination of uncorrelated hits
- others

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D. INPUT DATA

A. As a first step the input data are converted to the following format. (It might be that the conversion to this format can be done already during the data taking step on the NORD).

1. HPCELL (ICELL); ICELL = 1,98 : pointer to first hit of cell 'ICELL'.
   - HPCELL (97) = pointer to first location after the last hit information.
   - HPCELL (98) = unused.
   - If a cell has no hits the corresponding pointer points to the location of the next hit.

   => HCELL (I+1) - HCELL (I) = No. of locations used for cell 'I'.

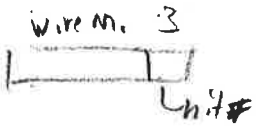
2. HITAR (I) : array with drift chamber data containing always 4 locations per hit :

   IWIR : wire number * 8 + hit #

   A_- : amplitude at '-z'

   A_+ : amplitude at '+z'

   τ : drifttime



- the number of hits/wire is omitted; the wire number is repeated in case of several hits on one wire.

It is foreseen to overwrite the original data with this format in order to save storage space.

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E. WORKING AREA

All data necessary for the correspondence of subroutines within one program package shall be stored in a working common :

COMMON / CWORK / LWORK , HWORK (10 000)

LWORK = 10 000 = length of working area (INTEGER * 2)

The same storage can be used by different packages. The information should be expected to be lost in case of a second call of the same package.

F. INTERMEDIATE RESULTS

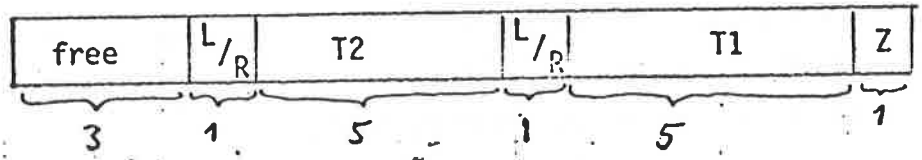
All intermediate results and data necessary for the correspondence between the 'SUPERVISOR' and the different 'PACKAGES' will be stored in a different common. The details are not yet fixed.

G. OUTPUT DATA

The output data consist of the following information :

1. event results : class, No. of tracks, etc.
   details are not yet fixed

2. HLBHIT (I), I = 1, NHIT : Label array (1 label/hit)



: 16 bits

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Z = { 0 if z-measurement is doubtful or wrong
1 if z-measurement is OK

T1 = No. of track, the hit is correlated with

$L/_R$ = { 0 if the left solution is used for T1
1 if the right solution is used for T1

$T2$, $L/_R$ } in case of an ambiguous hit, V-particles or crossing tracks

3. Track banks containing track results

- label of program producing the results
- $1/\rho$, ϕ, θ, origin of the track
- χ^2, fit parameters
- ambiguity marker (in case that one cannot distinguish between the left and the right solution two trackbanks are filled with the two solutions and the ambiguity marker is set).
- others

H. GENERAL CONVENTIONS

- There will be only one simple trackfinding routine.
- More than one pattern recognition package for complicated situations are needed.
- There will be only one simple backtracing routine.
- The backtracing routines should be interchangeable.
- Each package doing pattern recognition should work only on groups of cells.
- Decisions on goodness of fits and success of pattern recognition should be done only by the 'SUPERVISOR'.