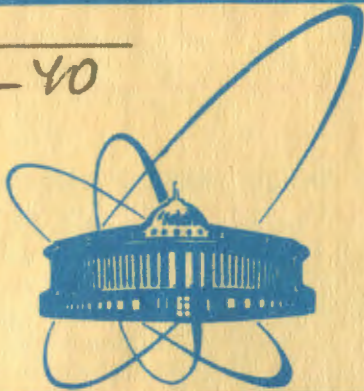


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**PROGRAM PACKAGE
FOR DATA PREPARATION
OF RISK EVENTS.**

2. Auxiliary Programs

AUXILIARY PROGRAMS FOR THE SMHV

In the previous paper^{/1/} we described the program SMHV, which transforms the data from RISK events measured on SAMET or IIVOC devices to such a format as if they were obtained from a HEVAS measuring device. In the present paper we want to describe auxiliary programs which prepare the input and use the output data of the SMHV.

1. PROGRAM DISPLY

DISPLY is designed for printout of a SAMET tape in decimal and hexadecimal format. It makes possible to control the measurements and to check whether an error indicated by the SMHV has been caused by a measurement error or not.

Steering cards (read by (A4,I6) format):

MIN= m, where m is the serial number on the SAMET tape of the first flex to be dumped.

Default value: 1

MAX= n, where n is the serial number on the SAMET tape of the last flex to be dumped.

Default value: 99999

INP= l, where l = 11, 21, or 31, is the logical unit number of the SAMET file.

Default value: 11

LIST Hexadecimal dump is requested too.

The steering cards can appear in any order on logical unit number 1.

Hexadecimal dump

If the card LIST occurs in the input stream, then the program dumps the contents of every record directly without any modification in hexadecimal format, i.e., every 4 bits are represented by one digit /0,1,2,.....,9,A,B,C,D,E,F/.

This format is as much inconvenient for reading coordinate values as octal format could be, but the header information of flexes is directly readable, since the operator sends this information by four bits as well.

Decimal dump

Independently of LIST option, the program decodes the header and measurement information and print them out in decimal format. This printout is reliable only if there is no operator or coding error on the tape.

II. PROGRAM CARDPR

This program - using topology information sent to the SAMET tape by the measuring operator - prepares the steering cards for the SMHV. CARDPR reads the SAMET tape (logical unit number =31) and for the first 50 events it produces steering cards on unit number 50. If it finds the same view (event) measured more than once on the SAMET tape, it uses always the last measurement. Steering cards will be prepared only for those events where the number of flexes coincides with the number promised by the measuring operator. This control of flex number can be switched off by user sequence.

Input cards:

The program reads one data card from logical unit number 1 in (I5) format: the serial number of the first flex on the SAMET file to be processed. (Variable NBEVMIN).

User sequences:

+KEEP, IPRINT.

DATA IPRINT /i/

If $i \neq 0$, additional printout appears about the contents of the SAMET file. Default value: $i=0$.

+KEEP, ICONTR.

DATA ICONTR /i/

If $i=0$, there will be no check for the number of flexes of one event. If $i=1$, only those events will be accepted by the program, for which the number of flexes coincides with the number promised by the measuring operator.

+KEEP, CPRMAX.

DATA MAXEV, MAXEV1 /i, j/

- i is the maximal number of events for which SMHV steering cards are to be produced. Default value: 50.
- j is the maximal number of events to be read from the SAMET tape (after skipping the first NBEVMIN flexes).

If there is more than j events on the tape, then an end of file is simulated. Default value: $j = 200$.

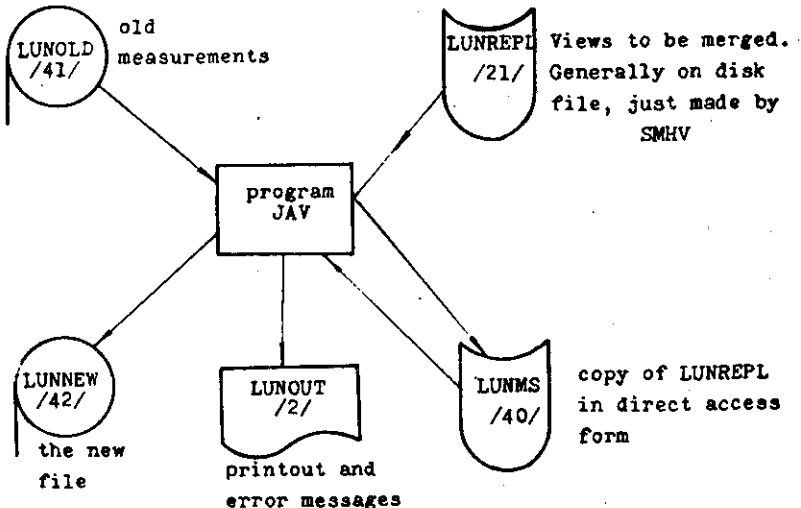
If one redefines the sequence CPRMAX, one has to redefine dimension statements in the sequence CPRCDE, as well.

Printout:

The program lists error messages on LUN = 2 and LUN = 99. Apart from these, a list is printed about the events read, containing roll and frame number of events together with the promised and found number of flexes and with the serial number of flexes on the SAMET tape for each view. If mark /////
 appears before a frame number than the promised and found numbers of flexes do not coincide and the SMHV steering cards will not be issued for this event.

III. PROGRAM JAV

This program is designed for replacing and adding newly measured frames and views in the HEVAS format. The program reads the old HEVAS tape (LUNOLD) and a HEVAS tape containing views to be added or replaced (LUNREPL) and it makes a new HEVAS tape (LUNNEW) from the first two (see the figure). If it finds the same event (view) in two input tapes, then it takes the one from the LUNREPL if its remeasurement number is greater



The input/output data streams of the program JAV.

than that of the LUNOLD. All other measurements are copied to the LUNNEW. The control of the remeasurement number can be switched off by redefining a data statement in the program (variable ICRMS). If it is 0, every event (view) from the LUNREPL will be recorded to the LUNNEW. If the patch PRINT is used, everything recorded to the LUNNEW will be dumped on the LUNOUT too.

Restrictions:

The program supposes the following about the HEVAS tapes:

- 1./ Files LUNOLD and LUNREPL were made by the SMHV or by an earlier run of the JAV.
- 2./ There is no more than 50 events on the LUNREPL.
- 3./ Events on the LUNREPL came from 10 different rolls at maximum.

If these restrictions are not kept, the program sends an error message and stops - or works erroneously.

IV. PROGRAM KERTAV

This program averages the coordinates from fiducial measurements relative to the first fiducial. It reads the SAMET tape (logical unit number = 21), looks only for fiducial coordinates in every event on it and plots the coordinates of each fiducial in a two dimensional histogram in such a way that the first fiducial coordinate is taken (0,0). The user has to read the most probable value of coordinates from the plots and put them to data statements in the SMHV program, in subroutine FELISM. These values will be used by the SMHV for fiducial identification.

Steering cards:

The user has to supply for the program the histogram parameters.

For every view to be included in histograms:

First card:

IXFH,IYFH in format (2I5)

these are the half widths of histograms in X and Y directions.

Second card:

IOBJ,N,IX1,IX2,IY1,IY2 in format (I1,I4,5X,4I10)

Then the next cards (if N is not zero), in format (I2,8X,2I10):

IP, KORDX, KORDY	}	N times
IP, KORDX, KORDY		
.		
.		
.		

where

IOBJ	is the view number,
N	is the number of fiducials on the view,
IX1	} define the dimension of the view in SAMET units. (That is, the smallest and the largest fiducial coordinates which can happen on the SAMET measurements for the given view, supposing that the first fiducial coordinates are (0,0)). If IX1, IX2, IY1, IY2 are not all zero than prior to the plots for each fiducial of the view, a common plot for all fiducials will appear on the output.
IX2	
IY1	
IY2	
IP	
KORDX	} are the expected coordinates of a fiducial relative to the first fiducial. This point will be the center of the plot.
KORDY	

If N = 0 no such plot will appear for the given view.

User options:

+USE, DIST.

If this Patchy steering card is used, then one dimensional histograms will appear showing the distance between the given and the first fiducial. The distances will be histogrammed in micron instead of the SAMET unit (= 2.5 μ).

V. PROGRAM PRTHOT

This program dumps a HEVAS tape in octal format. The logical unit number of the HEVAS tape is 22. The program needs one data card: the number of files to read. Its format is (I3).

VI. PROGRAM SELECT

This program is designed for listing and copying of data files containing "events" (i.e., logically connected data sequences). The definition of an "event" is in the user's hand. The listing and copying is steered by cards, which makes possible to copy only wanted "events" to another file.

The description of this program stands apart the framework of the present paper. Here we only describe the application of this program for selecting "events" (flexes or frames) from a SAMET or a HEVAS tape.

1. / Steering cards:

Program SELECT has two sorts of steering cards: immediate cards, which are executed when the program reads them, and logical cards, which determine the characteristics of "events" to be selected.

a. / Immediate cards are flagged by "*" in the first column and are identified by the first 3 letters of the card key. Blanks and trailing characters of the key are allowed and ignored. The key is separated from the first parameter by a comma, the card is terminated by "." or by column 80.

Immediate cards may be:

* BACKSPACE,L.

backspace one record on LUN=L.

*CONTROL,L.

read steering cards from LUN=L. Default: LUN=1.

*ENDFILE,L.

write end of the file mark to LUN=L.

*FORWARD,L,N.

LUN=L is positioned after the event number N.

*INPUT,L.

start to process file L. Logical cards must be read before this card. If LUN=0, file 11 is supposed.

*REWIND,L.

rewind LUN=L.

*SKIPFILE,L.

LUN=L is positioned after the next end of file mark.

If one wants to set the tape before EOF, use

*SKIPFILE,L.

*BACKSPACE,L.

b. / Logical cards describe which events are to be selected and what is to be done with them.

COPY,LUNOUT,LUNIND,LUNST.

This card describes what to do with the events fulfilling conditions. Conditions are described in the condition cards coming after the card COPY and before the card *INPUT.

Meanings of the parameters:

If LUNOUT \neq 0, write the event to file LUNOUT.

If LUNIND \neq 0, call a user routine which generally prints out information on the file LUNIND about the event.

If LUNST \neq 0, print statistics to file LUNST about the accomplishment of the conditions.

Selection conditions are described in condition cards. One condition is described in one card. Conditions in different cards are in OR relation, except if there is a card containing AND. on column 1-4 between two condition card groups.

The condition cards have the following format:

keyword, logical relation, L1,L2.

Here

keyword depends on the event to be read. Only the first 3 letters are significant, blanks are ignored. For further details see paragraph 2./and 3./ .

logical relation could be: (only the first 3 letters are significant and blanks are ignored)

BETWEEN,
OUTSIDE,
GREATER,
LESS THAN,
EQUAL TO,
NOT EQUAL.

L1 and L2 are numerical parameters for logical relations.

Program SELECT is a framework to make selection operations. The user has to write a couple of user routines and sequences defining the "event", the condition keywords and its meanings, to decide what information to print out about the events, etc. This user routines are written for selecting the events from the SAMET and HEVAS tape. They are stored in pam-file form.

2./ How to select events from the SAMET tape?

Patchy steering cards:

+USE,CONTROL.

or

+USE,SAMET.

The difference between the effect of two cards is only in the printout format.

Condition keywords:

Keyword

EVENT

Meaning

Serial number of the flex on the tape

2./ How to select events from HEVAS tape?

Patchy steering cards:

+USE,HOTSEL.

+USE,ORD. (this card is optional)

Keyword definitions:

<u>Keyword</u>	<u>Meaning</u>
EVENT	Serial number of an event on the tape
RUN	Experiment number \times 100 + run number
ROLL	Roll number
FRAME	Frame number

Printout:

If LUNIND \neq 0 on the COPY card, then one line will be printed about every selected event, containing serial, run, roll, frame numbers of events, together with the view and remeasurement numbers of measured views.

At the end of the run, if a +USE,ORD Patchy card has been used, independently of LUNIND, the same list appears but in sequence of frame numbers. This makes possible to check if the same events occur more than once on the HEVAS tape.

REFERENCES

1. Dénes E., Wagner I., Nagy J. JINR, E10-80-787, Dubna, 1980.

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