The "INDEX" System

(Modifications and additional facilities to the program described in CERN/TC/PROG 64-2)

Several modifications and additional facilities have been included in the INDEX program to simplify its application. The main modification was a change of the sorting and merging routines to allow for event numbers bigger than $2^{22} - 1 (= 4194303)$. It is still assumed that the event number is a floating point number with the measurement number as fraction. (There also exists a special version of INDEX which accepts the measurement number as last digit of a floating point event number. Please contact H. Schneider for details.)

The following items will be discussed in more detail:

1) Tape units for INDEX program
2) Control cards
3) Optional card input from A2
4) Deletion of GRIND and/or SLICE records from the Master Index Tape
5) Listing program for Master Index Tape on the IBM 7090.

1) Tape units for INDEX program

The following tape units are now used by INDEX:

A2 - Program; control card(s) and card input (Scan cards, Alteration cards), if required

A3 - Output; comments and lists of events for this INDEX run are printed

B5 - Update Index Tape(s), if any (GRIND Update tape(s), SLICE Update tape(s), Scan cards, Alteration cards)

B6 - Master Index Tape

B7 - A common tape

2) Control cards

All facilities are governed by one (or two) control cards. The first control card must contain OPTION in columns 1 - 6 and must always be there, even if the rest of the card is blank. If this card is missing or incorrect, the program is terminated.

The following options are possible:

a) Blank card (but OPTION in cols. 1 - 6)
   Input is taken from B5 and merged with the old Master Index to create a new (updated) Master Index tape.
b) NEW MT
A new Master Index tape will be started regardless of what was on this tape before. Usually, this option is only used at the beginning of an experiment.

c) OLD UT
If an Update Index tape is used by INDEX, the tape label is partly overwritten at the end of the program to avoid that, by mistake, the same tape is used once more. Sometimes, however, it may be necessary to use the same Update tape again. The tape will be accepted by the program if this option is required.

d) INPUT
If this option is punched on the control card, INDEX reads input from A2 until it finds a card with LAST in cols. 1 - 4. Then input is switched to B5 and the program reads further input from there, if any. The tape label is checked. If it is correct, more input is added into store. If the label is incorrect (common tape, wrong tape), the program ends, or continues if there is already input in store. See also remarks under 3).

e) DELETE
With this option GRIND and/or SLICE records can be deleted from the Master Index tape. Only in this case must a second control card be present which gives additional details. See also remarks under 4).

One or more options may be requested at the same time. The order in which these options appear on the control card is unimportant. They may be punched anywhere on the card, provided that the word starts at col. 11, 21... 71.

3) Optional card input from A2
Scan cards and Alteration cards can be read from B5 (normal input) or from A2, if option INPUT is punched on the first control card. Scan cards and Alteration cards (and additional input from B5) can be read at the same time. The last card before the End of File card must have LAST in cols. 1 - 4 (otherwise the E.o.F. is struck and the program is terminated). If the LAST card is found the input unit is reset to B5 and further input will be accepted from there. A typical data deck is shown as an example at the end of the report.

4) Deletion of GRIND and/or SLICE records
There exists a possibility to erase information from the Master Index tape, if necessary. The option DELETE must be punched on the first control card in this case. A second control card is required which has the following fixed format:

word 1 (cols. 1 - 5) : GRIND, SLICE
word 2 (cols. 11 - 15) : blank or GRIND date (YYMMDD-year, month, day)
word 3 (cols. 21 - 26) : blank or GRIND date ("","""")
word 4 (cols. 31 - 36) : blank or MODE (or anything else).

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Several combinations are possible:

a) **Word 1 contains GRIND**, words 2, 3 are blank (word 4 is irrelevant for GRIND):
   All GRIND and SLICE information is erased from the Master Index (MI).

b) **Word 1 contains SLICE**, words 2 - 4 are blank:
   All SLICE information is erased from the MI and the DST status word in all GRIND passes is set to zero.

c) **Word 1 contains SLICE**, words 2, 3 are blank, word 4 contains MODE (or anything else):
   All SLICE information is erased from the MI but only positive DST status words are set to zero (negative DST status words, that means rejects and reread measurements, are not altered).

d) **Word 1 contains GRIND (SLICE)**, word 2 contains GRIND date, word 3 is blank:
   All GRIND (SLICE) information from this GRIND date on (inclusive), will be erased (the mode for SLICE depends on word 4; GRIND date for SLICE means the date of the GRIND pass to which this SLICE information belongs).

e) **Word 1 contains GRIND (SLICE)**, word 2 is blank, word 3 contains GRIND date:
   All GRIND (SLICE) information up to this GRIND date (inclusive) will be erased.

f) **Word 1 contains GRIND (SLICE)**, words 2, 3 contain GRIND dates:
   Only GRIND (SLICE) information between the corresponding GRIND dates (inclusive) will be erased.

It is assumed that there is new input (Update tapes, cards) at the same time.

5) **Listing program for IBM 7090**

With this program the Master Index tape can be listed. The mode of listing is given by a data card. The following options are allowed (they can be punched in any order anywhere on the data card starting at cols. 1, 11, 21,..):

a) **Blank card**
   For each event SCAN, GRIND and SLICE, information will be listed together.

b) **SCAN**
   Only SCAN information will be listed.

c) **GRIND**
   Only GRIND information will be listed.

d) **SLICE**
   SLICE information but also GRIND passes with negative DST word will be listed.
e) NO REC
For all events which have no record corresponding to the option (SCAN, GRIND, SLICE), event number and apex letter will be printed.

The format of the listing is printed at the beginning of the output.

It is possible to request more than one option. These options will then be printed in separate blocks. Input (Master Index) for this program is on B6.

6) Typical data deck

```
* DATA
OPTION DELETE INPUT OLD UI  (1. control card)
GRIND 640830  640901  (2. control card)
.SCANNING CARDS FOR EXPERIMENT  EX  (heading card)

scan cards

.DELETION CARDS FOR EXPERIMENT  EX  (heading card)

alteration cards

LAST
END OF FILE
```

The INDEX program and the listing program for the Master Index tape can be obtained from Madame F. Bernasconi (T.C. Program Library).