

Lib. sc. 6; 1969; PAPER J.

Preparation of Schedule-on-Tape for Synthesis of Class Number by Computer.

(Non-conventional methods in document retrieval. 10).

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[Describes the procedure and gives flow-charts for the operation of a general-purpose computer for the transfer on to magnetic tape a schedule of Basic Subjects, schedules of Special Isolates for subjects going with different Basic Subjects, and schedules of Common Isolates of different kinds. Mentions the technique used in identifying a specific schedule and the symbols to indicate the use of a particular Colon Classification Device in forming Isolate Number.]

ABBREVIATIONS USED:

(ACI) = Anteriorising Common Isolate	(CN) = Class Number
(AD) = Alphabetical Device	(END) = Environment Device
(BCN) = Basic Class Number	(GD) = Geographical Device
(BS) = Basic Subject	(IN) = Isolate Number
CC = Colon Classification	(IT) = Isolate Term
(CD) = Chronological Device	(KT) = Kernel Term
(CI) = Common Isolate	(ND) = Numerical Device

1 Scope of the Paper

In an earlier paper (Lib sc. 5; 1968; Paper S), a step-by-step procedure and flow-charts for the preparation of a Schedule-on-Tape and for the synthesis by computer, of a (CN) for subjects going with a particular (BS) in accordance with a freely-faceted version of CC, were given. In Paper D in this volume the different problems in the formulation of the (IT) in the schedule and the (KT) for a subject, have been dealt with. The project reported in this and succeeding paper was essentially concerned with the synthesis of (CN) using the different devices prescribed by CC for the formation of (IN). However, some modification

of the procedure for the preparation of a schedule-on-tape described in the earlier paper was found necessary. The revised program provides for the computer to pick up a (BCN) from a schedule of (BS), the (IN) from a schedule of Special Isolates for the subjects going with the (BS) represented by that (BCN), and from a schedule of (CI). This paper describes the preparation of the different schedules-on-tape. In describing the step-by-step procedure, only the difference from the earlier procedure are indicated. The flow-charts given in Sec 7 of this paper are self-explanatory. The flow-charts and procedure for the computer operations in synthesising (CN) using the devices of CC are given in Paper K in this issue. The experiments were carried out on the general-purpose computer ICL 1903.

2 Schedule-on-Tape

21 KINDS OF SCHEDULES

As in the conventional method for classifying a subject, the following three kinds of schedules were prepared on tape:

- 1 Schedule of (BS), called BS-Schedule;
- 2 Schedules of Special Isolates going with each of the different (BS), called Spl-Schedule; and
- 3 Schedules of Common Isolates, called CI-Schedule.

22 SCHEDULES ON DIFFERENT REELS OF TAPE

It was found helpful to locate each of the three different kinds of schedules mentioned in Sec 21, on different reels of tape.

221 *BS-Schedule*

The schedule of (BS) does not contain a very large number of entries. It can easily be accommodated in a short length of tape in a reel.

222 *Spl-Schedule*

The number of schedules of Special Isolates required for classifying the micro subjects going with each of the different (BS) can be very large. These schedules of Special Isolates may, therefore, run into several reels of tape. Hence, when the computer searches the BS-Schedule and picks up a (BCN) for a particular (BS), it is found helpful to give an indication of the reel in which the schedule of Special Isolates for that particular (BS) may be found. For this purpose, against each entry in the BS-Schedule, the number of the reel of tape in which the schedule of Special Isolates for subjects going with the respective (BS) is located, is given. Within the reel, the particular Spl-Schedule for a particular (BS) is identified by means of the (BCN) given at the head of that schedule.

223 *CI-Schedule*

The schedule of (CI) does not contain a very large number of entries. It can be accommodated in one reel of tape. The schedule of (CI) will be used for two purposes:

1 To pick out the (IN) for an isolate deemed to be manifestation of the (FC) Space or of Time; and

2 To pick out the appropriate (IN) whenever the use of a particular device prescribed by CC requiring reference to a schedule of (CI) for the formation of (IN) is indicated in the Spi-Schedule.

23 CONDITION OF NO (BCN) BEING SELECTED

While comparing the (BS) Terms given in the BS-Schedule with each of the (KT) for a subject, a situation may arise such that the computer does not establish a match between any one of the (BS) Terms and a (KT). This condition may indicate that;

1 The (BS) Term has not been formulated in the Expressive Title in facet-analysing the subject (See Paper D, Sec 312 in this volume); or

2 The (KT) representing the (BS) has not been correctly formulated; or

3 A new (BS) Term has been formulated, but the BS-Schedule has not been updated; or

4 A new subject has come up for which there are no schedules on the Schedule-on-Tape.

24 CONDITION OF TWO OR MORE (BCN) BEING SELECTED

While scanning the BS-Schedule, the computer may match two or more (BS) Terms with two or more (KT) formulated for a subject. This condition may indicate:

1 That the subject for which the (KT) have been formulated is a Complex Subject — that is, a case of Phase Relation between two subjects; or

2 A homonym between a (BS) Term and an (IT).

The program for the synthesis of a (CN) involving Phase Relation will be dealt with in a later paper. The problem of homonym between a (BS) Term and an (IT) has been discussed in Sec 421 and 55 in paper D in this volume.

3 Preparation of BS-Schedule Tape**31 PUNCHED CARD****311 *Allocation of Columns***

The 80-columns in the standard punched card were allocated as follows:

Column N	To take
1- 8	Basic Class Number
9-40	Basic Subject Term.
41-48	Number of the reel of tape in which the corresponding SpI-Schedule is located.
77-80	Indication for card sequence

312 *Last Card*

The last card was indicated by placing four asterisks (****) in col 1-4. This is in conformity with ICL software practice.

32 OUTPUT

The output will be a BS-Schedule on magnetic tape and a printout check list of the same schedule.

33 FLOW-CHART

Fig 1 in Sec 71, gives a flow-chart of the computer operations. For convenience of reference, the steps are numbered 1-1, 1-2, 1-3, etc.

The sequence of operations is more or less similar to the one adopted for the preparation of the Schedule-on-Tape prescribed in the earlier paper (Lib sc. 5; 1968; Paper S, Sec 4). In the present case, the computer opened a reel of magnetic tape and labelled it BS-Schedule. An entry in the Schedule-on-Tape described earlier, contained the (IN) and the (IT). Corresponding to these two elements the entry in the BS-Schedule would contain the (BCN) and the (BS) Term. In addition to this, it will carry a number to indicate the reel of the magnetic tape which contained the SpI-Schedule for the subjects going with that (BS). (See Sec 222).

Provision for a print-out of the BS-Schedule for use as a check list was provided for by making use of the off and on conditions of a particular switch.

4 Creation of SpI-Schedules Tape

41 PUNCHED CARD

411 *Allocation of Columns*

The 80-columns in the standard punched card were allocated as follows:

Column N	To take
1- 8	Isolate Number with appropriate connecting digit prefixed.
9-40	Isolate Term.
43-44	Symbol indicating Device to be used in forming the (IN).
76	An asterisk to indicate the last card of the group.
77-80	Serial Number to facilitate sorting the cards in proper sequence.

42 END MARKER

A reel of tape can accommodate several Spi-Schedules for subjects going with different (BS). It was found helpful to mark off the end of each Spi-Schedule going with a particular (BS). The symbol used for this purpose was four ampersands (&&&&). This provision prevented the computer from unnecessarily searching in Spi-Schedules for subjects going with (BS) other than that desired.

43 IDENTIFICATION OF PARTICULAR SPI-SCHEDULE

After a (BCN) is picked up from the BS-Schedule, the computer has to locate the particular Spi-schedule for subjects going with the (BS) represented by that (BCN) is another reel of magnetic tape. The serial number given against each entry in the BS-Schedule helps the machine operator to make available to the computer the particular reel of tape containing the Spi-Schedule for subjects going with the (BS) concerned. Within this reel each Spi-Schedule for subjects going with a particular (BS) has as the Header the appropriate (BCN). The computer, while scanning the Spi-Schedules, senses the required Spi-Schedule by matching the (BCN) picked up from the BS-Schedule with that given as Header.

44 FLOW-CHART

Fig 2 in Sec 72, gives a flow-chart of the computer operations. For convenience of reference, the steps are numbered 2·1, 2·2, 2·3, etc. The steps in the preparation of the Spi-Schedule type are similar to those used for the preparation of the BS-Schedule tape.

5 Creation of CI-Schedule Tape**51 PUNCHED CARD****511 Allocation of Columns**

The 80-columns in the standard punched card were allocated in the same pattern as for the preparation of the Spi-Schedule (See Sec 411).

52 SCHEDULES OF (CI)

The following Schedules of (CI) were put in the CI-Schedule tape for the experiment:

- Schedule of Common Energy Isolates
- Schedule of Environment Isolates
- Schedule of Space Isolates
- Schedule of Time Isolates

53 IDENTIFICATION OF SCHEDULE

The formation of an (IN) on the basis of a device is indicated in the appropriate entry in the Spi-Schedule by placing a symbol in the character positions 43 and 44. The symbols used were as follows:

Symbol	Indicates the use of
AD	Alphabetical device
EN	Environment device
ND	Numerical device
SI	Geographical device
TI	Chronological device

To form an (IN) on the basis of (GD), (CD), and (END), the computer has to make use of the schedules in the CI-Schedule tape. To facilitate identification of the particular schedule among the schedules of (CI), it was found helpful to use as Header to the schedule in the CI-Schedule tape the same symbol as the one used in the Spi-Schedules to indicate the device to be used. For example the schedule of Environment Isolates used in (END), is headed by the symbol "EN"; the schedule of Space Isolates, used in (GD), is headed by the symbol "SI"; and the schedule of Time Isolates, used in (CD), is headed by the symbol "TI". This provision prevented the computer searching in a schedule of (CI) other than the one desired.

54 END MARKER

As in the case of the schedules in the SpI-Schedule tape, it was found helpful to mark off the schedule for a particular species of (CI) by the use of four ampersands (&&&&).

55 FLOW-CHART

Fig 2 in Sec 72 gives a flow-chart of the computer operations. The steps in the preparation of the CI-Schedule tape are similar to those used for the preparation of the SpI-Schedule tape.

6 Working Speed

The program for the preparation of each of the three kinds of schedules on tape was run at maximum speed. The card reading speed was 300 characters per minute.

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7 Flow-Chart
 71 PREPARATION OF BS-SCHEDULE

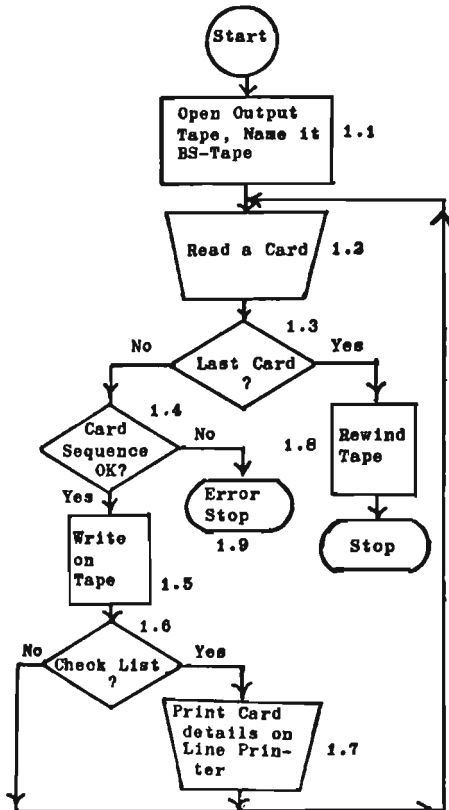


FIG 1. Flow-chart 1: Preparation of BS-Schedule-on-Tape.
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72 PREPARATION OF SPI-SCHEDULE AND CI-SCHEDULE

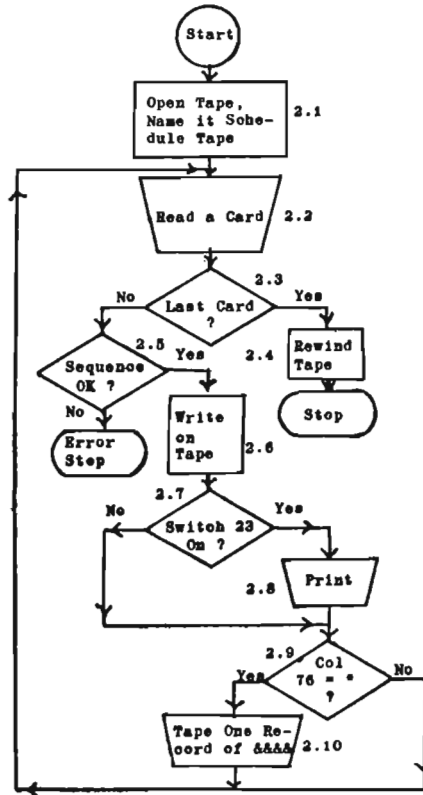


FIG 2. Flow-chart 2. Preparation of SPI-Schedule-on-Tape and CI-Schedule-on-Tape.

8 Specimen of Schedule-on-Tape:

MP85	FOUNTAINPEN		1263	SILVER
MP89	PEN		12J1	GOLD
MC	PENBRAND	AD	12J	METAL
-ZB	PENSTYLE	T1	10P3	WRITINGCOMFORT
-E	PENMAKE	S1	10P3	WRITINGFACILITY
-S1T1	SCHOOLUSE		1470	BREAKING
-S1T2	STUDENTUSE		1474	CORROSION
-S1P1T1	SHORTHANDWRITERSUSE		1472	CRACKING
-S1P1T2	CALLIGRAPHISTSUSE		146	CLOGGING
-S1MP	DRAWINGUSE		14	DAMAGE
-S1MY	MILITARYUSE		-07	WRITINGPRESSURECAUSE
-B1L1	DOCTORUSE		-0	MECHANICALCAUSE
-B1L2	MEDICALMANUSE		-C4	HEATCAUSE
-S1D1	ENGINEERSUSE		-9	INKCAUSE
-S14	REPORTERSUSE		-42	DUSTCAUSE
-S14	JOURNALISTSUSE		-61	DIRTCAUSE
-06	GENTLEMAN		1006	LIFE
-05	LADY		1005	COLOUR
-05	WOMAN		10E4195	FLAMEPROOF
-P1	CHILD		10CP10	THERMALRESISTIVITY
-P3	ADULT		1000	SHAPE
-B	ENVIRONMENT	E1	10A73	PURITY
-L93	PENWITHHEARINGAID		1055	FINISH
-L90	PENWITHCAMERA		17	ASSEMBLY
-L6	PENWITHRADIO		1076	TEST
-L5	PENWITHTORCHLIGHT			

FIG. 3. Specimen print-out of Schedule-on-Tape

T1			
'J	15	.51	WORLD
'K	16	.4	ASIA
'L	17	.41	CHINA
'M	18	.42	JAPAN
'N	19	.44	INDIA
'P	20	.5	EUROPE
		.56	GREATBRITAIN
EN		.571	SWEEDEN
M	PHYSICAL	.572	DENMARK
M27	PRESSURE	.58	USSR
M271	LOWPRESSURE	.594	SWITZERLAND
M273	HIGHPRESSURE	.6	AFRICA
M4	HEAT	.72	CANADA
M41	LOWTEMPERATURE	.77	USA
M5	RADIATION	.8	AUSTRALIA
M52	ULTRAVIOLET	.081	SUBTERRANEAN
N	CHEMICAL	.083	PLAIN
N1	CORROSIVE	.084	DESERT
UA3	TROPICAL	.085	DELTA
MA4	SUBTROPICAL	.088	ISLAND
MA7	ARTIC	.09	FOREST
UC4	DESERT	.91	HAWLET
UG8	SNOWLEVEL	.62	VILLAGE
MP4	SALTWATER	.83	TOWN
UP7	OCEAN	.94	CITY
MQ1	TROPOSPHERE	.94	TOWN

FIG. 4. Specimen print-out of Schedule-on-Tape: CI-Schedule.

9 Acknowledgement

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