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ABSTRACT

This technical manual is intended for the use of those familiar with data processing who wish to understand the internal operations of the PEAPOL system (Program Evaluation at the Performance Objective Level). This automated system is described, including ten specific computer program descriptions with flow charts. Designed to allow vocational teachers and district administrators to closely monitor student progress and costs incurred in individual classrooms, this system generates a series of reports by linking progress data to cost data at the performance objective level of instruction. Operational procedures are discussed, noting these requirements for utilizing this system: (1) performance objectives with time allotments must be set up, (2) individualized instruction is necessary, (3) a time clock to record individual progress is needed, and (4) the school district must have access to a computer system programed for this purpose. Funded under the Vocational Education Act of 1968, this document is related to a nontechnical user's manual and an outside evaluation, available in this issue as VT 018 580 and VT 018 579, respectively. (AG)

# PEAPOL I

## Program Evaluation At The Performance Objective Level

Funded under Vocational Education Act of 1968, Part C

## Technical Manual

Fresno County Department of Education

July 1, 1972

This document was developed for the Fresno County Department of Education under a Vocational Education Act research grant. It is intended for use by persons well versed in data processing who wish to obtain a thorough understanding of the internal operations of the PEAPOL system. Much of the contents of the chapter are taken directly from the final system specifications which were used to define the programming phase of the project. The manual contains sufficiently detailed information to allow experienced programmers and systems analysts to make modifications in the operation of the system and troubleshoot any difficulties which may arise in attempting to use PEAPOL in a production oriented environment. For a nontechnical, more user-oriented view of PEAPOL, it is suggested that the reader refer to the companion manual, Fresno PEAPOL System User's Manual (TM-4902/000/00).

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## A Summary of Capabilities and Constraints

PEAPOL (Program Evaluation at the Performance Objective Level) is an automated system which generates a series of reports designed to allow vocational teachers and district administrators to closely monitor the progress being made, and expenses being incurred, in individual classrooms. The system accepts cost data which is similar to that required by educational budgeting and forecasting systems, but then combines this data with individual student progress information in order to generate a series of reports linking progress data to cost data at the performance objective level of instruction. This allows the costs being incurred in teaching individual performance objectives, and the number of hours spent by each student working on each performance objective, to be monitored on a weekly basis. The system also charts performance trends for each student and each classroom; and it allows special analyses to be made which report the progress that is being made by special groupings of students that may be expected to have instructional requirements different from those of other students. Among others, reports can be generated which provide grouped progress data for students of different ages, sexes, ethnic groups, reading levels, and math levels.

To evaluate student performance on different behavioral objectives, a time clock is installed in each class. This allows the time each student spends working on each behavioral objective to be precisely recorded. This information is then entered into a data base which also is used to collect and analyze student progress data, student descriptive data, and class cost management information.

## Steps Required for the Successful Operation of PEAPOL

The operations listed below are the ones required for the successful operation of PEAPOL. They are all explained fully in this chapter.

Before the semester begins:

a) develop a set of measurable behavioral objectives which completely describe the content of the course;

b) develop the required course and budget information;

c) install time clocks and print the required forms;

d) gather all available student and class information;

e) construct the initial versions of the studentmaster file and the classmaster file;

f) validate all initial data input; and

g) orient teachers and students to PEAPOL's purposes, advantages and procedures.

During the first week of the semester:

a) make final corrections on input data;

b) familiarize students and parents with the purposes and operation of the system; and

c) begin submitting time cards and class event input forms.

Throughout the semester:

a) post the latest copy of the student summary report where students will see it;

b) maintain careful control over the accuracy and completeness of the data entered into the system; and

c) make periodic checks against the teacher's grade book to ensure that student data are being accurately reported and analyzed.

Exhibit 1 - Steps Required for the Successful Operation of PEAPOL

At mid-term and at the end of the semester:

a) provide the student with a copy of the latest data pertaining to his work found in the student summary report;

b) carefully analyze the latest copy of the classroom summary report and the dollar summary report with the objective of modifying instructional procedures inherent in the more expensive performance objectives so that overall class costs can be reduced and/or efficiency increased; and

c) analyze a complete set of special student reports with the objective of modifying general classroom procedures and specific instructional sequences so that specific groups within the classroom will be able to achieve a better level of performance.

Exhibit 1 - Steps Required for the Successful Operation of PEAPOL (Cont'd)

In order for PEAPOL to operate, it must be supplied with various types of information on a scheduled basis. This schedule is summaried in Exhibit 1.

From this flow of information, the system generates four reports on a weekly basis.

The student summary report shows how much time each student has spent on each performance objective, which objectives he has completed, and how his present rate of progress compares to that of previous weeks. It also generates warning or merit indicators whenever this rate changes appreciably.

The classroom summary report produces grouped data which shows the total amount of time all of the students in a class have spent working on each objective, and how the class's present rate of progress compares to that of previous weeks. A special message is generated whenever a class's rate of progress deviates markedly from its established rate. Based on the total amount of time consumed in working on each objective and the number of students who have begun work on each objective, it reports a "present prorated cost" and a "prorated cost per pupil" for each objective, allowing cost analyses to be made at the performance objective level.

The dollar summary report displays overall class budget, dollars expended to date, prorated cost for each objective, and prorated cost per student for each objective.

The special student report groups students by sex, ethnic group, age, reading or math scores, and produces performance data for each group. Thus, the progress being made by students with different reading levels or ethnic group memberships can be reported in summarized, grouped data form, without identifying particular students within each group.

It should not be assumed that PEAPOL is capable of being utilized with any type of instructional situation. There are specific constraints which sharply delimit its use. These constraints can be summarized as follows:

a) the entire course of study must be defined in terms of readily measurable performance objectives which each require approximately the same amount of time for a student to complete;

b) the class must be structured so that every student proceeds independently through the course at his own rate of progress;

c) each classroom must be equipped with a time clock which reports elapsed time to the nearest hundredth-of-an-hour, or an alternate means of recording this information; and

d) the district must have access to a Honeywell computer configuration equipped with an operational version of this system.

Needless to say, these constraints pertain only to this particular system. By modifying the present version of PEAPOL, variations could be produced with entirely different sets of capabilities. However, it was not the purpose of this project to develop a system that would be "all things to all men." Rather, the purpose was to develop a pilot system which could be used to evaluate the practicality of applying the concepts developed by the author in this chapter, and to provide other researchers with a set of proven computer programs which could be used as the core of other reporting systems designed to meet requirements not dealt with satisfactorily by the present version of the system.

The operational version of this system was developed by System Development Corporation and the Fresno County Department of Education under a Vocational Education Act research grant. The project formally began in August, 1971, and the system went into operation in January, 1972. It is now being used in three automobile repair classes located in two different school districts in Fresno County.

The programs operate on a Honeywell computer located at the Fresno Regional Data Processing Center for Education. PEAPOL requires a Honeywell H-200 series computer configuration with 24K of core memory, 5 tape drives, a 132-character line printer and a card reader. Programming is done in Honeywell COBOL (TR) and the Honeywell H-200 (TR) operating system is utilized.

## Hardware and Software Requirements

In keeping with the concept that PEAPOL should be able to be utilized in many different localities, the hardware and software requirements of the system are modest.

The present version of the system operates on Honeywell H-200 series computers equipped with at least:

a) 24K internal storage;

b) 5 tape drives;

c) 132-character line printer; and

d) card reader.

This is the computer configuration utilized in nearly all California educational data processing centers and in many other educational installations throughout the United States.

The system is programmed entirely in Honeywell COBOL D and utilizes the Honeywell H-200 (TR) operating system. Because Honeywell COBOL is highly compatible with the COBOL compilers of other manufacturers, it would be extremely inexpensive and easy to modify the COBOL coding so that the system would operate on machines manufactured by other vendors. All of the program routines are straightforward, and explanations are included within the programs so that program modifications can be made with minimal cost and effort.

## System Description

The PEAPOL system is composed of ten main computer programs:

a) PEAPOL control program;

b) studentmaster build;

c) studentmaster revise;

d) classmaster build;

e) classmaster revise;

f) weekly update;

g) student summary report;

h) special summary report;

i) classroom summary report; and

j) dollar summary report.

The PEAPOL control program routes data to the proper programs and does preliminary editing* to ensure that all input data contain the proper types of information coded in the proper form. It also controls the processing sequence so that, as different activities are attempted by the system, the individual programs are called by the system at the proper times.

Studentmaster build and classmaster build are used to construct the two data files which are the heart of the system. These two files are called the studentmaster file and the classmaster file; they are described in detail later in this chapter. Studentmaster revise and

*In data processing jargon, a reference to a computer program performing "editing" usually means that it has been programmed to ensure that common input errors, such as inverted card orders or numeric rather than alphameric punches (or _vice versa_), will not be accepted as valid input.

classmaster revise are utilized to change information in these files when necessary.

The weekly update program is the most complex in the system. It is used to enter student hours' data and progress data into the studentmaster file, and then to update the classmaster file with the new information contained in the studentmaster file.

The remaining four programs generate output data. They are called student summary report, special summary report, classroom summary report, and dollar summary report.

In addition to the ten main programs, the system also incorporates numerous sort routines. These are used to arrange records in the proper order within the data files or in the generated reports. These sorts are standard within the Honeywell H-200 (TR) operating system and will not be discussed in any detail.

On the following pages, three flowcharts are utilized to depict the relationship between the different system programs. The first flowchart shows how the new files are built, the second shows the weekly file update procedure, and the last shows how reports are generated. These three processing operations comprise the entire scope of the system. Each flowchart shows a type of computer run and describes the programs, types of input, and products resulting from each type of run. These computer runs are used either separately, or in combinations, depending upon what kind of operation is being undertaken.

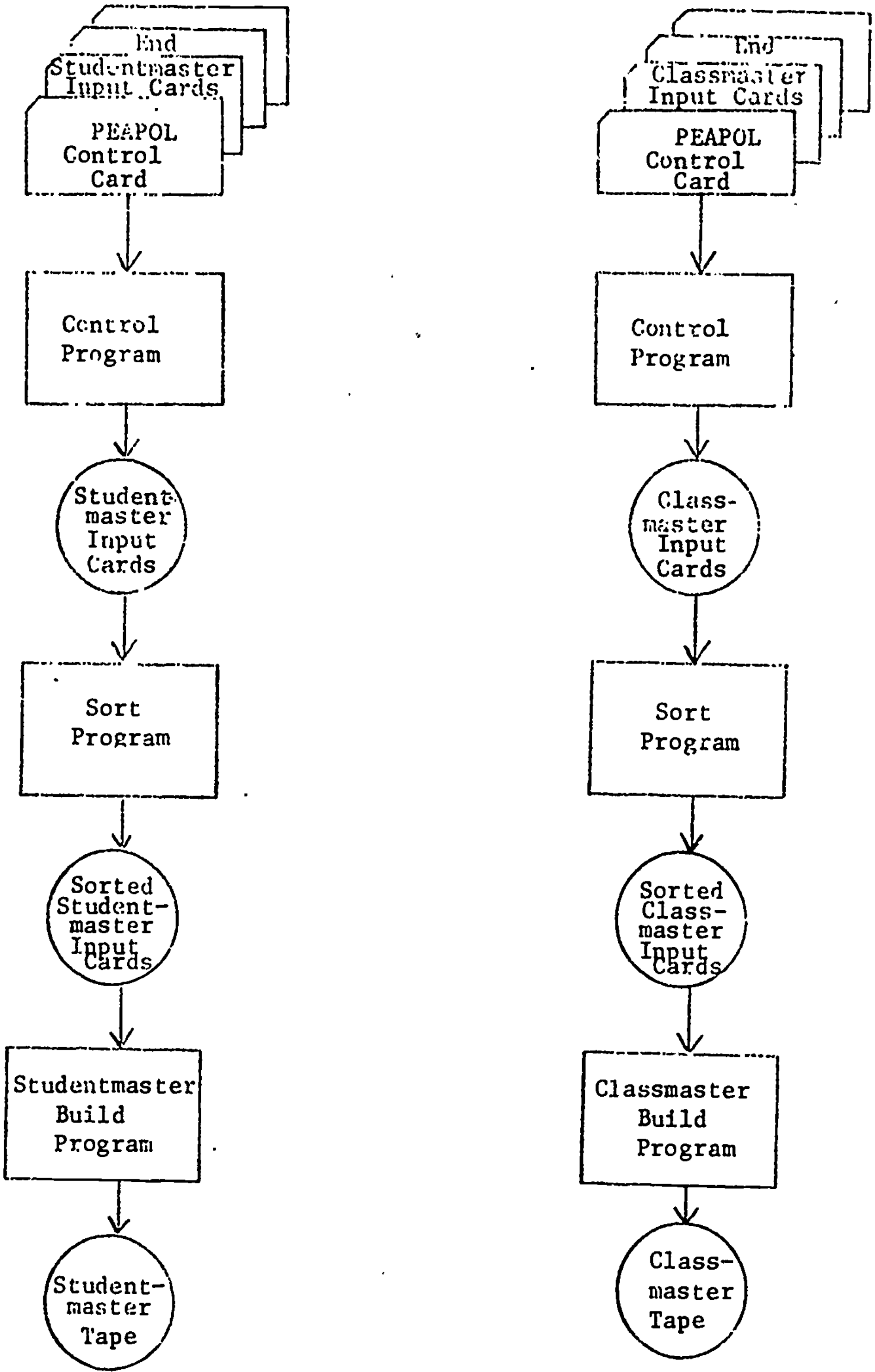


Exhibit 2 - Building New Files

*blank card at end of deck

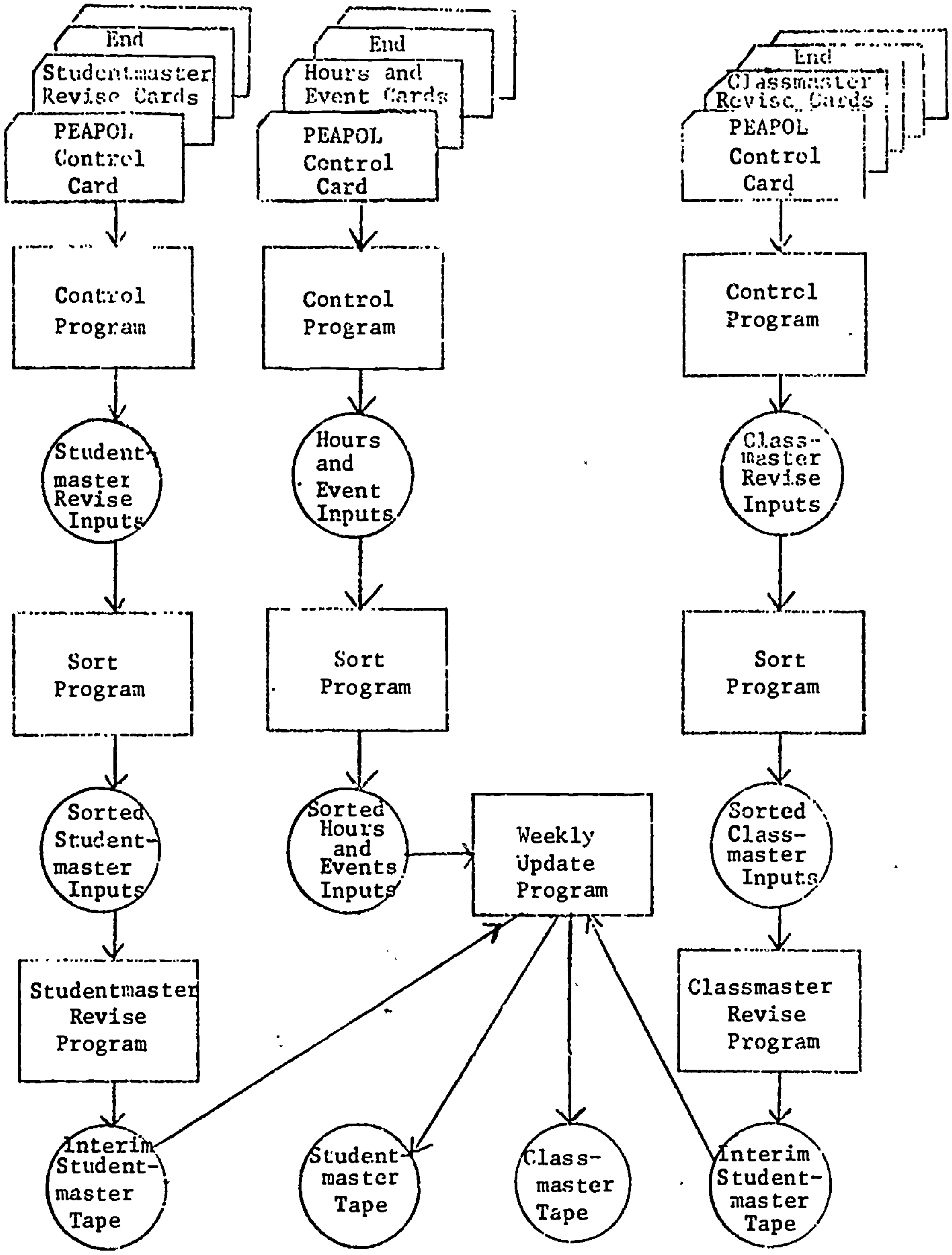

End
Studentmaster Revise Cards
PEAPOL Control Card
End
Hours and Event Cards
PEAPOL Control Card
End
Classmaster Revise Cards
PEAPOL Control Card
Control Program
Control Program
Control Program
Student-master Revise Inputs
Hours and Event Inputs
Class-master Revise Inputs
Sort Program
Sort Program
Sort Program
Sorted Student-master Inputs
Sorted Hours and Events Inputs
Weekly Update Program
Sorted Class-master Inputs
Studentmaster Revise Program
Classmaster Revise Program
Interim Student-master Tape
Student-master Tape
Class-master Tape
Interim Student-master Tape

Exhibit 3 - Weekly File Update Procedure

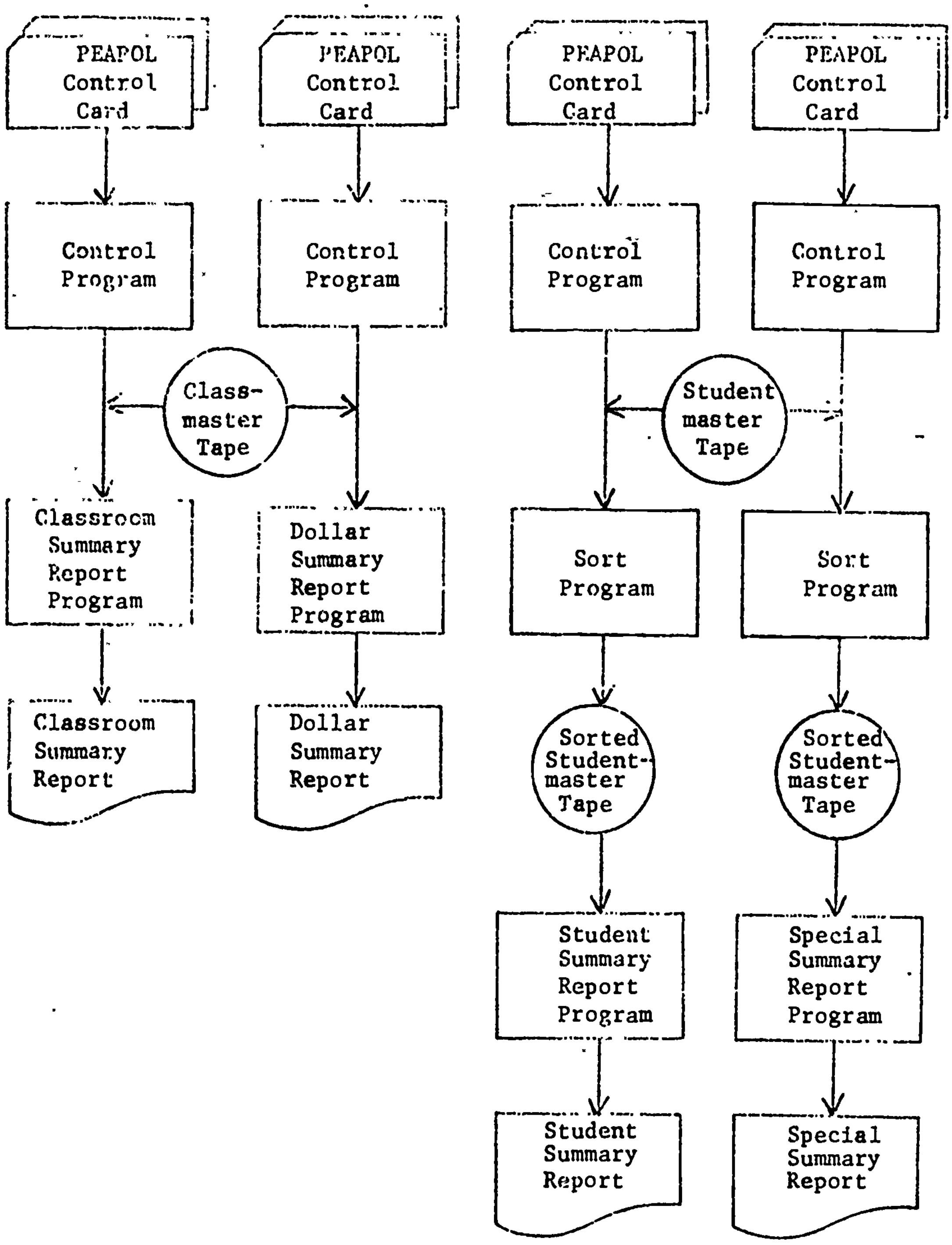


Exhibit 4 - Creating Reports

## Program Descriptions

In this section, a description is given of each of the computer programs in the PEAPOL system. This includes a description of inputs, cutputs, processing procedures, edit checks, and algorithms. Two flowcharts are supplied with most program descriptions. The first flowchart is a logic flowchart showing the basic tasks carried out by each program. The second flowchart is a procedures flowchart showing the specific types of input, the sorting routines utilized by the program, any intermediate files utilized by the program, and the final endproducts of the program.

## PEAPOL Control Program (PEAPOL)

The PEAPOL control program has the program name of PEAPOL. As mentioned earlier, it performs an editing and routing function. It checks all control cards giving directions to the system; it edits key input fields, such as those containing identification information, to ensure that all the required data are present and in the proper form; and it calls in each program in the system at the proper time in the processing sequence. The processing sequence is in part controlled by control cards submitted by the computer operator, and in part controlled by the logic in the PEAPOL program.

This program also allows the entire system to operate in a dynamic mode. After the completion of any program in the system, control is transferred to the PEAPOL program so that the next program in the system can be run. This means that the operator does not have to decide which program in the system should be called in at any given time. This program will also print instructions to the operator at different points in the processing sequence. Typically, such instructions will tell the operator to mount a particular magnetic tape on a certain tape drive, ask him what date should be printed on a report, or tell him that system operations have ceased because bad data of a particular type were submitted to the system.

Because this program is never used alone, but always in conjunction with other programs in the system, only a logic flow chart has been provided. The procedures flow chart is not required for PEAPOL.

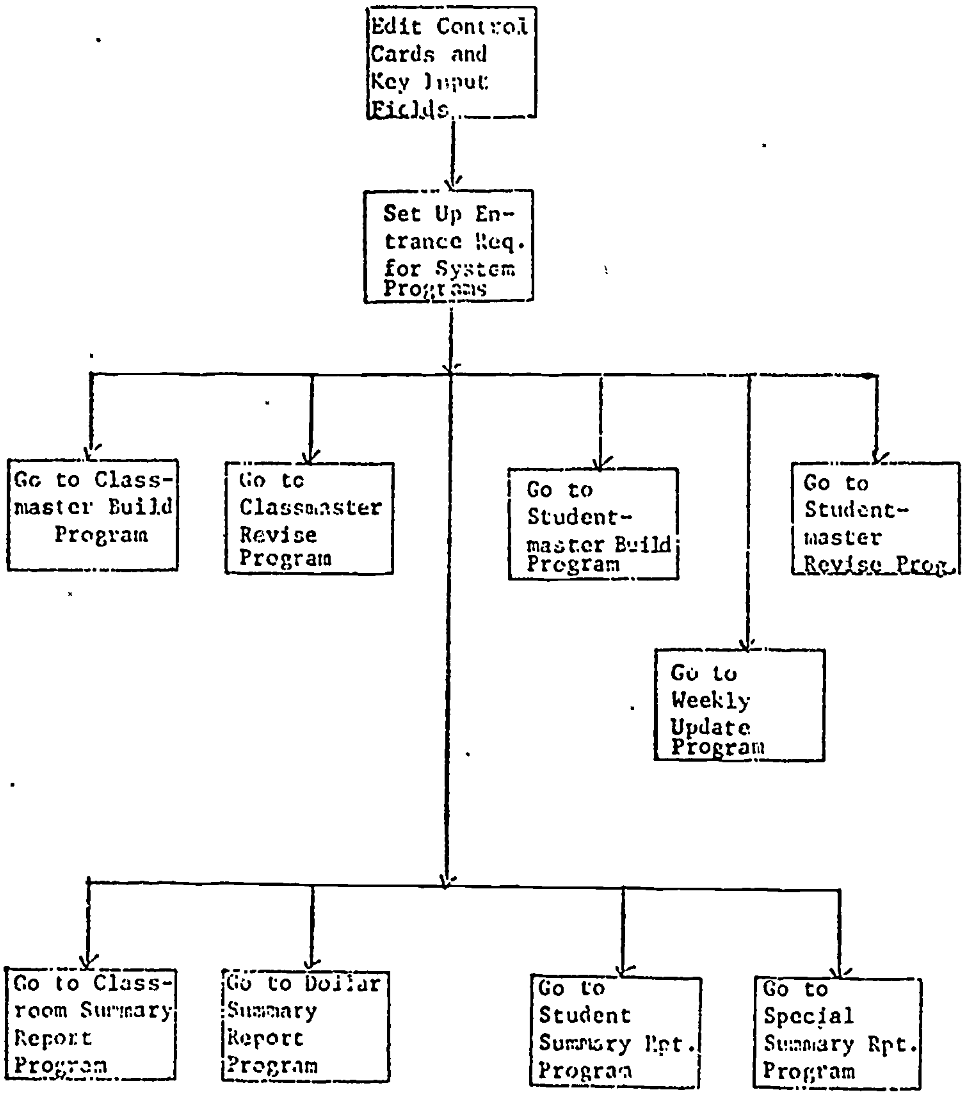

Edit Control Cards and Key Input Fields
Set Up Entrance Req. for System Programs
Go to Classmaster Build Program
Go to Classmaster Revise Program
Go to Studentmaster Build Program
Go to Studentmaster Revise Prog.
Go to Weekly Update Program
Go to Classroom Summary Report Program
Go to Dollar Summary Report Program
Go to Student Summary Rpt. Program
Go to Special Summary Rpt. Program

Exhibit 5 - PEAPOL Control Program (logic flowchart)

## Studentmaster Build Program (STUD-1)

This program reads studentmaster input cards onto a reel of tape, then sorts the tape by student number, within class number, school number, district number, to create a new studentmaster tape file.

In order for a record to be accepted, it must have, at a minimum, columns 1-50 correctly filled in. For record fields where no information is submitted, including fields for which values are calculated by the following programs, the program will insert blanks if the field is alpha and zeros where fields are numeric.

The following will be treated as error conditions:

a) If all information required in columns 1-50 is not supplied, the entire card will be rejected and its contents printed out on the line printer with words INSUFFICIENT IDENTIFIER INFORMATION.

b) If an element entry is of the wrong type (alphameric instead of numeric, etc.), the incorrect element is not accepted (the rest of the record is) and the invalid element and the words ELEMENT INCORRECT FORM will appear on the line printer.

c) As shown in Exhibit 5, whenever the studentmaster build program is run, an "S" must be in column 1, an "N" in column 2, and an "A" in column 3 of the input card. If these three columns are not correct, the record will be rejected and its contents will appear on the line printer along with the message INCORRECT IDENTIFIERS.

The studentmaster build program can only be used to create a new studentmaster file. Therefore, errors made in creating the file must be corrected by using the studentmaster revise program.

Exhibit 6 - Studentmaster Record Input Card Format

| Columns | Content |
|---|---|
| 1 | file type = S |
| 2 | type of input N = new record<br>U = record update<br>D = record deletion (only columns 1-28 need be punched) |
| 3 | card type = A |
| 4-8 | district number |
| 9-15 | school number |
| 16-18 | class number |
| 19-28 | student number |
| 29-48 | student name (last name first) |
| 49-50 | number of performance objectives in course |
| 51 | sex (M or F) |
| 52 | ethnic code 1 = Spanish surname<br>2 = other White<br>3 = Negro<br>4 = Chinese, Japanese, Korean<br>5 = American Indian<br>6 = other non-White |
| 53-54 | year of birth |
| 55-58 | reading score |
| 59-62 | math score |
| 63-64 | percentile score |
| 65-79 | class name |

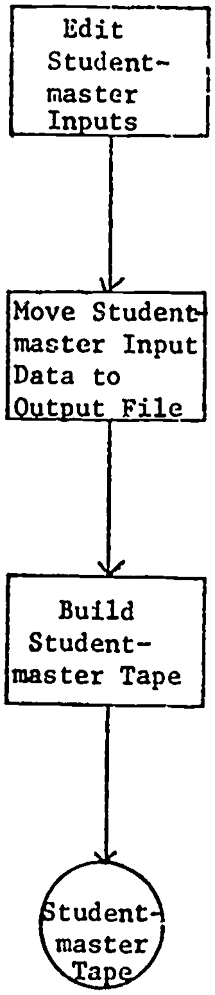

Edit Student-master Inputs
Move Student-master Input Data to Output File
Build Student-master Tape
Student-master Tape

Exhibit 7 - Studentmaster Build Program (logic flowchart)

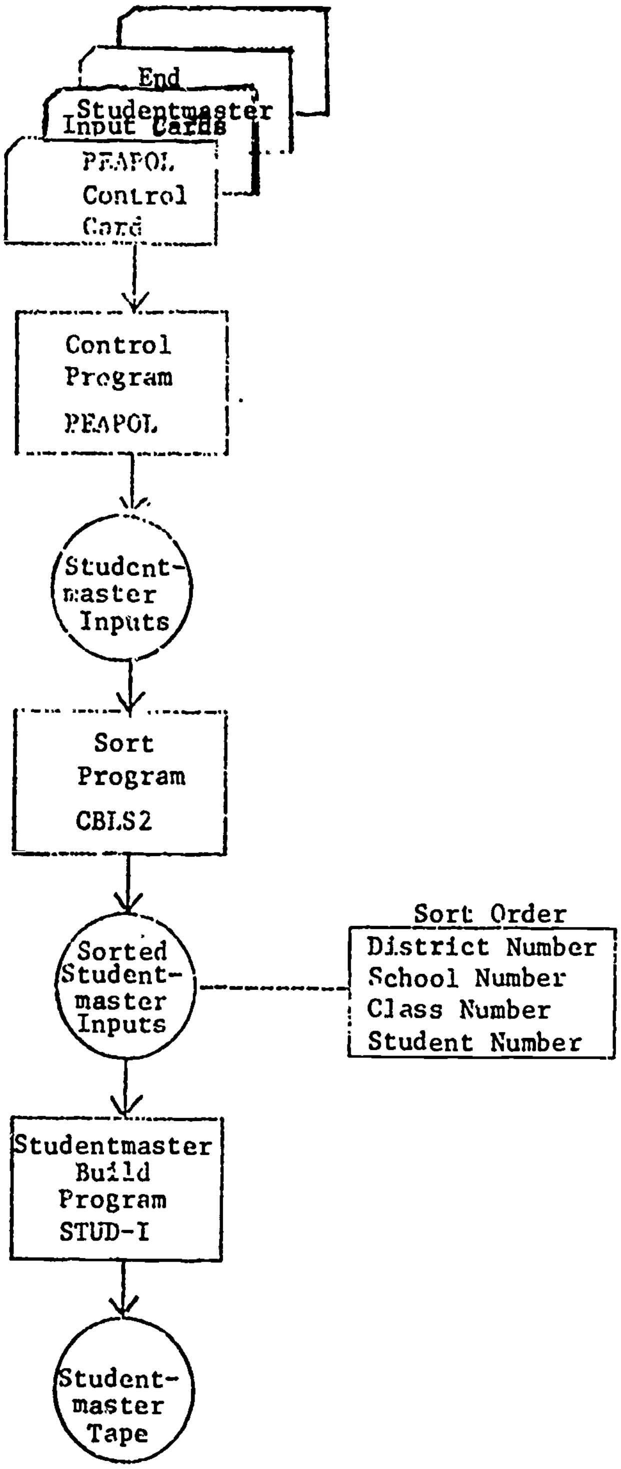


Exhibit 8 - Studentmaster Build Program (procedures flowchart)

## Studentmaster Revise Program (STUD-U)

Studentmaster revise is used to add or delete a record from an existing studentmaster file or to change information (aside from information handled by the weekly update program) within a studentmaster file.

Although studentmaster revise is nearly identical to studentmaster build, studentmaster revise can perform additional tasks.

First, studentmaster revise can update an existing record using practically the same procedure employed to create the record. To change an existing information element, a studentmaster input card with a "U" in column 2 is submitted to the program.

The required changes are produced in the existing record by simply having the program enter the new information in the proper place in the record, producing a new interim studentmaster tape.

For changes of the above type, the same error messages produced by studentmaster build are generated. In addition, one other is added: NO SUCH RECORD. This message is produced, along with the offending identifier information, when a "U" card is entered that cannot be matched to an existing record in the file.

To delete an existing record the required identifier information is submitted in columns 1-28, with a "D" in column 2. This will erase the entire record. The error message, NOTHING TO DELETE, is printed out, along with the offending entry and the identifier information, if the program is asked to delete a record which is not in the file.

Studentmaster revise is also used to add a complete record to an existing file. This is done by entering the new record, following the procedure described for the studentmaster build program. The same "N" identifier is punched in column 2. The same entry formats are used, and the same error messages are generated. When "N" cards are submitted into this program, they will be written on a new studentmaster tape file which then will be merged with the existing studentmaster file to create a new interim studentmaster file.

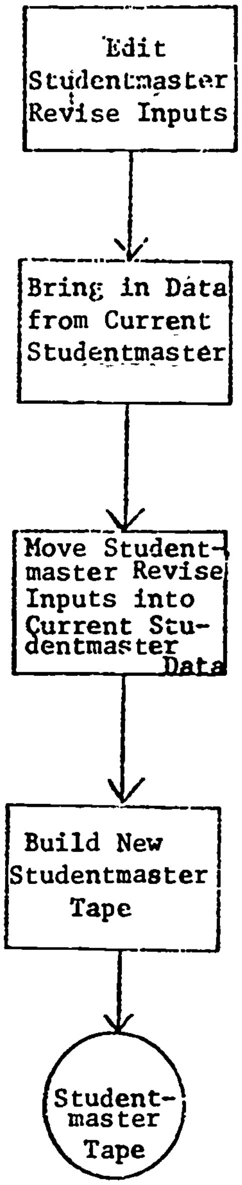

Edit Studentmaster Revise Inputs
Bring in Data from Current Studentmaster
Move Studentmaster Revise Inputs into Current Studentmaster Data
Build New Studentmaster Tape
Studentmaster Tape

Exhibit 9 - Studentmaster Revise Program (logic flowchart)

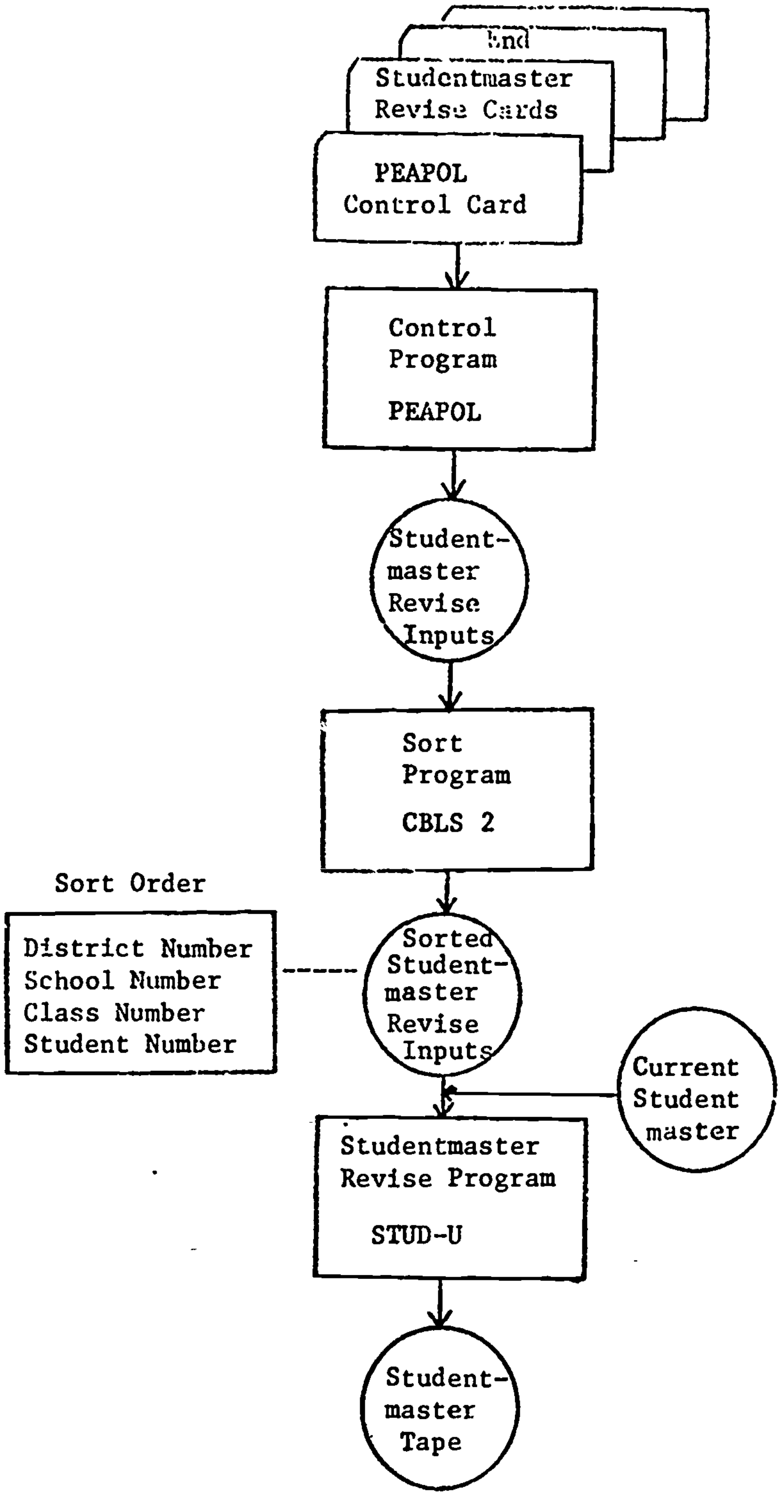


Exhibit 10 - Studentmaster Revise (procedures flowchart)

Classmaster Build Program (CLAS-I)

This program reads classmaster record input cards onto a reel of tape and then sorts the tape by class number within school and district number. Two different card types are required to input a complete record. For file fields where no information is submitted, including fields generated by later programs, the program will insert blanks if the field is alpha and zeros if the field is numeric.

The following will be treated as error conditions:

a) If all information required (columns 1-72 on card A and columns 1-68 on card B) is not supplied, the entire card will be rejected and its contents printed out on line printer with words INSUFFICIENT INFORMATION.

b) If a non-identifier element entry is of the wrong type (alphameric instead of numeric, etc.), the individual element is rejected and it appears on the line printer along with the contents of columns 1-18 and the words ELEMENT INCORRECT FORM.

Errors of the above type will be corrected by re-entering corrected data using the classmaster revise program. The classmaster build program is used only to create a new file.

Exhibit 11-Classmaster Record Input Card Format

| Column | Contents |
|---|---|
| First Card Type | |
| 1 | file type = C |
| 2 | type input N = new record<br>U = update<br>D = record deletion (only columns 1-27 need be punched) |
| 3 | card type = A |
| 4-8 | district number |
| 9-15 | school number |
| 16-18 | class number |
| 19-27 | teacher number |
| 28-47 | teacher name (last name first) |
| 48-49 | total number performance objectives in course |
| 50-51 | active enrollment |
| 52-66 | course name |
| 67-68 | number of weeks class meets |
| 69-72 | number of scheduled instructional hours |
| Second Card Type | |
| 1 | file type = C |
| 2 | type input N = new record<br>U = record update |
| 3 | card type = B |
| 4-8 | district number |
| 9-15 | school number |
| 16-18 | class number |
| 19-24 | nonbudgeted savings or expenses (column 26 must contain a plus or minus sign with "+" denoting an expense and "-" denoting a savings) |
| 25-29 | dollars budgeted-certified salaries |
| 30-34 | dollars budgeted-classified salaries |
| 35-39 | dollars budgeted-benefits |
| 40-43 | dollars budgeted-books and supplies |
| 44-47 | dollars budgeted-support services |
| 48-52 | dollars budgeted-other services |
| 53-57 | dollars budgeted-other outgo |
| 58-62 | total dollars budgeted |
| 63-68 | budgeted cost per pupil (to nearest cent) |

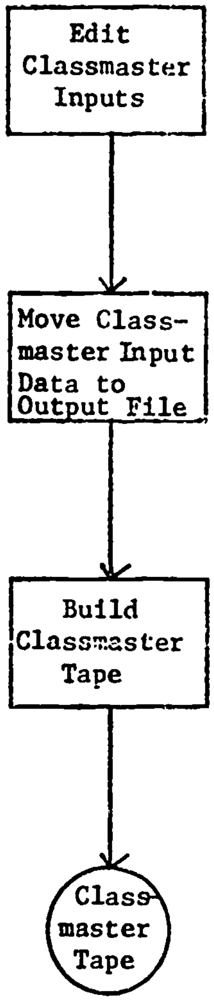


Exhibit 12 - Classmaster Build Program (logic flowchart)

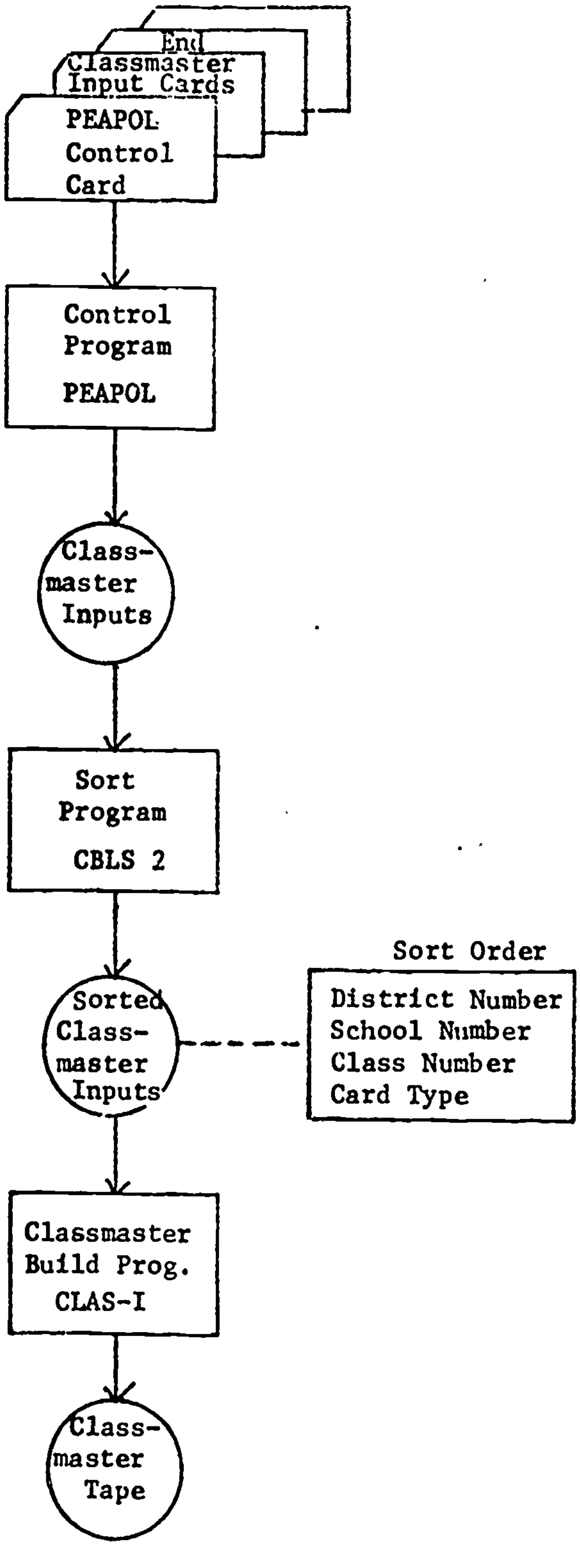


Exhibit 13 - Classmaster Build (procedures flowchart)

Classmaster Revise Program (CLAS-U)

Classmaster revise is used to add or delete a record from an existing classmaster file or to change information within a classmaster file.

Classmaster revise is nearly identical to classmaster build, except that classmaster revise can also perform additional tasks.

First, classmaster revise can update an existing record using practically the same procedure employed to create the record. To change an existing information element, a classmaster input card with a "U" in column 2 is submitted to the program.

The required changes are produced in the existing record by simply having the program enter the new information in the proper place in the record, and writing and producing a new interim classmaster tape.

For changes of the above type, the same error messages produced by the classmaster build program are generated. In addition, one other is added: NO SUCH RECORD. This message is produced, along with the offending identifier information, when a "U" card is entered that cannot be matched to an existing record in the file.

To delete an existing record, the required identifier information is submitted in columns 1-27, with a "D" in column 2. This will erase the entire record. The same error messages can be generated; in addition, NOTHING TO DELETE is printed out, along with the offending entry and the identifier information, if the program is asked to delete a record which is not in the file.

Classmaster revise is also used to add a complete record to an existing file. This is done by entering the new record following the procedure described for the classmaster build program. The same "N" identifier is punched in column 2. The same entry formats are used, and the same error messages are generated. When "N" cards are submitted into this program, they will be written on a new classmaster tape file which then will be merged with the existing classmaster file to create a new interim classmaster file.

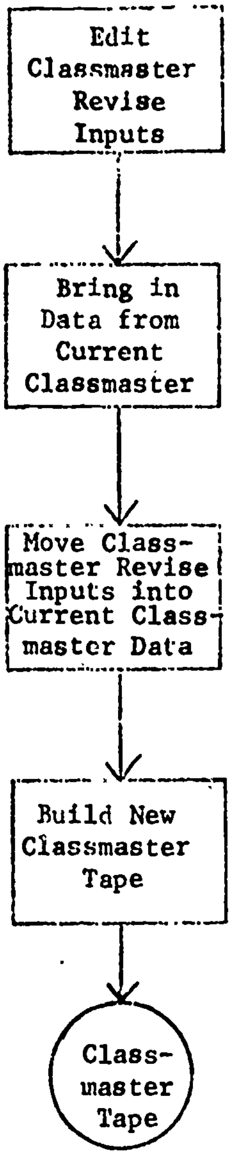

Edit Classmaster Revise Inputs
Bring in Data from Current Classmaster
Move Classmaster Revise Inputs into Current Classmaster Data
Build New Classmaster Tape
Classmaster Tape

Exhibit 14 - Classmaster Revise Program (logic flowchart)

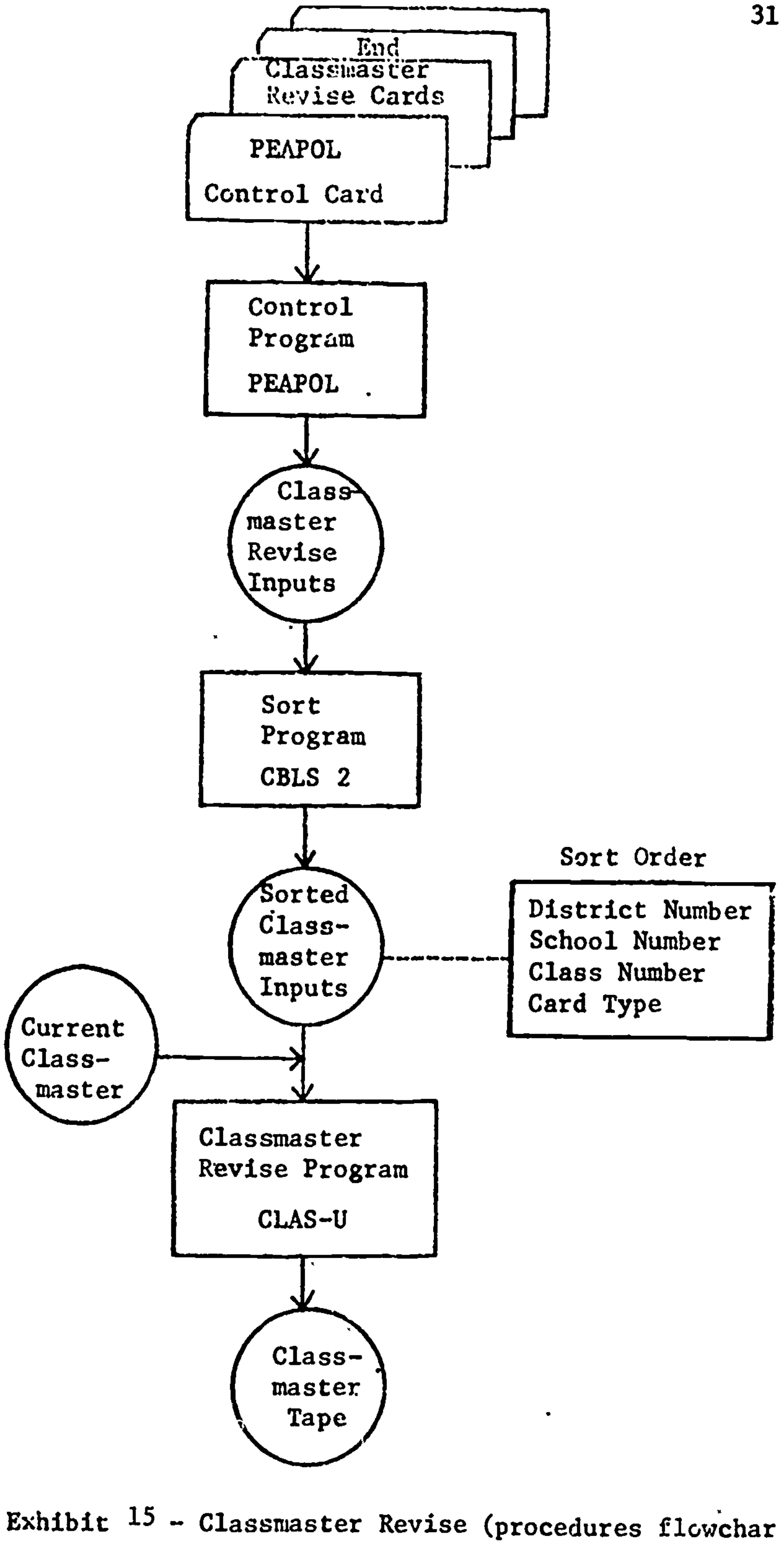


Exhibit 15 - Classmaster Revise (procedures flowchart)

Weekly Update Program (WEEK-U)

This program performs two functions:

a) It accepts data pertaining to student hours, absences, commendations, discipline reports, and performance objective completions, and increments the field storing each type of information by the required amount.

b) It recalculates all quantitative system data and generates new studentmaster and classmaster tapes.

Two types of input cards are accepted by this program--hours recording input cards and class event input cards. The first operation carried out by this program is sorting a submitted deck of cards into the following order: (1) type of input (column 2); (2) student number; (3) class number; (4) school number; and (5) district number. Once this sort is carried out, information can then be merged with the existing studentmaster file.

As students in classes monitored by this system perform their classwork, they enter onto a time card the precise number of hours which they spend working on different performance objectives. This information is submitted weekly to the computer center for keypunching. The keypunch operator punches these time cards for entry into the data base.

The program will only accept performance objective numbers between 1 and 75, and start and finish times between 0000 and 2399. An invalid performance objective number will cause the student identifier information, the invalid number, and the message INVALID

Exhibit 16 - Hours Recording Input Card Format

| Column | Content |
|---|---|
| 1 | file type = S |
| 2 | type of input H = hours update |
| 3-7 | district number |
| 8-14 | school number |
| 15-17 | class number |
| 18-27 | student number |
| 28-30 | first 3 letters of student's last name |
| 31-32 | performance objective number |
| 33-36 | start time |
| 37-40 | end time |
| 41-42 | performance objective number |
| 43-46 | start time |
| 47-50 | end time |
| 51-52 | performance objective number |
| 53-56 | start time |
| 57-60 | end time |
| 61-62 | performance objective number |
| 63-66 | start time |
| 67-70 | end time |
| 71-72 | performance objective number |
| 73-76 | start time |
| 77-80 | end time |

Exhibit 17 - Class Event Input Card Format

| Column | Content | |
|---|---|---|
| 1 | file type = S | |
| 2 | type of input E = event card | |
| 3-7 | district number | |
| 8-14 | school number | |
| 15-17 | class number | |
| 18-27 | student number | |
| 28-30 | first 3 letters of student's last name | |
| 31-32 | first event code | DS = discipline report |
| 33-34 | second event code | CM = commendation |
| 35-36 | third event code | xx = number of a performance objective (numbers 01 through 75 are valid) which student has completed |
| 37-38 | fourth event code | |
| 39-40 | fifth event code | |
| 41-42 | sixth event code | |

(etc. - remainder of card can be used to record events)

NUMBER to appear on the printer. Valid notations on the same card will be entered. An invalid time will cause the student identifier information, the invalid time, and the message INVALID TIME to appear on the printer. Here again, valid entries on the same card will be accepted.

The program will take each of these time entries and will subtract the start time from the end time. It will then round the result of this subtraction to the nearest tenth and add this amount to the existing amount within the proper field. If a negative number or a number greater than 12.0 should result from the subtraction, the offending hours notation will be printed out with the identifier information on the printer and no credit will be given for these hours. At the beginning of the semester, as a part of studentmaster build and studentmaster revise, zeros will be entered in all the valid performance objective fields for each student. These zeros are needed to ensure that all students start the year with blank fields. These fields will be incremented throughout the school year as student time cards enter the system.

Data pertaining to student absences, commendations, discipline reports, and performance objective completions will enter the system in a similar manner.

At this point, the program automatically updates the existing files.

Studentmaster file -- this is the first file updated by the program. A description of the record format for this file is given in Exhibit 17.

a) On each record, the "hours credited to date for individual performance objectives" fields are totalled. The sum is placed in the "class hours credited" field of the studentmaster record.

b) On each record, the "performance objective completion indicator" fields are totalled. The sum is placed in the "total number of performance objectives completed" field of the studentmaster record.

c) On each studentmaster record, the "performance objectives" completed/hours credited ratio" fields are updated. This is done by dividing the contents of "performance objectives completed" by the contents of "hours credited," and rounding the answer to two decimal places. The results of this calculation are placed in the "present week" field. Before doing this, the former contents of this field are moved to the "one week ago" field; the contents of this field are moved to the "two weeks ago" field; the contents of this field are moved to the "three weeks ago" field, and the contents of this field are moved to the "four weeks ago" field. The former contents of the "four weeks ago" field are discarded.

d) After performing the operations described directly above, the "current warning/merit flag" field is updated. This is done by employing the following algorithm:

$$F = \frac{\begin{pmatrix}\text{contents of "present}\\ \text{week" field}\end{pmatrix} + \begin{pmatrix}\text{contents of "one}\\ \text{week ago" field}\end{pmatrix}}{\begin{pmatrix}\text{contents of "three}\\ \text{weeks ago" field}\end{pmatrix} + \begin{pmatrix}\text{contents of "four}\\ \text{weeks ago" field}\end{pmatrix}}$$

If $F < .75$, a warning indicator (a "W' in "current warning/merit flag" field) is generated and "warning flags" is incremented by 1.

Exhibit 18 - Studentmaster File Description

| FIELD DESCRIPTION | PICTURE | # OF CHARS | ACCUM CHARS |
|---|---|---|---|
| district number | 99999 | 5 | 5 |
| school number | 9(7) | 7 | 12 |
| class number | 999 | 3 | 15 |
| student number | 9(10) | 10 | 25 |
| student name (last name first) | X(20) | 20 | 45 |
| sex | X | 1 | 46 |
| ethnic code | X | 1 | 47 |
| year | 99 | 2 | 49 |
| reading score | X(4) | 4 | 53 |
| math score | X(4) | 4 | 57 |
| percentile score | 99 | 2 | 59 |
| class hours credited | 9999.9 | 5 | 64 |
| periods missed | 999 | 3 | 67 |
| warning flags | 99 | 2 | 69 |
| commendations | 99 | 2 | 71 |
| merit flags | 99 | 2 | 73 |
| discipline reports | 99 | 2 | 75 |
| total no. performance objectives completed | 99 | 2 | 77 |
| hours credited to date for individual performance objectives | 99.9(ea.) | 3(ea.) | - |
| Objective 1 | | | - |
| Objective 2 | | 225 | 302 |
| Objective 75 | | | - |
| performance objective completion indicator | X(ea.) | 1(ea.) | |
| Objective 1 | | | |
| Objective 2 | | 75 | 377 |
| Objective 75 | | | |
| performance objectives completed/ hours credited ratio | - | - | - |
| present week | 9.99 | 3 | 380 |
| 1 week ago | 9.99 | 3 | 383 |
| 2 weeks ago | 9.99 | 3 | 386 |
| 3 weeks ago | 9.99 | 3 | 389 |
| 4 weeks ago | 9.99 | 3 | 392 |
| current warning/merit flag | X | 1 | 393 |
| number of performance objectives in course | 99 | 2 | 395 |
| class name | X(15) | 15 | 410 |

If F>1.25, a merit indicator (an "M" in "current warning/merit flag" field) is generated and "merit flags" is incremented by 1.

If F is between .75 and 1.25, the content of the "current warning/merit flag" field is replaced with a blank.

What this algorithm accomplishes is to compare a student's rate of progress during the past two weeks with the progress which he was making a month before. Progress in this case is defined as "performance objectives completed per hour." The program requires that the operator input "week in semester" from the console; if this number is less than five, no ratios will be computed and no warning or merit flags will be set. The program also handles absences of two or more weeks by inserting "1" as the algorithm denominator whenever the true denominator should be zero.

Classmaster file--This file is updated by the program after updating of the studentmaster file has been completed. The record format for the classmaster file is given in Exhibit 18.

a) When the previous segment of this program was operating, a message appeared on the console for the operator, WHAT WEEK NUMBER IS THIS IN THE SCHOOL YEAR? The reply was stored in the computer's memory. This number is now entered into every classmaster record being processed in the "current school week number" field. Updating is done on the classmaster a record at a time. As each classmaster record is read, the studentmaster tape file (also mounted) is moved to the position of the class being processed.

b) The number of students in each class on the studentmaster file is counted and put into the "active enrollment" field.

Exhibit 19 - Classmaster File Description

| FIELD DESCRIPTION | PICTURE | # OF CHARS | ACCUM CHARS |
|---|---|---|---|
| district number | 99999 | 5 | 5 |
| school number | 9(7) | 7 | 12 |
| class number | X(3) | 3 | 15 |
| teacher number | X(9) | 9 | 24 |
| teacher name | X(20) | 20 | 44 |
| total no. performance objectives in course (75) | 99 | 2 | 46 |
| total hours credited | 99999.9 | 6 | 52 |
| active enrollment | 99 | 2 | 54 |
| total periods missed | 9999 | 4 | 58 |
| total warning flags | 999 | 3 | 61 |
| total commendations | 999 | 3 | 64 |
| total merit flags | 999 | 3 | 67 |
| total discipline reports | 999 | 3 | 70 |
| total number of performance objectives completed | 9999 | 4 | 74 |
| total class warning indicators | 99 | 2 | 76 |
| total class progress indicators | 99 | 2 | 78 |
| number of weeks course meets | 99 | 2 | 80 |
| dollars budgeted-certified salaries | 99999 | 5 | 85 |
| dollars budgeted-classified salaries | 99999 | 5 | 90 |
| dollars budgeted-benefits | 99999 | 5 | 95 |
| dollars budgeted-books and supplies | 9999 | 4 | 99 |
| dollars budgeted-support services | 9999 | 4 | 103 |
| dollars budgeted-other services | 99999 | 5 | 108 |
| dollars budgeted-other outgo | 99999 | 5 | 113 |
| total dollars budgeted | 99999 | 5 | 118 |
| nonbudgeted expenses or savings to date | ±99999 | 6 | 124 |
| dollars expended to date | 99999 | 5 | 129 |
| budgeted cost per pupil | 9999.99 | 6 | 135 |
| present cost per pupil | 9999.99 | 6 | 141 |
| cost per credited pupil hour | 9999.99 | 6 | 147 |
| total hours credited to each objective | 99999.9 (ea.) | 6(ea.) | - |
| (need 1 field for each 75 objectives) | - | 450 | 597 |
| number of students working on each objective | 99(ea.) | 2(ea.) | - |
| (need 1 field for each of 75 objectives) | - | 150 | 747 |
| number of students who have completed each objective | 99(ea.) | 2(ea.) | - |
| (need 1 field for each of 75 objectives) | - | 150 | 897 |

Exhibit 19 - Classmaster File Description (cont'd)

| FIELD DESCRIPTION | PICTURE | # OF CHARS | ACCUM CHARS |
|---|---|---|---|
| currenc warning/merit flag indicator | X | 1 | 898 |
| current school week number | 99 | 2 | 900 |
| class performance objectives completed/hours credited | - | - | - |
| ratio | - | - | - |
| present week | 9.99 | 3 | 903 |
| 1 week ago | 9.99 | 3 | 906 |
| 2 weeks ago | 9.99 | 3 | 909 |
| 3 weeks ago | 9.99 | 3 | 912 |
| 4 weeks ago | 9.99 | 3 | 915 |
| course name | X(15) | 15 | 930 |
| number of scheduled instructional hours | 9999 | 4 | 934 |

c) The "class hours credited" field on the studentmaster is totalled for all the class members and the sum is placed in the "total hours credited" field.

d) The "periods missed" field on the studentmaster is totalled for all class members and the sum placed in the "total periods missed" field.

e) The "warning flags" field on the studentmaster is totalled for all class members and the sum placed in the "total warning flags" field.

f) The "commendations" field on the studentmaster is totalled for all class members and the sum placed in the "total commendations" field.

g) The "merit flags" field on the studentmaster is totalled for all class members and the sum placed in the "total merit flags" field.

h) The "discipline reports" field on the studentmaster is totalled for all class members and the sum placed in the "total discipline reports" field.

i) The "total number of performance objectives completed" field is totalled for all class members and the sum placed in the "class total of performance objectives completed" field.

j) The "hours credited to date for individual performance objectives" fields (up to 75) on the studentmaster are each totalled separately and the individual sums are placed in the "total hours credited to each objective" fields. In this way, the total hours credited to each objective are computed.

k) The same studentmaster fields (hours credited to date) are examined to see if they contain the number zero. Again, this is done one field at a time (it is done at the same time operation j above is being done). The total number of non-zero fields for each objective is counted, and the totals placed in the classmaster's "number of students working on each objective" fields.

l) The studentmaster "performance objective completion indicator" fields are then individually totalled for each class. The sum for each objective is then placed in the "number of students who have completed each objective" fields of the classmaster. The sum for each objective is also subtracted from the classmaster fields filled in operation k. These fields now contain the true number of students in each class who are working on, but have not completed, each performance objective.

m) "Dollars expended to date" in classmaster is then computed in the following way:

$$\frac{\left(\begin{array}{l}\text{"current school}\\ \text{week number" field}\end{array}\right)}{\left(\begin{array}{l}\text{"number of weeks}\\ \text{course meets" field}\end{array}\right)} * \left(\begin{array}{l}\text{"total dollars}\\ \text{budgeted" field}\end{array}\right) + \left(\begin{array}{l}\text{"non-budgeted}\\ \text{expenses or savings}\\ \text{to date" field}\end{array}\right)$$

n) The "present cost per pupil" field is computed by dividing the "dollars expended to date" field by the "active enrollment" field.

o) The "cost per credited pupil hour" field is computed by dividing the "dollars expended to date" field by the "total hours credited" field.

p) The "current class warning/progress flag indicator" field is then calculated by following exactly the same procedure as described earlier in this section for computing individual student indicators, except that in this case the ratio fields from the classmaster file are used instead of the ratio fields from the studentmaster file. The resulting class indicator, if not a blank, also increments either the "class warning indicators" field or the "class progress indicators" field by one if a warning or progress indicator flag should be set by the program.

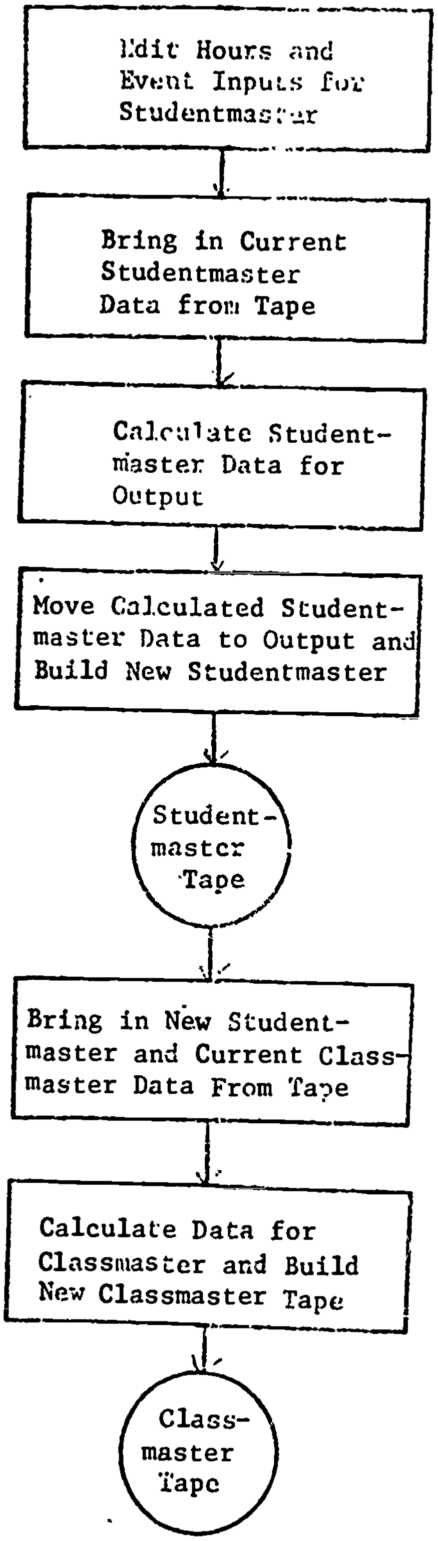

Edit Hours and Event Inputs for Studentmaster
Bring in Current Studentmaster Data from Tape
Calculate Studentmaster Data for Output
Move Calculated Studentmaster Data to Output and Build New Studentmaster
Studentmaster Tape
Bring in New Studentmaster and Current Classmaster Data From Tape
Calculate Data for Classmaster and Build New Classmaster Tape
Classmaster Tape

Exhibit 20 - Weekly Update Program (logic flowchart)

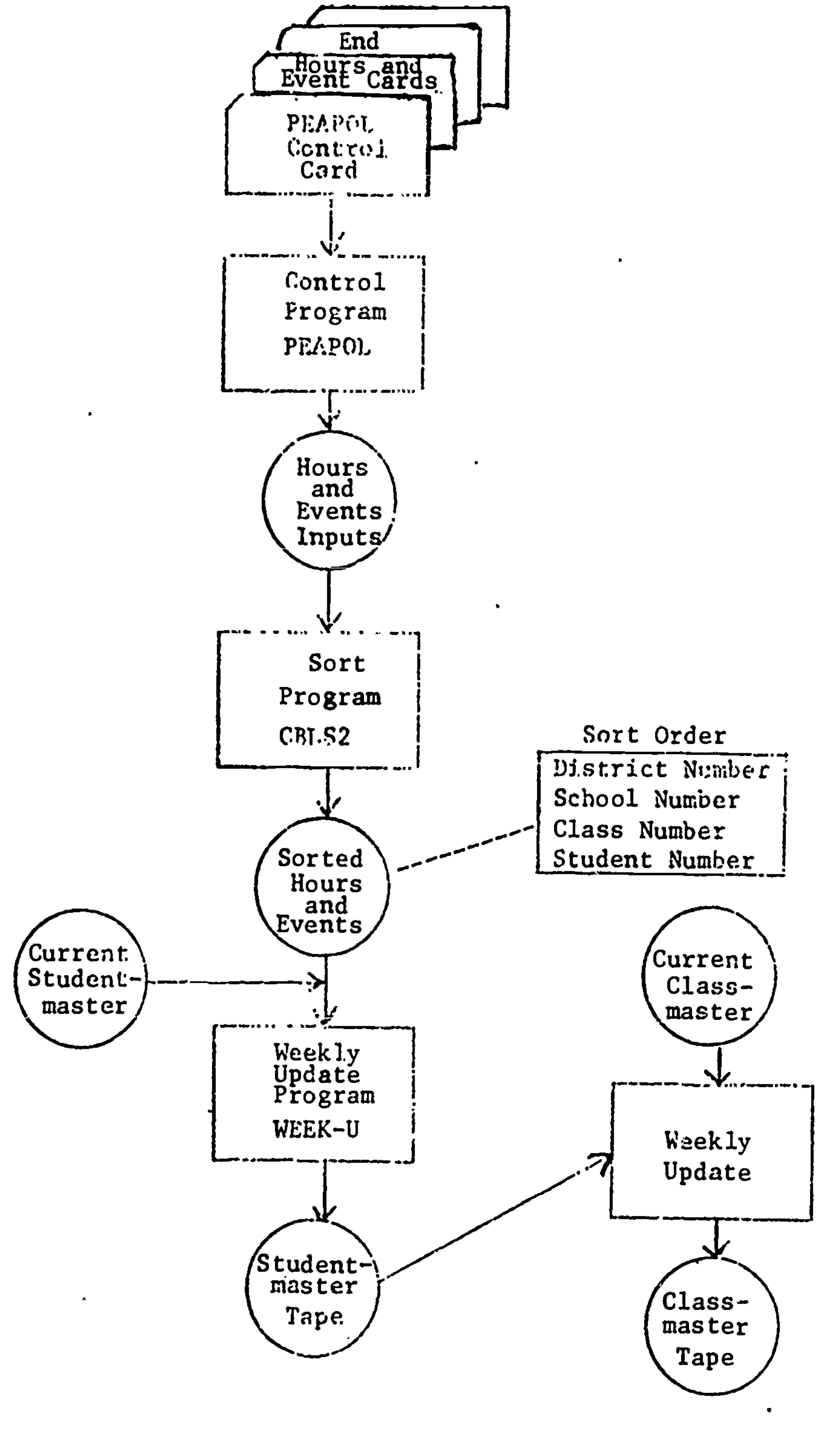


Exhibit 21 - Weekly Update Program (procedures flowchart)

Classroom Summary Report Program (CLASSU)

This program produces a report which is designed to give the teacher and administrator an overall view of the progress of individual classes within the reporting system. The report is generated from the classmaster file and is a rather straightforward listing of information pertaining to individual classes contained within that file. The program will require the operator to input the desired report date on the console in response to the message, "WHAT REPORT DATE?"

The report lists out for each class:

district number
school number
class number
teacher number
teacher name
class name
current school week number
number of weeks course meets
active enrollment

**total days absent
**total warning flags
**total merit flags
**total commendations
**total discipline reports
total class warning indicators
total class progress indicators

**total hours credited
**total number of performance objectives completed
performance objectives completed/hours credited ratios
current week
1 week ago
2 weeks ago
3 weeks ago
4 weeks ago
current class warning/progress indicator

for each performance objective in course (up to 75)
  total hours credited to each objective
  number of students presently working on each objective
  number of students who have completed each objective
  *prorated cost of each performance objective
  *prorated cost per student of each performance objective

budget information
  dollars expended to date
  budgeted cost per pupil
  present cost per pupil
  cost per credited pupil hour
  budgeted cost per hour

All information which this report requires, except for the single-asterisked cost items and the double-asterisked fields which will be averaged (contents will be divided by contents of "active enrollment" field), comes directly from fields in the classmaster file. No calculations are required to generate these items.

The prorated cost of each performance objective is determined using the following algorithm:

$$\text{prorated cost of objective} = \frac{\text{hours credited to a given objective}}{\text{total hours credited}} * \text{dollars expended to date}$$

The prorated cost per student of each objective is determined by using the following algorithm:

$$\text{prorated cost per student of each objective} = \frac{\text{prorated cost of objective}}{\text{number of students presently working on objective} + \text{number of students who have completed objective}}$$

The number of performance objectives on which reports will be given will be the same as the number entered into the "number of performance objectives in course" field. If this number should vary within a class from the value read on the first student record for a given class, the variant record will be printed out with the message INVALID PERFORMANCE OBJECTIVE TOTAL and the variant data will be ignored.

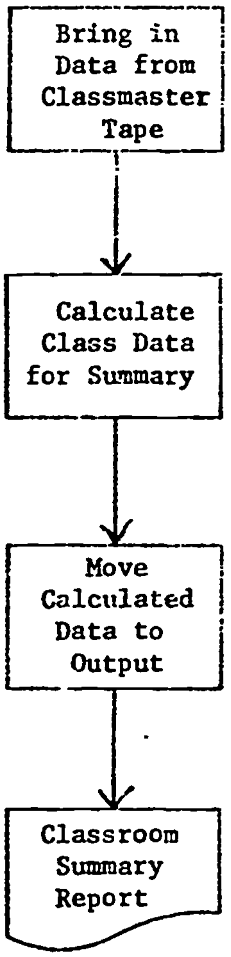

Bring in Data from Classmaster Tape
Calculate Class Data for Summary
Move Calculated Data to Output
Classroom Summary Report

Exhibit 22 - Classroom Summary Report Program (logic flowchart)

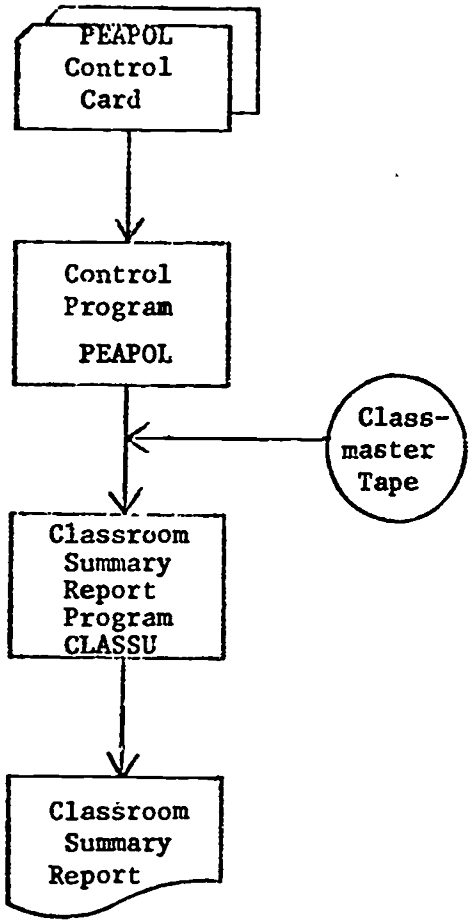
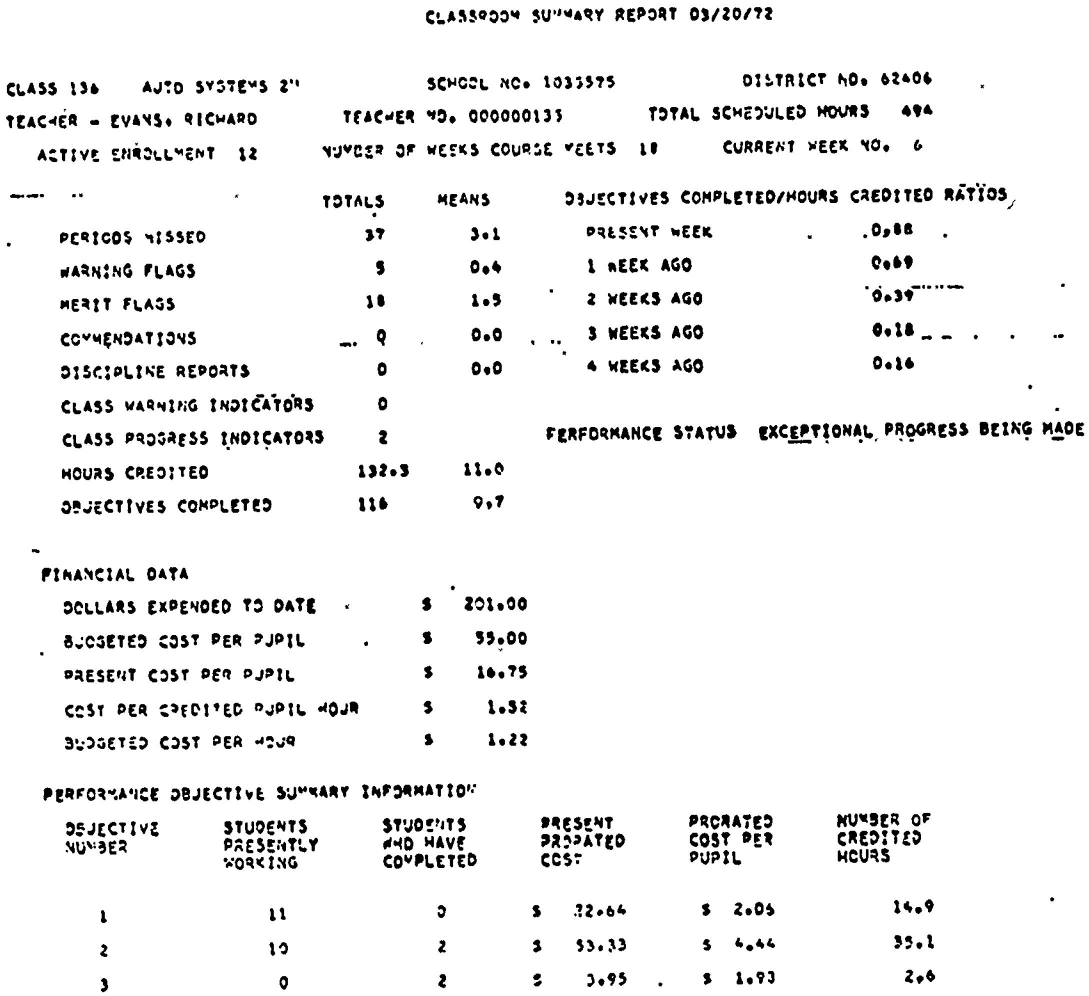


Exhibit 23 - Classroom Summary Report Program (procedures flowchart)



```
                              CLASSROOM SUMMARY REPORT 03/20/72

CLASS 136    AUTO SYSTEMS 2"             SCHOOL NO. 1033575             DISTRICT NO. 62406
TEACHER - EVANS, RICHARD         TEACHER NO. 000000133        TOTAL SCHEDULED HOURS   494
   ACTIVE ENROLLMENT  12      NUMBER OF WEEKS COURSE MEETS  18       CURRENT WEEK NO.  6

                                TOTALS     MEANS      OBJECTIVES COMPLETED/HOURS CREDITED RATIOS

     PERIODS MISSED                37        3.1        PRESENT WEEK            0.88
     WARNING FLAGS                  5        0.4        1 WEEK AGO              0.69
     MERIT FLAGS                   18        1.5        2 WEEKS AGO             0.39
     COMMENDATIONS                  0        0.0        3 WEEKS AGO             0.18
     DISCIPLINE REPORTS             0        0.0        4 WEEKS AGO             0.16
     CLASS WARNING INDICATORS       0
     CLASS PROGRESS INDICATORS      2                 PERFORMANCE STATUS  EXCEPTIONAL PROGRESS BEING MADE
     HOURS CREDITED             132.3       11.0
     OBJECTIVES COMPLETED         116        9.7

   FINANCIAL DATA
     DOLLARS EXPENDED TO DATE           $  201.00
     BUDGETED COST PER PUPIL            $   55.00
     PRESENT COST PER PUPIL             $   16.75
     COST PER CREDITED PUPIL HOUR       $    1.52
     BUDGETED COST PER HOUR             $    1.22

   PERFORMANCE OBJECTIVE SUMMARY INFORMATION
     OBJECTIVE      STUDENTS       STUDENTS       PRESENT       PRORATED      NUMBER OF
     NUMBER         PRESENTLY      WHO HAVE       PRORATED      COST PER      CREDITED
                    WORKING        COMPLETED      COST          PUPIL         HOURS

        1              11             0          $   22.64     $  2.06          14.9
        2              10             2          $   53.33     $  4.44          35.1
        3               0             2          $    3.95     $  1.93           2.6
```

Exhibit 24 - Classroom Summary Report

CLASSROOM SUMMARY REPORT 03/20/72

PERFORMANCE OBJECTIVE SUMMARY INFORMATION

| OBJECTIVE NUMBER | STUDENTS PRESENTLY WORKING | STUDENTS WHO HAVE COMPLETED | PRESENT PRORATED COST | PRORATED COST PER PUPIL | NUMBER OF CREDITED HOURS |
|---|---|---|---|---|---|
| 4 | 0 | 8 | $ 5.10 | $ 0.65 | 3.4 |
| 5 | 1 | 5 | $ 3.19 | $ 0.53 | 2.1 |
| 6 | 1 | 4 | $ 8.20 | $ 1.64 | 5.4 |
| 7 | 2 | 2 | $ 0.45 | $ 0.11 | 0.3 |
| 8 | 0 | 3 | $ 2.13 | $ 0.71 | 1.4 |
| 9 | 1 | 2 | $ 1.67 | $ 0.56 | 1.1 |
| 10 | 1 | 2 | $ 0.45 | $ 0.15 | 0.3 |
| 11 | 0 | 7 | $ 0.45 | $ 0.06 | 0.3 |
| 12 | 1 | 3 | $ 2.43 | $ 0.61 | 1.6 |
| 13 | 0 | 0 | $ 0.00 | $ 0.00 | 0.0 |
| 14 | 0 | 0 | $ 0.00 | $ 0.00 | 0.0 |
| 15 | 0 | 0 | $ 0.00 | $ 0.00 | 0.0 |
| 16 | 1 | 6 | $ 2.13 | $ 0.30 | 1.4 |
| 17 | 2 | 4 | $ 1.21 | $ 0.20 | 0.8 |
| 18 | 0 | 3 | $ 1.67 | $ 0.56 | 1.1 |
| 19 | 0 | 0 | $ 0.00 | $ 0.00 | 0.0 |
| 20 | 0 | 0 | $ 0.00 | $ 0.00 | 0.0 |
| 21 | 0 | 0 | $ 0.00 | $ 0.00 | 0.0 |
| 22 | 1 | 0 | $ 0.61 | $ 0.61 | 0.4 |
| 23 | 0 | 0 | $ 0.00 | $ 0.00 | 0.0 |
| 24 | 0 | 0 | $ 0.00 | $ 0.00 | 0.0 |
| 25 | 0 | 1 | $ 0.30 | $ 0.30 | 0.2 |
| 26 | 1 | 1 | $ 0.45 | $ 0.23 | 0.3 |
| 27 | 0 | 0 | $ 0.00 | $ 0.00 | 0.0 |

Exhibit 24 - Classroom Summary Report (cont'd)

Dollar Summary Report Program (DOLLSU)

This report is a slightly modified and abbreviated version of the classroom summary report. It is designed to give an administrator a purely financial picture of the internal operations of a district's classes. The report is generated from the classmaster file and, except for the same three fields which had to be calculated in the classroom summary report, involves nothing more than directly printing out information contained in the classmaster file for each class. The program will require the operator to input the desired report date on the console in reply to the message "WHAT REPORT DATE?"

The report lists out for each class:

district number
school number
class number
teacher number
teacher name
class name

number of weeks course meets
current school week number
active enrollment

for each performance objective in course
*prorated cost of each performance objective
*prorated cost per student of each performance objective
total hours credited to each objective
number of students presently working on each objective
number of students who have completed each objective

total dollars budgeted
dollars budgeted-certified salaries
dollars budgeted-classified salaries
dollars budgeted-benefits
dollars budgeted-books and supplies
dollars budgeted-support services
dollars budgeted-other services
dollars budgeted-other outgo
nonbudgeted expenses or savings to date
dollars expended to date

budgeted cost per pupil
present cost per pupil
cost per credited pupil hour
*budgeted cost per hour

*See classroom summary report writeup for description of how these items are generated.

The number of performance objectives on which reports will be given will be the same as the number entered into the "number of performance objectives in course" field. If this number should vary within a class from the value read on the first student record for a given class, the varying record will be printed out with the message INVALID PERFORMANCE OBJECTIVE TOTAL and the varying data will be ignored.

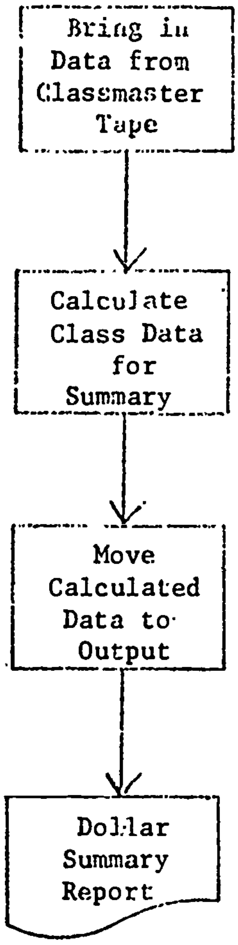

Bring in Data from Classmaster Tape
Calculate Class Data for Summary
Move Calculated Data to Output
Dollar Summary Report

Exhibit 25 - Dollar Summary Report Program (logic flowchart)

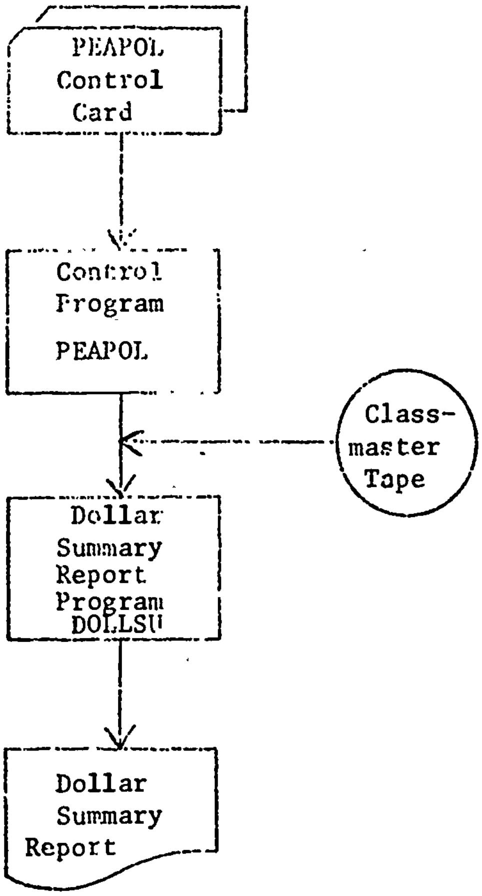
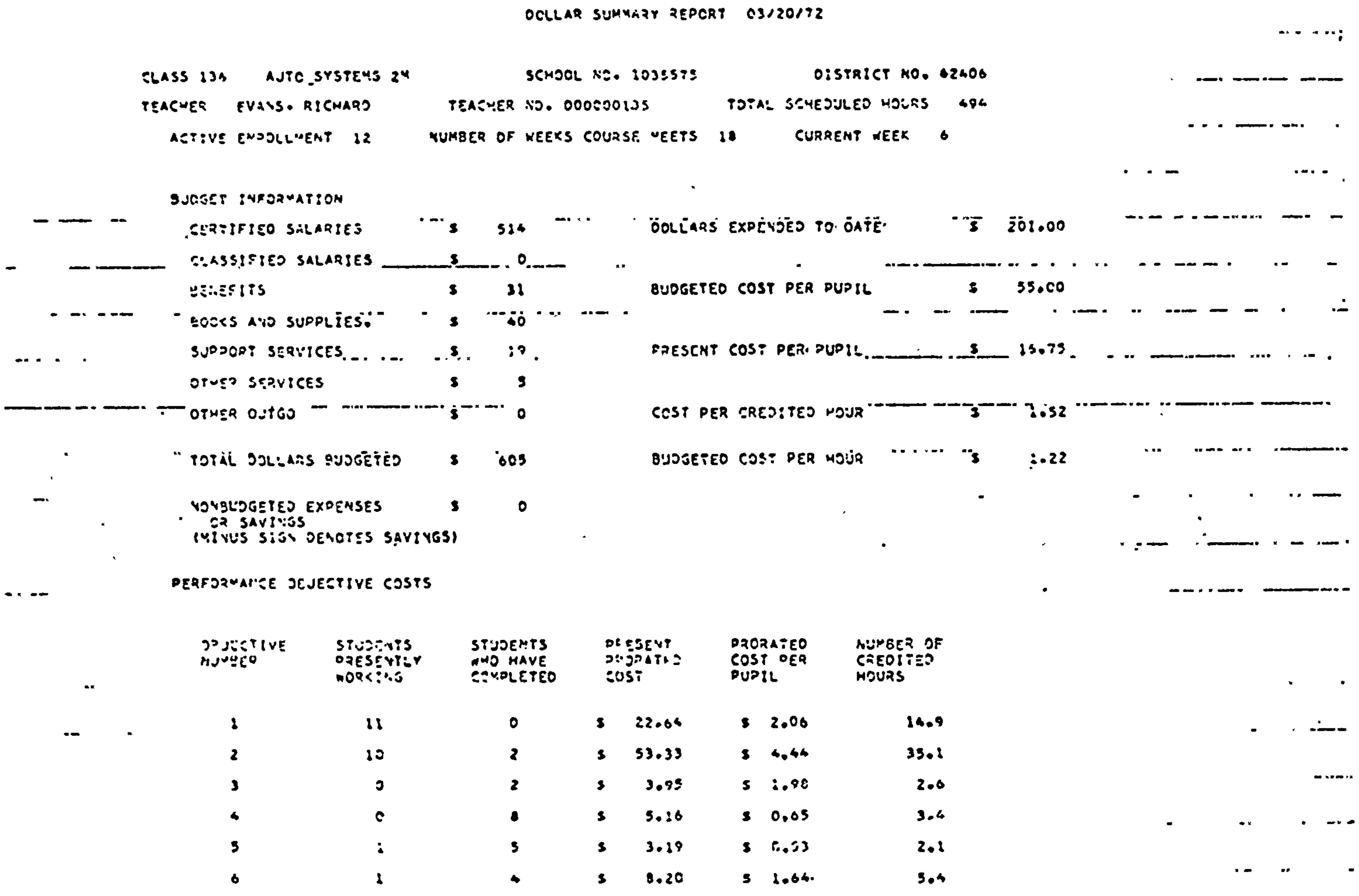


Exhibit 26 - Dollar Summary Report Program (procedures flowchart)



```
                              DOLLAR SUMMARY REPORT  03/20/72

CLASS 136    AUTO SYSTEMS 2M           SCHOOL NO. 1035575           DISTRICT NO. 62406
TEACHER   EVANS. RICHARD        TEACHER NO. 000000135        TOTAL SCHEDULED HOURS   494
   ACTIVE ENROLLMENT  12      NUMBER OF WEEKS COURSE MEETS  18      CURRENT WEEK   6


   BUDGET INFORMATION
     CERTIFIED SALARIES        $     514         DOLLARS EXPENDED TO DATE        $   201.00
     CLASSIFIED SALARIES       $       0
     BENEFITS                  $      31         BUDGETED COST PER PUPIL         $    55.00
     BOOKS AND SUPPLIES.       $      40
     SUPPORT SERVICES          $      19         PRESENT COST PER PUPIL          $    16.75
     OTHER SERVICES            $       5
     OTHER OUTGO               $       0         COST PER CREDITED HOUR          $     1.52

     TOTAL DOLLARS BUDGETED    $     605         BUDGETED COST PER HOUR          $     1.22

     NONBUDGETED EXPENSES      $       0
       OR SAVINGS
     (MINUS SIGN DENOTES SAVINGS)

   PERFORMANCE OBJECTIVE COSTS


     OBJECTIVE     STUDENTS      STUDENTS      PRESENT       PRORATED      NUMBER OF
     NUMBER        PRESENTLY     WHO HAVE      PRORATED      COST PER      CREDITED
                   WORKING       COMPLETED     COST          PUPIL         HOURS

        1             11             0         $   22.64     $  2.06          14.9
        2             10             2         $   53.33     $  4.44          35.1
        3              0             2         $    3.95     $  1.98           2.6
        4              0             8         $    5.16     $  0.65           3.4
        5              1             5         $    3.19     $  0.53           2.1
        6              1             4         $    8.20     $  1.64           5.4
```

Exhibit 27 - Dollar Summary Report

DOLLAR SUMMARY REPORT 03/20/72

PERFORMANCE OBJECTIVE COSTS

| OBJECTIVE NUMBER | STUDENTS PRESENTLY WORKING | STUDENTS WHO HAVE COMPLETED | PRESENT PRORATED COST | PRORATED COST PER PUPIL | NUMBER OF CREDITED HOURS |
|---|---|---|---|---|---|
| 7 | 2 | 2 | $ 0.45 | $ 0.11 | 0.3 |
| 8 | 0 | 3 | $ 2.13 | $ 0.71 | 1.4 |
| 9 | 1 | 2 | $ 1.67 | $ 0.56 | 1.1 |
| 10 | 1 | 2 | $ 0.45 | $ 0.15 | 0.3 |
| 11 | 0 | 7 | $ 0.45 | $ 0.06 | 0.3 |
| 12 | 1 | 3 | $ 2.43 | $ 0.61 | 1.6 |
| 13 | 0 | 0 | $ 0.00 | $ 0.00 | 0.0 |
| 14 | 0 | 0 | $ 0.00 | $ 0.00 | 0.0 |
| 15 | 0 | 0 | $ 0.00 | $ 0.00 | 0.0 |
| 16 | 1 | 6 | $ 2.13 | $ 0.30 | 1.4 |
| 17 | 2 | 4 | $ 1.21 | $ 0.20 | 0.8 |
| 18 | 0 | 3 | $ 1.67 | $ 0.56 | 1.1 |
| 19 | 0 | 0 | $ 0.00 | $ 0.00 | 0.0 |
| 20 | 0 | 0 | $ 0.00 | $ 0.00 | 0.0 |
| 21 | 0 | 0 | $ 0.00 | $ 0.00 | 0.0 |
| 22 | 1 | 0 | $ 0.61 | $ 0.61 | 0.4 |
| 23 | 0 | 0 | $ 0.00 | $ 0.00 | 0.0 |
| 24 | 0 | 0 | $ 0.00 | $ 0.00 | 0.0 |
| 25 | 0 | 1 | $ 0.30 | $ 0.30 | 0.2 |
| 26 | 1 | 1 | $ 0.45 | $ 0.23 | 0.3 |
| 27 | 0 | 0 | $ 0.00 | $ 0.00 | 0.0 |
| 28 | 1 | 0 | $ 0.45 | $ 0.45 | 0.3 |
| 29 | 2 | 1 | $ 4.10 | $ 1.37 | 2.7 |

Exhibit 27 - Dollar Summary Report (cont'd)

## Student Summary Report Program (STUDSU)

This is a report which is designed to give the student and instructor a comprehensive picture of the progress being made by each individual in the class. The report is produced by accessing the studentmaster file, and nearly all of the items listed in the report are taken directly from fields within each student's record in the file. As with the previously described reports, the operator will be required to input the desired report date on the console before processing can begin.

Before any printing is done by this program, all of the student records within each class on the studentmaster file are first sorted alphabetically by the students' last names. At this point, a report containing the following information for each student in the class is produced:

*district number
*school number
*class number
*class name
student number
student name
**class hours credited
**days absent
**warning flags
**merit flags
**total number of performance objectives completed

performance objectives completed/hours credited ratio
**current week
**1 week ago
**2 weeks ago
**3 weeks ago
**4 weeks ago
current warning/merit flag indicator

for each performance objective (up to 75)
hours credited to date
performance objective completion indicator

Except for the four single-asterisked items at the top of the list of elements, all other information produced by this program will be printed out in matrix form, with the horizontal dimension being the individual items of information and the vertical dimension being the student names in each class printed out in alphabetical order. The vertical dimension of the matrix will include summary information pertaining to the class as a whole. Summaries will also be produced in this report for the asterisked items at the school level and the district level. These summaries will be printed out whenever there is a control break caused by a shift in schools or a shift in districts. The fields which are double asterisked will be averaged for the class as a whole and reported at the bottom of each matrix. This will be done by dividing their contents by the computer count of the number of records located in a given control break group. Separate counts will have to be maintained for each reporting level.

It is realized that a complete listing of performance objective information might not be required for every class every week. Therefore, the report section describing students' progress on individual performance objectives has been designed as an option. It is located on pages which follow the page giving other information produced for the individual student, and the user is given a chance to omit the printing of this section entirely. The message, SHALL PERFORMANCE OBJECTIVE LISTINGS BE SUPPRESSED?, will appear on the console before printing begins, and the operator will give his instructions by typing either YES or NO.

The number of performance objectives which will be reported on will be the same as the number entered into the "number of performance objectives in course" field. If this number should vary within a class from the value read on the first student record for a given class, the variant record will be printed out with the message INVALID PERFORMANCE OBJECTIVE TOTAL and the variant data will be ignored.

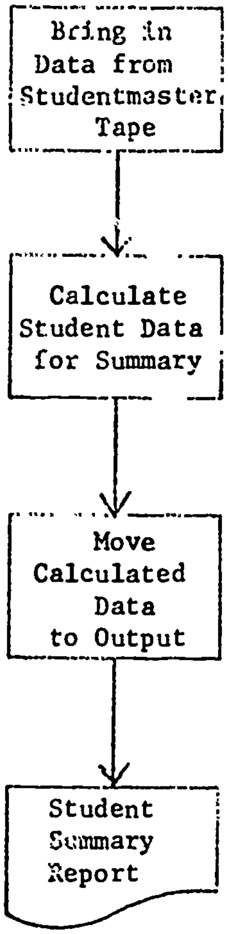

Bring in Data from Studentmaster Tape
Calculate Student Data for Summary
Move Calculated Data to Output
Student Summary Report

Exhibit 28 - Student Summary Report Program (logic flowchart)

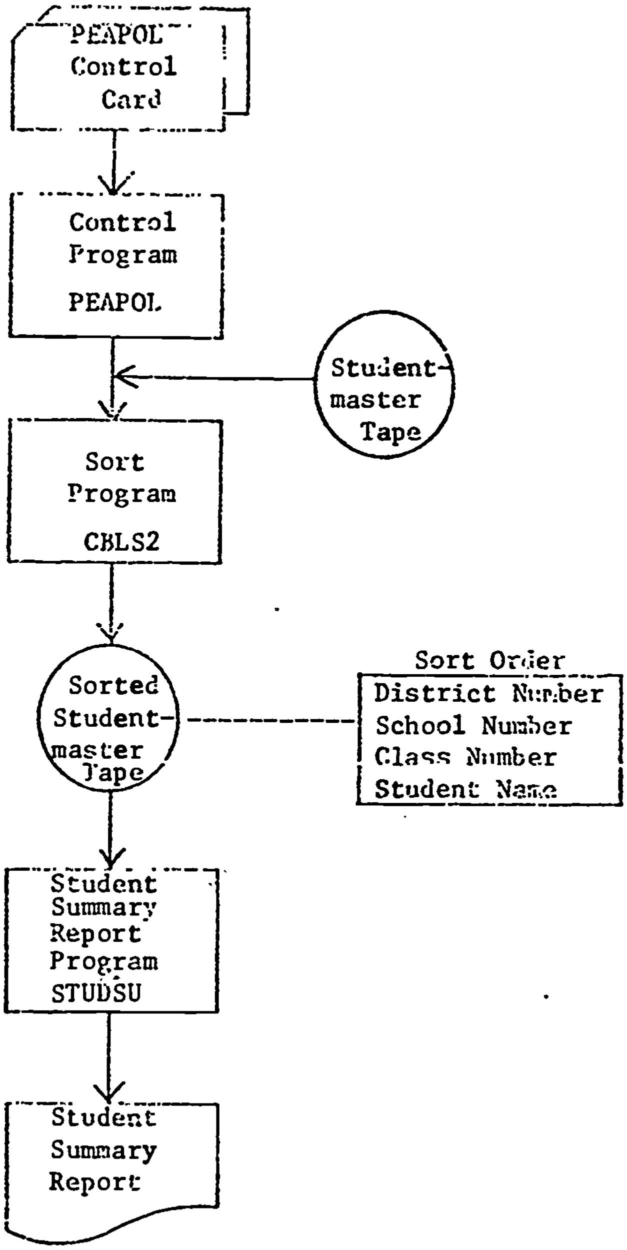


Exhibit 29 - Student Summary Report Program (procedures flowchart)

STUDENT SUMMARY REPORT 03/20/72

CLASS 061 AUTO ELECTRICS SCHOOL NO. 1036672 DISTRICT NO. 62430

| STUDENT NAME | STUDENT NUMBER | PERFORMANCE INDICATOR | HOURS CREDITED | PERIODS MISSED | WARN. FLAGS | MERIT FLAGS | OBJECTIVES COMPLETED | OBJECTIVES COMPLETED/HOURS CREDITED RATIO (WEEKS AGO) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | NOW | 1 | 2 | 3 | 4. |
| BANDY RICKY | 0002176739 | NORMAL | 14.9 | 3 | 0 | 0 | 10 | 0.67 | 0.82 | 0.88 | 0.96 | 1.04 |
| BERTRAND CURTIS | 0002176745 | NORMAL | 7.2 | 3 | 0 | 1 | 7 | 0.97 | 1.06 | 1.74 | 2.22 | 0.09 |
| CASTANON RAYMOND | 0002176768 | WARNING | 12.5 | 6 | 2 | 0 | 6 | 0.48 | 0.65 | 0.55 | 0.68 | 0.91 |
| ENGSTROM BERT FELT | 0002176799 | NORMAL | 19.1 | 0 | 1 | 0 | 29 | 1.52 | 1.59 | 1.97 | 1.78 | 2.00 |
| ENGSTROM DAVID MELVI | 0002176800 | NORMAL | 20.3 | 0 | 0 | 0 | 23 | 1.13 | 1.22 | 1.16 | 1.25 | 1.17 |
| ESTRADA VALENTIN | 0002196063 | NORMAL | 14.2 | 3 | 0 | 0 | 9 | 0.63 | 0.79 | 0.71 | 0.78 | 0.69 |
| FORRESTER ROBERT | 0002176806 | WARNING | 17.7 | 4 | 2 | 0 | 14 | 0.79 | 0.79 | 0.90 | 0.92 | 1.35 |
| GARCIA THOMAS | 0002176820 | NORMAL | 18.9 | 0 | 0 | 0 | 13 | 0.69 | 0.86 | 1.07 | 1.10 | 0.73 |
| GRIJALVA GARY DAVID | 0002176824 | NORMAL | 20.3 | 1 | 0 | 1 | 9 | 0.44 | 0.45 | 0.49 | 0.61 | 0.34 |
| KENNER DANNY ANTHONY | 0002196210 | NORMAL | 16.9 | 0 | 0 | 0 | 28 | 1.66 | 1.74 | 1.89 | 2.00 | 1.90 |
| LEBARON LOREN SCOTT | 0002176858 | NORMAL | 17.0 | 3 | 0 | 0 | 16 | 0.94 | 0.93 | 1.06 | 1.14 | 0.76 |
| MULLIGAN MIKE | 0002176893 | NORMAL | 16.7 | 4 | 0 | 0 | 14 | 0.84 | 0.79 | 0.75 | 0.77 | 0.57 |
| TAMAYO RUBEN | 0002176979 | NORMAL | 15.9 | 3 | 0 | 0 | 22 | 1.38 | 1.22 | 0.85 | 1.11 | 1.35 |
| TEIXEIRA CLARENCE | 0002177052 | WARNING | 9.9 | 2 | 1 | 0 | 10 | 1.01 | 1.01 | 1.19 | 1.46 | 1.52 |
| WILSON SCOTT ALLEN | 0002177057 | WARNING | 13.0 | 1 | 1 | 0 | 15 | 1.15 | 1.49 | 1.47 | 1.96 | 1.82 |
| CLASS TOTALS | | | 234.4 | 33 | 7 | 2 | 225 | | | | | |
| CLASS AVERAGES | | | 15.6 | 2.2 | 0.5 | 0.1 | 15.0 | 0.95 | 1.03 | 1.08 | 1.25 | 1.08 |

Exhibit 30 - Student Summary Report

```
                                          STUDENT SUMMARY REPORT   03/20/72
                                          HOURS AND COMPLETION (*) INFORMATION
       CLASS 061 . ..AUTO ELECTRICS       SCHOOL NO, 1036672     .. ... DISTRICT NO, 62480

   STUDENT NAME          NUMBER    OBJ 1  OBJ 2  OBJ 3  OBJ 4  OBJ 5  OBJ 6  OBJ 7  OBJ 8  OBJ 9  OBJ 10 OBJ 11 OBJ 12

BANDY RICKY            0002176739   4.5    0.2*   0.0    0.0    0.4    0.6    0.0    0.0    0.5    0.5*   0.4*   0.0
BERTRAND CURTIS        0002176745   1.0    0.5    0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0*
CASTANON RAYMOND       0002176768   1.8    0.1*   0.0    0.0    0.0    0.0    0.0    0.0    0.0    1.5    0.0    0.0
ENGSTROM BERT FELT     0002176799   4.0    0.3*   0.1*   0.0    0.3*   0.0    0.0    0.0    0.5*   0.2*   0.0    0.7*
ENGSTROM DAVID MELVI   0002176800   3.6    0.0    0.4*   0.0    0.0    0.0    0.0    0.0    0.6*   0.5*   0.4*   0.8
ESTRADA VALENTIN       0002196063   3.9    0.4*   0.5    0.0    0.0    0.0    0.0    0.0    1.0    0.9*   0.0    0.0
FORESTER ROBERT        0002176806   4.9    0.0    0.2*   0.0    0.7    0.0    0.0    0.0    0.0    0.0    0.0    0.0
GAUCIN THOMAS          0002176820   4.1    0.1*   0.0    0.0    0.7    0.0    0.0    0.0    0.0    0.7*   0.0    0.0
GRIJALVA GARY DAVID    0002176824   5.1    0.0    0.0    0.0    0.0    0.7    0.0    0.0    0.0    0.0    0.5*   0.0
KENNER DANNY ANTHONY   0002196210   3.1    0.2*   0.1*   0.3*   0.3*   0.1*   0.0    0.0    0.8*   0.4*   0.4*   0.4*
LEBARON LOREN SCOTT    0002176858   4.6    0.3*   0.0    0.0    0.0    0.6*   0.0    0.0    0.0    0.3*   0.0    0.0
MULLIGAN MIKE          0002176893   5.9    0.4*   0.2*   0.0    0.3*   0.5*   0.0    0.0    0.0    0.7*   0.0    0.0
TAMAYO RUBEN           0002176970   4.2    0.2*   0.3*   0.0    0.5*   0.1*   0.0    0.0    0.7*   0.8*   0.0    0.0
TEIXEIRA CLARENCE      0002177052   4.5    0.1*   0.2*   0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0
WILSON SCOTT ALLEN     0002177057   3.7    0.2*   0.1*   0.0    0.0    0.4    0.0    0.0    0.0    0.0    0.0    0.0
```

Exhibit 30 - Student Summary Report (cont'd)

Special Student Report (SPECIA)

This report is generated by first sorting the studentmaster file so that it can produce special categories of information, and then printing out a report which summarizes data for each of these information categories. Each special sort is called an option. The following are the available options:

The ETHNIC OPTION sets up the following sort order:

ethnic classification (1 - 6)
district number
school number
class number

The SEX OPTION sets up this sort order:

sex (M or F)
district number
school number
class number

The READING OPTION sets up this sort order:

*reading score
district number
school number
class number

The MATH OPTION sets up this sort order:

*math score
district number
school number
class number

The AGE OPTION sets up this sort order:

year of birth (each birth year)
district number
school number
class number

The PERCENTILE OPTION sets up this sort order:

*percentile score
district number
school number
class number

*After sorting math, reading, and percentile scores, the program will group and report information for the above mean group and the below mean group. All scores entered into the system for a given class must be for the same test, test form, test level, norm type, and administration date. No scores more than 12 months old should be entered.

When this program is run, a message appears on the operator's console, WHICH OPTIONS DID YOU WISH -- AGE, SEX, ETHNIC, READING, MATH, PERCENTILE? The operator then simply types in the words which describe the reports which he is supposed to generate. Each word should be separated from the others by a comma. As each report is produced, the heading contains in the "option" field the title of the option being reported.

After the options are selected, the operator must insert the desired report date in answer to the console message WHAT REPORT DATE? After this is done, the program is ready to run.

The report produced by this program is similar to the summary information produced in the student summary report. Due to the sensitivity of some of these grouped data, no information pertaining to specific individuals is produced.

The only fields requiring special explanation on this report are the "% this week" fields in the merit and warning flag columns. These numbers are derived by having the program total the current warning and current merit indicators for a particular group and then divide these totals by the quantity in the "group size" field.

The "group size" field on this report contains the number of records in each control break group. This total is used in computing all of the averages required in this program.

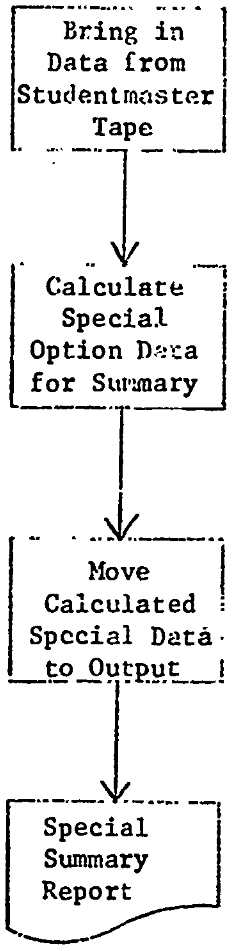
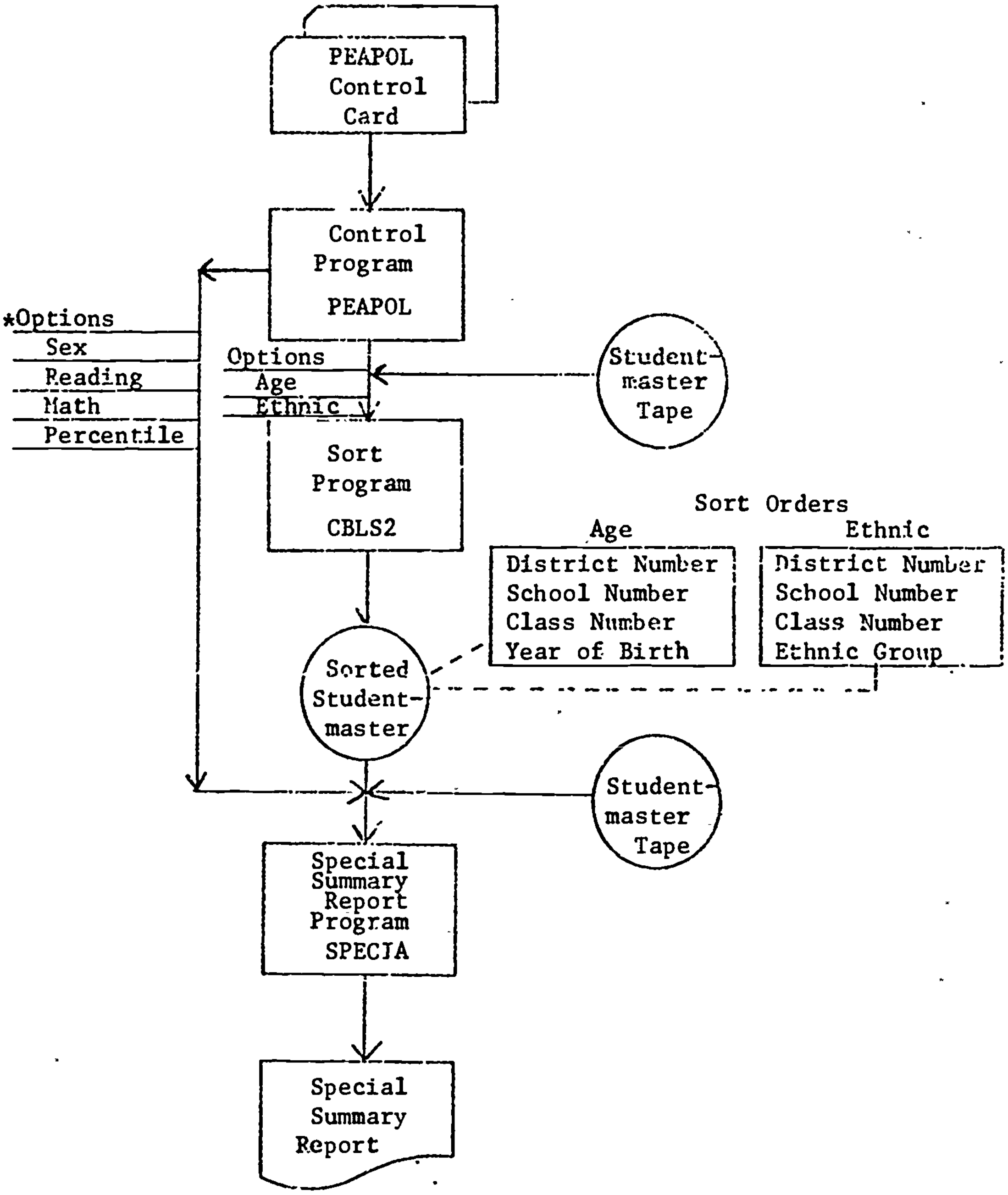

Bring in Data from Studentmaster Tape
Calculate Special Option Data for Summary
Move Calculated Special Data to Output
Special Summary Report

Exhibit 31 - Special Student Report Program (logic flowchart)



*Sorts are not required for the age or ethnic options as records are already arranged in the proper order for these runs.

Exhibit 32 - Special Student Report Program (procedures flowchart)

SPECIAL STUDENT REPORT 03/20/72

OPTION READING

SCHOOL NO. 1036672 DISTRICT NO. 62430

| CLASS NUMBER | CLASS NAME | GROUP SIZE | AVERAGE HOURS CREDITED | AVERAGE OBJECTIVES COMPLETED | AVERAGE PERIODS MISSED | WARNING FLAGS |  | MERIT FLAGS |  | AVERAGE DISCIPLINE REPORTS | AVERAGE COMMEND REPORTS | OBJECTIVES COMPLETED/HOURS CREDITED RATIOS(AVERAGE) |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  |  |  | AV | PCT THIS WEEK | AV | PCT THIS WEEK |  |  | NOW | 1 | 2 | 3 | 4 |
| OPTION GROUP - STUDENTS AT OR ABOVE MEAN 60 AVERAGE SCORE 79 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 061 | AUTO ELECTRICS | 7 | 15.6 | 16.3 | 2.0 | 0.6 | 29 | 0.1 | 0 | 1.4 | 0.4 | 1.02 | 1.13 | 1.84 | 1.46 | 1.17 |
| OPTION GROUP - STUDENTS BELOW MEAN 60 AVERAGE SCORE 58 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 051 | AUTO ELECTRICS | 6 | 15.7 | 12.3 | 2.7 | 0.5 | 33 | 0.2 | 0 | 7.5 | 0.2 | 0.81 | 0.84 | 0.82 | 0.97 | 0.90 |

Exhibit 33 - Special Student Report (Reading Option)

SPECIAL STUDENT REPORT 01/26/72

OPTION SEX

SCHOOL NO. 0000021 DISTRICT NO. 00031

| CLASS NUMBER | CLASS NAME | GROUP SIZE | AVERAGE HOURS CREDITED | AVERAGE OBJECTIVES COMPLETED | AVERAGE PERIODS MISSED | WARNING FLAGS | | MERIT FLAGS | | AVERAGE DISCIPLINE REPORTS | AVERAGE COMMEND REPORTS | OBJECTIVES COMPLETED/HOURS CREDITED RATIOS(AVERAGE) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | AV | PCT THIS WEEK | AV | PCT THIS WEEK | | | NOW | 1 | 2 | 3 | 4 |
| OPTION GROUP - FEMALE | | | | | | | | | | | | | | | | |
| 011 | AUTO | 2 | 1.5 | 0.0 | 0.0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| OPTION GROUP - MALE | | | | | | | | | | | | | | | | |
| 011 | AUTO | 6 | 2.7 | 0.3 | 4.2 | 0.0 | 0 | 0.0 | 0 | 3.3 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| OPTION GROUP - FEMALE | | | | | | | | | | | | | | | | |
| 012 | BODY SHOP | 1 | 0.0 | 0.0 | 0.0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| OPTION GROUP - MALE | | | | | | | | | | | | | | | | |
| 012 | BODY SHOP | 7 | 1.0 | 1.0 | 0.0 | 0.0 | 0 | 0.0 | 14 | 0.1 | 0.0 | 0.20 | 0.13 | 0.10 | 0.07 | 0.12 |

Exhibit 34 - Special Student Report(Sex Option)

```
                                        SPECIAL STUDENT REPORT  03/13/72

                                        OPTION  AGE

      SCHOOL NO. 1036672                DISTRICT NO. 62630

CLASS    CLASS           GROUP  AVERAGE   AVERAGE    AVERAGE WARNING    MERIT     AVERAGE    AVERAGE  OBJECTIVES COMPLETED/HOURS
NUMBER   NAME            SIZE   HOURS     OBJECTIVES PERIODS FLAGS      FLAGS     DISCIPLINE COMMEND  CREDITED RATIOS(AVERAGE)
                                CREDITED  COMPLETED  MISSED                       REPORTS    REPORTS
                                                             AV PCT     AV PCT
                                                                THIS       THIS                        NOW   1     2     3     4
                                                                WEEK       WEEK

OPTION GROUP - YEAR OF BIRTH 1953

061    AUTO ELECTRICS     4      13.4      12.3        2.5  0.3  25   0.0  0     0.0          0.0  0.92  0.90  1.02  1.12  1.22

OPTION GROUP - YEAR OF BIRTH 1954

061    AUTO ELECTRICS     9      12.3      12.7        1.4  0.1  11   0.2  22    0.4          0.0  1.04  1.13  1.34  0.97  1.21

OPTION GROUP - YEAR OF BIRTH 1955

061    AUTO ELECTRICS     2      11.6      15.0        3.0  0.5  50   0.0  0     2.0          0.0  1.20  1.22  1.34  1.41  1.71
```

Exhibit 35 - Special Student Report (Age Option)

```
                                         SPECIAL STUDENT REPORT  03/18/72

                                         OPTION  ETHNIC

            SCHOOL NO. 1036672                DISTRICT NO. 62430

    CLASS      CLASS           GROUP  AVERAGE   AVERAGE     AVERAGE WARNING   MERIT    AVERAGE     AVERAGE  OBJECTIVES COMPLETED/HOURS
    NUMBER     NAME            SIZE   HOURS     OBJECTIVES  PERIODS FLAGS     FLAGS    DISCIPLINE  COMMEND  CREDITED RATIOS(AVERAGE)
                                      CREDITED  COMPLETED   MISSED                     REPORTS     REPORTS
                                                                     AV PCT   AV PCT
                                                                        THIS     THIS                        NOW    1     2     3     4
                                                                        WEEK     WEEK
    OPTION GROUP - ETHNIC GROUP 1

    061     AUTO ELECTRICS      5      13.0      10.2        2.6    0.2  20   0.2  20     1.0         0.0   0.80  0.73  0.07  0.80  0.79
    OPTION GROUP - ETHNIC GROUP 2

    061     AUTO ELECTRICS     10      12.3      14.2        1.6    0.2  20   0.1  10     0.3         0.0   1.16  1.25  1.45  1.22  1.52
```

Exhibit 36 - Special Student Report (Ethnic)

```
                                              SPECIAL STUDENT REPORT  03/20/72

                                              OPTION  MATH

        SCHOOL NO. 1036572                    DISTRICT NO. 61430

CLASS       CLASS          GROUP  AVERAGE   AVERAGE     AVERAGE WARNING  MERIT    AVERAGE    AVERAGE  OBJECTIVES COMPLETED/HOURS
NUMBER      NAME           SIZE   HOURS     OBJECTIVES  PERIODS FLAGS    FLAGS    DISCIPLINE COMMEND  CREDITED RATIOS(AVERAGE)
                                  CREDITED  COMPLETED   MISSED                    REPORTS    REPORTS
                                                                AV PCT   AV PCT
                                                                   THIS     THIS                       NOW   1     2     3     4
                                                                   WEEK     WEEK

OPTION GROUP - STUDENTS AT OR ABOVE MEAN  40  AVERAGE SCORE  65

061     AUTO ELECTRICS     6      15.7      17.3        1.8  0.7  33  0.2   0      1.3         0.5    1.08  1.18  1.30  1.55  1.19

OPTION GROUP - STUDENTS BELOW MEAN        40  AVERAGE SCORE  19

061     AUTO ELECTRICS     7      15.6      12.0        2.7  0.4  29  0.1   0      2.4         0.1    0.79  0.83  0.83  0.97  0.92
```

Exhibit 37 - Special Student Report (Math Option)

```
                                    SPECIAL STUDENT REPORT  03/20/72

                                    OPTION  PERCENTILE

          SCHOOL NO. 1036672        DISTRICT NO. 62430

  CLASS      CLASS        GROUP AVERAGE  AVERAGE    AVERAGE WARNING  MERIT   AVERAGE    AVERAGE  OBJECTIVES COMPLETED/HOURS
  NUMBER     NAME         SIZE  HOURS    OBJECTIVES PERIODS FLAGS    FLAGS   DISCIPLINE COMMEND  CREDITED RATIOS(AVERAGE)
                                CREDITED COMPLETED  MISSED                   REPORTS    REPORTS
                                                        AV PCT   AV PCT
                                                           THIS     THIS                          NOW   1     2     3     4
                                                           WEEK     WEEK

  OPTION GROUP - STUDENTS AT OR ABOVE MEAN   56  AVERAGE SCORE   73

  061    AUTO ELECTRICS    6      14.2      12.8      2.7  0.5  33  0.2  0     2.8        0.2  0.89  1.05  1.14  1.27  0.95

  OPTION GROUP - STUDENTS BELOW MEAN         56  AVERAGE SCORE   40

  061    AUTO ELECTRICS    7      16.9      15.9      2.0  0.6  29  0.1  0     1.1        0.4  0.95  0.96  0.96  1.12  1.12
```

Exhibit 38 - Special Student Report (Percentile Option)

Description of Studentmaster and Classmaster Tape Files

The following pages contain the design of the two tape files which are the heart of this system.

Studentmaster contains fixed length, 410 character records. These records describe the work of every student operating within the system. The file is sorted in the following order:

district number
school number
class number
student number

Classmaster contains fixed length, 934 character records. These records describe each class operating within the system. The file is sorted in the following order:

district number
school number
class number

In addition to these two main files, there are a number of sorted variations of each which are utilized in different programs as "scratch files." These additional files have the same elements and composition as the main files. The studentmaster and classmaster files were previously described in Exhibits 17 and 18, but the descriptions are repeated here for the reader's convenience.

Exhibit 39 - Studentmaster File Description

| FIELD DESCRIPTION | PICTURE | # OF CHARS | ACCUM CHARS |
|---|---|---|---|
| district number | 99999 | 5 | 5 |
| school number | 9(7) | 7 | 12 |
| class number | 999 | 3 | 15 |
| student number | 9(10) | 10 | 25 |
| student name (last name first) | X(20) | 20 | 45 |
| sex | X | 1 | 46 |
| ethnic code | X | 1 | 47 |
| year | 99 | 2 | 49 |
| reading score | X(4) | 4 | 53 |
| math score | X(4) | 4 | 57 |
| percentile score | 99 | 2 | 59 |
| class hours credited | 9999.9 | 5 | 64 |
| periods missed | 999 | 3 | 67 |
| warning flags | 99 | 2 | 69 |
| commendations | 99 | 2 | 71 |
| merit flags | 99 | 2 | 73 |
| discipline reports | 99 | 2 | 75 |
| total no. performance objectives completed | 99 | 2 | 77 |
| hours credited to date for individual | 99.9(ea.) | 3(ea.) | - |
| performance objectives | | | |
| Objective 1 | | | - |
| Objective 2 | | 225 | 302 |
| Objective 75 | | | - |
| performance objective completion | X(ea.) | 1(ea.) | |
| indicator | | | |
| Objective 1 | | | |
| Objective 2 | | 75 | 377 |
| Objective 75 | | | |
| performance objectives completed/ | | | |
| hours credit ratio | - | - | - |
| present week | 9.99 | 3 | 380 |
| 1 week ago | 9.99 | 3 | 383 |
| 2 weeks ago | 9.99 | 3 | 386 |
| 3 weeks ago | 9.99 | 3 | 389 |
| 4 weeks ago | 9.99 | 3 | 392 |
| current warning/merit flag | X | 1 | 393 |
| number of performance objectives in course | 99 | 2 | 395 |
| class name | X(15) | 15 | 410 |

Exhibit 40 - Classmaster File Description

| FIELD DESCRIPTION | PICTURE | # OF CHARS | ACCUM CHARS |
|---|---|---|---|
| district number | 99999 | 5 | 5 |
| school number | 9(7) | 7 | 12 |
| class number | X(3) | 3 | 15 |
| teacher number | X(9) | 9 | 24 |
| teacher name | X(20) | 20 | 44 |
| total no. performance objectives in course (75) | 99 | 2 | 46 |
| total hours credited | 99999.9 | 6 | 52 |
| active enrollment | 99 | 2 | 54 |
| total periods missed | 9999 | 4 | 58 |
| total warning flags | 999 | 3 | 61 |
| total commendations | 999 | 3 | 64 |
| total merit flags | 999 | 3 | 67 |
| total discipline reports | 999 | 3 | 70 |
| total number of performance objectives completed | 9999 | 4 | 74 |
| total class warning indicators | 99 | 2 | 76 |
| total class progress indicators | 99 | 2 | 78 |
| number of weeks course meets | 99 | 2 | 80 |
| dollars budgeted-certified salaries | 99999 | 5 | 85 |
| dollars budgeted-classified salaries | 99999 | 5 | 90 |
| dollars budgeted-benefits | 99999 | 5 | 95 |
| dollars budgeted-books and supplies | 9999 | 4 | 99 |
| dollars budgeted-support services | 9999 | 4 | 103 |
| dollars budgeted-other services | 99999 | 5 | 108 |
| dollars budgeted-other outgo | 99999 | 5 | 113 |
| total dollars budgeted | 99999 | 5 | 118 |
| nonbudgeted expenses or savings to date | ±99999 | 6 | 124 |
| dollars expended to date | 99999 | 5 | 129 |
| budgeted cost per pupil | 9999.99 | 6 | 135 |
| present cost per pupil | 9999.99 | 6 | 141 |
| cost per credited pupil hour | 9999.99 | 6 | 147 |
| total hours credited to each objective | 99999.9 (ea.) | 6(ea.) | - |
| (need 1 field for each 75 objectives) | - | 450 | 597 |
| number of students working on each objective | 9(ea.) | 2(ea.) | - |
| (need 1 field for each of 75 objectives) | - | 150 | 747 |
| number of students who have completed each | 99(ea.) | 2(ea.) | - |
| objective (need 1 field for each of 75 objectives) | - | 150 | 897 |

Exhibit 40 - Classmaster File Description (cont'd)

| FIELD DESCRIPTION | PICTURE | # OF CHARS | ACCUM CHARS |
|---|---|---|---|
| current warning/merit flag indicator | X | 1 | 898 |
| current school week number | 99 | 2 | 900 |
| class performance objectives completed/hours credited | - | - | - |
| ratio | - | - | - |
| present week | 9.99 | 3 | 903 |
| 1 week ago | 9.99 | 3 | 906 |
| 2 weeks ago | 9.99 | 3 | 909 |
| 3 weeks ago | 9.99 | 3 | 912 |
| 4 weeks ago | 9.99 | 3 | 915 |
| course name | X(15) | 15 | 930 |
| number of scheduled instructional hours | 9999 | 4 | 934 |

## Input Documents

The followi'.g pages contain the input documents utilized by the system. All of the information supplied on these forms is keypunched onto data cards and read into the system via the procedures already described. The student time card is printed on heavy card stock. The numbers on the right-hand side of the three other forms are used by the keypunch operators to instruct them as to the proper columns into which the various types of information should be keypunched.

Exhibit 41 - Classmaster Record Input Form

| | | |
|---|---|---|
| C | C | 1 |
| type of input (N,U,D) | _ | 2 |
| A | A | 3 |
| district number | _ _ _ _ _ | 4-8 |
| school number | _ _ _ _ _ _ _ | 9-15 |
| class number | _ _ _ | 16-18 |
| teacher number | _ _ _ _ _ _ _ _ _ | 19-27 |
| teacher name (last name first) | _ _ _ _ _ _ _ _ _ _<br>_ _ _ _ _ _ _ _ _ _ | 28-47 |
| total no. performance objectives in course | _ _ | 48-49 |
| active enrollment | _ _ | 50-51 |
| course name | _ _ _ _ _ _ _ _ _ _<br>_ _ _ _ | 53-66 |
| no. weeks class meets | _ _ | 67-68 |
| no. scheduled instructional hours | _ _ _ _ | 69-72 |

| | | |
|---|---|---|
| C | C | 1 |
| type of input (N,U) | _ | 2 |
| B | B | 3 |
| district number | _ _ _ _ _ | 4-8 |
| school number | _ _ _ _ _ _ _ | 9-15 |
| class number | _ _ _ | 16-18 |
| nonbudgeted savings/<br>nonbudgeted expenses | _ _ _ _ _ _<br>+ _ _ _ _ _ | 19-24 |
| dollars budgeted | | |
| certified salaries | _ _ _ _ _ | 25-29 |
| classified salaries | _ _ _ _ _ | 30-34 |
| benefits | _ _ _ _ _ | 35-39 |
| books and supplies | _ _ _ _ | 40-43 |
| support services | _ _ _ _ | 44-47 |
| other services | _ _ _ _ _ | 48-52 |
| other outgo | _ _ _ _ _ | 53-57 |
| total dollars budgeted | _ _ _ _ _ | 58-62 |
| budgeted cost per pupil (to nearest cent) | _ _ _ _ _ _ | 63-69 |

Exhibit 42 - Student Time Card

STUDENT TIME CARD

CLASS # 5043 CLASS NAME Auto Adv. Systems--B

STUDENT # ______ WEEK NUMBER ______

DISTRICT NUMBER ______

STUDENT NAME □□□□□□□□□□ (last) ______ (first)

SCHOOL NUMBER 1035575

| P.O. # | NAME OF PERFORMANCE OBJECTIVE | | TIME |
|---|---|---|---|
| | | Start | |
| | | Stop | |
| | | Start | |
| | | Stop | |
| | | Start | |
| | | Stop | |
| | | Start | |
| | | Stop | |
| | | Start | |
| | | Stop | |
| AL:ja<br>1/5/72 | | | |

Exhibit 43- Class Event Input Form

student name______________________________teacher signature______________

date____________________________

| | | |
|---|---|---|
| S | S | 1 |
| E | E | 2 |
| district number | _ _ _ _ _ | 3-7 |
| school number | _ _ _ _ _ _ _ | 8-14 |
| class number | _ _ _ | 15-17 |
| student number | _ _ _ _ _ _ _ _ _ _ | 18-27 |
| first three letters of student's last name | _ _ _ | 28-30 |

numbers of performance objectives student has completed this week _ _

_ _

_ _

_ _

_ _

_ _

_ _

_ _

_ _

How many discipline reports this week? _ _

How many commendations this week? _ _

How many periods missed this week? _ _

Exhibit 44 - Studentmaster Record Input Form

| | | |
|---|---|---|
| S | S | 1 |
| type of input | __ | 2 |
| A | A | 3 |
| district number | __ __ __ __ __ | 4-8 |
| school number | __ __ __ __ __ __ __ | 9-15 |
| class number | __ __ __ | 16-18 |
| student number | __ __ __ __ __ __ __ __ __ __ | 19-28 |
| student name<br>(last name first) | __ __ __ __ __ __ __ __ __ __<br>__ __ __ __ __ __ __ __ __ __ | 29-48 |
| number of performance objectives in course | __ __ | 49-50 |
| sex | __ | 51 |
| ethnic code<br>1 = Spanish surname<br>2 = other White<br>3 = Negro<br>4 = Chinese, Japanese, Korean<br>5 = American Indian<br>6 = other non-White | __ | 52 |
| year of birth | __ __ | 53-54 |
| reading score | __ __ __ __ | 55-58 |
| math score | __ __ __ __ | 59-62 |
| percentile score | __ __ | 63-64 |
| class name | __ __ __ __ __ __ __ __ __ | 65-79 |

__ __ __ __ __.__

## Keypunching and Verifying Instructions

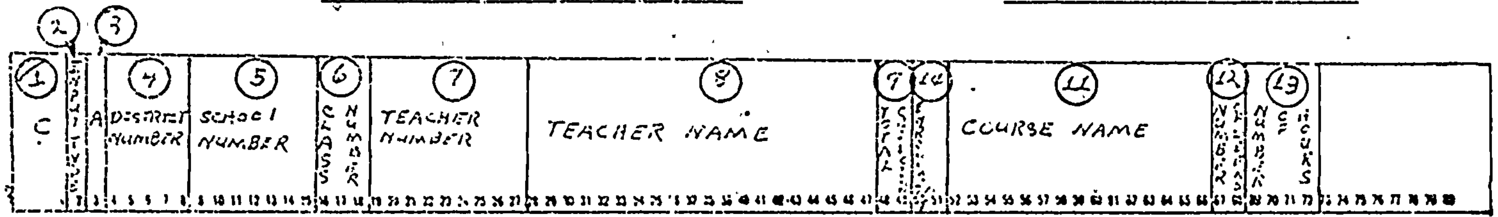
The following pages reproduce the keypunching and verifying instructions developed by the Fresno County Regional Data Processing Center for use with PEAPOL. Complete descriptions of the individual fields contained in each input card are found in the previous chapter, Input Documents.

## PUNCHING & VERIFICATION INSTRUCTIONS

JOB TITLE CLASSMASTER RECORD JOB NUMBER ______

A. Source of Input CLASSMASTER RECORD INPUT FORM B. Card Name CLASSMASTER RECORD INPUT

C. Cards Used 5081 D. Distribution CONTROL



| Ref | Name of Field | Columns From | Columns Thru | Remarks |
|---|---|---|---|---|
| 1 | CARD CODE | 1 | 1 | MUST ALWAYS BE A "C" |
| 2 | CARD INPUT CODE | 2 | 2 | MUST ALWAYS BE A "D", "N", OR "U". D-DELETE, N-NEW, U-UPDATE OF A CLASS RECORD. |
| 3 | CARD TYPE | 3 | 3 | MUST ALWAYS BE A "A" |
| 4 | DISTRICT NUMBER | 4 | 8 | MUST BE PUNCHED. MUST BE NUMERIC. PRECEDING ZEROS REQUIRED. |
| 5 | SCHOOL NUMBER | 9 | 15 | " " " " " " " " " |
| 6 | CLASS NUMBER | 16 | 18 | " " " " " " " " " |
| 7 | TEACHER NUMBER | 19 | 27 | " " " " " " " " " |
| 8 | TEACHER NAME | 28 | 47 | MUST BE PUNCHED. MUST BE ALPHABETIC. LAST NAME FIRST. |
| 9 | NUMBER OF PERFORMANCE OBJECTIVES IN COURSE | 48 | 49 | MUST BE PUNCHED. MUST BE NUMERIC. |
| 10 | ACTIVE ENROLLMENT | 50 | 51 | " " " " " " |
| 11 | COURSE NAME | 52 | 66 | MUST BE PUNCHED. MAY BE ALPHANUMERIC. |
| 12 | NUMBER OF WEEKS COURSE MEETS | 67 | 68 | MUST BE PUNCHED. MUST BE NUMERIC. |
| 13 | NUMBER OF SCHEDULED INSTRUCTIONAL HOURS | 69 | 72 | " " " " " " |
| CVEDPC/6/5/66 Form #201 | | | | |

Exhibit 45 - Keypunching and Verifying Instructions (Classmaster Card A)

# PUNCHING & VERIFICATION INSTRUCTIONS

JOB TITLE CLASSMASIER RECORD

JOB NUMBER ________

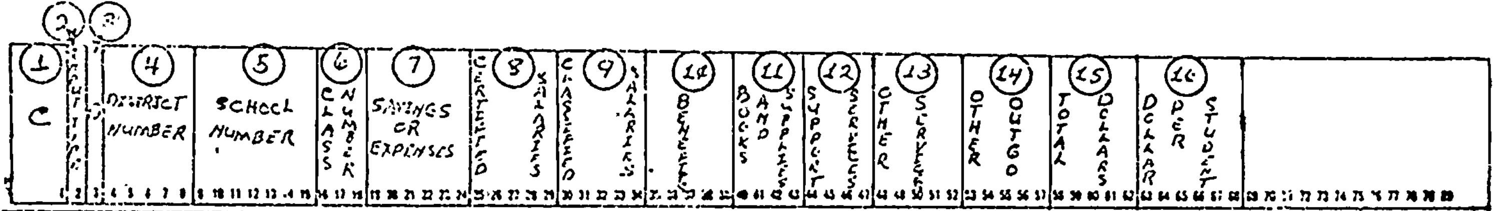
PAGE 1 OF 2

A. Source of Input CLASSMASTER RECORD INPUT FORM

B. Card Name CLASSMASTER RECORD INPUT

C. Cards Used 5081

D. Distribution CONTROL



| Ref. | Name of Field | Columns | | Remarks |
|---|---|---|---|---|
| | | From | Thru | |
| 1 | CARD CODE | 1 | 1 | MUST ALWAYS BE A "C" |
| 2 | CARD INPUT CODE | 2 | 2 | MUST ALWAYS BE A "D", "N", OR "U". D- DELETE, N-NEW, U-UPDATE OF CLASS RECORD. |
| 3 | CARD TYPE | 3 | 3 | MUST ALWAYS BE A "B" |
| 4 | DISTRICT NUMBER | 4 | 8 | MUST BE PUNCHED. MUST BE NUMERIC. PRECEDING ZEROS REQUIRED. |
| 5 | SCHOOL NUMBER | 9 | 15 | " " " " " " " " " |
| 6 | CLASS NUMBER | 16 | 18 | " " " " " " " " " |
| 7 | SAVINGS OR EXPENSES | 19 | 24 | MUST BE NUMERIC OR BLANK. NEGATIVE SIGN PUNCHED OVER VALUE IN COLUMN 24. PRECEDING ZEROS REQUIRED. |
| 8 | CERTIFIED SALARIES | 25 | 29 | MUST BE NUMERIC OR BLANK. PRECEDING ZEROS REQUIRED. |
| 9 | CLASSIFIED SALARIES | 30 | 34 | " " " " " " " " |
| 10 | BENEFITS | 35 | 39 | " " " " " " " " |
| 11 | BOOKS AND SUPPLIES | 40 | 43 | " " " " " " " " |
| 12 | SUPPORT SERVICES | 44 | 47 | " " " " " " " " |
| 13 | OTHER SERVICES | 48 | 52 | " " " " " " " " |
| CVEDPC/6/5/66 Form #201 | | | | ( SEE PAGE 2 FOR REFERENCE NUMBERS 14, 15, AND 16) |

Exhibit 46 - Keypunching and Verifying Instructions (Classmaster Card B)

## PUNCHING & VERIFICATION INSTRUCTIONS

JOB TITLE CLASSMASTER RECORD JOB NUMBER ______ PAGE 2 OF 2

A. Source of Input CLASSMASTER RECORD INPUT FORM B. Card Name CLASSMASTER RECORD INPUT

C. Cards Used 5081 D. Distribution CONTROL

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

| Ref. | Name of Field | Columns | | Remarks |
|---|---|---|---|---|
| | | From | Thru | |
| 14 | OTHER OUTGO | 53 | 57 | MUST BE NUMERIC OR BLANK. PRECEDING ZEROS REQUIRED. |
| 15 | TOTAL DOLLARS | 58 | 62 | MUST BE PUNCHED. MUST BE NUMERIC. PRECEDING ZEROS REQUIRED. |
| 16 | DOLLARS BUDGETED PER STUDENT | 63 | 68 | " " " " " " " " " |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| CVEDPC/6/5/66 Form #201 | | | | |

Exhibit 46 - Keypunching and Verifying Instructions (Classmaster Card B) Cont'd

## PUNCHING & VERIFICATION INSTRUCTIONS

JOB TITLE PEAPOL WEEKLY UPDATE JOB NUMBER ________

A. Source of Input STUDENT TIME CARD B. Card Name HOURS RECORDING

C. Cards Used 5081 D. Distribution CONTROL

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S | H | DISTRICT NUMBER | SCHOOL NUMBER | CLASS NUMBER | STUDENT NUMBER | STUDENT NAME | OBJECTIVE NUMBER | START TIME | STOP TIME | [illegible] NUMBER | START TIME | STOP TIME | [illegible] NUMBER | START TIME | STOP TIME | [illegible] NUMBER | START TIME | STOP TIME | [illegible] NUMBER | START TIME | STOP TIME |
| 1 | 2 | 3 4 5 6 7 | 8 9 10 11 12 13 14 | 15 16 17 | 18 19 20 21 22 23 24 25 26 27 | 28 29 30 | 31 32 | 33 34 35 36 | 37 38 39 40 | 41 42 | 43 44 45 46 | 47 48 49 50 | 51 52 | 53 54 55 56 | 57 58 59 60 | 61 62 | 63 64 65 66 | 67 68 69 70 | 71 72 | 73 74 75 76 | 77 78 79 80 |

| Ref | Name of Field | Columns | | Remarks |
|---|---|---|---|---|
| | | From | Thru | |
| 1 | CARD CODE | 1 | 1 | MUST ALWAYS BE A "S" |
| 2 | CARD INPUT CODE | 2 | 2 | MUST ALWAYS BE A "H" |
| 3 | DISTRICT NUMBER | 3 | 7 | MUST BE PUNCHED. MUST BE NUMERIC.. PRECEDING ZEROS REQUIRED. |
| 4 | SCHOOL NUMBER | 8 | 14 | "" "" " " " " " " |
| 5 | CLASS NUMBER | 15 | 17 | "" " " ' " " " " " |
| 6 | STUDENT NUMBER | 18 | 27 | " " " " " " " " " |
| 7 | FIRST THREE LETTERS OF STUDENT NAME | 28 | 30 | MUST BE PUNCHED. MUST BE ALPHABETIC. |
| 8,11,<br>14,17<br>20 | PERFORMANCE OBJECTI-<br>-VE NUMBER | 31,41<br>51,61<br>71 | 32,42<br>52,62<br>72 | MUST BE 2 DIGITS FOR EACH PERFORMANCE OBJECTIVE NUMBER. FIRST BLANK FIELD<br>CONCLUDES CARD. |
| 9,12<br>15,18<br>21 | START TIME | 33,43<br>53,63<br>73 | 36,46<br>56,66<br>76 | MUST BE 4 DIGITS FOR EACH START TIME. |
| 10,13<br>16,19<br>22 | STOP TIME | 37,47<br>57,67<br>77 | 40,50<br>60,70<br>80 | MUST BE 4 DIGITS FOR EACH STOP TIME. |

CVEDPC/6/5/66 Form #201

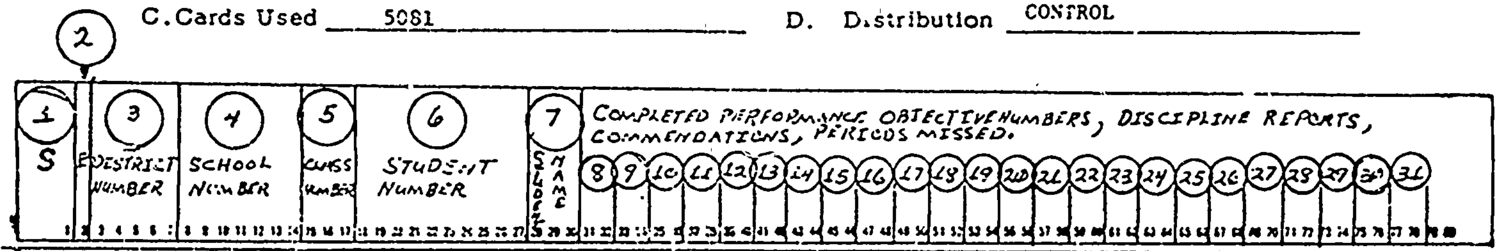
Exhibit 47 - Keypunching and Verifying Instructions (Hours Recording Card)

# PUNCHING & VERIFICATION INSTRUCTIONS

JOB TITLE PEAPOL WEEKLY UPDATE JOB NUMBER ________

A. Source of Input CLASS EVENT INPUT FORM B. Card Name CLASS EVENT

C. Cards Used 5081 D. Distribution CONTROL



| Ref | Name of Field | Columns From | Columns Thru | Remarks |
|---|---|---|---|---|
| 1 | CARD CODE | 1 | 1 | MUST ALWAYS BE A "S" |
| 2 | CARD INPUT CODE | 2 | 2 | MUST ALWAYS BE A "E" |
| 3 | DISTRICT NUMBER | 3 | 7 | MUST BE PUNCHED. MUST BE NUMERIC. PRECEDING ZEROS REQUIRED. |
| 4 | SCHOOL NUMBER | 8 | 14 | MUST BE PUNCHED. MUST BE NUMERIC. PRECEDING ZEROS REQUIRED. |
| 5 | CLASS NUMBER | 15 | 17 | MUST BE PUNCHED. MUST BE NUMERIC. PRECEDING ZEROS REQUIRED. |
| 6 | STUDENT NUMBER | 18 | 27 | MUST BE PUNCHED. MUST BE NUMERIC. PRECEDING ZEROS REQUIRED. |
| 7 | FIRST THREE LETTERS OF STUDENT NAME | 28 | 30 | MUST BE PUNCHED. MUST BE ALPHABETIC. |
| 8-31 | EVENTS | 31 | 32 | MUST BE 2 DIGITS OR 2 LETTERS PER FIELD. "DS" FOR EACH DISCIPLINE REPORT. |
| | | 33 | 34 | |
| | | 35 | 36 | "CM" FOR EACH COMMENDATION. "AB" FOR EACH PERIOD MISSED. "dd" FOR EACH PERFORMANCE |
| | | 37 | 38 | |
| | | 39 | 40 | OBJECTIVE COMPLETED. FIRST BLANK FIELD COMPLETES CARD. |
| | | 41 | 42 | |
| | | 43 | 44 | |
| | | 45 | 46 | |
| | | 47 | 48 | |
| | | 49 | 50 | |
| | | etc | 80 | |
| CVEDPC/6/5/66 Form #201 | | | | |

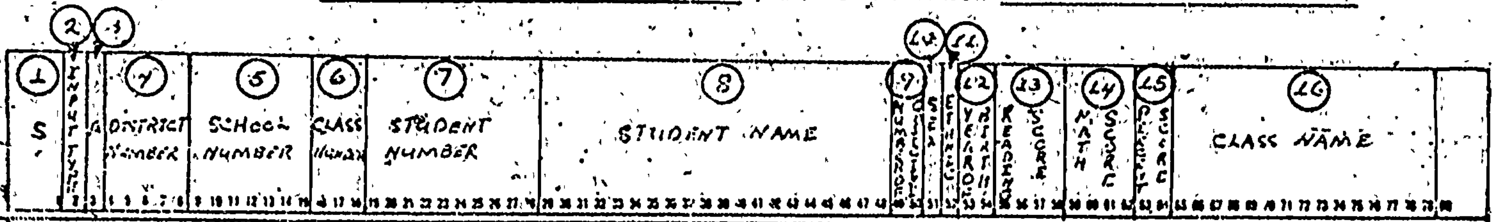
Exhibit 48 - Keypunching and Verifying Instructions (Class Event Card)

# PUNCHING & VERIFICATION INSTRUCTIONS

JOB TITLE STUDENTMASTER RECORD JOB NUMBER ________ PAGE 1 OF 2

A. Source of Input STUDENTMASTER RECORD INPUT FORM B. Card Name STUDENTMASTER RECORD INPUT

C. Cards Used 5081 D. Distribution CONTROL



| Ref. | Name of Field | Columns From | Columns Thru | Remarks |
|---|---|---|---|---|
| 1 | CARD CODE | 1 | 1 | MUST ALWAYS BE A "S" |
| 2 | CARD INPUT CODE | 2 | 2 | MUST ALWAYS BE A "D", "N", OR "U". D-DELETE, N-NEW, U-UPDATE OF A STUDENT RECORD. |
| 3 | CARD TYPE | 3 | 3 | MUST ALWAYS BE A "A" |
| 4 | DISTRICT NUMBER | 4 | 8 | MUST BE PUNCHED. MUST BE NUMERIC. PRECEDING ZEROS REQUIRED. |
| 5 | SCHOOL NUMBER | 9 | 15 | " " " " " " " " " |
| 6 | CLASS NUMBER | 16 | 18 | " " " " " " " " " |
| 7 | STUDENT NUMBER | 19 | 28 | " " " " " " " " " |
| 8 | STUDENT NAME | 29 | 48 | MUST BE PUNCHED. MUST BE ALPHABETIC. LAST NAME FIRST. |
| 9 | NUMBER OF PERFORMANCE OBJECTIVES IN COURSE | 49 | 50 | MUST BE PUNCHED. MUST BE NUMERIC. |
| 10 | SEX | 51 | 51 | MUST BE ALPHABETIC OR BLANK. |
| 11 | ETHNIC CODE | 52 | 52 | MUST BE NUMERIC (1-6) OR BLANK. |
| 12 | YEAR OF BIRTH | 53 | 54 | MUST BE NUMERIC OR BLANK. |
| 13 | READING SCORE | 55 | 58 | MUST BE NUMERIC OR BLANK. CAN BE "dddd" OR "dd.d". |
| CVEDPC/6/5/66 Form #201 | | | | (SEE PAGE 2 FOR REFERENCE NUMBERS 14, 15, AND 16) |

Exhibit 49--Keypunching and Verifying Instructions (Studentmaster Card)

# PUNCHING & VERIFICATION INSTRUCTIONS

JOB TITLE STUDENTMASTER RECORD   JOB NUMBER ______   PAGE 2 OF 2

A. Source of Input STUDENTMASTER RECORD INPUT FORM   B. Card Name STUDENTMASTER RECORD INPUT

C. Cards Used 5081   D. Distribution CONTROL 8

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

| Ref. | Name of Field | Columns |  | Remarks |
|---|---|---|---|---|
|  |  | From | Thru |  |
| 14 | MATH SCORE | 59 | 62 | MUST BE NUMERIC OF BLANK. CAN BE "dddd" OR "dd.d". |
| 15 | PERCENTILE SCORE | 63 | 64 | MUST BE NUMERIC OF BLANK. "dd". |
| 16 | COURSE NAME | 65 | 79 | MAY BE ALPHANUMERIC |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
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|  |  |  |  |  |
|  |  |  |  |  |

CVEDPC/6/5/66. Form #20

Exhibit 49 Keypunching and Verifying Instructions (Studenmaster Card) Cont'd

## Error Messages and Recovery Procedures

There are two types of error messages generated by the system. The first type of error message occurs when an H-200 (TR) operating procedure is violated. In this case, the operating system itself will generate an error message and will either continue with the processing procedure (if the operating system has been programmed to regard the error as a relatively minor one) or it will halt all system operations. The error handling procedures incorporated into the H-200 operation system are quite extensive, and rather than include a complete list of operating system error messages and recovery procedures, it is suggested that t e H-200 operating system manual (Honeywell, 1970) be referenced by the person in need of this type of information.

The second type of error message is generated by programs within the PEAPOL system. Generally speaking, there are three different types of errors:

a) those that result in an information item being rejected;

b) those that result in an entire record being rejected; and

c) those that cause the entire computer run to be aborted.

Nearly all of the error handling routines within PEAPOL are activated when input is being edited by the system. In cases where unacceptable but noncritical information (such as a student's age) is either in unacceptable form or completely missing, the system will reject the unacceptable item (the system considers a blank as an unacceptable entry), but will accept the remainder of the record. In these cases, a message will appear on the printer giving the identity information of the unsatisfactory record and the specific information element(s) which caused the rejection.

Where more critical information is either missing or incorrect, the system will reject the entire record. This will usually happen in cases where required identifier information is missing or rejected. In this type of situation, a message appears on the line printer which reproduces the entire unacceptable record and tells why the rejection action was taken.

There is only one generalized case that will cause the entire computer run to be aborted by PEAPOL. This will happen if a match cannot be made between a student record in the studentmaster file and a classmaster record in the classmaster file. This might happen in any of the following circumstances:

a) A class is deleted from the classmaster file but the students in that class are not deleted from the studentmaster file.

b) All the students in a class are dropped from the studentmaster file but the class record is not deleted from the classmaster file.

c) An identification element (district number, school number, class number) is incorrectly keypunched on either a new studentmaster or classmaster input. If the identification number incorrectly punched on the entry is not that of an existing class and is of the proper form, a system abort message will be generated.

While rather drastic, the above procedure is the only one that can be adopted if the integrity of the relationship of the two files to each other is to be maintained. When such an abort signal is generated, control will shift back to the PEAPOL control program which will then generate a printer message giving the identity numbers of the record causing the abort and then terminate the computer run. Processing can later be resumed (after the error is corrected) at the beginning of the program in which the abort occurred.

The printer, rather than the computer console, is utilized for reproducing most program error messages for reasons of processing efficiency. In the Honeywell operating system, printing a message on the console requires that all other processing operations cease. By utilizing the line printer for such messages, this situation can be avoided.