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**ABSTRACT**
This technical memo is designed for persons who are interested in research with and development of curriculum material. Detailed information regarding computer programs, and program documentation used in the development and evaluation of ISCS curriculum materials is provided. The memo includes supplemental information to ISCS Technical Report I entitled "CAI Utilization for Formative Curriculum Evaluation." Flow diagrams and program listings of the ten types of CAI programming macros as well as the five data analysis programs developed by ISCS are included. This material also provides analysis programs for the formative evaluation of CAI text.

(Author/FL)
Prepared By

David Dasenbrock
and
Thomas Teates

June 1
1970

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INTERMEDIATE SCIENCE CURRICULUM STUDY
DEPARTMENT OF SCIENCE EDUCATION
FLORIDA STATE UNIVERSITY
TALLAHASSEE, FLORIDA
ACKNOWLEDGMENTS

Many of the macros and analysis programs described in this memo were designed by the authors. Mr. Paul Flood assisted with the design of several macros and contributed valuable suggestions and constructive criticisms during the development of the analysis programs.

At the FSU-CAI Center, Dr. Duncan Hansen, Center Director, and Dr. Walter Dick provided encouragement and advice as well as making their facilities available for the development and use of these programs. Much credit is due Mrs. Betty Wright for her frequent and most helpful suggestions regarding macro designs and programming details. Mr. George Hogshead provided valuable assistance with the development of analysis programs.

All inquiries regarding this memo should be addressed to:

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The Florida State University
Tallahassee, Florida 32304
FORWARD

The ISCS Tech Memo series, like the ISCS Technical Report series, is intended to provide communication to other colleagues and interested professionals who are actively interested in research with and development of curriculum material.

The rationale for the Technical Report series is three fold. First, to report in a concise, descriptive, and explanatory nature advances made in the technology of curriculum development. Secondly, pilot studies that show great promise with potential for further research and subsequent reporting can be given quick distribution. Third, the Technical Report series provides for distribution of pre-publication copies of implementation studies that, after proper technical review, will ultimately be found in professional journals.

The Tech Memo, on the other hand, serves a supporting documentation function by providing detailed information such as computer programs, program documentation, etc. with sufficient explanatory sections to enable the use or adaptation of the material presented.

This Tech Memo provides supplemental information to ISCS Technical Report 1 entitled "CAI UTILIZATION FOR FORMATIVE CURRICULUM EVALUATION." Included herein are Flow Diagrams and program listings of the ten types of CAI programming macros as well as the five data analysis programs developed by ISCS which were described in the report. This material is offered in the spirit of making available information which should significantly reduce the effort required to program curriculum material. In addition, it provides potentially useful analysis programs for the formative evaluation of CAI text.

Ernest Berkman, Director
Intermediate Science Curriculum Study

June 1, 1970
The Florida State University
Tallahassee, Florida
GENERAL BACKGROUND ON THE INTERMEDIATE SCIENCE CURRICULUM STUDY

The Intermediate Science Curriculum Study (ISCS) is a large-scale instructional research project supported to date by a contract with the United States Office of Education and grants from the National Science Foundation. The project is designed to develop, test, and disseminate into practice a system of individualized science instruction for grades seven through nine.

The project is organized on a develop-field-test-revise design. Draft materials are produced at Florida State University by on- and invited off-campus personnel and tested on a large national sample of junior-high-school students. During the 1969-70 school year, more than 75,000 students in 25 states are involved in the field testing of the ISCS materials. In addition, a small number of students from the Florida State University campus school are taking a computer-assisted instruction version of the materials from which additional feedback data are being accumulated. To date, more than 400 scientists, teachers, and education specialists have cooperated in the development process.

The most unique feature of the ISCS materials is the fact that the students using them progress at different rates and through different instructional pathways depending upon their interests, abilities, and previous experience. The materials are being designed that this can be accomplished in ordinary science classrooms by teachers with limited special training.

The package of instructional materials for each grade level consists of student printed materials, specially designed laboratory apparatus, a student self-evaluation system based upon behavioral objectives established for the instructional materials, teacher orientation materials, and standardized tests. The Silver Burdett Corporation, in conjunction with Damon Educational Corporation, is distributing these materials during the experimental phase of the project and will market the commercial version of them.

The project has generated world-wide interest and its newsletter, published twice yearly, now goes to more than 10,000 people in 42 countries. ISCS materials are now in use in Australia and will be used in American dependent schools in Germany and Japan in September. Experimental testing of the materials is now underway in Manila, and plans have been established for a joint Florida State University - Philippines effort to produce a special Philippines version of the program. In addition, project personnel have visited Japan, India, and several South American countries for preliminary discussions related to possible use of the materials in these areas.
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<td>20</td>
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<td>55</td>
</tr>
<tr>
<td>13</td>
<td>Program ISCS9 Flow Diagram</td>
<td>60</td>
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</tbody>
</table>
INTRODUCTION

For four years the Intermediate Science Curriculum Study has utilized computer assisted instruction as a relatively new technique for curriculum evaluation. The purpose of the CAI trial was to obtain objective data to aid in the revision of the ISCS texts used in the regular classroom. To attain this goal, a computer assisted instruction course was developed, that paralleled as closely as possible the ISCS individualized course materials in use in the regular classroom. The production of the CAI version of the ISCS instructional materials was a by-product of the basic research effort of curriculum evaluation and revision. A general description of the development and utilization of CAI by ISCS is presented in Technical Report 1 "CAI Utilization for Formative Curriculum Evaluation" available from ISCS.

This memo presents the technical details of the macros and analysis programs by which ISCS implemented and analyzed the most recent (1968-69) CAI versions of the entire level I (grade seven) and level II (grade eight) materials and one-half of the 1969-70 level III (grade nine) materials. In addition, details of content, processes, and other frame identifiers codes useful for analysis are described.

The computer programs are basically linear. The courses consist of a basic core, which all students follow. Excursions are provided, which are branches away from the core sequence, and the core is re-entered from where it was left. The students are able to go forward or backward in the materials, and are not limited to going forward only. The students therefore are able to go back and change answers at any time. The program is non-reinforcing, and is completely macro based. The macro system presents the student's last answer when the previous frame is reviewed.
The general "flow" of student progress is linear through either of the three levels of ISCS materials. Figure 1 illustrates the basic design of this linear flow from segment to segment of the program. Usually, each segment within a level represents one chapter of text material and the excursions designed to accompany that chapter. In some instances it was possible for students to review to an excursion in an earlier segment when remedial work was desired. (For example, a branch to an excursion on graphing (1-6) was available from either segment 3 or segment 10 of the level 1 program).
The Macros

General Descriptions

It has been said that the ISCS programs are "completely macro based." It is probable that the extensive evaluation completed for each grade level of the curriculum could not have been completed without the utilization of this very useful capability of the Coursewriter II language and the IBM 1500 system.

The following is a brief description of each macro. A more comprehensive description of the macros and their functions is given in ISCS Technical Report 1 -- "CAI Utilization for Formative Curriculum Evaluation".

<table>
<thead>
<tr>
<th>Macro</th>
<th>Mode*</th>
<th>Type of Text Programmed</th>
<th>Branches</th>
</tr>
</thead>
<tbody>
<tr>
<td>tid500</td>
<td>LP</td>
<td>Information Presentation</td>
<td>Continue, Review</td>
</tr>
<tr>
<td>exd500</td>
<td>LP</td>
<td>Branch to Excursion decision Frame</td>
<td>Excursion, Next frame, Review</td>
</tr>
<tr>
<td>ysd500</td>
<td>LP</td>
<td>Question which has a yes or no answer. Yes is the correct response. (A Variation provides for no as a correct response.)</td>
<td>Next Frame (with selection of answer), Review</td>
</tr>
<tr>
<td>mad500</td>
<td>LP</td>
<td>Multiple choice questions, choice A is correct answer. (Variations provide for B, C, or D as correct answer.)</td>
<td>Next frame (via an answer), Review</td>
</tr>
<tr>
<td>rst500</td>
<td>LP</td>
<td>Resource decision frame. (Request one of 32 resources, used in geology unit only.)</td>
<td>Continue (to next frame), Call for resource, Review</td>
</tr>
<tr>
<td>tst500</td>
<td>LP</td>
<td>Test question. (Any one of 4 possible answers can be programmed as &quot;correct.&quot; )</td>
<td>Skip (to next question), Review (to previous question), Respond (to one of four possible answers).</td>
</tr>
</tbody>
</table>
The use of counters, switches, and return registers was standardized as much as possible throughout the macros in order to facilitate and expedite programming. The usual assignments for these record keeping devices are given below.

### Counter Assignments

- **cl**: correct answers
- **c2**: incorrect answers
- **c3**: total reviews
- **c7**: current number of reviews
- **c20-30**: control of display of previous answer upon review

### Switch Usage

- **s20-s30**: control of display of previous answer upon review
- **s10**: control of branching in treatment and control groups for 1969-70 level III materials

### Return Register Usage

- **rr2**: return from excursions
- **rr4**: return from graphic data display and resource display
Detailed Listings and Flow Diagrams

For each macro described above, this section sets forth the macro parameters, the Coursewriter II statements used to construct the macro, and a flow diagram for the macro.

TTD500
parameters
$01           review frame label
$02           EPID

TTD macro expanded

MACWTR
MA  TTD500 S  00000
DTI 30,0 / /6,0 /$01
LR  $01 /RR4
DTI 27,26 / /8,26 / / REVIEW
DTI 27,3 / /19,3 / / READY TO CONTINUE
PA  30
EPP 9999 /$02
NX
BR  RE
CAP 4,26,3,2 /TM
BR  PR1
AAP 4,26,3,25 /RV
BR  $01
UN  UN
BR  RE
EM
FIGURE 2
FLOW DIAGRAM FOR MACRO ttd500
exd500
parameters
$01 review frame label
$02 next frame label
$03 excursion frame label
$04 EPID

EXD macro expanded

MACWTR
MA EXD500 $ 00000
DT 28 // // REVIEW
DT 20 // // I WILL DO THE EXCURSION
DT 24 // // I WILL NOT DO THE EXCURSION
PA 30
EPP 9999 /$04
NX
BR RE
CAP 4,19,3,0 /EX
LR $02 /RR2
BR $03
CAP 4,23,3,0 /TM
BR $02
AAP 4,27,3,0 /RV
BR $01
UN UN
BR RE
EM
FIGURE 3
MACRO exd500 FLOW DIAGRAM
ITIJ

ysd500
parameters
$01
$02
$03
$04

review frame label
switch and counter number for this frame
switch and counter number for the next frame
EPID

YSD macro expanded

MA  YSD500 $  00000
DTI 27,2 / /5,2 / / YES
LR $01 /RR4
DTI 27,16 / /4,16 / / NO
DTI 27,31 / /8,31 / / REVIEW
BR #11 /C7 /G /9
BR #11 /S$02 /O
BR #12 /C$02 /E /2
DTI 27,14 / /1,14 /X
BR #11

#12
DTI 27,0 / /1,0 /X

#11
PA  30
EPP 9999 /S04
NX
BR RE
CAP 4,26,3,1 /CA
LD 2 /C$02
AD 1 /C1
BR #16
AAP 4,26,3,30 /RV
AD 1 /C7
AD 1 /C3
BR $01
WAP 4,26,3,15 /WN
LD 1 /C$02
AD 1 /C2
BR #16
UN UN
BR RE

#16
BR #18 /C7 /G /O
LD 1 /S$02
LD 0 /S$03
BR PR1

#18
SB 1 /C7
BR PR1
EM
START OF MACRO

DISPLAY TEXT

FIRST PASS

PAUSE

RESPONSE

IN TIME

STORE ANSWER

CA

REVIEW

ADD 1 COUNTER 1

ADD 1 COUNTER 2

END OF MACRO

NEXT FRAME

FIGURE 4
MACRO ysd500 FLOW DIAGRAM
nod500
parameters
$01
$02
$03
$04

review frame label
switch and counter number for this frame
switch and counter number for the next frame
EPID

NOD macro expanded

MA NOD500 $ 00000
DTI 27,2 /5,2 / YES
LR $01 /RR4
DTI 27,16 /4,16 / NO
DTI 30,0 /6,0 /$01
DTI 27,31 /8,31 / REVIEW
BR #11 /C7 /G /9
BR #11 /$S02 /G
BR #12 /C$02 /E /2
DTI 27,0 /1,0 /X
BR #11

#12
DTI 27,14 /1,14 /X

#11
PA 30
EPP 9999 /$04
NX
BR RE
CAP 4,26,3,15 /CA
LD 2 /C$02
AD 1 /C1
BR #16
AAP 4,26,3,30 /RV
AD 1 /C3
BR $01
WAP 4,26,3,1 /MY
LD 1 /C$02
AD 1 /C2
BR #16
UN UN
BR RE

#16
BR #18 /C7 /G /0
LD 1 /$S02
LD 0 /$S03
BR PR1

#18
SB 1 /C7
BR PR1

Note: The flow diagram for this macro is identical to that shown in Figure 4 for ysd500.
mad500
parameters
$01
$02
$03
$04

MAD macro expanded

MA MAD500 $ 00000
DTI 14,32 / /6,32 /$01
DTI 14,20 / /9,20 / / REVIEW
LR $01 /RR4
DTI 16,1 / /3,1 / /
DTI 20,1 / /3,1 / /
DTI 24,1 / /3,1 / /
DTI 28,1 / /3,1 / /
BR #31 /C7 /G /9
BR #31 /S$02 /0
BR #34 /C$02 /E /4
BR #33 /C$02 /E /3
BR #32 /C$02 /E /2
DTI 16,0 / /1,0 /X
BR #31
#32
DTI 20,0 / /1,0 /X
BR #31
#33
DTI 24,0 / /1,0 /X
BR #31
#34
DTI 28,0 / /1,0 /X
#31
PA 30
EPP 9999 /$04
NX
BR RE
CAP 4,15,3,1 /CA
LD 1 /C$02
AD 1 /C1
BR #36
WAP 4,13,3,19 /RV
AD 1 /C3
AD .1 /C7
BR $01
WAP 4,19,3,1 /WB
LD 2 /C$02
BR #35
WAP 4,23,3,1 /WC
LD 3 /C$02
BR #35
WAP 4,27,3,1 /WD
BR #35
UN UN
BR RE

(continued on next page)
Note: The flow diagram for this macro is identical to the one in Figure 4 for ysd500.
MBD macro expanded

```
MA  MBD500  $00000
LR $01 /RR4
DTI 14,32 //6,32 /$01
DTI 14,20 //9,20 / /REVIEW
DTI 16,1 //3,1 / /  
DTI 20,1 //3,1 / /  
DTI 24,1 //3,1 / /  
DTI 28,1 //3,1 / /  
BR #31 /C7 /G /9
BR #31 /S$02 /0
BR #34 /C$02 /E /4
BR #33 /C$02 /E /3
BR #32 /C$02 /E /2
DTI 16,0 //1,0 /X
BR #31
#32
DTI 20,0 //1,0 /X
BR #31
#33
DTI 24,0 //1,0 /X
BR #31
#34
DTI 28,0 //1,0 /X
PA 30
EPP 9999 /$04
NX
BR RE
CAP 4,19,3,1 /CA
LD 2 /C$02
AD 1 /C1
BR #36
AAP 4,13,3,19 /RV
AD 1 /C7
AD 1 /C3
BR $01
WAP 4,15,3,1 /WA
LD 1 /C$02
BR #35
WAP 4,23,3,1 /WC
LD 3 /C$02
BR #35
WAP 4,27,3,1 /WD
LD 4 /C$02
BR #35
UN UN
BR RE
```
mbd500 continued

#35
AD 1 /C2

#36
BR #38 /C27 /G /0
LD 1 /S$02
LD 0 /S$03
BR PR1

#38
SB 1 /C7
BR PR1

Note: The flow diagram for this macro is identical to the one shown in Figure 4 for ysd500.
mod500
parameters
$01  review frame label
$02  switch and counter number for this frame
$03  switch and counter number for the next frame
$04  EPID

MCD macro expanded

    MA MCD500 $00000
    DTI 14,32 /6,32 /$01
    LR $01 /RR4
    DTI 14,20 /9,20 /REVIEW
    DTI 16,1 /3,1 /
    DTI 20,1 /3,1 /
    DTI 24,1 /3,1 /
    DTI 28,1 /3,1 /
    BR #31 /C7 /G /9
    BR #31 /S$02 /0
    BR #34 /C$02 /E /4
    BR #33 /C$02 /E /3
    BR #32 /C$02 /E /2
    DTI 16,0 /1,0 /X
    BR #31
    #32
    DTI 20,0 /1,0 /X
    BR #31
    #33
    DTI 24,0 /1,0 /X
    BR #31
    #34
    DTI 28,0 /1,0 /X
    BR #31
    #31
    PA 30
    EPP 9999 /$04
    NX
    BR RE
    CAP 4,23,3,1 /CA
    LD 3 /C$02
    AD 1 /C1
    BR #36
    AAP 4,13,3,19 /RV
    AD 1 /C7
    AD 1 /C3
    BR $01
    WAP 4,19,3,1 /WB
    LD 2 /C$02
    BR #35
    WAP 4,15,3,1 /WA
    LD 1 /C$02
    BR #35
    WAP 4,27,3,1 /WD
    LD 4 /C$02
    BR #35
    UN UN
    BR RE
mc5d00 continued

#35
AD 1 /C2

#36
WR #38 /C7 /G /0
LD 1 /S%02
LD 0 /S%03
BR PRI

#38
SB 1 /C7
WR PRI
LH

Note: The flow diagram for this macro is identical to the one for ysd500 shown in Figure 4.
mdd500
parameters
$01  review frame label
$02  switch and counter number for this frame
$03  counter and switch number for the next frame
$04  EPID

MDD macro expanded

MA MDD500 $ 00000
DTI 14,32 / 6,32 $01
LR $01 /RR4
DTI 14,20 / 9,20 / REVIEW
DTI 16,1 / 3,1 /
DTI 20,1 / 3,1 /
DTI 24,1 / 3,1 /
DTI 28,1 / 3,1 /
BR #31 /C7 /G /9
BR #31 /S$02 /0
BR #34 /CS02 /E /4
BR #33 /CS02 /E /3
BR #32 /CS02 /E /2
DTI 16,9 / 1,0 /X
BR #31

#32
DTI 20,0 / 1,0 /X
BR #31

#33
DTI 24,0 / 1,0 /X
BR #31

#34
DTI 28,0 / 1,0 /X
BR #31

PA 30
EPP 9999 /$04
NX
BR RE
CAP 4,27,3,1 /CA
LD 4 /CS02
AD 1 /C1
BR #36
AAP 4,13,3,19 /RV
AD 1 /C7
AD 1 /C3
BR $01
WAP 4,19,3,1 /WB
LD 2 /CS02
BR #35
WAP 4,15,3,1 /WA
LD 1 /CS02
BR #35
WAP 4,23,3,1 /WC
LD 3 /CS02
BR #35
UN UN
BR RE
mdd500 continued

#35
AD 1 /C2

#36
m#38 /C7 /0
LD 1 /$02
LD 0 /$03

ldr PR1

#38
sb 1 /C7
ldr PR1

Note: The flow diagram for this macro is identical to the one for ysd500 shown in Figure 4.
rst500 parameters
$01  last frame label
$02  this frame label
$03  EPID

rst500 macro expanded

MA RST500 $  00000
DTI  30,0 /2,30 /6,0 /$01
LR $02 /RR2
DTI  27,29 /2,27 /8,29 / /REVIEW
DTI  27,3 /2,27 /10,3 / /CONTINUE
DTI  23,11 /2,23 /19,11 / /CALL FOR RESOURCE
PA  30
EPP 9999 /$03
NX
BR RE
CAP  4,26,3,2 /TW
BR PR1
AAP  4,22,3,10 /RS
BR RESORS
AAP  4,26,3,28 /RV
BR $01
UN UN
BR RE
EM

A listing is included below for the "Resors" statements which appeared at the end of each segment where it was called by rst500.

RESORS*E

1  PRR *E
2  DE 0+/32*E
3  DT  0,0+/6,0+/40,0+/(U)SE THE (T)ABLE OF (C)ONTENTS IN YOUR *C*ISTUDENT TEXT TO SELECT THE (R)ESOURCE*C*IYOU WANT TO STUDY.*E
4  DT 8,0+/4,8+/40,0+/TYPE THE NUMBER OF THE RESOURCE*C*IYOU HAVE SELECTED*E
5  EPI 10,27+/2,10+/3,27+/9999+/RESORS*E
6  NX *E
7  BR RE*E
8  CA 1+/C1*E
9  BR 1*E
10 CA 2+/C2*E
11 BR 2*E

etc.
The following branch statements were used to transfer to the segment where the resources were located.

1*e
1  epp 0Yrcs1*e
2  nx  *e
3  tr 16Ypa001*e

2*e
1  epp 0Yres2*e
2  nx  *e
3  tr 16Yph001*e

3*e
1  epp 0Yres3*e
2  nx  *e
3  tr 16Ypc001*e

4*e
1  epp 0Yres4*e
2  nx  *e
3  tr 16Ypc001*e

5*e
1  epp 0Yres5*e
2  nx  *e
3  tr 16Ype001*e

6*e
1  epp 0Yres6*e
2  nx  *e
3  tr 16Ypc001*e

7*e
1  epp 0Yres7*e
2  nx  *e
3  tr 16Ypy001*e

8*e
1  epp 0Yres8*e
2  nx  *e
3  tr 16Yph001*e

9*e
1  epp 0Yrcs9*e
2  nx  *e
3  tr 16Yph001*e

10*e
1  epp 0Yres10*e
2  nx  *e
3  tr 16Yph001*e

32*e
1  epp 0Yres32*e
2  nx  *e
3  tr 16Ypz001*e
FIGURE 5
rst500 MACRO FLOW DIAGRAM

Previous Frame

Start of Macro

Display Text

Pause

Response

In Time

No

Review

No

Resource

Yes

End of Macro

Next Frame

Display Text

Macro Number

First Frame of Resource

Yes

No
tst500#
parameters
$01  EPID
$02  Switch for correct answer
$03  Switch for first wrong answer
$04  Switch for second wrong answer
$05  Switch for third wrong answer
$06  First line (on the CRT screen) of correct answer response
$07  Letter representing position of the correct answer (A, B, C, or D)
$08  First line of the first wrong answer
$09  Letter for position of first wrong answer
$10  First line of second wrong answer
$11  Letter for position of second wrong
$12  First line of third wrong answer
$13  Letter for position of third wrong answer
$14  Previous frame label

*Note: This version of tst500 is a revision of the original macro which was used to program the text for the test for Volume 3A. This macro was used to program the text for one-half of Volume 3B.

(The expanded macro is on the following page.)
macro ts500 expanded

1  DTI 30,24+/2,30+/6,24+/+/ SKIP*E
2  DTI 30,31+/2,30+/8,31+/+/ REVIEW*E
3  DTI 14,0+/2,14+/3,0+/+ *E
4  DTI 18,0+/2,18+/3,0+/+ *E
5  DTI 22,0+/2,22+/3,0+/+ *E
6  DTI 26,0+/2,26+/3,0+/+ *E
7  LR (3)11(3)45+/TR4*E
8  BR (3)22(3)45+/S$02+/1*E
9  BR (3)33(3)45+/S$03+/1*E
10 BR (3)44(3)45+/S$04+/1*E
11 BR (3)55(3)45+/S$05+/1*E
12 EPP 9999+/$01*E
13 NX . #E
14 BR R5*E
15 CAP 4,$06,3,0+/C$07*E
16 AD 1+/C25*E
17 LD 1+/S$02*E
18 WAP 4,$08,3,0+/W$09*E
19 AD 1+/C26*E
20 LD 1+/S$03*E
21 BRPR1*E
22 WAP 4,$10,3,0+/W$11*E
23 AD 1+/C26*E
24 LD 1+/S$04*E
25 BRPR1*E
26 WAP 4,$12,3,0+/W$13*E
27 AD 1+/C26*E
28 LD 1+/S$05*E
29 BRPR1*E
30 AAP 3,30,2,23+/SK*E
31 AD 1+/C28*E
32 BRPR1*E
33 AAP 3,29,2,20+/TV*E
34 AD 1+/C27*E
35 BR S$14*E
36 UN UN*E
37 BR RE*E
(3)22(3)45*E
1  DTI 14,0+/2,14+/3,0+/+ BR RR4*E
2  BR RR4*E
(3)33(3)45*E
1  DTI 18,0+/2,18+/3,0+/+ BR RR4*E
2  BR RR4*E
(3)44(3)45*E
1  DTI 22,0+/2,22+/3,0+/+ BR RR4*E
2  BR RR4*E
(3)55(3)45*E
1  DTI 26,0+/2,26+/3,0+/+ BR RR4*E
2  BR RR4*E
(3)55(3)45*E

FIGURE 6
FLOW DIAGRAM FOR tst500
dcd500
parameters
$01 review frame label
$02 buffer number for this frame
$03 counter and switch number for this frame
$04 counter and switch number for the next frame
$05 EPID

DCD macro expanded

```
MA DCD500 $00000
DTI 30,0 /6,0 /$01
DT 26,5 // I F YOU WISH TO REVIEW, TYPE XX.
LR S01 /RR4
BR #11 /C7 /G /3
BR #11 /S$03 /0
DT 21 // Y OUK ANSWER LAST TIME WAS
DT 24 // /B$02
DT 28 // /C O NTINUE BY REANSWERING THE QUESTION,
#11
PA 30
EP 17 // /9999 /40 /$05
NX
BR RE
AA XX /RV
AD 1 /C7
AD 1 /C3
BR $01
CA 8 /DC
LD B0 /B$02
BR #44 /C7 /G /0
LD 1 /S$03
LD 0 /S$04
BR PR1
#44
SB 1 /C7
BR PR1
EN
```
FIGURE 7
FLOW DIAGRAM FOR doc500
macro cmt500 expanded

MA CMT500 $ 00000
DTI 30,0 / /6,0 /$01
DTI 27,26 / /8,26 / / REVIEW
DTI 27,3 / /19,3 / / READY TO COMMENT
PA 30
EPP 9999 /$02
NX
BR RE
CAP 4,26,3,2 /CT
LR $03 /RR5
BR HOLD
AAP 4,26,3,25 /RV
BR $01
UN UU
BR RE
EM
FIGURE 8
FLOW DIAGRAM FOR cmr500
lmd500
parameters
$01  review frame label
$02  buffer number for this frame
$03  switch and counter number for this frame
$04  switch and counter number for the next frame
$05  EPID
$06  lower numerical limit
$07  upper numerical limit

LMD macro expanded

MA LMD500 $  00000
DTI 30,0 / 6,0 /$01
DT 26,5 / / I F YOU WISH TO REVIEW, TYPE XX.
LR $01 /RR4
BR #11 /C7 /G /3
BR #11 /S$03 /0
DT 21 / / / Y OUR ANSWER LAST TIME WAS
DT 24 / / /B$02
DT 28 / / / C O NTINUE BY REANSW E RING THE QUESTION.

#11
PA 30
EP 17 / /9999 /40 /$05
NX
BR RE
AA XX /RV
AD 1, /C7
AD 1 /C3
BR $01
FN2 LT / / /$06 /$DT /C /CF
AD 1 /C1
BR #33
WA 0 /MF
AD 1 /C2

#33
LD 80 /B$02
BR #44 /C7 /G /0
LD 1 /S$03
LD 0 /S$04
BR PR1

#44
SB 1 /C7
BR PR1
EM

Note: The flow diagram for lmd500 is identical to the one shown in Figure 4 above.
kld500
parameters

$01 review frame label
$02 buffer number for this frame
$03 switch and counter number for this frame
$04 switch and counter number for the next frame
$05 EPID
$06 correct answer
$07 number of words necessary for a correct match

KLD macro expanded

MACWTR

MA  KLD500 $ 00000
DTI 30,0 / /6,0 /$01
DT 26,5 / / I F YOU WISH TO REVIEW, TYPE XX.
LD  $06 /B4
LR  $01 /RR4
BR  #11 /C7 /G /3
BR  #11 /S$03 /0
DT 21 / / Y OUR ANSWER LAST TIME WAS
DT 24 / / /B$02
DT 28 / / C O NTINUE BY REANSWERING THE QUESTION.

#11
PA  30
EP  17 / /9999 /40 /$05
NX
BR  RE
AA  XX /RV
AD  1 /C7
AD  1 /C3
BR  $01
FN2'KEYL /$07 /C / /CF
AD  1 /C1
BR  #33
WA  8 /WF
AD  1 /C2

#33
LD  80 /B$02
BR  #44 /C7 /G /0
LD  1 /S$03
LD  0 /S$04
BR  PRI

#44
SB  : /C7
BR  PRI
EM

Note: The flow diagram for kld500 is identical to Figure 4 above.
For frames which contain a question for the student to answer.

multiple choice answer

CA correct response
WA incorrect response, student picked choice A
WB incorrect response, student picked choice B
WC incorrect response, student picked choice C
WD incorrect response, student picked choice D

yes - no answer
CA correct response
WN incorrect response, student picked "no," "yes" was correct
WY incorrect response, student picked "yes," "no" was correct

free response question

CF correct response, through the use of the limit or keyletter function
WF incorrect response, through the use of the limit or keyletter function
DC "don't care" response, which must be examined manually if a correct or incorrect interpretation is necessary

The above response identifiers are the only ones which are used in the macro system to detect correct or incorrect responses. Note that all correct responses have a C in the first position of the identifier, and all incorrect responses have a W in the first position. (C = correct, W = wrong) The second position is a modifier which allows you to determine the type of question.

Other identifiers used, which are not associated with a correct or incorrect response:

RV review
UN unrecognizable response
EX selection of an excursion
TM continue, under macro ttd500
CT time out, a identifier put in by the system
NM answer mismatch, put in by the system
CC comment response indicating that a comment will be entered by the student
The Ten-Digit ISCS EPID Code

The ten-digit ISCS EPID code included eight fields as shown in the diagram below:

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
<th>Content</th>
<th>Process</th>
<th>Track</th>
<th>Question Code</th>
<th>Question Number</th>
<th>Sequence Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7-8</td>
<td>9-10</td>
</tr>
</tbody>
</table>

Descriptions of each field

1. **Chapter**  Alphanumeric code, a-z, corresponding to chapter numbers 1-26.

2. **Page**  Alphanumeric code, a-z, corresponding to page numbers 1-26.

3. **Content**  Alphanumeric code, a-z and 1-9, for identification of the frame.

4. **Process**  Alphanumeric code a-z, 1-9, for identification of the scientific process involved in the frame. The representation is the same for both seventh and eighth grades.

5. **Track**  Alphanumeric code, corresponding to the following key:
   - m mainline
   - e, i, x, excursion for first, second, or third set of 26 excursions respectively.

6. **Question Code**  Each frame contains an alphanumeric code to allow for sorting on questions.
   - a no question in frame, only the presentation of information
   - x question in the computer program to be answered at the terminal
   - t, y, z, question, with answer to be written in student text

7-8. **Question Number**  Two character numeric code, which corresponds to the question number in the classroom text. If there is no question, the code is 00.

Note: If the frame in question was an excursion decision frame, EPID characters 3 and 4 were used for the chapter number and characters 7 and 8 were used for the excursion number.

9-10. **Sequence Number**  Two character numeric code, 01-99, corresponding to the frame sequence number. The first frame of each segment is 01, the next 02, etc. If there are more than 99 frames, the code recycles, starting with 01.
Content and Process Codes

The content and process code designations used for the grades seven and eight programs are defined in the lists below. It should be noted that separate lists are used for grades seven and eight content, while a common list was used for the processes. As of the date of this publication, no separate content list is available for the ninth grade materials.

**Content** Alphanumeric code, a \( \rightarrow \) z and 1 \( \rightarrow \) 9, for identification of the scientific content of the frame.

<table>
<thead>
<tr>
<th>Code</th>
<th>Grade 7</th>
<th>Grade 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>models</td>
<td>definition</td>
</tr>
<tr>
<td>b</td>
<td>force</td>
<td>chemical nomenclature</td>
</tr>
<tr>
<td>c</td>
<td>friction</td>
<td>word statements</td>
</tr>
<tr>
<td>d</td>
<td>distance</td>
<td>chemical reaction</td>
</tr>
<tr>
<td>e</td>
<td>work</td>
<td>chemical test</td>
</tr>
<tr>
<td>f</td>
<td>time</td>
<td>chemical system</td>
</tr>
<tr>
<td>g</td>
<td>speed</td>
<td>model, characteristics of models</td>
</tr>
<tr>
<td>h</td>
<td>potential energy</td>
<td>particle model</td>
</tr>
<tr>
<td>i</td>
<td>kinetic energy</td>
<td>atoms, elements</td>
</tr>
<tr>
<td>j</td>
<td>chemical energy</td>
<td>ions</td>
</tr>
<tr>
<td>k</td>
<td>electrical energy</td>
<td>molecules</td>
</tr>
<tr>
<td>l</td>
<td>light energy</td>
<td>structure</td>
</tr>
<tr>
<td>m</td>
<td>heat energy</td>
<td>compounds</td>
</tr>
<tr>
<td>n</td>
<td>energy in general</td>
<td>conservation of matter</td>
</tr>
<tr>
<td>o</td>
<td>temperature</td>
<td>properties of matter</td>
</tr>
<tr>
<td>p</td>
<td>energy conversion</td>
<td>mass-weight</td>
</tr>
<tr>
<td>q</td>
<td>weight-mass</td>
<td>math, graphing</td>
</tr>
<tr>
<td>r</td>
<td>momentum</td>
<td>combination &amp; permutations</td>
</tr>
<tr>
<td>s</td>
<td>resistance</td>
<td>volume</td>
</tr>
<tr>
<td>t</td>
<td>voltage</td>
<td>reaction time, time</td>
</tr>
<tr>
<td>u</td>
<td>current</td>
<td>energy, work, temp. change</td>
</tr>
<tr>
<td>v</td>
<td>circuitry</td>
<td>electrical charge</td>
</tr>
<tr>
<td>w</td>
<td>calorimetry</td>
<td>forces</td>
</tr>
<tr>
<td>x</td>
<td>phase change</td>
<td>combining power</td>
</tr>
<tr>
<td>y</td>
<td>expansion</td>
<td>density</td>
</tr>
<tr>
<td>z</td>
<td>particles</td>
<td>concentration</td>
</tr>
<tr>
<td>1</td>
<td>establishing standards</td>
<td>catalysts</td>
</tr>
<tr>
<td>2</td>
<td>math</td>
<td>sciencing</td>
</tr>
<tr>
<td>3</td>
<td>quantification</td>
<td>chemical composition</td>
</tr>
<tr>
<td>4</td>
<td>definition</td>
<td>miscellaneous</td>
</tr>
<tr>
<td>5</td>
<td>sciencing</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>moments</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>chemical change</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>magnetism</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>miscellaneous</td>
<td></td>
</tr>
</tbody>
</table>
Process Alphanumeric code a→z, l→y, for identification of the scientific process involved in the frame. The representation is the same for both seventh and eighth grades.

| 1   | a   | functional definition |
| 2   | b   | operational definition |
| 3   | c   | establishing standards |
| 4   | d   | choice and use of correct units |
| 5   | e   | use of instruments |
| 6   | f   | making observations |
| 7   | g   | averaging |
| 8   | h   | numeric operations |
| 9   | i   | arranging axis and plotting points |
| 10  | j   | interpreting graphical data |
| 11  | k   | interpreting non-graphical data |
| 12  | l   | specific factual recall |
| 13  | m   | identifying variables |
| 14  | n   | controlling variable |
| 15  | o   | hypothesis formation |
| 16  | p   | hypothesis testing |
| 17  | q   | model definition and construction |
| 18  | r   | application of course models |
| 19  | s   | application of a principle or concept |
| 20  | t   | equipment instructions |
| 21  | u   | statement of a principle or concept |
| 22  | v   | thought stimulation or focus |
| 23  | w   | information presentation |
| 24  | x   | answer to previous question |
| 25  | y   | filling a data table |
| 26  | z   | review of previous material |
| 27  | 1   | systems analysis |
| 28  | 2   | descriptive definition |
| 29  | 3   | predicting |
| 30  | 4   | garbage |
ISCS LABEL SCHEME

Each frame programmed by ISCS was labeled by means of the following scheme. The label served the usual Coursewriter II functions in regard to branching, restart, etc.

6 Characters

1 2 3 4 5 6

1. **Chapter** Alphanumeric code a-z, corresponding to chapter number 1 → 26.

2. **Page Number** Alphanumeric code a-z, corresponding to page number 1 → 26.

3-4-5. **Sequence Number** Numeric code, 0 → 900 corresponding to the frame sequence number. The first frame of each course segment begins with the number 1, and they are numbered consecutively from that point.

6. **Extra** This position is normally blank. If frames must be inserted at a later date, this position allows for keeping the same label scheme, and using an alphanumeric code in this position to distinguish between frames.
The Analysis Programs

There were five analysis programs developed by ISCS for processing the data that was recorded, sorted, and merged by the CAI Center's Data Management System (DMS) operating under the ISS Monitor. In addition, the center provided item analysis summaries and listings of student comments. The latter two analysis were performed by the center, using the sort and analysis capability of the DMS. Any inquiries relative to the DMS-ISS monitor system or operations should be directed to Mr. George Hogshead, CAI Center, Florida State University, Tallahassee, Florida 32306.

Detailed Listings and Documentation

Program logic description, operator instructions, flow diagrams, and detailed program listings with comments are presented for each of the five ISCS analysis programs.
The purpose of the program is to provide a detailed, but edited, listing of student responses. The printed records consist of the student number, EPID, response identifier, date of response, latency, and the contents of buffer zero.

The program runs on a work tape, in regular history file sequence, containing only the student population wanted. The tape may be mounted on either drive.

1. The program reads a student record, using subroutine FAKE, into the 136 character array IREC. If it is a new student, the program goes to 2 below. If it is not a new student, the program goes to 3 below.

2. The program stores the student number, skips to a new page on the printer, and writes the page header.

3. The program prints the student number, EPID, response identifier, latency, date of response, and buffer zero, then returns to 1 above.

After each read statement, an end of file check is made.

*The layout for array IREC is given in the Appendix*
FIGURE 9
PROGRAM ISCSA FLOW DIAGRAM
THE PURPOSE OF THIS PROGRAM IS TO PROVIDE AN EDITED DETAILED LISTING WHICH IS MORE COMPACT THAN THAT PROVIDED BY THE CENTER. THE OUTPUT LISTS 150 STUDENT NUMBER, DATE, LATENCY, BUFFER 0, EPI D, AND RESPONSE IDENTIFIER. THE PRIMARY USE OF THIS PROGRAM IS FOR REFERENCE. THE PROGRAM RUNS OFF OF TAPE OF THE STUDENTS IN HISTORY FILE SEQUENCE.

COMMON IREC(134), JDATE(4)

IREC = 134 CHARACTER ARRAY FOR THE TAPE RECORD
DATA IA, IB, NUM/ 'C ', 'XX'/
TOTAL = 0.0
N = 2

SET TAPE DRIVE SENSE SWITCH
WRITE(E(12,3004))

FORMAT(/,20X,'SET TAPE DRIVE SENSE SWITCH',/,
*20X,' SS 4 ON = USE TAPE DRIVE 5',/,
*20X,' SS 4 OFF = USE TAPE DRIVE 6',////)
PAUSE
CALL SSWITCH(4,JD)
GO TO (3001,3002), JD

IDRIV = 5
GO TO 19

IDRIV = 6

READ THE HEADER
CALL RHDR(IDRIV)

READ A STUDENT RECORD
A STUDENT RECORD IS READ INTO THE IREC ARRAY USING SUBROUTINE FAKE.

CALL FAKE(IDRIV, N)

CHECK FOR END OF FILE
IF(N-2)50, 10, 50

CHECK FOR A NEW STUDENT
IF(IREC(5)-NUM) 11, 13, 11
CONTINUE
WRITE(2,111) TOTAL

FORMAT(/,5X,'TOTAL TIME IN CHAPTER ',F6.1,' MINUTES')
TOTAL = 0.0

WRITE NEW PAGE HEADER
WRITE(2,12)

FORMAT(1H1,///,40X,'STUDENT RESPONSE PROFILE',//)
NUM = IREC(5)

CALL DATE
TIME = IREC(22)/600.0
TOTAL = TOTAL + TIME

ADD TIME IN MINUTES
IF(IREC(21) = IÀ) 14, 16, 14
IF(IREC(21) = IÀ) 15, 16, 15
WRITE RECORD
WRITE(2, 17) IREC(4), IREC(5), (IREC(J), J = 10, 21), JDATE, TIME
FORMAT(2X, 2A2, 2X, 10A1, 2X, 2A1, 2X, 4A2, 2X, F6.2)
FORMAT(2X, 2A2, 2X, 10A1, 2X, 2A1, 2X, 4A2, 2X, F6.2, 2X, 22A2)
GO TO 20
WRITE(2, 18) IREC(4), IREC(5), (IREC(J), J = 10, 21), JDATE, TIME,
 *(IREC(K), K = 84, 104)
GO TO 20
REWIND IDRIV
STOP
END
// XEQ ISCSA
PROGRAM ISCSA

OPERATING INSTRUCTIONS

The program is designed to print an edited detailed listing, from a work tape in history file sequence, of the selected ISCS students.

To run the program

1. mount the work tape (either drive)
2. put stock paper in printer
3. load fortran deck
4. set sense switch 4 to assign the proper tape drive.
   (drive selection instructions appear on printer)

OUTPUT

1. tape drive selection instruction
2. student listing
The purpose of this program is to provide a graphic plot of each student's progress through the instructional materials, with respect to time. The ISCS-CAI macro system is such, that the last two characters of the EPID contain the frame sequence number. The frames are numbered consecutively, starting with 1 at the beginning of each course segment. The program uses this sequence number for reference when plotting the data points.

The program runs on a work tape, in regular history file sequence, containing only the student population wanted. The tape may be mounted on either tape drive.

1. The program reads a student record, using subroutine \texttt{FALIE}, into the 134 character array \texttt{IN:}. If it is a new student, the program goes to 2 below. If it is not a new student, the program goes to 3 below.

2. The program stores the student number, \texttt{sicips} to a new page on the printer, and writes the page header, which includes the student number, and x axis of the graph.

3. The program examines \texttt{IRUC(18)} and \texttt{IRUC(1y)}, which are the last two characters of the EPID. The numerical value of these two positions are found, \( K = 10 \times \texttt{IRUC(18)} + \texttt{IRUC(1y)} \), and a \texttt{x} placed as the data point in Line (\( K \)).

4. The latency from the record is added to the total latency. If the total latency is less than 5 minutes, the program returns to 1.

5. If the total latency is greater than 5, 5 is subtracted from the total latency, array \texttt{LINK} is printed, then set equal to blanks, except the last data point. The program returns to 1 above.

After each read statement, an end of file check is made.
START
READ HEADER
READ RECORD

yes
EOF

no
NEW STUDENT

yes
STORE STUDENT NUMBER

WRITE PAGE HEADER
DETERMINE DATA POINT
TOTAL LATENCY

no

L = L - 5

yes
WRITE LINE

UNLOAD
STOP

FIGURE 10
PROGRAM ISCSP FLOW DIAGRAM
DIMENSION NUM(10), LINE(102)
COMMON IREC(134), JDATE(4)

THE PURPOSE OF THIS PROGRAM IS TO PLOT STUDENT PROGRESS THROUGH THE ISCS 50
INSTRUCTIONAL MATERIALS WITH RESPECT TO TIME. THE PROGRAM RUNS OFF OF A WORK
TAPE, WITH THE STUDENTS IN HISTORY FILE ORDER. THE PROGRAM PLOTS TIME IN 170
FIVE MINUTE INTERVALS AS THE Y AXIS, AND THE FRAME SEQUENCE NUMBER AS THE X 0
AXIS. THE FRAME SEQUENCE NUMBER IS DERIVED FROM THE LAST TWO CHARACTERS 00190
OF THE EPID.

THE PROGRAM WAS WRITTEN BY
DAVID H. DASENBROCK
JANUARY, 1969

C LINE = ALPHANUMERIC ARRAY CONTAINING 0-9M FOR DETERMINING FRAME NUMBER
ISP00210
ISP00220
ISP00230
ISP00240
ISP00250
ISP00260
ISP00270
ISP00280
ISP00290
ISP00300
ISP00310
ISP00320
ISP00330
ISP00340
ISP00350
ISP00360
ISP00370
ISP00380
ISP00390
ISP00400
ISP00410
ISP00420
ISP00430
ISP00440
ISP00450
C SET THE LEGEND FOR THE PLOT.

C SET AXIS

DO 13 I=1,102
LINE(I)=IDOT
13 CONTINUE
J=0
WRITE(2,102)J,LINE

102 FORMAT(2X,15,2X.A1)

DO 14 I=2,101
LINE(I)=IBLNK
14 CONTINUE
DO 15 I=1,9
M=I*10+1
LINE(M)=IY
15 CONTINUE
J=J+1
K=(J/10)*10
IF(J-K)40,20,40

DO 21 I=2,101,10
MOP=I+4
LINE(MOP)=IY
MPD=I+8
LINE(MPD)=IY
LINE(I)=IY
21 CONTINUE

C DETERMINE COORDINATES OF DATA POINT

DO 45 I=1,10
IF(IREC(18)-NUM(I))43,42,43
IA=I-1
43 IF(IREC(19)-NUM(I)) 45,44,45
IB=I-1
44 CONTINUE
45 IF(IA=0)47,46,47
46 IF(IB=0)47,10,47
47 IC=IA*10+IB+1

C TOTAL TIME IS L.
LINE(IC)=IX
L=L+IREC(22)
IF(L-3090)10,50,50

C WRITE LINE
THE DATA POINT IS PLOTTED AS A LETTER...LINES ARE PLOTTED AS DOTS WITH
C DASHES FOR FIVE MINUTE INTERVALS.

50 M = J * 5
   WRITE (2,102) M, LINE
   L = L - 3000 - IREC(22)
   GO TO 60

C UNLOAD THE BLOODY TAPE, THE PROGRAM HAS RUN OUT OF THE STUPID STUFF

5   REWIND IDRV
   STOP
   END
   // XEQ ISCSP
PROGRAM ISCSP

OPERATING INSTRUCTIONS

This program is designed to read a work tape, comprised of ISCS students in history file sequence, and provide a plot of student progress, with respect to 5 minute time intervals.

To run the program

1. mount work tape (either drive)
2. put stock paper in printer
3. load fortran deck
4. set sense switch 4 to assign proper tape drive.
   (drive selection instructions appear on printer)

OUTPUT

1. tape drive selection instructions
2. plot of students path through the instructional materials, with respect to time.
PROGRAM ISCST

PROGRAM LOGIC DESCRIPTION

The purpose of this program is to provide a graphic trace of each student's progress through the instructional sequence. The ISCS-CAI macro system is such that the last two characters of the LPID contain the frame sequence number. The frames are numbered consecutively, starting with 1 at the beginning of each course segment. The program uses the sequence number for reference when plotting the data points.

The program runs on a work tape, in regular history file sequence, containing only the student population wanted. The tape may be mounted on either tape drive.

1. The program reads a student record, using subroutine FALU, into the 134 character array IRUC. If the end of file is encountered, the program checks for a new student number. If it is a new student, the program goes to 2 below. If it is not a new student, the program executes 3 below.

2. The program stores the student number, goes to a new page on the printer, and writes the page header, which includes the student number and the axis of the graph.

3. The program examines IRUC(18) and IRUC(19), which are the last two characters of the LPID. The numerical value of these two positions are found, \( K = 10 \times \text{IRUC(18)} + \text{IRUC(19)} \), and the first character of the response LP is stored as a data point in LINE(h).

4. The array LINE is written, and the data point is then removed from the array. The program repeats 1 above.
START

READ HEADER

READ RECORD

STOP

FILE

ERROR

READ RECORD

STORE STUDENT NUMBER

NEW STUDENT

no

WRITE PAGE HEADER

yes

UNLOAD

Determine data point

WRITE LINE

FIGURE 11
PROGRAM ISCST FLOW DIAGRAM
**Detailed Listing-ISCST**

**DIMENSION NUM(10), LINE(102)**

**C**

**THIS PROGRAM WAS WRITTEN BY**

**DAVID H. DASENBROCK**

**ISC**

**OCTOBER 1968**

**C**

**THE PURPOSE OF THIS PROGRAM IS TO TRACE A STUDENT'S PATH THROUGH THE INSTRUCTIONAL MATERIALS. THE X AXIS SERVES AS THE FRAME NUMBER, THE Y AS THE RESPONSE NUMBER. THE FIRST CHARACTER OF THE RESPONSE EP IS RECORDED ON THE PLOT. A PLOT IS DRAWN FOR EACH STUDENT. THE PROGRAM IS RUN ON A WORK TAPE IN REGULAR HISTORY FILE SEQUENCE, SORTED BY STUDENT. ANY EPID WITH 01 SEQUENCE NUMBERS APPEARING AS INIT SERVES AS A RESTART POINT. THIS INCLUDES EXCURSIONS, CHAPTER BEGINNINGS, OR ANY SEQUENCE WITH AN EPID OF THE FORM 00.**

**C**

**LINE = ALPHANUMERIC ARRAY FOR LINE ON THE PRINTER, IN WHICH TO STORE GRAPHIC CHARACTERS.**

**NUM = ALPHANUMERIC ARRAY CONTAINING THE NUMBERS 0-9, FOR DETERMINING THE X AXIS POSITION**

**COMMON IREC(134), JDATE(4)**

**DATA NUM/'C', '2', '3', '4', '5', '6', '7', '8', '9', '0'/**

**DATA IBLNK, IDOT, ID, N/'1', '2', '3', '40', '2'/**

**C**

**SET THE TAPE DRIVE NUMBER**

**WRITE(2, 3004)**

**3004 FORMAT(/, 'SET TAPE DRIVE SENSE SWITCH', //, '20X', 'SS 4 GN = USE TAPE DRIVE 5', //, '20X', 'SS 4 OFF= USE TAPE DRIVE 6', //, '11111')**

**C**

**JD IS USED AS A SWITCH TO SET THE DRIVE NUMBER**

**C**

**JD IS SET BY SENSE SWITCH FOUR**

**CALL SSWTCH(4, JD)**

**%RT1(3001, 3002), JD**

**GO TO 19**

**C**

**READ THE TAPE RECORD**

**C FAKE IS THE FORTRAN SUBROUTINE ON THE CAI SYSTEM THAT READS EACH STUDENT RECORD INTO A 134 CHARACTER ARRAY CALLED FAKE.**

**10 CALL FAKE(IDRIV, N)**

**C**

**CHECK FOR THE END OF FILE**

**IF(N-2)5, 11, 5**

**C**

**CHECK FOR A NEW STUDENT**

**11 IF(ID=IREC(5))12, 40, 12**

**C**

**SET STUDENT NUMBER**

**12 ID=IREC(5)**

**C**

**WRITE PAGE HEADER**

**100 WRITE(2, 101)**

**101 FORMAT(1H1)**

**110 FORMAT(1H1)**

**WRITE(2, 120) IREC(1), IREC(2), IREC(3)**

**FORTRAN '2X, 3A2)
WRITE(2,110) IREC(4), IREC(5), IREC(10)
110 FORMAT(35X,'STUDENT NUMBER ',2A2,10X,'CHAPTER ',A2,/)
WRITE(2,106)
106 FORMAT(2X,'RESPONSE ',40X,'FRAME')
WRITE(2,107)
107 FORMAT(1X,'NUMBER')
C WRITE THE GRAPHIC AXIS
WRITE(2,108)
108 WRITE(2,105)
105 FORMAT(19X,'111111111122222222233333333344444444445555555555666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666666
PROGRAM ISCST

OPERATING INSTRUCTIONS

This program is designed to read a work tape, comprised of ISCS students in history file sequence, and provide a trace of the students progress through the instructional materials.

To run the program:

1. Mount the work tape (either drive)
2. Put stock paper in printer
3. Load the Fortran deck
4. Set sense switch 4 to assign the proper tape drive (drive selection instructions appear on printer)

OUTPUT

1. Tape drive selection instructions
2. Trace of student path through the instructional materials.
PROGRAM LOGIC DESCRIPTION

This program was developed to fulfill specific data analysis needs of the Intermediate Science Curriculum Study. The ISCS-CAI program is completely macro based. As a result, the same response identifiers are used throughout the course to indicate answers to free response questions. The purpose of this program is to select free response questions from a work tape containing only the student population wanted, and sorted by an item analysis sequence. The program prints the student responses, by question.

1. The program reads the tape header.

2. The program reads one student record, using subroutine FAKE. The student record is stored in the 134 character array IRLE. The program searches for a D in IRLE(20) or an F in IRLE(21). These two characters, D and F, are unique in those two positions for free response questions in the macro system.

3. If a D or F is not encountered, the program repeats 2 above.

4. If a D or F is encountered, the program goes to a new page on the printer, and writes the page header containing the LPID.

5. The LPID is stored.

6. The student number, response identifier, and the contents of buffer zero are printed.

7. The program reads the next student record. This LPID is compared with the stored LPID.

8. If it is the same, the program returns to 6 above.

9. If it is not the same, the program returns to 3 above.

After each read statement, an end of file check is made.
Detailed Listing-ISCSB

**DIMENSION ID(10),IALP(26),IACPT(2)**

**THIS PROGRAM WAS WRITTEN BY**

**DAVID H. DASENBROCK**

**ISCs**

**NOVEMBER 1968**

**THE PURPOSE OF THIS PROGRAM IS TO SELECT FROM A WORK TAPE, SORTED IN A ITEM ANALYSIS SEQUENCE, THOSE QUESTIONS WHICH HAVE A FREE RESPONSE ANSWER. TO DO THIS THE PROGRAM SEARCHES FOR AN F AS THE SECOND CHARACTER IN THE EP RESPONSE IDENTIFIER, OR A D IN THE FIRST CHARACTER OF THE IDENTIFIER, AS THESE ARE UNIQUE IN THE MACRO CO**

**BEING USED BY ISCS.**

**IREC = 134 CHARACTER ARRAY FOR THE TAPE RECORD**

**A STUDENT RECORD IS READ INTO THE IREC ARRAY USING SUBROUTINE FAKE.**

**ID = ARRAY FOR STORING AND CHECKING THE 10 CHARACTER EPID**

**IALP = ARRAY IN WHICH IS STORED THE 26 LETTERS OF THE ALPHABET**

**IACPT = ARRAY CONTAINING F AND D FOR SELECTION OF THE QUESTIONS**

**COMMON IREC(134),JDATE(4)**

**DATA DECLARATIONS**

**DATA IALP(/A,'B','C','D','E','F','G','H','I','J','K','L','M','N','O','P','Q','R','S','T','U','V','W','X','Y','Z'/)**

**DATA IACPT/"F","D"/**

**DATA IR/R/**

**INITIATE THE CORRECT TAPE DRIVE. JD IS USED AS A SWITCH TO SELECT DRIVE, AND SET IDRIVE, THE TAPE DRIVE NUMBER SENSE SWITCH**

**TO SET JD**

**WRITE(2,3004)**

**FORMAT(/"//,20X,"SET TAPE DRIVE SENSE SWITCH",/)**

**#20X,2 SS 4 ON = USE TAPE DRIVE 5","/**

**#20X,1 SS 4 OFF= USE TAPE DRIVE 6","///////////)**

**PAUSE**

**CALL SSWTCH(4,JD)**

**GO TO (3001,3002),JD**

**3001 IDRIV=5**

**GO TO 199**

**2002 IDRIV=6**

**READ THE HEADER**

**CALL RHDR(IDRIV)**

**WRITE(2,25)**

**N=2**

**READ A TAPE RECORD**

**CALL FAKE(IDRIV,N)**

**CHECK FOR END OF FILE OR TAPE ERROR**

**IF(N-2)23,10,23**

**CHECK FOR CORRECT RESPONSE IDENTIFIER**

**10 IF(I_REC(21)-IACPT(1))19,20,19**

**IF(I_REC(20)-IACPT(2))22,20,22**
C  STORE NEW EPID
20  DO 11 I=1,10
   ID(I)=IREC(I+9)
11  CONTINUE
   DO 15 I=1,22
      IF(IREC(10)=IALP(I))13,12,13
      C  CHECK FOR CHAPTER
12  IC=I
13  IF(IREC(11)=IALP(I))15,14,15
      C  CHECK FOR PAGE
14  IP=I
15  CONTINUE
    C  CHECK FOR REVIEW
16  WRITE(2,16)IC,IP,IREC(16),IREC(17),ID
    FORMAT(1H11/410X'CHAPTER',13/,10X,'PAGE ',13/,2X,'QUESTION',*/2X,2A1,18X,'IDENTIFIER',*/,35X,10A1)
17  DO 18 I=1,10
    C  CHECK FOR NEW EPID
18  IF(ID(I)=IREC(I+9))10,18,10
    C  WRITE THE RECORD, AS AT THIS POINT IT IS ACCEPTABLE
20  WRITE(2,21)IREC(4),IREC(5),IREC(20),IREC(21),(IREC(K),K=84,104)
21  FORMAT(10X,2A2,2X,2A1,2X,2A2)
    C  READ A NEW RECORD
22  CALL FAKE(5,N)
23  WRITE(2,25)
25  FORMAT(1H1)
    C  END OF TAPE, UNLOAD
1502  REWIND IDRIV
STOP
// XEQ ISCSB

PROGRAM ISCSB

OPERATING INSTRUCTIONS

This program is designed to read an item analysis sorted work tape, comprised of ISCS students, and write student responses to free response questions.

To run the program.

1. mount the work tape (either drive)
2. put 1 ply stock paper in printer
3. load the fortran deck
4. set sense switch 4 to assign proper tape drive
   (drive selection instructions will be printed)

OUTPUT

1. Tape drive selection instructions.
2. Student number, response EP, buffer zero, of free response questions.
Program ISCSM or ISCS9

Note: Program ISCS9 is a modification of the series of programs labeled ISCSM, ISCS7, and ISCS8. The original (1967-68) version of these programs was labeled ISCS.

Program Logic Description

It has been found that for revision purposes and other uses of the data from the CAI trial, a matrix is the most useful format in which to obtain data. Program ISCSM was developed to provide matrices of student response identifiers, latency times, numbers of reviews, and dates of response. The program prints each of the four types of data in a matrix ordered by student number and frame identifier (EPID).

1. The program reads the tape header.

2. One student record is read, using subroutine FAKE, and a check for end of file is made.

3. A check is made to determine whether a new EPID has been encountered.
   a. If a new EPID is encountered, the response for the frame is stored as the last response for that student and the latency is zeroed.
   b. If a new EPID is not encountered, a check is made for a new student number. If a new student number is not encountered, latency is added and a new record is read as in 2 above.
   c. If a new student number is encountered, the response is stored and the latency is zeroed.

4. A check is made to determine whether data for 8 frames have been stored.
   a. If data for 8 frames are stored, a response matrix is written and a check is made relative to the need to print or skip the latency, data and review matrices. The latter three matrices are skipped if data for questions only are included in the records. (This would normally occur if a sort for questions only had been made prior to the analysis.)
   b. A check is made for whether or not punched card output is desired, and if so, data in binary form are punched on cards.
   c. The EPID counter is reset to zero.

5. If data for less than 8 frames are stored, a check is made for whether the response is a review. If it is a review a new response record is read as in 2. If it is not a review, the response is stored as the first response for the student, the student number is stored, and then a new record is read.
Detailed Listing-ISCS9

1001 INTEGER EPI(80),ANSI(31,8,4)
1002 DIMENSION NUM(31),ICA(2),NLR(3),IQU(3),I3IN(62,8),LAT(31,8),
  *IDAT(31,8,4),IEPID(10),ICK(31,8),RAT(31,8),AVE(8),
  *IREV(31,8),IREVT(8),NX1(16),X1(16)
1003 COMMON IREC(134),JDATE(4)
  DATA NS,NL,NC,NY/31,3,2,0/
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  C THIS PROGRAM WAS WRITTEN BY
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  DAVID DASENBROCK
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  ISCS
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  NOVEMBER, 1968
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  AND MODIFIED BY GEORGE HOGSHEAD
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  CAI CENTER
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  OCTOBER, 1969
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  C THIS PROGRAM IS DESIGNED TO PRESENT FOUR MATRICES OF DATA AS OUTPUT.
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  THE WORK TAPE FROM WHICH RECORDS ARE READ ARE SORTED IN ITEM ANALYSIS
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  SEQUENCE. EACH STUDENT RECORD IS READ AND THE AUTHENTICITY OF THE
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  STUDENT NUMBER IS CHECKED. TOTAL LATENCY AND AVERAGE LATENCY ARE
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  CALCULATED FOR EACH FRAME FOR EACH STUDENT AND STORED IN THE LATENCY
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  MATRIX. ERROR RATES ARE CALCULATED FOR EACH FRAME AND STORED IN THE
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  MATRIX WITH RESPONSE IDENTIFIERS. FOUR MATRICES ARE PRINTED OUT...
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  RESPONSE, LATENCY, NUMBER OF REVIEWS, AND DATE OF RESPONSE...ALL IN
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  SEPARATE MATRICES FOR WHICH THE FRAME EPID APPEARS ALONG THE HORIZONAL
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  AXIS AND STUDENT NUMBER APPEARS ALONG THE VERTICAL AXIS.
  NS=NUMBER OF STUDENTS NA=BLANKS, NL= NUMBER OF ILEGAL RESPONSES, NC= NUMBER
  C OF CORRECT ANSWERS, NY= END OF TAPE CHECK
  IBIN IS AN ARRAY OF BINARY NUMBERS FOR PUNCHING 1 AND 0 ON CARDS.
  DATA NUM/'00', '01', '02', '03', '04', '05', '06', '07', '08', '09', '10',
  **11', '12', '13', '14', '15', '16', '17', '18', '19', '20', '21', '22', '23',
  **24', '25', '26', '27', '28', '29', '30'/
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  C NLR=OTON,RV
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  DATA NLR/'U ', 'R ', 'O '/
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  C ICA=CA,CF,EX
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  DATA ICA,NA/'C ', 'E ', 'I '/
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  DATA I3IN/X 'Y ', 'C '/
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  C THREE BLANK CARDS ARE READ TO CLEAR THE PROGRAM FROM THE PUNCH AREA.
  1005 READ (1,2001)X
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  READ (1,2001)IX
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  READ (1,2001)IX
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  C NOTE TO OPERATOR TO SET SENSE SWITCHES.
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  WRITE(2,2002)
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  WRITE(2,2003)
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  WRITE(2,2002)
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  1007 PAUSE
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  CALL SSWITCH(2,JQ)
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  CALL SSWITCH(3,JP)
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  C DETERMINE SENSE SWITCH SETTING FOR THE TAPE DRIVE IN USE. INSTRUCTIONS
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
  ARE PRINTED ON THE PRINTER.
  WRITE(2,3004)
  ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **
3004  FORMAT(//,20X,'SET TAPE DRIVE SENSE SWITCH',/,  
*20X,' SS 4 ON = USE TAPE DRIVE 5',/,  
*20X,' SS 4 OFF= USE TAPE DRIVE 6',/////)
PAUSE
C COMPUTER SETS DRIVE TO BE USED.
   CALL SSWTCH(4,JD)
   GO TO (3001,3002),JD
3001  IDRIV=5
   GO TO 3003
3002  IDRIV=6
3003  WRITE(2,2301)JQ,JP
2301  FORMAT(10X,2I4,//)
C READ TAPE HEADER.
   CALL RHDR(IDRIV)
   GO TO (10,15),JP
C WRITE STATEMENT TO TELL OPERATOR THAT THE PROGRAM WILL PUNCH CARDS.
10  WRITE(2,2004)
   PAUSE
C GO TO TOP OF PAGE.
15  WRITE(2,2005)
   LPCK=0
   LA=0
   M1=0
   N=2
C ZERO MATRICES,
19  DO 20 J=1,8
   DO 20 I=1,NS
   IREV(J)=0
   AVE(J)=0
   IREV(I,J)=0
   LAT(I,J)=0
   ICK(I,J)=0
   DO 21 KA=I,4
C BLANK MATRICES.
   ANS(I,J,KA)=NA
   IDATE(I,J,KA)=NA
21  CONTINUE
20  CONTINUE
D0173  I=1,16
NX1(I)=0
173  CONTINUE
C SET BINARY MATRIX NUMBERS EQUAL TO 2, IF NO RESPONSE, 2 WILL REMAIN,
C IF THERE IS A RESPONSE, 1 OR 0 WILL BE PUNCHED.
   DO 110 J=1,8
   DO 110 I=1,62
   IBIN(I,J)=2
110  CONTINUE
   IPAGE=1
24  CALL FAKE(IDRIV,N)
CK EOF
   IF(N-2)1000,25,1000
CK NEW EPID
25  IF(M1-10)26,27,26
CK FOR QU
GO TO (50,51), JQ
50 DO 52 I=1,2
   IF(IREC(15)-IQU(I))52,51,52
   CONTINUE
   GO TO 24
   DO 29 I=1,10
   IEPID(I)=IREC(I+9)
   CONTINUE
   M1=10
   NB=IREC(5)
   GO TO 28
   DO 28 I=1,10
   IF(IEPID(I)-IREC(I+9))30,28,30
   CONTINUE
   CK NEW STD
C IREC%5 CONTAINS THE LAST TWO DIGITS OF A STUDENT NUMBER. NB CONTAINS
C A STORED STUDENT NUMBER. IF THEY ARE EQUAL, THE PROGRAM CONTINUES.
C IF THEY ARE NOT EQUAL, LATENCY IS RESET TO 0, AND THEN IT CONTINUES.
   IF(NB-IREC(5))101,31,101
   101 LPCK=0
   LA =0
   ICK(NAME,IPAGE)=10
   C LATENCY IS DIVIDED BY 60 TO GET IT INTO MINUTES. THE COUNTER OVER-
C FLOWS IF LATENCY IS STORED IN SECONDS. IT MAY OVERFLOW IN MINUTES,
C ON OCCASION, AND THE RESULT IS A NEGATIVE LATENCY.
   31 LA=LA+IREC(22)/60
   IF(LPCK<10)103,152,103
   152 ANS(NAME,IPAGE,3)=IREC(20)
   ANS(NAME,IPAGE,4)=IREC(21)
   102 LAT(NAME,IPAGE)=LA
   C THIS CHANGES LATENCY FROM AN INTEGER TO A REAL NUMBER.
   RAT(NAME,IPAGE)=LA*1
   IF(NLR(2)-IREC(22))13291319132
   131 IREV(NAME,IPAGE)=IREV(NAME,IPAGE)+1
   132 DO 106 I=1,NS
   IF(IREC(20)-ICA(I))106,107,106
   107 IBIN(NAMB,IPAGE)=1
   GO TO 24
   106 CONTINUE
   IBIN(NAMB,IPAGE)=0
   GO TO 24
   103 NB=IREC(5)
   DO 33 I=1,NS
   NAME=I
   NAMB=NAME+31
   IF(NUM(I)-IREC(5))33,35,33
   33 CONTINUE
C WRITES A STUDENT NUMBER WHICH DOES NOT MATCH A CORRECT ONE.
   LA=0
   WRITE(2,2006)IREC(4),IREC(5)
   GO TO 24
   35 IF(ICK(NAME,IPAGE)-10)36,24,36
   36 DO 32 I=1,NL
   IF(IREC(20)-NLR(I))32,102,32
CONTINUE
ANS(NAME, IPAGE, 1) = IREC(20)
ANS(NAME, IPAGE, 2) = IREC(21)
DO 46 I = 1, NC
IF (IREC(20) - ICA(I)) 46, 37, 46
IBIN(NAME, IPAGE) = 1
C FILL BINARY ARRAY.
GO TO 38
46 CONTINUE
IBIN(NAME, IPAGE) = 0
CALL DATE
C DETERMINE DATE OF RESPONSE.
DO 39 I = 1, 4
IDATE(NAME, IPAGE, I) = JDATE(I)
CONTINUE
LPCK = 10
GO TO 102
C FILL EPID IDENTIFIER ARRAY.
DO 41 I = 1, 10
IB = (IPAGE * 10) + 10 + I
EPID(IB) = IEPID(I)
IEPID(I) = IREC(I + 9)
CONTINUE
TOT = 0.0
C TOTAL LATENCY ON THE FRAME.
DO 127 I = 1, 31
TOT = TOT + RAT(I, IPAGE)
CONTINUE
C DETERMINE THE AVERAGE LATENCY.
AVE(IPAGE) = TOT / 31.0
LPCK = 0
LA = 0
M1 = 0
KOUNT = IPAGE
IPAGE = IPAGE + 1
IF (IPAGE = 8) 26, 26, 100
NY = 10
C PRINT RESPONSE MATRIX.
WRITE(2, 2050) IREC(1), IREC(2), IREC(3)
WRITE(2, 2200)
WRITE(2, 2051) EPID
DO 55 I = 1, NS
WRITE(2, 2060) NUM(I), ((ANS(I, J, K), K = 1, 4), J = 1, KOUNT)
CONTINUE
DO 171 I = 1, NS
DO 171 J = 1, KOUNT
C DETERMINE ERROR RATE.
L = J + 2
K = L - 1
M = I + 31
NX1(K) = NX1(K) + IBIN(I, J)
NX1(L) = NX1(L) + IBIN(M, J)
X1(K) = (31.0 - NX1(K)) / 31.0
X1(L) = (31.0 - NX1(L)) / 31.0
IF(X1(K)>.001)172,172,179
172 X1(K)=0.0
179 IF(X1(L)>.001)174,174,171
174 X1(L)=0.0
171 CONTINUE
WRITE(2,2038)X1
2038 FORMAT(/3X,'ERROR RATE',2X,8(1X,E4.2,1X,F4.2,2X))
GO TO (86,87),JQ
C CHECK TO SEE IF OTHER MATRIX IS WANTED.
87 WRITE(2,2050)IREC(1),IREC(2),IREC(3)
C PRINT LATENCY MATRIX.
WRITE(2,2201)
WRITE(2,2051)EPID
DO 60 I=1,NS
WRITE(2,2061)NUM(I),(RAT(I,J),J=1,KOUNT)
60 CONTINUE
WRITE(2,2020)AVE
2020 FORMAT(/2X,'AVE LAT',8X,8(F6.2,6X))
C PRINT REVIEW MATRIX.
DO 143 I=1,NS
DO 143 J=1,KOUNT
IREVT(J)=IREVT(J)+IREV(I,J)
143 CONTINUE
WRITE(2,2050)IREC(1),IREC(2),IREC(3)
WRITE(2,2033)
2033 FORMAT(40X,'NUMBER OF REVIEWS')
WRITE(2,2051)EPID
DO 141 I=1,NS
WRITE(2,2030)NUM(I),(IREV(I,J),J=1,KOUNT)
141 CONTINUE
WRITE(2,2031)IREVT(I),I=1,KOUNT
2030 FORMAT(6X,'AVE',A297X,8(1X,F6.2,6X))
2031 FORMAT(/6X,'TOTAL',6X,8(2X,F6.2,6X))
C PRINT DATE MATRIX.
WRITE(2,2050)IREC(1),IREC(2),IREC(3)
WRITE(2,2202)
WRITE(2,2051)EPID
DO 70 I=1,NS
WRITE(2,2062)NUM(I),(IDATE(I,J,K),K=1,4),J=1,KOUNT)
70 CONTINUE
86 CONTINUE
81 WRITE(2,2005)
GO TO (80,85),JP
80 DO 85 I=1,KOUNT
C PUNCH CARDS.
IH=I*10
NG=NS*2
IW=IH-9
WRITE(1,2100)EPID(L),L=IW,IH),(IBIN(K,I),K=1,NG),IREC(3)
GO TO (85,89),JQ
89 WRITE(1,2101)EPID(L),L=IW,IH),(LAT(K,I),K=1,NS),IREC(3)
85 CONTINUE
DO 88 I=1,80
EPID(I)=NA
CONTINUE
1501 IF(NY-10)19,1500,19
1500 Rewind IDRIV
2001 FORMAT(A2)
2002 FORMAT(/ / /)
2003 FORMAT(/ / / ,30X,'SET SENSE SWITCHES, SEE DATA REQUEST SHEET',/ / /)
2004 FORMAT(/ / / ,10X,'THIS PROGRAM WILL PUNCH CARDS',/ / / / / / / /)
2005 FORMAT(1H1)
2006 FORMAT(/,10X,'STUDENT NUMBER ',2A2,' MISMATCH')
2050 FORMAT(1H1,///,50X,3A2)
2051 FORMAT(4X,'STUDENTS',4X,8(10A1,2X))
2060 FORMAT(6X,'VO',A2,6X,8(2X,2A1,2X,2A1,4X))
2061 FORMAT(6X,'VO',A2,7X,8(F6.1,6X))
2062 FORMAT(6X,'VO',A2,7X,8(4A2,4X))
2100 FORMAT(10A1,40I1,20X,A2)
2101 FORMAT(10A1,2013,A2)
2200 FORMAT(/,45X,'MATCH IDENTIFIER*)
2201 FORMAT(/,45X,'LATENCY IN MINUTES*')
2202 FORMAT(/,45X,'DATE OF RESPONSE*')
STOP
END
// XEQ 1SCS9
PROGRAM ISCS 9

OPERATING INSTRUCTIONS

The program is designed to print student response identifies latency, response date, and number of review in student by question matrices. The program will also punch the first and last pass responses in binary form. The work tape must be in item analysis sequences.

1. Mount work tape (either drive)
2. Put 1 ply stock paper in printer
3. Load the fortran deck and 4 blank cards
4. Set sense switch 4 to assign proper tape drive
   (drive selection instruction will be printed)
5. Set sense switch 2 (on = questions only, off = all frames)
6. Set sense switch 3 (on = punched output, off = no punched output)
7. Load blank cards if punched output is desired

*Note: Program ISCS9 is a modification of the program ISCS7 and ISCS8. The original version of these three programs was labeled program ISCS.
LAYOUT FOR ARRAY IREC

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

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Course Name
Student Number
Type
Date
Time of Day
EPID
Response I.D. (unpacked)
Latency
Switches 32 words
Counters 30 words
Student response 50 words