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ABSTRACT

This pamphlet describes a course designed to give students mastery over the 10-key and full-key adding-listing machines in solving special business problems. With course guidelines, performance objectives, course content, learning activities, evaluative instruments, student and teacher resources, the course content seeks to develop occupational proficiency for initial job placement. (NH)

AUTHORIZED COURSE OF INSTRUCTION FOR THE QUINMESTER PROGRAM

ADDING-LISTING MACHINES
(TEN-KEY AND FULL-KEY)

Business Education—7718.07 and 5283.28

DADE COUNTY PUBLIC SCHOOLS

DIVISION OF INSTRUCTION•1971

ADDING-LISTING MACHINES (TEN-KEY AND FULL-KEY)

7718.07 and 5233.20

Business Education

Written by Lottie N. McKinney
And Approved by the Business Education Steering Committee
For Quinmester Courses

for the

DIVISION OF INSTRUCTION
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I. COURSE TITLE—ADDING-LISTING MACHINES (TEN-KEY AND FULL-KEY)

II. COURSE NUMBERS--7718.07 and 5283.28

III. COURSE DESCRIPTION

A. Synopsis
Students will develop mastery of the ten-key and full-key adding-listing machines in solving special business problems.

B. Occupational Relationships

Recordkeeper	Sales recorder
Bookkeeper	Stenographer
Accountant	Receptionist
Office machine operator	Cashier
Clerical office worker	Clerk-typist
Secretary	Data-processing analyst

C. Vocational Scheme
Develops occupational proficiency for initial job placement

D. Rationale
Skill in using an adding machine is required of almost all office workers. If a student has not gained reasonable proficiency in the previous course, Preview of Computational Machines, he will find this course valuable for future success.

IV. COURSE ENROLLMENT GUIDELINES

A. Student Classification—co-educational

B. Prior Experiences Needed
The student should have attained the objectives of Preview of Computational Machines prior to enrollment in this course.

V. COURSE OF STUDY PERFORMANCE OBJECTIVES

Upon completion of the course, the student will be able to—

1. change the tape and ribbon correctly on the machines available and in use;

2. operate the ten-key machine by touch using the proper fingering techniques;

3. solve 10 addition, 10 subtraction, and 10 multiplication problems of varying difficulty found in the textbook to accompany the ten-key and full-key machines with 80 percent accuracy in 30 minutes;

4. solve division problems by using reciprocal tables; and

5. apply all of the above fundamental processes and operations in completing a variety of business forms.

VI. COURSE CONTENT

A. Equipment and Supplies
   1. Basic
      a. Machine desk
      b. Ten-key and full-key machines—electric or manual
      c. Chair
      d. Textbook
      e. Tapes
      f. Ribbon
   2. Supplementary
      a. Controlled reader and adding machine filmstrips
      b. Screen
      c. Overhead projector
      d. Tape recorder and blank audio tape

B. Pre-Operation Activities
   Arrange the work area with the machine to the right and your textbook to the left

C. Techniques on the Ten-Key Machine
   1. Posture
      a. Position machine for easy reach
      b. Sit erect and close to material for easy reading
      c. Place feet flat on the floor
   2. Stroking
      a. Fingers curved over home row
      b. Touch pattern
      c. Keys struck with light firm touch

D. Techniques on the Full-Keyboard Machine
   1. Posture and position
   2. Stroking techniques
      a. Keyboard colored for easy recognition of columns
      b. No touch system required
      c. Reading amounts

E. Machine Parts
   1. Keyboard
   2. Digit indicator
   3. Line space regulator
   4. Cylinder knob
   5. Paper release

F. Operation Parts
   1. Plus bar
   2. Minus bar
   3. Repeat bar
   4. Total key
   5. Sub-total key
   6. Non-add key
   7. Correction key
   8. Motor bar

VI. COURSE CONTENT, Continued

G. Tape Symbols
   1. Total—clear
   2. Sub-total
   3. Minus
   4. Add
   5. Repeat
   6. Credit balance
   7. Non-add

H. Fundamental Skills on the Ten-Key
   1. Addition—the touch method
      a. Clearing the machine
      b. Operating the keys
      c. Correcting errors before printed
      d. Correcting errors after printing
      e. Checking for accuracy
   2. Recognition of tape symbols for operational parts of the machine
   3. Addition of fractions
   4. Subtraction of fractions
   5. Multiplication—short cut method
   6. Multiplication of fractions
   7. Division—table of reciprocals

I. Fundamental Skills on the Full-Keyboard Machine
   1. Addition
      a. Clearing the machine
      b. Fingering method
      c. Operating the keys and motor bar
      d. Correcting errors before recorded
      e. Correcting errors after printing
      f. Checking the tape for accuracy
   2. Recognition of tape symbols for the operational parts of the machine
   3. Addition of fractions
   4. Subtraction of fractions
   5. Multiplication—short cut method
   6. Multiplication of fractions
   7. Subtraction when there is no minus key

J. Application of Skill
   1. Billing cycle
      a. Sales slip
      b. Discounts—cash and trade
      c. Net amount
      d. Credit memorandum
      e. Express charges
      f. Special terminology of unit prices
         (1) Per C
         (2) Per M
         (3) Per ream
         (4) Per gross
         (5) Per CWT

VI. COURSE CONTENT, Continued

g. Invoices
h. Statement of account
i. Sales and cash books
j. Inventory stock card
k. Departmental net sales, gross costs and net profit

2. Payroll
   a. Wages—regular earnings
   b. Wages with overtime earnings
   c. Deductions from wages
      (1) Social security
      (2) Income tax
      (3) Other deductions
   d. Net pay
   e. Payroll register proof
   f. Cash breakdown
   g. Salary on a commission basis
   h. Salary on a piece work basis
3. Banking
   a. Check stub balance
   b. Bank statement
   c. Reconciliation of the bank statement
4. Finding percentage
   a. Return on investment
   b. Apportioning of expenses
   c. Sales and expense analysis
   d. Average costs
   e. Interest problems

K. Maintaining and Caring for the Machine
   1. During class
   2. At the end of the day

VII. SUGGESTED PROCEDURES, STRATEGIES AND LEARNING ACTIVITIES

Since this course includes developing skill performance on two machines, a simple rotation system must be employed. The arrangement of this rotation system will depend upon the number of students enrolled as well as the number of each type of machine available. If an equal number of each type of machine is on hand, the student can spend an equal amount of time on each machine. Otherwise, the teacher should design a rotation scheme to give each student an opportunity to use both types of machines.

Once the functional parts of the machine have been learned, the types of problems and drills, whether in project form to cover several days of work or in single daily lessons, can be the same for both machines.

For easy grading, student solutions can be recorded on answer sheets, but tapes should be checked to evaluate correct methods for solving problems.

VII. SUGGESTED PROCEDURES, STRATEGIES AND LEARNING ACTIVITIES, Continued

The EDL touch-training course for adding machines may be used as a learning activity. Although designed for the ten-key, it can also be adapted to the full-key machine. The teacher's manual which accompanies the EDL course gives suggestions for the use and evaluation of this material and methods of operating the equipment.

Methods that can be adapted for this course are demonstrations, practice sessions, audio-visual presentations (EDL), technique and speed improvement drills, contract method, job-sheet method, and performance tests.

SPECIAL ACTIVITIES	PROCEDURES
Progress Charts	Progress charts may be displayed on bulletin boards showing the improvement in speed and skill development of techniques and completed problems.
Flow-Charts	Flow-charts may be developed with the students analyzing the steps involved in new techniques to be learned, and procedures for solving business application problems.
Homework Day	Periodically, announce to the class a period or part of a period will be used to do outside assignments—bookkeeping, recordkeeping, proving the accuracy of parent's checkstub balance, and income tax returns.
School Activity Participation	Volunteer the class to tally the sales slips for the various magazines sold during the junior class magazine drive, or a similar school activity.
Recognition Day	After the completion of a budget or project, make a bulletin board with the best work produced.
Listen and Solve	The teacher can call out digits for addition, subtraction, and multiplication problems and have the rows of students compete with each other for accuracy. Problems can be pre-recorded on audio tape to free the teacher for observation of correct techniques.

VII. SUGGESTED PROCEDURES, STRATEGIES AND LEARNING ACTIVITIES, Continued

SPECIAL ACTIVITIES	PROCEDURES
Definition Bee	Divide the class into two teams and have the teams take turns defining terms relating to machine problems.
Find the Error	Give each student a copy of a completed business problem (ex. an invoice) that contains an error or errors. Have students compete with each other to see who can find the mistakes and give the correct solution.
Flash Cards	The teacher flashes digits and the students register the amounts and find the total. An overhead projector may be used if available.
"Jeopardy"	This can be a game to provide interest as well as improve speed and skill. The class is divided into two teams. The teacher makes up a series of problems that can consist of addition, subtraction, multiplication, division, and business application problems (ex. invoice involving discount plus sales tax). The first student who arrives at the correct solution adds a certain number of points to his team's score. A second method for scoring might be to give a point to the team that has the greatest number of students obtaining the correct answer.

VIII. EVALUATIVE INSTRUMENTS

A. Pretest

It is suggested that a pretest be developed to diagnose placement of individuals within the course. Therefore, it should measure all of the performance objectives of this course and Preview of Computational Machines (Course No. 7713.01).

B. Interim Tests

The tests and drills included in this course of study are samples of items that may be used to evaluate student progress. Most textbooks presenting the ten-key and the full-key machines include many exercises that can be used for evaluating the progress and proficiency of the student periodically during the course.

VIII. EVALUATIVE INSTRUMENTS, Continued

To improve performance and skill, timed exercises can be evaluated in two ways:

1. Students can be alloted five minutes to solve twelve problems (total digits precounted). If all problems are completed before the time is up, the students start with the first problem again. Students will check their tapes and circle all incorrect digits. To find the correct digits per minute, the following formula is used:

   Total digits completed minus incorrect digits, divided by 5 = correct digits per minute.

   The students should keep a record of their scores each time such an exercise is done. The aim should be to improve the previous score.

2. Students will note the time it takes them to complete the set of problems. Tapes will be checked, and the following formula will be used to find the correct digits per minute.

   (Total digits minus incorrect digits divided by time)

To test knowledge and comprehension of principles presented and business-type application problems, the samples included in the Appendix may be used. Periodically, a series of problems may be assigned and evaluated on an accuracy and production basis.

C. Final Evaluation

This test should measure all of the performance objectives of this course.

IX. RESOURCES FOR STUDENTS

A. Books

Agnew, Peter L. and Pasewark, William R. Full-Keyboard Adding-Listing Machine Course. Cincinnati: South-Western Publishing Company, 1963.

Agnew, Peter L. and Pasewark, William R. Ten-Key Adding-Listing Machine and Printing Calculator Course. Cincinnati: South-Western Publishing Company, 1963.

Cornelia, Nicholas; Pasewark, William R; and Agnew, Peter. Office Machines Course, 4th edition. Cincinnati: South-Western Publishing Company, 1971.

IX. RESOURCES FOR STUDENTS, Continued

A. Books, Continued

Fasnacht, Harold; Bawrnfeind, Harry; and Vigen, Donald. How to Use Business Machines, 3rd edition. New York: Gregg Division of McGraw-Hill Book Co., 1969.

Meehan, James R. and Kahn, Gilbert. How to Use Adding Machines: Ten Key, Full Key, Printing Calculator. New York: Gregg Division of McGraw-Hall Book Co., 1962.

Pactor, Paul and Johnson, Mina M. Comprehensive Business Machines Course. New York: Pitman Publishing Corp., 1968.

Pactor, Paul and Johnson, Mina M. Full-Keyboard Adding Machine Course. New York: Pitman Publishing Corp., 1968.

Pactor, Paul and Johnson, Mina M. Ten-Key Adding Machine Course. New York: Pitman Publishing Corp., 1968.

Walker, Arthur L; Roach, J. Kenneth; and Hanna, J. Marshall. How to Use Adding and Calculating Machines. New York: McGraw-Hill Book Company, 1967.

B. Filmstrips

EDL Filmstrip TEN-KEY COURSE TOUCH TRAINING (25 films) used with Controlled Reader. Teacher's Manual and Student Manual are available. Ruegg, Robert J. New York: Educational Development Laboratories.

X. RESOURCES FOR TEACHERS

A. Books

Agnew, Peter L. and Cornelia, Nicholas J. Office Machines Course. Cincinnati, Ohio: South-Western Publishing Company, 1963.

Romey, Kenneth A. and Anderson, Yvonne. A Laboratory Manual in Business Machines. Dubuque, Iowa: Wm. C. Brown Company, 1970.

B. Periodicals

Balance Sheet, The. Cincinnati: South-Western Publishing Company. Monthly.

Business Education World. New York: Gregg Division of McGraw-Hill Book Co. Six issues yearly.

X. RESOURCES FOR TEACHERS, Continued

B. Periodicals, Continued

Journal of Business Education. Wilkes-Barre: Robert C. Trethaway. Monthly.

C. Articles

Flowcharting: A Graphic Approach in the Machines Classroom. Business Education World, May-June 1971, p. 18, by Kallaus, Norman F. and Clark, James.

Individualizing your Rotation Plan, The Balance Sheet; Copeland, Amanda. South-Western Publishing Company, March 1971, p. 247.

Using Tape Analysis to Teach Arithmetic and Office Machines, Business Education World; Carr, Glenna D. McGraw-Hill Company, Jan.-Feb. 1971, p. 14.

D. Booklets

Monograph 91, Handbook for Office Practice Teachers. Cincinnati: South-Western Publishing Co.

Suggestions for Programs of Office Practice and Procedures. Cincinnati: South-Western Publishing Co.

E. Manuals

Teacher manuals are available from the publishers for those books listed under "Books" in the "Resources for Students" section.

A P P E N D I X

PAYROLL SHEET WEEK ENDED _____

Directions: Complete the following payroll sheet. All time over 40 hours is considered overtime. The overtime rate is computed at 1½ times the regular rate.

Name	Total Hours	O.T. Hours	Reg. Rate	Reg. Wages	O.T. Rate	O.T. Wages	Total Wages	FICA Tax	With-holding	Net Wages
Alford	43		3.20						16.00	
Arnold	50		3.20						13.70	
Bates	40		2.80						22.80	
Barnes	43		2.80						18.30	
Evans	60		3.30						22.30	
Fielder	44		3.30						14.80	
Harmon	35		2.90						12.80	
Morris	52		2.90						17.90	
Parks	43		2.73						16.40	
Redding	41		2.78						16.10	
Simons	40		2.26						8.90	
TOTALS										

KEY QUIZ

Directions: Identify the following function keys of the machine you are using and explain their uses and the symbols that appear on the tape.

Type of Machine: _____

Make: _____

Key	Use	Symbol on Tape
1. Plus bar key		
2. Minus key		
3. Sub-total key		
4. Total key		
5. Non-add key		
6. Correction key		
7. Repeat key		

WEEKLY STUDENT PROGRESS CHECK

ADDITION

Date	Number of Problems	Time	Digits Per Min.	Number Correct	Number Incorrect

Note: The same or a similar chart can be used to check progress in subtraction, multiplication, division, and mixed problems.

TECHNIQUE TEST

1. What is the first operation you should perform before starting a problem?

2. What are the home row keys?

3. What key is used to repeat a number?

4. What key would be used to identify or number a problem?

5. What finger is used to depress the plus or add bar?

6. What key is used to get a partial total?

7. How do you remove a number registered on the keyboard but not printed on the tape?

8. How can you identify on your machine if the balance in a subtraction problem is a credit balance?

9. How would you correct an error that has already been printed on the tape?

10. How would you check the accuracy of a problem?

11. What pencil mark is placed on the tape to indicate the amount has been checked and is correct?

12. In reading an amount such as $126.48, where would you pause?

13. What is the function of the correction key?

14. How are the home keys distinguished by touch from the other keys?

FUNDAMENTAL SKILLS TEST

1. Label the terms used to identify the following arithmetic processes.

```
 837.29  ____________          277  ____________
-211.45  ____________         +311  ____________
    ?    ____________            ?  ____________

 237     ____________
x 38     ____________                        ?
  ?      ____________     ________   28/ 745  ____________
                                              ____________
```

2. State the number of decimal places you would point off in the product of each of the following problems.

28.5 x 32 = ____________
.87 x .45 = ____________
23 x 89 = ____________
9-1/2 x .16-3/4 = ____________

3. How would you round the following amounts when expressing them in dollars and cents.

18.7319 ____________
18.7349 ____________
18.7359 ____________
18.7399 ____________

4. How would you write the following in order to multiply on the machine?

15% ____________
$35\frac{1}{2}$% ____________
$23\frac{1}{4}$ ____________

5. Use the table of reciprocals in your textbook and write the reciprocals for the following divisors:

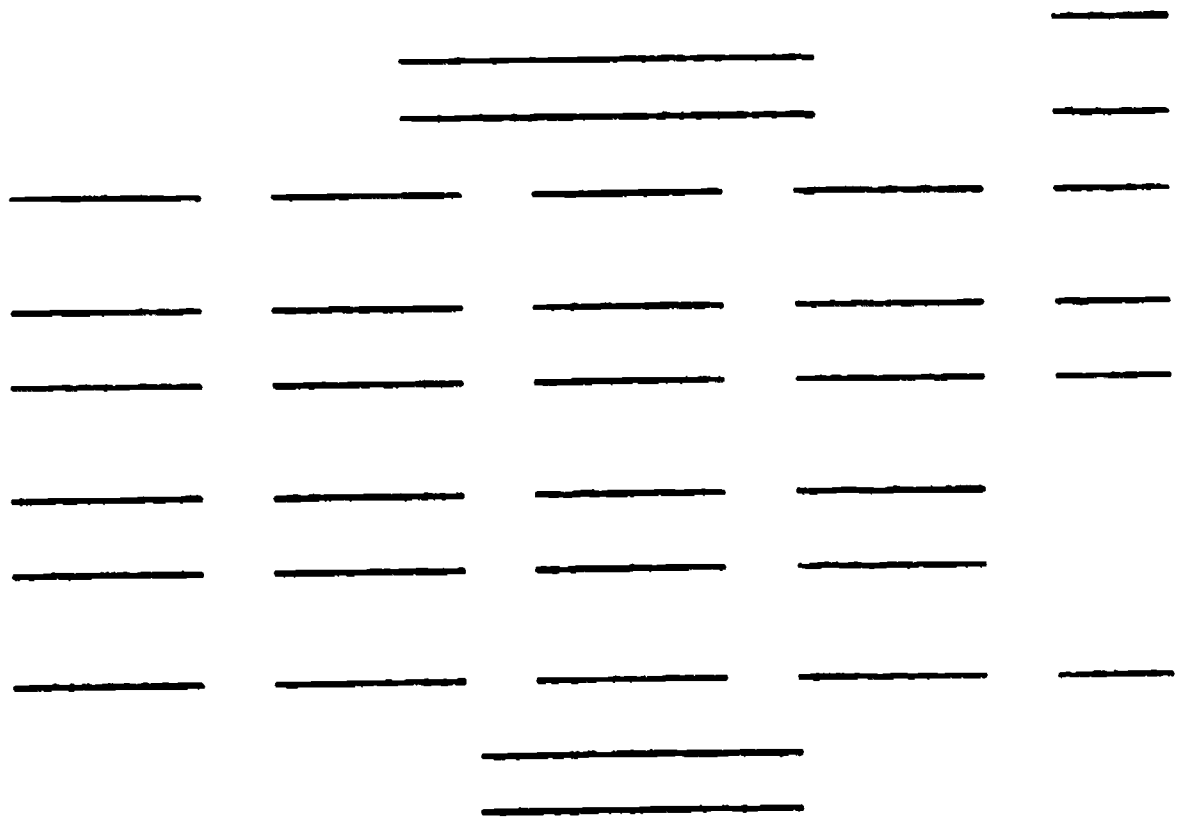
268 ____________
724 ____________
585 ____________

6. Solve the following multiplication problems by using the short-cut method and attach your tape to this test.

374 x 287 =
295 x 190 =

KEYBOARD TEST

A diagram of the keyboard showing the fingering of the digit and operation keys can be used to determine if the students are using the correct techniques. The diagram should correspond to the keyboard of the model(s) used in the classroom.



Directions: Indentify the number keys by inserting the proper number on those keys.
Identify the operational keys by labeling those keys in the spaces provided above.
Identify the digit indicator by labeling the indicator with a "d.i."
Identify the correct finger to be used by inserting the following in the key spaces provided above:

0 for thumb
1 for first finger
2 for second finger
3 for third finger
4 for fourth finger