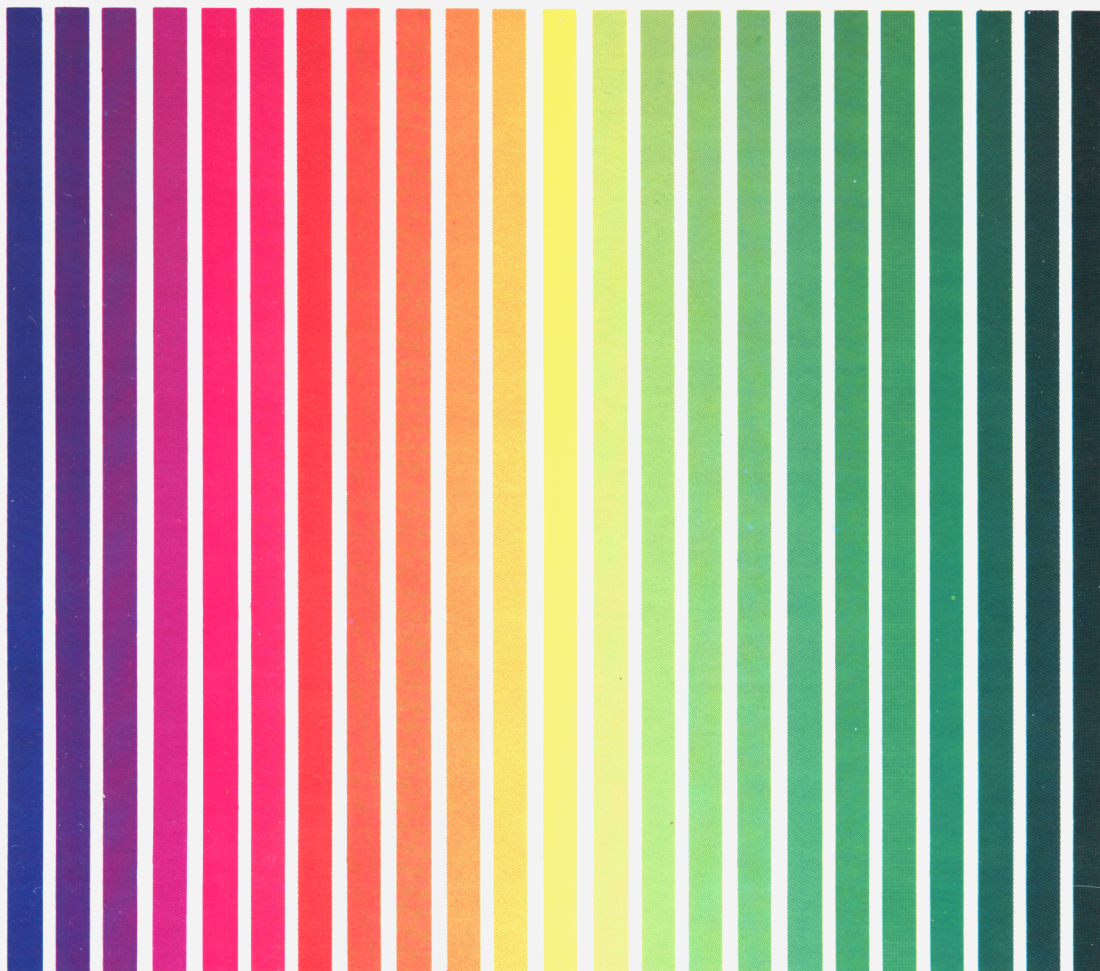# APX
ATARI® PROGRAM EXCHANGE

Dan Rohr

THREE R MATH SYSTEM
Create and use customized math drills for ages 5-13

Diskette: 40K (APX-20133)

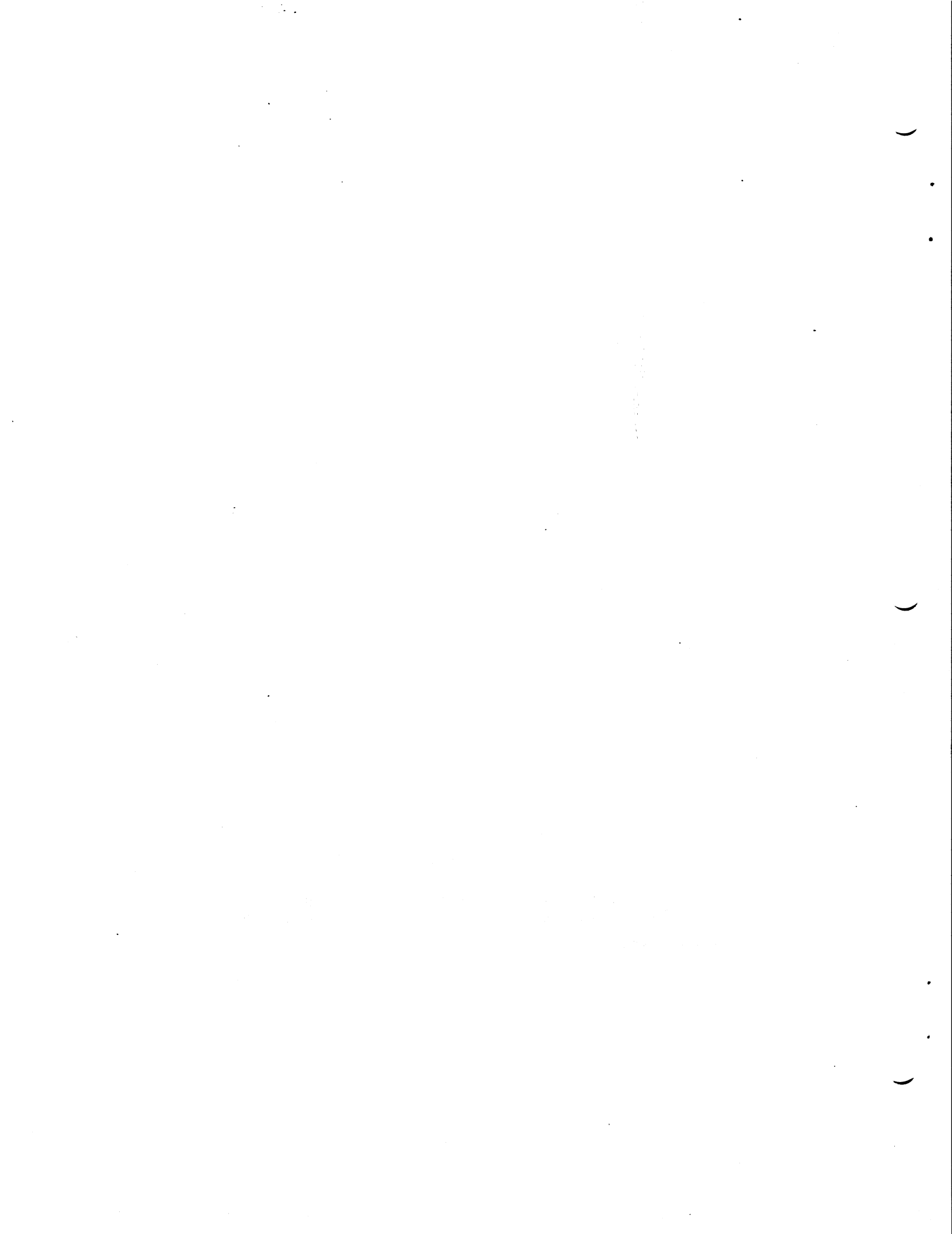## User-Written Software for ATARI Home Computers

Dan Rohr

THREE R MATH SYSTEM
Create and use customized math drills for ages 5-13

Diskette: 40K (APX-20133)

THREE R MATH SYSTEM

by

Dan Rohr

Program and Manual Contents © 1982   Dan Rohr

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The ATARI Program Exchange
P.O. Box 3705
Santa Clara. CA 95055

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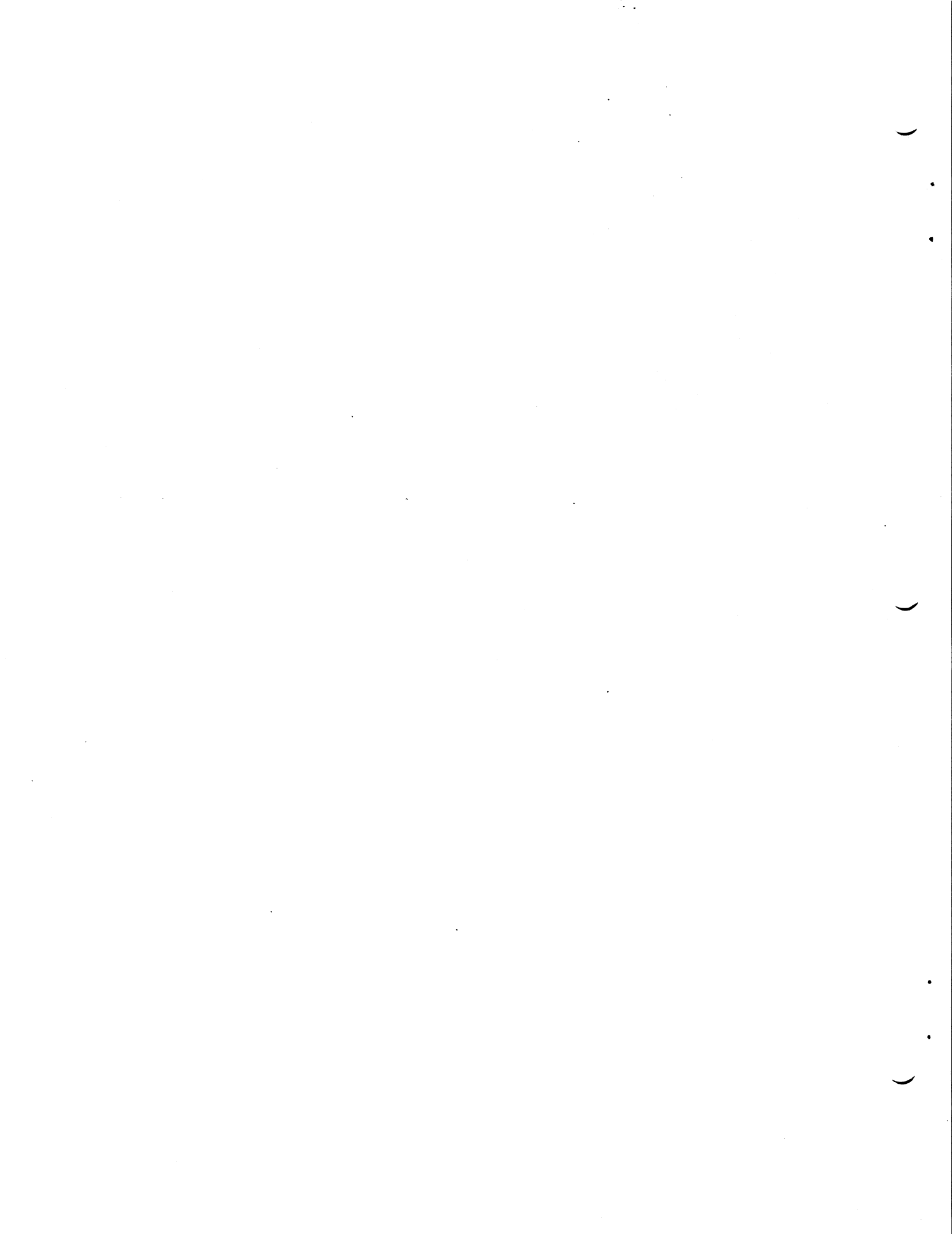ATARI 850™ Interface Module

SPECIAL WARNING

DUPLICATE STUDENT DATA DISKETTE BEFORE USING THIS PROGRAM!
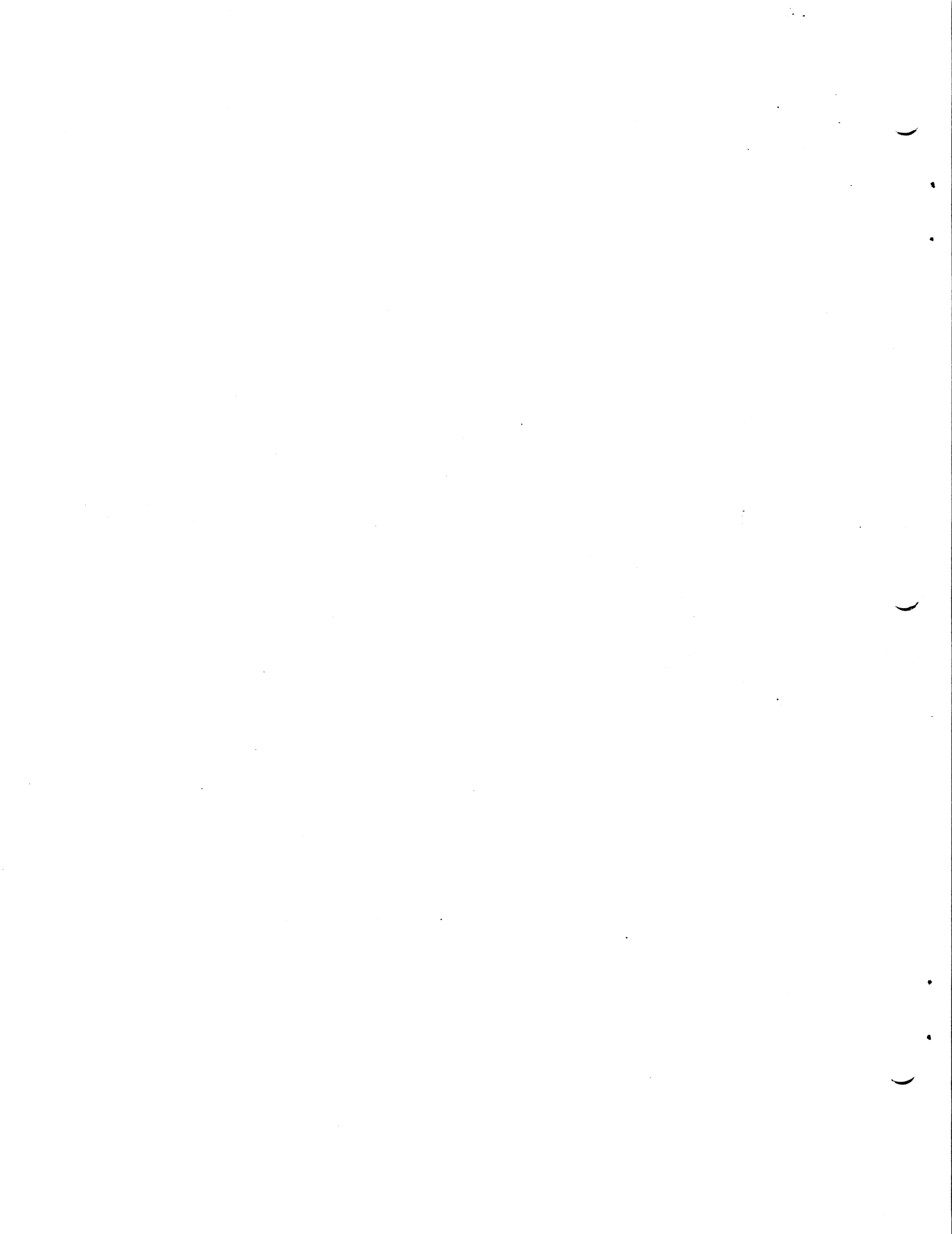
The THREE R MATH SYSTEM's Student Data diskette is unnotched to protect the software against accidental erasure. However, this protection also prevents a program from storing information on the diskette. The program you've purchased involves storing information. Therefore, before you can use the program, you must duplicate the Student Data diskette onto a notched disktte that doesn't have a write-protect tab covering the notch.

To duplicate the diskette, call the Disk Operating System (DOS) menu and select option J, Duplicate Disk. You can use this option with a single disk drive by manually swapping source (the APX diskette) and destination (a notched diskette) until the duplication process is complete. You can also use this option with multiple disk drive systems by inserting source and destination diskettes in two separate drives and letting the duplication process proceed automatically. (Note. This option copies sector by sector. Therefore, when the duplication is complete, any files previously stored on the destination diskette will have been destroyed.)

TABLE OF CONTENTS

INTRODUCTION

OVERVIEW

The THREE R MATH SYSTEM-A is a basic math drill and practice program. It uses a unique password system that allows the teacher/parent not only to select a specific type and level of problem to be worked, but also to set the amount of time the problem is on the screen, the number of problems desired, and the total time allowed to work the problems assigned. Once the password is selected, the student only has to do two steps: type his name and type the password! The THREE R MATH SYSTEM-A takes over from there.

This program is designed for students from kindergarten through the eighth grade level. It can also be used to improve efficiency in using hand held calculators. Because of the flexibility of the program, it can be used for an entire school system, in an individual classroom, or in the home.

There are 101 specific difficulty levels of addition, subtraction, multiplication, and division from which to choose. These range from adding two one-digit numbers to multiplying a three digit number by a four digit number. The levels are sequentially designed so that the student can work on problems that are at his proper ability level.

In addition to being summarized on the screen at the end of a problem set, the student's results can be saved and printed out later. Because all problems worked are given on the printout with their correct answers, the student's answers, and the time spent on each problem, areas that cause difficulty can easily be pinpointed and then discussed with the student. Ten extra practice problems are also included on each printout. These can be used in the discussion with the student, as additional practice, or just for fun.

If this is used in a school setting, there is a program that allows the teacher's names to be added to the student's printouts and to the summary sheets.

When this program is used with a class, a summary of each student's results is available. An autoprint program gives a summary of all students' work and an individual printout for each student. Suggestions are included in the documentation for setting up a record keeping program so that only a minimal amount of time has to be spent on bookkeeping.

REQUIRED ACCESSORIES

40K RAM
ATARI 810 Disk Drive
ATARI BASIC Language Cartridge

OPTIONAL ACCESSORIES

ATARI printer or equivalent printer

CONTACTING THE AUTHOR

Users wishing to contact the author about the THREE R MATH SYSTEM-A may phone or write to him at:

> 2823 Alta St.
> P.O. Box 391
> Los Olivos, CA 93441
>
> (Ph. 805-688-8270)

PROGRAM OUTLINE

The THREE R MATH SYSTEM contains a TEACHER DISK and a STUDENT DATA DISK. The main student program, the printout programs, and all related programs are on the TEACHER DISK. The STUDENT DATA DISK contains several data files necessary for running the student program and a large data file to store information from each student's session of working on the program.

The student program gives the student randomly generated basic math problems. The type and level of difficulty of these problems have been selected by the teacher from a catalog of 101 different kinds of problems. The teacher is also able to specify the length of time the problems remain on the screen, the total time the student can be at the computer, and the number of problems the student should do. All of this is given to the student in the form of one simple seven character password. The student just has to type in his name and the password to start the student program.

Following the prompts, the student program is loaded into the computer from the TEACHER DISK. You are told to insert the STUDENT DATA DISK before this program can be run. At this point the TEACHER DISK does not need to be used again to run the student program.

At the end of the student's session he may elect to save his problem information for a printout at a later time. This takes about 10 to 15 seconds. After this is done the program recycles back to the beginning. It is then set for the next student to use.

At the end of the period, day, week, or whenever it is convenient for the teacher, the teacher program can be loaded from the TEACHER DISK. By selecting from a variety of options from the teacher program menu, you will be able to view the students' data in a variety of forms. These range from a screen (TV) summary of each, to a detailed printout of each student's work. All of these are explained in detail in the following documentation.

The best part of any new computer program is to see it actually work rather than spending hours reading over its documentation. To demonstrate the ease with which the THREE R MATH SYSTEM can be used, run the program according to the following directions. While this will not give you an idea of all the powers of the system, it will demonstrate the main features of the student program. The choice of problem type and difficulty will be discussed in the PASSWORD SECTION. The various types of printouts and student record data will be covered in the TEACHER SECTION.

( ) 1.   Load the ATARI BASIC language cartridge into the left slot of your computer.

( ) 2.   Turn on your disk drive. When the BUSY light goes out, open the disk drive door and insert the TEACHER DISK.

( ) 3.   Turn on your computer and TV set. A menu will automatically load.

( ) 4.   Press 1 (Student Program).Insert the STUDENT DATA DISK when instructed. Press [START].

( ) 5.   Press [START] when instructed by the next display.

( ) 6.   Type your name. Press [RETURN].Type Y.

( ) 7.   Type E 4 B P F A A   .Type Y.

          [This will set up a program to give you 5 subtraction problems(a 2 digit number subtracted from a 3 digit number with no regrouping). They will remain on the screen for a maximum of 15 seconds. You will have a maximum of 5 minutes to complete all of them. This is but 1 of 101 problem choices you have and only 1 of over 100,000 program format choices you have.]

( ) 8.   When a problem appears,type your answer. If correct, press any key to continue. Be sure to miss at least one problem to see how the program's error function operates.

( ) 9.   When the last problem is completed, a "letter" and summary of the set will appear. After checking this summary, type N , press [RETURN] , and then type E . This will take you to the original display.

Now that you have an idea of what is involved with the THREE R MATH SYSTEM, continue reading this documentation to find out how you can set this up in your school or home.

PASSWORD CODE

The strongest parts of the THREE R MATH SYSTEM-A are the ease
with which the students can use the program and the ability of
a teacher/parent to assign specific types of problems which
the student can work.   There are 101 different types of
addition, subtraction, multiplication, and division problems
available.   The speed, number of problems, and total time
allowed can also be controlled.

The following is a brief description of the different
letters/numbers used in the password that must be typed into
the computer to run the main student program. There are seven
parts to each password.   Each part tells the computer your
specific requests for running a program.

The student does not need to learn the function of each part
of the PASSWORD. He/she simply types it into the computer.
The computer takes over from there. A detailed explanation is
given in the CLASSROOM SUGGESTIONS section on how to set up a
system in your classroom/home to eliminate much of the
bookkeeping that is associated with a program such as this.

PART   DECRIPTION

1./2.   The first two spaces require a letter and a number.
           These designate which one of the 101 programs you want
           to work on. Details are given on the following pages.

3.   The third letter sets the number of problems the
           student is to work. This can range from 5 to 70 or not
           be set at all.

4.   The fourth letter sets the amount of time the problems
           will be displayed on the screen (speed).   This can be
           set from 1 second to 90 seconds or not be set at all.

5.   The fifth letter sets the maximum number of minutes the
           student is allowed to work on the program.   This time
           starts after the student enters his name and password.
           When the time is up the computer will automatically
           send the program to the final letter and summary even
           if the specified number of problems have not been
           worked. This time can range from 1 minute to 25 minutes
           or not be set at all.

6./7.   The sixth and seventh letters are to be used only if
           you will be using a printer.   If the printer IS NOT to
           be used, type "A" for both of these spaces.   The sixth
           letter sets the minimum percentage required to get a
           positive response on the printout. The seventh letter
           sets the teacher's name to be used on the printout. See
           the "Teacher's Name Program" section for specific
           directions for setting these.

```
****************************************************************************
****************************************************************************
*****      ***      ***      ***      ***      ***      ***      *****
*****      ***      ***      ***      ***      ***      ***      *****
*****      ***      ***      ***      ***      ***      ***      *****
*****      ***      ***      ***      ***      ***      ***      *****
****** 1 ***** 2 ***** 3 ***** 4 ***** 5 ***** 6 ***** 7 ******
****************************************************************************
  PROGRAM PROGRAM PROBLEMS SPEED    TIME     GOAL    TEACHER
```

START:_____ STOP:_____ PROBLEMS:_____SPEED:_____

NAME:_____GRADE:_____

TEACHER:_____ROOM:_____

COMMENTS:

1—2 Program Letters	3 No. of Problems	4 Speed Per Problem	5 Total Time	6 Min. % Correct	7 Teacher's Name
First 2 Spaces	A-Not Set	A-Not Set	A-Not Set	A-Not Set	A-
	B- 5	B- 1 Sec.	B- 1 Min.	B- 10%	B-
	C- 10	C- 2	C- 2	C- 20%	C-
See Problem Codes	D- 15	D- 3	D- 3	D- 30%	D-
	E- 20	E- 4	E- 4	E- 40%	E-
	F- 25	F- 5	F- 5	F- 50%	F-
	G- 30	G- 6	G- 6	G- 60%	G-
	H- 35	H- 7	H- 7	H- 70%	H-
	I- 40	I- 8	I- 8	I- 80%	I-
	J- 45	J- 9	J- 9	J- 90%	J-
	K- 50	K- 10	K- 10	K- 100%	K-
	L- 55	L- 11	L- 11	L-Z (Not Set)	L-
	M- 60	M- 12	M- 12		M-
	N- 65	N- 13	N- 13		N-
	O- 70	O- 14	O- 14		O-
	P-Z (Not Set)	P- 15	P- 15		P-
		Q- 16	Q- 16		Q-
		R- 17	R- 17		R-
		S- 18	S- 18		S-
		T- 19	T- 19		T-
		U- 20	U- 20		U-
		V- 30	V- 21		V-
		W- 40	W- 22		W-
		X- 50	X- 23		X-
		Y- 60	Y- 24		Y-
		Z- 90	Z- 25		Z-

A D D I T I O N

CODE	PROBLEM	SAMPLE	
A 1	Add two 1 digit numbers (Numbers from 1 to 5)	1 + 1 ---	5 + 5 ---
A 2	Add two 1 digit numbers (Sums less than 10)	1 + 1 ---	9 + 0 ---
A 3	Add two 1 digit numbers (All sums greater than 10)	5 + 6 ---	9 + 9 ---
A 4	Add two 1 digit numbers (Any sum)	2 + 3 ---	8 + 6 ---
A 5	Add a 2 digit and 1 digit number (No regrouping)	11 + 1 ---	98 + 1 ---
A 6	Add a 2 digit and 1 digit number (All regrouping)	11 + 9 ---	99 + 9 ---
A 7	Add a 2 digit and 1 digit number (Mixed)	23 + 5 ---	67 + 8 ---

A D D I T I O N

CODE	PROBLEM		SAMPLE	
B 1	Add two 2 digit numbers (No regrouping)		11 +11 ---	88 +11 ---
B 2	Add two 2 digit numbers (All regrouping)		19 +11 ---	99 +99 ---
B 3	Add two 1 or 2 digit numbers (Mixed)		15 + 3 ---	99 +87 ---
B 4	Add two 2 digit numbers (Mixed)		12 +13 ---	98 +86 ---
B 5	Add two 3 digit numbers (No regrouping)		111 +111 ---	798 +201 ---
B 6	Add two 3 digit numbers (All regrouping)		111 +109 ---	999 +999 ---
B 7	Add two 3 digit numbers (Mixed)		123 +105 ---	999 +888 ---

A D D I T I O N

CODE	PROBLEM	SAMPLE	
C 1	Add two 2 or 3 digit numbers (Mixed)	111 + 11 ---	888 +888 ---
C 2	Add three 1 digit numbers (Mixed)	2 1 + 3 ---	9 9 + 9 ---
C 3	Add three 1,2,or 3 digit numbers (Mixed)	15 3 +211 ----	699 487 +678 ----
C 4	Add three 1 or 2 digit numbers (Mixed)	2 13 + 1 ----	98 86 + 99 ----
C 5	Add three 2 or 3 digit numbers (Mixed)	11 11 + 11 ----	98 201 +989 ----

S U B T R A C T I O N

CODE	PROBLEM	SAMPLE	
D 1	Subtract a 1 digit number from a 1 digit number	2 - 1 ---	9 - 5 ---
D 2	Subtract a 1 digit number from a 2 digit number (No regrouping)	11 - 1 ---	99 - 6 ---
D 3	Subtract a 1 digit number from a 2 digit number (Regrouping)	15 - 6 ---	98 - 9 ---
D 4	Subtract 7, 8, or 9 from a 2 digit number (Mixed)	17 - 7 ---	98 - 9 ---
D 5	Subtract a 1 digit number from a 2 digit number (Mixed)	11 - 1 ---	98 - 9 ---

S U B T R A C T I O N

CODE	PROBLEM	SAMPLE	
E 1	Subtract a 2 digit number from a 2 digit number (No regrouping)	11 - 10 ---	99 - 21 ---
E 2	Subtract a 2 digit number from a 2 digit number (Regrouping)	21 - 19 ---	88 - 39 ---
E 3	Subtract a 2 digit number from a 2 digit number (Mixed)	15 - 12 ---	82 - 59 ---
E 4	Subtract a 2 digit number from a 3 digit number (No regrouping)	132 - 11 ---	958 - 46 ---
E 5	Subtract a 2 digit number from a 3 digit number (Regrouping)	121 - 12 ---	998 - 79 ---
E 6	Subtract a 2 digit number from a 3 digit number (Mixed)	211 - 19 ---	899 - 69 ---

S U B T R A C T I O N

CODE	PROBLEM	SAMPLE	
F 1	Subtract a 3 digit number from a 3 digit number (No regrouping)	111 - 100 ----	999 - 645 ----
F 2	Subtract a 3 digit number from a 3 digit number (Regrouping)	221 - 119 ----	988 - 699 ----
F 3	Subtract a 3 digit number from a 3 digit number (Mixed)	315 - 112 ----	882 - 659 ----
F 4	Subtract a 3 digit number from a 4 digit number (Regrouping)	1132 - 109 -----	8958 - 967 -----
F 5	Subtract a 3 digit number from a 4 digit number (Mixed)	2121 - 111 -----	7998 - 679 -----
F 6	Subtract a 4 digit number from a 4 digit number (Regrouping)	3211 -1219 -----	5897 -1998 -----
F 7	Subtract a 4 digit number from a 4 digit number (Mixed)	1123 -1010 -----	9867 -6989 -----

MULTIPLICATION

CODE	PROBLEM	SAMPLE	
G 1	2's multiplication table	1 x 2 ---	12 x 2 ---
G 2	3's multiplication table	1 x 3 ---	12 x 3 ---
G 3	4's multiplication table	1 x 4 ---	12 x 4 ---
G 4	5's multiplication table	1 x 5 ---	12 x 5 ---
G 5	6's multiplication table	1 x 6 ---	12 x 6 ---
G 6	7's multiplication table	1 x 7 ---	12 x 7 ---

MULTIPLICATION

CODE	PROBLEM	SAMPLE	
H 1	8's multiplication table	1 x 8 ---	12 x 8 ---
H 2	9's multiplication table	1 x 9 ---	12 x 9 ---
H 3	10's multiplication table	10 x 1 ---	12 x10 ---
H 4	11's multiplication table	11 x 1 ---	12 x11 ---
H 5	12's multiplication table	12 x 1 ---	12 x12 ---

MULTIPLICATION

CODE	PROBLEM	SAMPLE	
I 1	2's, 3's, or 4's multiplication tables	1 x 2 ---	12 x 4 ---
I 2	4's, 5's, or 6's multiplication tables	1 x 4 ---	12 x 6 ---
I 3	6's, 7's, or 8's multiplication tables	1 x 6 ---	12 x 8 ---
I 4	7's, 8's, or 9's multiplication tables	1 x 7 ---	12 x 9 ---
I 5	7's through 12's multiplication tables	1 x 7 ---	12 x12 ---
I 6	2's through 12's multiplication tables	1 x 2 ---	12 x12 ---

MULTIPLICATION

CODE	PROBLEM	SAMPLE	
J 1	Multiply a 2 digit number by a 1 digit number (2 - 5)	11 x 2 ---	99 x 5 ---
J 2	Multiply a 2 digit number by a 1 digit number (4 - 9)	11 x 4 ---	99 x 9 ---
J 3	Multiply a 2 digit number by a 1 digit number (Any)	11 x 2 ---	99 x 9 ---
J 4	Multiply a 3 digit number by a 1 digit number (2 - 5)	123 x 2 ----	989 x 5 ----
J 5	Multiply a 3 digit number by a 1 digit number (4 - 9)	101 x 4 ----	789 x 9 ----
J 6	Multiply a 3 digit number by a 1 digit number (Any)	111 x 2 ----	898 x 9 ----

MULTIPLICATION

CODE	PROBLEM	SAMPLE	
K 1	Multiply a 2 digit number by a 2 digit number (10 - 19)	11 x 10 ----	99 x 19 ----
K 2	Multiply a 2 digit number by a 2 digit number (Any)	11 x 11 ----	99 x 99 ----
K 3	Multiply a 3 digit number by a 2 digit number (10,20,30, ...)	121 x 10 ----	898 x 90 ----
K 4	Multiply a 3 digit number by a 2 digit number (11 - 19)	123 x 11 ----	989 x 19 ----
K 5	Multiply a 3 digit number by a 2 digit number (Any)	101 x 10 ----	889 x 99 ----

MULTIPLICATION

CODE	PROBLEM	SAMPLE	
L 1	Multiply a 3 digit number by a 3 digit number (101 - 199)	111 x 101 -----	999 x 199 -----
L 2	Multiply a 3 digit number by a 3 digit number (Any)	123 x 111 -----	898 x999 ----
L 3	Multiply a 4 digit number by a 2 digit number (11 - 19)	2121 x 11 -----	9898 x 19 -----
L 4	Multiply a 4 digit number by a 2 digit number (ANY)	1123 x 11 -----	8989 x 99 -----
L 5	Multiply a 4 digit number by a 3 digit number (Any)	1010 x 110 -----	7889 x 699 -----

D I V I S I O N

CODE	PROBLEM	SAMPLE	
M 1	2's division table	$2\,/\overline{2}$	$2\,/\overline{24}$
M 2	3's division table	$3\,/\overline{3}$	$3\,/\overline{36}$
M 3	4's division table	$4\,/\overline{4}$	$4\,/\overline{48}$
M 4	5's division table	$5\,/\overline{5}$	$5\,/\overline{60}$
M 5	6's division table	$6\,/\overline{6}$	$6\,/\overline{72}$
M 6	7's division table	$7\,/\overline{7}$	$7\,/\overline{84}$
N 1	8's division table	$8\,/\overline{8}$	$8\,/\overline{96}$
N 2	9's division table	$9\,/\overline{9}$	$9\,/\overline{108}$
N 3	10's division table	$10\,/\overline{10}$	$10\,/\overline{120}$
N 4	11's division table	$11\,/\overline{11}$	$11\,/\overline{132}$
N 5	12's division table	$12\,/\overline{12}$	$12\,/\overline{144}$

D I V I S I O N

CODE	PROBLEM	SAMPLE	
P 1	2-4 divided into 8-48	2 /8̄	4 /4̄8̄
P 2	4-6 divided into 12-72	4 /1̄2̄	6 /7̄2̄
P 3	6-9 divided into 12-108	6 /1̄2̄	9 /1̄0̄8̄
P 4	9-12 divided into 18-144	9 /1̄8̄	12 /1̄4̄4̄
P 5	2-9 divided into 8-108	2 /8̄	9 /1̄0̄8̄
P 6	6-12 divided into 12-144	6 /1̄2̄	12 /1̄4̄4̄
P 7	2-12 divided into 8-144	2 /8̄	12 /1̄4̄4̄
Q 1	2-4 divided into 100-500	2 /1̄0̄0̄	4 /5̄0̄0̄
Q 2	4-6 divided into 100-500	4 /1̄0̄0̄	6 /4̄9̄8̄
Q 3	6-9 divided into 100-500	6 /1̄0̄8̄	9 /4̄9̄5̄
Q 4	9-12 divided into 100-500	9 /1̄0̄8̄	12 /4̄9̄2̄
Q 5	2-9 divided into 100-500	2 /1̄0̄0̄	9 /4̄9̄5̄
Q 6	6-12 divided into 100-500	6 /1̄0̄8̄	12 /4̄9̄2̄

D I V I S I O N

CODE	PROBLEM	SAMPLE	
R 1	2-9 divided into 100-999	2 /$\overline{100}$	9 /$\overline{999}$
R 2	11-15 divided into 100-999	11 /$\overline{110}$	15 /$\overline{990}$
R 3	20-40 divided into 100-999	20 /$\overline{100}$	40 /$\overline{960}$
R 4	2-9 divided into 1000-9999	2 /$\overline{1000}$	9 /$\overline{9999}$
R 5	11-15 divided into 1000-9999	11 /$\overline{1100}$	15 /$\overline{9990}$
R 6	20-50 divided into 1000-9999	20 /$\overline{1000}$	50 /$\overline{9950}$
R 7	50-99 divided into 1000-9999	50 /$\overline{1000}$	99 /$\overline{9999}$

USING THE STUDENT PROGRAM

LOADING THE DISK

1. Insert the ATARI BASIC cartridge into the left slot of your computer.

2. Turn on your disk drive.

3. When the BUSY light goes out, open the disk drive door and insert the THREE R MATH SYSTEM-A, TEACHER DISK.

4. Turn on your TV set and computer. The menu will load in a few seconds. You have two options: 1) Student Program and 2) Teacher Program. Press 1 (Student Program).

5. It takes about 35 seconds to load the student program. The first display tells you to insert the STUDENT DATA DISK. Do this and press [START].

6. Figure one will now appear on the screen. This is the start display to which the program will return when the student is done. Press [START].

```
T H R E E    R    M A T H    S Y S .

              - A -


********************************
*                              *
*          P R E S S           *
*                              *
*          [START]             *
*                              *
*  TO                 BEGIN    *
*                              *
********************************
```

[FIGURE 1 - START DISPLAY]

RUNNING THE MAIN STUDENT PROGRAM

After Figure 1 appears, follow the prompt and press [START].
Figure 2 will be the next display.

W H A T   I S   Y O U R   N A M E ?

— — — — — — — —

Type your name then press   [RETURN]

[Figure 2 — Name Display]

A maximum of 10 spaces can be used for your name. These can
include letters, blank spaces, or a period. If any other keys
are pressed they will be ignored until one of the allowable
keys are pressed. As the keys are pressed they will appear on
the screen. If the allowable number of characters is
exceeded, the screen will automatically clear, tell you to use
a shorter name, and tell you to press any key to start again.

If you make an error while typing your name, press [RETURN].
When the next display appears, type N . This will return you
to the above display.

After you have entered your name and pressed [RETURN] Figure 3 will appear on the screen.

IS   THIS   CORRECT ?

Y / N

(Your Name)

[FIGURE 3 - CHECK DISPLAY]

If your name is not correct type N . The program will then go back to Figure 2. If correct type Y . Figure 4 will then appear on your screen.

(Your name), W H A T   I S
Y O U R   P A S S W O R D ?

----

1 2 3 4 5 6 7

Press [RETURN] if you make a
mistake.

[Figure 4 - Password Display]

Your PASSWORD has already been obtained using the PASSWORD MANUAL. (See pages 5-22 for a complete password description.) If you make a mistake while typing the password, press [RETURN]. This will clear the password and allow you to begin again. When you enter the last (seventh) letter, the screen will automatically go to a password check display. If the password is correct type a Y . If incorrect type a N . Figure 4 will then reappear.

So far, a student using this program has had to do only two things: type his name and password. This is one of the reasons why this program is ideally suited for even young children. All decisions as to which program to run have been made by his teacher or parent.

After you have typed Y to indicate that the password is correct, the computer will take five to ten seconds to obtain the program requested. During this time a "GET READY. SET? HERE YOU GO." display will appear.

The problem display (Figure 5) will now appear. The number in the upper left corner tells the number of the problem you are currently working. The number in the upper right corner is the countdown timer. At any time you can end the program by pressing the " * " key. This will take you to the ending "letter" and final summary.

```
         ////////////////////////////////////////
           ////////////////////////////////////
         #1 //                            // 15
            //          2  3              //
         /////         +  1  2            /////
         /////                            /////
         /////          ------            /////
         /////             ?              /////
         /////                            /////
         ////////////////////////////////////////
                P R E S S   *   T O   E N D
```

[Figure 5 - Problem Display]

After you have calculated your solution, type in the answer. You do not need to type [RETURN] after it is entered. Once you have entered a number, you CAN NOT go back to change it.

IF YOUR FIRST ANSWER IS CORRECT, the screen will flash, sounds will "congratulate" you, and a randomly selected positive message will appear at the bottom of the screen. Press any key for your next problem.

IF YOUR FIRST ANSWER IS INCORRECT, a new display will appear with the same problem. Your incorrect answer will not be shown. Recalculate your answer (do not enter it yet). Press any key. The screen will return to Figure 5 (your original problem). Now you may enter your corrected answer. During the display after your incorrect answer, the countdown timer was not running. This should eliminate any pressure a student might feel to rush through the second time to get the answer.

IF YOUR SECOND ANSWER IS CORRECT, the display will be the same as for a correct first answer.

IF YOUR SECOND ANSWER IS INCORRECT, the problem and the CORRECT answer will be shown on the screen. Study this answer. For the next problem press any key.

IF YOUR TIME IS UP, a new display with the same problem will appear on the screen. Study the problem and calculate the answer. When you press any key the screen will return to Figure 5 and your problem. Now enter your answer.

IF YOUR TIME IS UP A SECOND TIME, the problem with the correct answer will be displayed on the screen. Study the problem and answer. For the next problem, press any key.

STUDENT PROGRAM'S FINAL DISPLAY

If you have completed the specified number of problems or your total time is up, a "letter" from the computer will be shown on the screen. This will tell you how many problems you worked and also instruct you to press any key for your final summary.

Your final summary will give you the number of problems correct, wrong, etc. It will also give you a score. This score is based on the percentage of problems correct, minus points for the percentage incorrect, and multiplied by a percentage time factor.

At the bottom of the display will be:

                    S A V E   P R I N T O U T ?   Y / N

If you type "Y",the computer will save all of your problem data on the STUDENT DATA DISK. It will then return to the original display (Fig. 1). This will take about 10 to 20 seconds depending upon the number of problems worked.

If you answer with an " N ", follow the additional prompts. Next you will have to type [RETURN]. At this point you may change your mind and type a " Y " to save the data. If you press [RETURN] you are then instructed to copy your results and then type " E ". You will then be returned to the original display (Fig. 1).

Refer to the TEACHER DISK section for a complete description of the information available on the various printouts.

STUDENT PROGRAM—STUDENT DATA FILE

Each time you save a student problem data set by typing " Y " for the "SAVE PRINTOUT? Y/N" prompt, the data is saved in a special file on the STUDENT DATA DISK.There's room to save from about 50 to 150 different sets of data depending upon the number of problems worked. If you should ever try to exceed the capacity of the disk, a prompt will instruct you to clear the student problem file on the disk before using the STUDENT DATA DISK again.The current data set will be saved and not lost.

The student data on the disk is in the order in which it was entered. There is not a "sort" option available.

WHENEVER THE PRINTOUT OR OTHER OPTIONS ARE RUN ON THE DATA, THE STUDENT DISK SHOULD BE CLEARED BY USING THE CLEAR THE FILE PROGRAM ON THE TEACHER DISK.

The data in the student data file can not be harmed other than by physical abuse to the disk. If the student does not have the TEACHER DISK, there is no way that he has access to the data file.

STUDENT PROGRAM— GENERAL NOTES

Once the student program from the TEACHER DISK is loaded, most of the keys,other than those required, are disabled.The purpose of this is to try to eliminate the student accidentally typing a "wrong" key.

The "Delete Backspace" key has been eliminated primarily because of the younger students using the program. It has been found that it is easier for them to "start over" rather than to try to "erase" part of a word to correct it.

While it is generally not standard procedure to not let a student correct an answer once entered, in this program it is done for a specific reason. When a student is practicing his basic facts (6 x 5 = , 7 + 2 = , etc.) part of the learning occurs by associating the answer with the problem. If the student's incorrect answers were allowed to remain on the screen and he learned to associate the incorrect answers with the problems, the program would be more harmful than beneficial to him.

The only key that is "alive" throughout the entire program is the [SYSTEM RESET] key. By pressing this at any time during the program, the current program will be cleared and all the data will be lost for that student. The word "READY" will appear in the top left corner of the screen. If a student "accidentally" presses [SYSTEM RESET], type RUN and press [RETURN]. This will take you to the beginning of the Student Program.

USING THE TEACHER DISK

LOADING THE DISK

Use the same procedure for loading the TEACHER DISK as give on page 23 for loading the Student Program. (Insert the TEACHER DISK. Turn on the computer. If it is on, type RUN "D:MENU" and press [RETURN].)

At the first display, press 2 (TEACHER Program). The following display (Fig. 6) will be the next one on the screen.

```
                   THREE R MATH SYSTEM-A
                    PRINTOUT   MENU
        BY DAN ROHR              COPYRIGHT   (C)1982


        1.   SCREEN (TV) REVIEW
        2.   MINI SUMMARY PRINTOUT
        3.   DETAILED SUMMARY PRINTOUT
        4.   INDIVIDUAL PRINTOUTS
        - - - - - - - - - - - - - - - - - - - - - -
        5.   SCREEN   (TV)   REVIEW   AND
                MINI SUMMARY PRINTOUT
        6.   MINI  SUMMARY PRINTOUTS  AND
                INDIVIDUAL  PRINTOUTS
        7.   DETAILED  SUMMARY  PRINTOUTS
                INDIVIDUAL  PRINTOUTS
        - - - - - - - - - - - - - - - - - - - - - -
        8.   SPECIFIED INDIVIDUAL PRINTOUTS
        9.   TEACHER'S NAME PROGRAM

        10. CLEAR THE FILE


            TYPE SELECTION NUMBER AND [RETURN]

          [ Figure  6        Teacher Disk Menu ]
```

Following is a detailed discussion and various examples of the use of each of the above programs. In all of these programs you will have to insert the STUDENT DATA DISK when instructed. IF the incorrect disk is in the disk drive,you will be told to insert the correct one. No information or data will be lost.

In any program using the printer, be sure that the paper is lined up before you start. The program is designed so that it will automatically space to the top of the page before starting the next page. Also be sure that the interface module , printer, and printer 'on line' switch are on before beginning the printout.

TEACHER DISK-1. SCREEN(TV) REVIEW

By selecting this option you will be able to quickly view all
of the records in the student data file. A basic summary for
each student record will be scrolled on the screen. To stop
to examine a record, SIMULTANEOUSLY PRESS the [CTRL] key and 1
(number one). To start again repeat the same procedure.

At the end of the file you will be told to press [RETURN]
to go back to the printout menu.

TEACHER DISK-2.MINI SUMMARY

By selecting this option you will get a one line summary of
each of the records on file. This is the quickest way to get a
hard copy of the information that is on the file. Page 31 is
a short sample of a mini summary. If the number of correct
problems plus the number of incorrect problems do not add up
to the total number of problems, don't start worrying about
your computer's computational ability. Problems not worked
are not shown on this printout.

TEACHER DISK-3.DETAILED SUMMARY

By selecting this option you will receive a detailed summary
of each record on file. This not only includes all the
information available on the mini summary, but also the
answers to the sample problems that are included on the
individual student printouts. A sample of the detailed
printout summary is given on page 32.

THREE R MATH SYSTEM-A   MINI STUDENT FILE SUMMARY

REC.	STUDENT	PROG.	RIGHT(%)	WRONG(%)	PROB.	SCORE	TIME	TEACHER
1	JOHN	D1APDHC	32(100%)	0 (0 %)	32	9270	3	MR.BELL
2	SUE	D1APDHC	19(100%)	0 (0 %)	19	7279	3	MR.BELL
3	KRISTI	A5APDHC	17(94%)	1 (5 %)	18	7367	3	MR.BELL
4	DAVID	P1APDIC	10(76%)	3 (23 %)	13	3597	3	MR.BELL
5	JANET	D2APDID	18(100%)	0 (0 %)	18	7129	3	MRS.JONES
6	STEVE	D1APDID	24(100%)	0 (0 %)	24	8861	3	MRS.JONES

```
        THREE  R  MATH  SYSTEM-A    STUDENT  DATA  FILE  SUMMARY

# 1  KRISTI        SCORE(2000)..PROG.(I6EKKGC)..NO.PROB.(20)..SPEED(10)..GOAL(60 %)
(MRS. SMITH)       PROB.TIME(2  MIN 30 SEC)...TOTAL TIME(5  MIN)...SET TIME(10 MIN)
ANSWERS FOR EXTRA PROBLEMS 1) 40    2) 84    3) 4    4) 33    5) 84    6) 24    7) 14    8) 36    9) 45    10) 8
                   -------------------------------------------------------------------
                   CORRECT ! 1ST TIME! 2ND TIME! WRONG   ! NOT DONE! PROB.WORKED
                   12(60 %)! 10(50 %)! 2 (10 %)! 6 (30 %)! 2 (10 %)! 20
                   -------------------------------------------------------------------

<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>

# 2  STEVE         SCORE(6342)..PROG.(F1AKDGC)..NO.PROB.(0 )..SPEED(1&)..GOAL(60 %)
(MRS. SMITH)       PROB.TIME(1  MIN 10 SEC)...TOTAL TIME(3  MIN)...SET TIME(3  MIN)
ANSWERS FOR EXTRA PROBLEMS 1) 42    2) 693   3) 222   4) 221   5) 513   6) 54    7) 211   8) 75    9) 51    10) 411
                   -------------------------------------------------------------------
                   CORRECT ! 1ST TIME! 2ND TIME! WRONG   ! NOT DONE! PROB.WORKED
                   20(95 %)! 17(80 %)! 3 (14 %)! 0 (0  %)! 1 (4  %)! 21
                   -------------------------------------------------------------------

<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>

# 3  PAM           SCORE(8489)..PROG.(P1AKDGC)..NO.PROB.(0 )..SPEED(10)..GOAL(60 %)
(MRS. SMITH)       PROB.TIME(0  MIN 40 SEC)...TOTAL TIME(3  MIN)...SET TIME(3  MIN)
ANSWERS FOR EXTRA PROBLEMS 1) 12    2) 4     3) 9     4) 10    5) 7     6) 5     7) 12    8) 10    9) 5     10) 11
                   -------------------------------------------------------------------
                   CORRECT ! 1ST TIME! 2ND TIME! WRONG   ! NOT DONE! PROB.WORKED
                   36(97 %)! 35(94 %)! 1 (2  %)! 1 (2  %)! 0 (0  %)! 37
                   -------------------------------------------------------------------

<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>
```

By selecting this option you will receive a detailed printout of the work that each student did. At first the individual printouts may be somewhat overwelming because of all the information included on them. This vast amount of information was included because of the wide variety of people who will be using this program. No one individual will be using all of the information included. Select that which is applicable to your situation and ignore the rest.

Following are some specific uses that can be made of the individual printouts:

1. Diagnose specific problem areas by checking the student's incorrect responses.

2. Use the printout as positive reinforcement for the work the student just did.

3. Send the printout home for positive communication with the parents.

4. Have the student work the ten extra problems the computer gave him. If the student was having problems, the student and teacher could work some of these together to try to remedy the troublesome area.

Refer to the sample student printout on the next page while reading this section. Some of the areas of the individual printouts are obvious, while others take some explanation. First, the problems with their correct answers are given. These are followed by a set of one, three, or four numbers.

ONE NUMBER.....(e.g. T=6) This means that it took the student six seconds to answer the problem. The answer was CORRECT!

THREE NUMBERS.....(e.g. *17/ T=4/ T=2) This means that the student's first answer of " 17 " was incorrect. It took him four seconds to answer it. His second answer was correct and it took him two seconds to answer it.

FOUR NUMBERS.....(e.g. *30/ *63/ T=4/ T=8) This means that the first answer, "30" was incorrect and took four seconds. The second answer,"63", was also incorrect and took eight seconds. The correct answer is always given under the problem.

If a " * 0 " appears in the student answer section, this means that the time allowed for the problem ran out before the student completed his answer.

In the summary section the "score" is calculated by adding points for a PERCENTAGE of the correct answers, subtracting points for a PERCENTAGE of the incorrect answers, and then multiplying this by a PERCENTAGE time factor. If a student gets a score lower than 300, he will be given a score of 300 on his printout. The maximum score is just under 10,000. To make a valid comparison between program scores the speed (password-fourth letter) must be identical.

If the more conventional system with 100% is desired, the percentages of correct, incorrect, etc. are also given. Also included is the number correct on the first try and the number correct on the second try, in addition to a number for the total correct.

The "problem time" in the summary is the amount of time that the student was looking at the problem display. This is the sum of all the times listed under the problems. These times do not include the time spent looking at a problem after it was missed or the time had run out.

The "total time" in the summary is the amount of time the student spent on the program from the time the password was entered until the final letter and summary appeared.

The "set time" was from the fifth letter of the password. If the student has exceeded this time, the program would have automatically gone to the final letter and summary even though all the assigned problems were not completed.

Each printout takes from about 1 to 3 minutes to print. The length of time depends upon the number of problems worked. The program is designed so that the printer will automatically feed to the top of the next page regardless of the number of problems worked. Be sure that the first sheet is lined up correctly before starting any printout program.

The following page is a sample of one student's individual printout. By familiarizing yourself with the various parts you will be able to quickly select just that information that is useful for your program.

```
*********** KRISTI        ************
HERE ARE THE PROBLEMS YOU JUST WORKED
       YOU DID A VERY GOOD JOB!

===================================================================
    7!     5!     9!     7!     5!    12!     3!     9!     6!    11!    11!     5!    12!     6!     6!     9!
X   5! X   3! X   2! X   2! X   4! X   2! X   2! X   2! X   6! X   2! X   7! X   2! X   9! X   3! X   5! X   9!
-------------------------------------------------------------------
   35!    15!    18!    14!    20!    24!     6!    18!    36!    22!    77!    10!   108!    18!    30!    81!
-------------------------------------------------------------------
     !      !      !      ! *  0! *  0!      ! * 17! * 30! *  0! *  0!      ! * 999!     !      ! *  0!
     !      !      !      ! *  0! *  0!      !      ! * 63! * 11! * 22!      ! * 100!     !      ! *  0!
     !      !      !      !(T=10)!(T=10)!      !(T= 4)!(T= 4)!(T=10)!(T=10)!      !(T= 6)!      !      !(T=10)!
(T= 6)!(T= 1)!(T= 2)!(T= 2)!(T= 1)!(T=10)!(T= 1)!(T= 2)!(T= 8)!(T= 1)!(T= 1)!(T= 1)!(T= 2)!(T= 1)!(T= 7)!(T=10)!
===================================================================

===================================================================
    8!    12!     6!     9!
X   5! X   7! X   4! X   5!
-------------------------------------------------------------------
   40!    84!    24!    45!
-------------------------------------------------------------------
* 35! * 19!      !      !
* 36! * 91!      !      !
(T= 7)!(T= 5)!      !      !
(T= 8)!(T= 1)!(T= 1)!(T= 8)!
===================================================================
    * = WRONG ANSWER ------------------------------------------- T = TIME
       SHOW THIS TO YOUR PARENTS AND MRS. SMITH.  IT IS GREAT WORK.

<><><><><><><><><><><><><><>  SUMMARY  ><><><><><><><><><><><><><><>
   SCORE(2000)....PROG.(I6EKKGC).....PROB.SET(20).....SPEED(10)....GOAL(60 %)
   PROB. TIME (2  MIN 30 SEC)......TOTAL TIME (5  MIN)......SET TIME (10 MIN)
------------------------------------------------------------------------------
   CORRECT    | 1ST TIME  | 2ND TIME  | WRONG     | NOT DONE  | PROB.WORKED
   12(60 %)   | 10(50 %)  | 2 (10 %)  | 6 (30 %)  | 2 (10 %)  | **  20  **
------------------------------------------------------------------------------
<><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><><>

TOTAL CORRECT  (12)                      SCORE  (2000)
```

```
* * * * * * * * * * * * *     CAN YOU WORK THESE?     * * * * * * * * * * * *

(1)   10 (2)   12 (3)    2 (4)   11 (5)   12 (6)    8 (7)    7 (8)    9 (9)    9(10)
   X   4   X   7   X   2   X   3   X   7   X   3   X   2   X   4   X   5   X
   ----     ----     ----     ----     ----     ----     ----     ----     ----     ---
```

```
5. SCREEN   (TV)   REVIEW   AND
      MINI SUMMARY PRINTOUT
6. MINI   SUMMARY   PRINTOUT   AND
      INDIVIDUAL   PRINTOUTS
7. DETAILED SUMMARY PRINTOUTS AND
      INDIVIDUAL   PRINTOUTS
```

The above selections are combinations of the programs that you have gone over. The selection of any one of these will depend upon the situation in which this is used. One of the most frequently used options is # 6. The teacher can keep the mini summary for his records and give the individual printouts to the students who worked them.

TEACHER DISK—
8. SPECIFIED INDIVIDUAL PRINTOUTS

By selecting this option you will be able to have just those individual printouts printed that you desire. You have to obtain the record number of the individual printouts from either the "Screen (TV) Review", "Mini Summary", or "Detailed Summary". Once you have these, run this program, enter these numbers following the prompts, and let the computer do the rest. Because the records are sequentially stored on the STUDENT DISK, this may take a minute or two extra per record to run.

TEACHER DISK—
9. TEACHER'S NAME PROGRAM

This program needs to be used only once to set up a file of teacher's names whose students are using the THREE R MATH SYSTEM-A. First assign a letter (A,B,etc.) to each teacher's name. On the APX master disks, "YOUR TEACHER" is assigned to each letter. Run this program and follow the prompts. You will be given a letter and the name that is on file with that letter. To change or revise a file, simply type in the new name that you want with a particular letter. This file will have to be added to the STUDENT DATA DISK. Do not worry, the prompts will very easily "walk" you through the entire process.

TEACHER DISK—
10. CLEAR THE FILE

The student data records are stored on the STUDENT DISK. After you have obtained the desired printout or TV review, the disk should be "cleared". To do this just run option # 10. Be sure that you have obtained all the necessary information from the records before you run this program. Once it is run, ALL RECORDS ARE DELETED!

One of the primary factors in successfully using the THREE R MATH SYSTEM-A is the ability of the teacher to motivate the students. After the initial novelty of any drill and practice program wares off, a student left on his own would cease to use it. This is where your skill and training as an educator comes in. Following are several specific suggestions for getting the THREE R MATH SYSTEM-A set up in your classroom. Once you have used it, you will probably come up with a wide variety of varietations.

Each student should have his own computer folder with a record sheet in it similiar to the one on the following page. The teacher could fill in 10 - 15 passwords that are appropriate for his student's level. The teacher could use a yellow magic marker to mark a box by the password that the student was to use the next time he went to the computer. At the end of the day the teacher could run a mini summary and transfer the appropriate information to each student's computer folder.

TIMED PRACTICE- If this method is used, the FIFTH LETTER of each password is set for the same total amount of time (i.e. 4 minutes). The third letter of the password is set at " A ". This leaves the total number of problems open. The goal is to see how many problems a student can work correctly in a set amount of time.

If a student gets 15 (???) correct he might get an "Expert" certificate. If he gets 25 (???) correct he might get the "Pro" certificate. If a student gets 5 (???) "Pro" certificates he gets some special type of reward. This puts a lot of emphasis on not only trying to increase speed, but also accuracy.

NUMBER PRACTICE- On this a specific number of problems is set (password- THIRD LETTER). The student would attempt to see how many of these problems he could get correct. A system similiar to above could be used.

There are various levels at which a student could compete. He can compete only with himself, with a small group close to his ability level, or with an entire class. The advantage of using the THREE R MATH SYSTEM-A is that the teacher only has to select the passwords. The computer generates whatever types of problems desired and immediately scores them. Not only that, but it also gives additional practice problems!

An ideal method for using this at the elementary level would be to have each student use this program about 3 times a week for 3 to 5 mimutes each session. In most cases it is best to avoid having a student work on any drill program such as this for more than about 5-10 minutes at a time. Short frequent sessions are much better than fewer longer sessions.

	Program										
1.	A 1 A P D H C	18 9/30	23 10/2								
2.	A 4 A P D H C	10 10/4	11 10/5								
3.	C 2 A P D H C	3 10/9	6 10/12	15 10/16	17 10/20						
4.	A 5 A P D H C										
5.	B 1 A P D H C										
6.	B 3 A P D H C	12 10/8	15 10/17								
7.											
8.											

This is a sample student record sheet. Fill in a box next to the program you want the student to do with a yellow marker. When it is his turn to use the computer, he gets his folder, looks for your yellow mark, and they types in his password.

At the end of the day you can obtain a mini summary printout and use this to enter the number the student got correct and the date on each student's record sheet. As you do this you can mark the next program you want the student to do.

By using this method there is minimal classroom disruption when it is the student's turn to go to the computer. Also very little of your time is spent with record keeping.

9.
10.
11.
12.
13.
14.
15.
16.
17.
18.
19.

SUMMARY FOR USING THE
THREE R MATH SYSTEM

One of the main advantages of using this program in your school system or even your home is the ease with which it can be used.

STEP 1: Insert the TEACHER DISK and turn on the computer system. Select 1 (Student Program) from the menu and load it.

STEP 2: Refer to the "Password Manual" to obtain a 7 character password for the type of problems and method (speed, number of problems, total time, etc.) of drill you want the student to do.

STEP 3: Usually students will use this program one at a time. The student types in his name, password (to obtain the specific type of drill you desire), and begins. When the student answers the required number of problems or the specified amount of time is up, a summary of the student's work will appear on the screen.

STEP 4: The student then has the option to save his problem data for a printout. The program then automatically returns to the first display. Everything is set for the next student.

STEP 5: At the end of the day (or period), the teacher can then insert the TEACHER DISK. By turning the computer off/on (or following the directions on page 23) the main teacher program can be loaded from the first menu.

STEP 6: Once the printout program is loaded a printout menu will appear on the screen. The teacher has eight different options with which to obtain the student data on the disk. These range from viewing the results on the screen (TV) to obtaining a detailed report of each student's work.

STEP 7: Once the option has been selected, the teacher will be instructed to insert the STUDENT DISK and press [START]. The desired program will then be run. At the completion of the program the printout menu with the teacher options will appear.

STEP 8: If all data from the disk is obtained, the disk should be cleared by running the "10. CLEAR THE DISK" program from the printout menu. This clears the disk so that the previous students' results will not contineously be printed on the printouts.

STEP 9: If several different student disks are to be used, simply select the option desired, insert the next student disk, and press [START].

STEP 10: There is a gold mine of information on the student's individual printout. By looking at the amount of time it took the student to work individual problems and his correct and incorrect answers, you will be able to pinpoint the student's strengths and weaknesses. With this information you can accurately prescribe the student's next drill.

The ten additional problems at the bottom of the printout can also be useful as pracice problems or used in going over difficult areas the student had with the work.

The mini summary printout and the detailed summary printout are useful for record keeping. Most of the information needed will be available on either one of these printouts.

In everyday practice most teachers will run #6 MINI SUMMARY PRINTOUT AND INDIVIDUAL STUDENT PRINTOUTS or #7 DETAILED SUMMARY PRINTOUT AND INDIVIDUAL PRINTOUTS from the printout menu. The teacher then keeps the summary printout and gives the students the individual printouts. The record sheet (page 38) is an easy way to keep track of the students' cumulative work.

— NOTES —

APPENDIX A

The following is a "Password Code Manual". It contains the information necessary for writing the passwords. It should be duplicated and given to any teacher using the THREE R MATH SYSTEM-A.

THREE R MATH SYSTEM- A

PASSWORD CODES

BY DAN ROHR

NAME_____

THREE R MATH SYSTEM-A   PASSWORD CODE KEY

1—2 Program Letters	3 No. of Problems	4 Speed Per Problem	5 Total Time	6 Min. % Correct	7 Teacher's Name
First 2 Spaces	A—Not Set	A—Not Set	A—Not Set	A—Not Set	A—
	B— 5	B— 1 Sec.	B— 1 Min.	B— 10%	B—
	C— 10	C— 2	C— 2	C— 20%	C—
See Problem Codes	D— 15	D— 3	D— 3	D— 30%	D—
	E— 20	E— 4	E— 4	E— 40%	E—
	F— 25	F— 5	F— 5	F— 50%	F—
	G— 30	G— 6	G— 6	G— 60%	G—
	H— 35	H— 7	H— 7	H— 70%	H—
	I— 40	I— 8	I— 8	I— 80%	I—
	J— 45	J— 9	J— 9	J— 90%	J—
	K— 50	K— 10	K— 10	K— 100%	K—
	L— 55	L— 11	L— 11	L—Z (Not Set)	L—
	M— 60	M— 12	M— 12		M—
	N— 65	N— 13	N— 13		N—
	O— 70	O— 14	O— 14		O—
	P—Z (Not Set)	P— 15	P— 15		P—
		Q— 16	Q— 16		Q—
		R— 17	R— 17		R—
		S— 18	S— 18		S—
		T— 19	T— 19		T—
		U— 20	U— 20		U—
		V— 30	V— 21		V—
		W— 40	W— 22		W—
		X— 50	X— 23		X—
		Y— 60	Y— 24		Y—
		Z— 90	Z— 25		Z—

```
**********************************************************************
**********************************************************************
****      ***      ***      ***      ***      ***      ***      ****
****      ***      ***      ***      ***      ***      ***      ****
****      ***      ***      ***      ***      ***      ***      ****
****      ***      ***      ***      ***      ***      ***      ****
****** 1 ***** 2 ***** 3 ***** 4 ***** 5 ***** 6 ***** 7 ******
**********************************************************************
```

PROGRAM PROGRAM PROBLEMS SPEED   TIME   GOAL   TEACHER

START: _____   STOP: _____   PROBLEMS: _____ SPEED: _____

NAME: _____GRADE: _____

TEACHER: _____ROOM: _____

COMMENTS:

ADDITION
PROBLEM PASSWORD CODE- MINI KEY

PROGRAM   DESCRIPTION

A1...........Add two 1 digit numbers (numbers from 1-5)

A2..........Add two 1 digit numbers (sums less than 10)

A3..........Add two 1 digit numbers (all sums greater than 10)

A4..........Add two 1 digit numbers (any sum)

A5..........Add a 2 and 1 digit number (no regrouping)

A6..........Add a 2 and 1 digit number (all regrouping)

A7..........Add a 2 and 1 digit number (mixed)

B1..........Add two 2 digit numbers (no regrouping)

B2..........Add two 2 digit numbers (all regrouping)

B3..........Add two 1 or 2 digit numbers (mixed)

B4..........Add two 2 digit numbers (mixed)

B5..........Add two 3 digit numbers (no regrouping)

B6..........Add two 3 digit numbers (all regrouping)

B7..........Add two 3 digit numbers (mixed)

C1..........Add two 2 or 3 digit numbers (mixed)

C2..........Add three 1 digit numbers (mixed)

C3..........Add three 1,2, or 3 digit numbers (mixed)

C4..........Add three 1 or 2 digit numbers (mixed)

C5..........Add three 2 or 3 digit numbers (mixed)

SUBTRACTION
PROBLEM PASSWORD CODE- MINI KEY

PROGRAM   DESCRIPTION

D1........Subtract a 1 digit from a 1 digit number

D2........Subtract a 1 digit from a 2 digit no.(no regrouping)

D3........Subtract a 1 digit from a 2 digit number (regrouping)

D4........Subtract 7, 8, or 9 from a 2 digit number (mixed)

D5........Subtract a 1 digit from a 2 digit number (mixed)

E1........Subtract a 2 digit from a 2 digit no.(no regrouping)

E2........Subtract a 2 digit from a 2 digit number(regrouping)

E3........Subtract a 2 digit from a 2 digit number (mixed)

E4........Subtract a 2 digit from a 3 digit no.(no regrouping)

E5........Subtract a 2 digit from a 3 digit number(regrouping)

E6........Subtract a 2 digit from a 3 digit number (mixed)

F1........Subtract a 3 digit from a 3 digit no.(no regrouping)

F2........Subtract a 3 digit from a 3 digit number(regrouping)

F3........Subtract a 3 digit from a 3 digit number (mixed)

F4........Subtract a 3 digit from a 4 digit number(regrouping)

F5........Subtract a 3 digit from a 4 digit number (mixed)

F6........Subtract a 4 digit from a 4 digit number(regrouping)

F7........Subtract a 4 digit from a 4 digit number (mixed)

MULTIPLICATION
PROBLEM PASSWORD CODE- MINI KEY

PROGRAM DESCRIPTIN

```
G1.......Multiplication Table 2
G2.......Multiplication Table 3
G3.......Multiplication Table 4
G4.......Multiplication Table 5
G5.......Multiplication Table 6
G6.......Multiplication Table 7
H1.......Multiplication Table 8
H2.......Multiplication Table 9
H3.......Multiplication Table 10
H4.......Multiplication Table 11
H5.......Multiplication Table 12
I1.......Multiplication Tables 2, 3, or 4
I2.......Multiplication Tables 4, 5, or 6
I3.......Multiplication Tables 6, 7, or 8
I4.......Multiplication Tables 7, 8, or 9
I5.......Multiplication Tables 7 - 12
I6.......Multiplication Tables 2 - 12
J1.......Multiply a 2 digit by a 1 digit number (2-5)
J2.......Multiply a 2 digit by a 1 digit number (4-9)
J3.......Multiply a 2 digit by a 1 digit number (any)
J4.......Multiply a 3 digit by a 1 digit number (2-5)
J5.......Multiply a 3 digit by a 1 digit number (4-9)
J6.......Multiply a 3 digit by a 1 digit number (any)
K1.......Multiply a 2 digit by a 2 digit number (10-19)
K2.......Multiply a 2 digit by a 2 digit number (any)
K3.......Multiply a 3 digit by a 2 digit number (10,20,...)
K4.......Multiply a 3 digit by a 2 digit number (11-19)
K5.......Multiply a 3 digit by a 2 digit number (any)
L1.......Multiply a 3 digit by a 3 digit number (101-199)
L2.......Multiply a 3 digit by a 3 digit number (any)
L3.......Multiply a 4 digit by a 2 digit number (11-19)
L4.......Multiply a 4 digit by a 2 digit number (any)
L5.......Multiply a 4 digit by a 3 digit number (any)
```

DIVISION

PROBLEM PASSWORD CODE— MINI KEY

PROGRAM   DESCRIPTION

M1........ 2 . . .   Divided into   2 - 24
M2........ 3 . . .   Divided into   3 - 36
M3........ 4 . . .   Divided into   4 - 48
M4........ 5 . . .   Divided into   5 - 60
M5........ 6 . . .   Divided into   6 - 72
M6........ 7 . . .   Divided into   7 - 84
N1........ 8 . . .   Divided into   8 - 96
N2........ 9 . . .   Divided into   9 - 108
N3........ 10 . .   Divided into   10 - 120
N4........ 11 . .   Divided into   11 - 132
N5........ 12 . .   Divided into   12 - 144
P1........ 2 - 4 .   Divided into   8 - 48
P2........ 4 - 6 .   Divided into   12 - 72
P3........ 6 - 9 .   Divided into   12 - 108
P4........ 9 - 12   Divided into   18 - 144
P5........ 2 - 9   Divided into   8 - 108
P6........ 6 - 12   Divided into   12 - 144
P7........ 2 - 12   Divided into   8 - 144
Q1........ 2 - 4   Divided into   100 - 500
Q2........ 4 - 6   Divided into   100 - 500
Q3........ 6 - 9   Divided into   100 - 500
Q4........ 9 - 12   Divided into   100 - 500
Q5........ 2 - 9   Divided into   100 - 500
Q6........ 6 - 12   Divided into   100 - 500
R1........ 2 - 9   Divided into   100 - 999
R2........ 11 - 15   Divided into   100 - 999
R3........ 20 - 40   Divided into   100 - 999
R4........ 2 - 9   Divided into   1000 - 9999
R5........ 11 - 15   Divided into   1000 - 9999
R6........ 20 - 50   Divided into   1000 - 9999
R7........ 50 - 99   Divided into   1000 - 9999

A D D I T I O N

CODE	PROBLEM	SAMPLE	
A 1	Add two 1 digit numbers (Numbers from 1 to 5)	1 + 1 ---	5 + 5 ---
A 2	Add two 1 digit numbers (Sums less than 10)	1 + 1 ---	9 + 0 ---
A 3	Add two 1 digit numbers (All sums greater than 10)	5 + 6 ---	9 + 9 ---
A 4	Add two 1 digit numbers (Any sum)	2 + 3 ---	8 + 6 ---
A 5	Add a 2 digit and 1 digit number (No regrouping)	11 + 1 ---	98 + 1 ---
A 6	Add a 2 digit and 1 digit number (All regrouping)	11 + 9 ---	99 + 9 ---
A 7	Add a 2 digit and 1 digit number (Mixed)	23 + 5 ---	67 + 8 ---

A D D I T I O N

CODE	PROBLEM	SAMPLE	
B 1	Add two 2 digit numbers (No regrouping)	11 +11 ---	88 +11 ---
B 2	Add two 2 digit numbers (All regrouping)	19 +11 ---	99 +99 ---
B 3	Add two 1 or 2 digit numbers (Mixed)	15 + 3 ---	99 +87 ---
B 4	Add two 2 digit numbers (Mixed)	12 +13 ---	98 +86 ---
B 5	Add two 3 digit numbers (No regrouping)	111 +111 ---	798 +201 ---
B 6	Add two 3 digit numbers (All regrouping)	111 +109 ---	999 +999 ---
B 7	Add two 3 digit numbers (Mixed)	123 +105 ---	999 +888 ---

A D D I T I O N

CODE	PROBLEM		SAMPLE	
C 1	Add two 2 or 3 digit numbers (Mixed)		111 + 11 ---	888 +888 ---
C 2	Add three 1 digit numbers (Mixed)		2 1 + 3 ---	9 9 + 9 ---
C 3	Add three 1,2,or 3 digit numbers (Mixed)		15 3 +211 ----	699 487 +678 ----
C 4	Add three 1 or 2 digit numbers (Mixed)		2 13 + 1 ----	98 86 + 99 ----
C 5	Add three 2 or 3 digit numbers (Mixed)		11 11 + 11 ----	98 201 +989 ----

S U B T R A C T I O N

CODE		PROBLEM		SAMPLE	
D 1	:	Subtract a 1 digit number from a 1 digit number	:	2 − 1 –––	9 − 5 –––
D 2	:	Subtract a 1 digit number from a 2 digit number (No regrouping)	:	11 − 1 –––	99 − 6 –––
D 3	:	Subtract a 1 digit number from a 2 digit number (Regrouping)	:	15 − 6 –––	98 − 9 –––
D 4	:	Subtract 7, 8, or 9 from a 2 digit number (Mixed)	:	17 − 7 –––	98 − 9 –––
D 5	:	Subtract a 1 digit number from a 2 digit number (Mixed)	:	11 − 1 –––	98 − 9 –––

S U B T R A C T I O N

CODE	PROBLEM	SAMPLE	
E 1	Subtract a 2 digit number from a 2 digit number (No regrouping)	11 - 10 ---	99 - 21 ---
E 2	Subtract a 2 digit number from a 2 digit number (Regrouping)	21 - 19 ---	88 - 39 ---
E 3	Subtract a 2 digit number from a 2 digit number (Mixed)	15 - 12 ---	82 - 59 ---
E 4	Subtract a 2 digit number from a 3 digit number (No regrouping)	132 - 11 ---	958 - 46 ---
E 5	Subtract a 2 digit number from a 3 digit number (Regrouping)	121 - 12 ---	998 - 79 ---
E 6	Subtract a 2 digit number from a 3 digit number (Mixed)	211 - 19 ---	899 - 69 ---

S U B T R A C T I O N

CODE	PROBLEM		SAMPLE	
F 1	Subtract a 3 digit number from a 3 digit number (No regrouping)		111 - 100 ----	999 - 645 ----
F 2	Subtract a 3 digit number from a 3 digit number (Regrouping)		221 - 119 ----	988 - 699 ----
F 3	Subtract a 3 digit number from a 3 digit number (Mixed)		315 - 112 ----	882 - 659 ----
F 4	Subtract a 3 digit number from a 4 digit number (Regrouping)		1132 - 109 -----	8958 - 967 -----
F 5	Subtract a 3 digit number from a 4 digit number (Mixed)		2121 - 111 -----	7998 - 679 -----
F 6	Subtract a 4 digit number from a 4 digit number (Regrouping)		3211 -1219 -----	5897 -1998 -----
F 7	Subtract a 4 digit number from a 4 digit number (Mixed)		1123 -1010 -----	9867 -6989 -----

MULTIPLICATION

CODE	PROBLEM	SAMPLE

G 1 | 2's multiplication table |

```
      1        12
    x 2      x 2
    ---      ---
```

G 2 | 3's multiplication table |

```
      1        12
    x 3      x 3
    ---      ---
```

G 3 | 4's multiplication table |

```
      1        12
    x 4      x 4
    ---      ---
```

G 4 | 5's multiplication table |

```
      1        12
    x 5      x 5
    ---      ---
```

G 5 | 6's multiplication table |

```
      1        12
    x 6      x 6
    ---      ---
```

G 6 | 7's multiplication table |

```
      1        12
    x 7      x 7
    ---      ---
```

MULTIPLICATION

CODE	PROBLEM	SAMPLE	
H 1	8's multiplication table	1 x 8 ---	12 x 8 ---
H 2	9's multiplication table	1 x 9 ---	12 x 9 ---
H 3	10's multiplication table	10 x 1 ---	12 x10 ---
H 4	11's multiplication table	11 x 1 ---	12 x11 ---
H 5	12's multiplication table	12 x 1 ---	12 x12 ---

MULTIPLICATION

CODE	PROBLEM	SAMPLE	
I 1	2's, 3's, or 4's multiplication tables	1 × 2 ---	12 × 4 ---
I 2	4's, 5's, or 6's multiplication tables	1 × 4 ---	12 × 6 ---
I 3	6's, 7's, or 8's multiplication tables	1 × 6 ---	12 × 8 ---
I 4	7's, 8's, or 9's multiplication tables	1 × 7 ---	12 × 9 ---
I 5	7's through 12's multiplication tables	1 × 7 ---	12 ×12 ---
I 6	2's through 12's multiplication tables	1 × 2 ---	12 ×12 ---

MULTIPLICATION

CODE	PROBLEM	SAMPLE	
J 1	Multiply a 2 digit number by a 1 digit number (2 - 5)	11 x 2 ---	99 x 5 ---
J 2	Multiply a 2 digit number by a 1 digit number (4 - 9)	11 x 4 ---	99 x 9 ---
J 3	Multiply a 2 digit number by a 1 digit number (Any)	11 x 2 ---	99 x 9 ---
J 4	Multiply a 3 digit number by a 1 digit number (2 - 5)	123 x 2 ----	989 x 5 ----
J 5	Multiply a 3 digit number by a 1 digit number (4 - 9)	101 x 4 ----	789 x 9 ----
J 6	Multiply a 3 digit number by a 1 digit number (Any)	111 x 2 ----	898 x 9 ----

MULTIPLICATION

CODE	PROBLEM	SAMPLE	
K 1	Multiply a 2 digit number by a 2 digit number (10 - 19)	11 x 10 ----	99 x 19 ----
K 2	Multiply a 2 digit number by a 2 digit number (Any)	11 x 11 ----	99 x 99 ----
K 3	Multiply a 3 digit number by a 2 digit number (10,20,30, ...)	121 x 10 ----	898 x 90 ----
K 4	Multiply a 3 digit number by a 2 digit number (11 - 19)	123 x 11 ----	989 x 19 ----
K 5	Multiply a 3 digit number by a 2 digit number (Any)	101 x 10 ----	889 x 99 ----

MULTIPLICATION

CODE		PROBLEM		SAMPLE	
L 1		Multiply a 3 digit number by a 3 digit number (101 - 199)		111 x 101 -----	999 x 199 -----
L 2		Multiply a 3 digit number by a 3 digit number (Any)		123 x 111 -----	898 x999 ----
L 3		Multiply a 4 digit number by a 2 digit number (11 - 19)		2121 x 11 -----	9898 x 19 -----
L 4		Multiply a 4 digit number by a 2 digit number (ANY)		1123 x 11 -----	8989 x 99 -----
L 5		Multiply a 4 digit number by a 3 digit number (Any)		1010 x 110 -----	7889 x 699 -----

D I V I S I O N

CODE	PROBLEM	SAMPLE	
M 1	2's division table	2 /$\overline{2}$	2 /$\overline{24}$
M 2	3's division table	3 /$\overline{3}$	3 /$\overline{36}$
M 3	4's division table	4 /$\overline{4}$	4 /$\overline{48}$
M 4	5's division table	5 /$\overline{5}$	5 /$\overline{60}$
M 5	6's division table	6 /$\overline{6}$	6 /$\overline{72}$
M 6	7's division table	7 /$\overline{7}$	7 /$\overline{84}$
N 1	8's division table	8 /$\overline{8}$	8 /$\overline{96}$
N 2	9's division table	9 /$\overline{9}$	9 /$\overline{108}$
N 3	10's division table	10 /$\overline{10}$	10 /$\overline{120}$
N 4	11's division table	11 /$\overline{11}$	11 /$\overline{132}$
N 5	12's division table	12 /$\overline{12}$	12 /$\overline{144}$

D I V I S I O N

CODE		PROBLEM		SAMPLE	
P 1	:	2-4 divided into 8-48	:	$2\,/\overline{8}$	$4\,/\overline{48}$
P 2	:	4-6 divided into 12-72	:	$4\,/\overline{12}$	$6\,/\overline{72}$
P 3	:	6-9 divided into 12-108	:	$6\,/\overline{12}$	$9\,/\overline{108}$
P 4	:	9-12 divided into 18-144	:	$9\,/\overline{18}$	$12\,/\overline{144}$
P 5	:	2-9 divided into 8-108	:	$2\,/\overline{8}$	$9\,/\overline{108}$
P 6	:	6-12 divided into 12-144	:	$6\,/\overline{12}$	$12\,/\overline{144}$
P 7	:	2-12 divided into 8-144	:	$2\,/\overline{8}$	$12\,/\overline{144}$
Q 1	:	2-4 divided into 100-500	:	$2\,/\overline{100}$	$4\,/\overline{500}$
Q 2	:	4-6 divided into 100-500	:	$4\,/\overline{100}$	$6\,/\overline{498}$
Q 3	:	6-9 divided into 100-500	:	$6\,/\overline{108}$	$9\,/\overline{495}$
Q 4	:	9-12 divided into 100-500	:	$9\,/\overline{108}$	$12\,/\overline{492}$
Q 5	:	2-9 divided into 100-500	:	$2\,/\overline{100}$	$9\,/\overline{495}$
Q 6	:	6-12 divided into 100-500	:	$6\,/\overline{108}$	$12\,/\overline{492}$

D I V I S I O N

CODE	PROBLEM	SAMPLE	
R 1	2-9 divided into 100-999	2 /$\overline{100}$	9 /$\overline{999}$
R 2	11-15 divided into 100-999	11 /$\overline{110}$	15 /$\overline{990}$
R 3	20-40 divided into 100-999	20 /$\overline{100}$	40 /$\overline{960}$
R 4	2-9 divided into 1000-9999	2 /$\overline{1000}$	9 /$\overline{9999}$
R 5	11-15 divided into 1000-9999	11 /$\overline{1100}$	15 /$\overline{9990}$
R 6	20-50 divided into 1000-9999	20 /$\overline{1000}$	50 /$\overline{9950}$
R 7	50-99 divided into 1000-9999	50 /$\overline{1000}$	99 /$\overline{9999}$

PASSWORD CODE

The strongest parts of the THREE R MATH SYSTEM-A are the ease
with which the students can use the program and the ability of
a teacher/parent to assign specific types of problems which
the student can work. There are 101 different types of
addition, subtraction, multiplication, and division problems
available. The speed, number of problems, and total time
allowed can also be controlled.

The following is a brief description of the different
letters/numbers used in the password that must be typed into
the computer to run the main student program. There are seven
parts to each password. Each part tells the computer your
specific requests for running a program.

The student does not need to learn the function of each part
of the PASSWORD. He/she simply types it into the computer.
The computer takes over from there. A detailed explanation is
given in the CLASSROOM SUGGESTIONS section on how to set up a
system in your classroom/home to eliminate much of the
bookkeeping that is associated with a program such as this.

PART   DECRIPTION

1./2.   The first two spaces require a letter and a number.
         These designate which one of the 101 programs you want
         to work on. Details are given on the following pages.

3.   The third letter sets the number of problems the
         student is to work. This can range from 5 to 70 or not
         be set at all.

4.   The fourth letter sets the amount of time the problems
         will be displayed on the screen (speed). This can be
         set from 1 second to 90 seconds or not be set at all.

5.   The fifth letter sets the maximum number of minutes the
         student is allowed to work on the program. This time
         starts after the student enters his name and password.
         When the time is up the computer will automatically
         send the program to the final letter and summary even
         if the specified number of problems have not been
         worked. This time can range from 1 minute to 25 minutes
         or not be set at all.

6./7.   The sixth and seventh letters are to be used only if
         you will be using a printer. If the printer IS NOT to
         be used, type "A" for both of these spaces. The sixth
         letter sets the minimum percentage required to get a
         positive response on the printout. The seventh letter
         sets the teacher's name to be used on the printout. See
         the "Teacher's Name Program" section for specific
         directions for setting these.

CLASSROOM SUGGESTIONS

One of the primary factors in successfully using the THREE R MATH SYSTEM-A is the ability of the teacher to motivate the students. After the initial novelty of any drill and practice program wares off, a student left on his own would cease to use it. This is where your skill and training as an educator comes in. Following are several specific suggestions for getting the THREE R MATH SYSTEM-A set up in your classroom. Once you have used it, you will probably come up with a wide variety of varietations.

Each student should have his own computer folder with a record sheet in it similiar to the one on the following page. The teacher could fill in 10 - 15 passwords that are appropriate for his student's level. The teacher could use a yellow magic marker to mark a box by the password that the student was to use the next time he went to the computer. At the end of the day the teacher could run a mini summary and transfer the appropriate information to each student's computer folder.

TIMED PRACTICE- If this method is used, the fifth letter of each password is set for the same total amount of time (i.e. 4 minutes). The third letter of the password is set at " A ". This leaves the total number of problems open. The goal is to see how many problems a student can work correctly in a set amount of time.

If a student gets 15 (???) correct he might get an "Expert" certificate. If he gets 25 (???) correct he might get the "Pro" certificate. If a student gets 5 (???) "Pro" certificates he gets some special type of reward. This puts a lot of emphasis on not only trying to increase speed, but also accuracy.

NUMBER PRACTICE- On this a specific number of problems is set (password- third letter). The student would attempt to see how many of these problems he could get correct. A system similiar to above could be used.

There are various levels at which a student could compete. He can compete only with himself, with a small group close to his ability level, or with an entire class. The advantage of using the THREE R MATH SYSTEM-A is that the teacher only has to select the passwords. The computer generates whatever types of problems desired and immediately scores them. Not only that, but it also gives additional practice problems!

An ideal method for using this at the elementary level would be to have each student use this program about 3 times a week for 3 to 5 mimutes each session. In most cases it is best to avoid having a student work on any drill program such as this for more than about 10 minutes at a time. Short frequent sessions are much better than fewer longer sessions.

NAME:_____

		18	23							
1.	A 1 A P D H C	9/30	10/2							
2.	A 4 A P D H C	10	11							
		10/4	10/5							
3.	C 2 A P D H C	3	6	15	17					
		10/9	10/12	10/16	10/20					
4.	A 5 A P D H C									
5.	B 1 A P D H C									
6.	B 3 A P D H C	12	15							
		10/8	10/17							
7.										

8.

9.   This is a sample student record sheet. Fill

10. in a box next to the program you want the student

11. to do with a yellow marker. When it is his turn

12. to use the computer, he gets his folder, looks for

13. your yellow mark, and they types in his password.

14.   At the end of the day you can obtain a mini

15. summary printout and use this to enter the number

16. the   student got   correct and   the date   on   each

17. student's record sheet. As you do this you can

18. mark the next program you want the student to do.

19.   By using this method there is minimal classroom

disruption when it is the student's turn to go to

the computer. Also very little of your time is

spent with record keeping.

NAME:_____

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

11.

12.

13.

14.

15.

16.

17.

18.

19.

SUMMARY FOR USING THE
THREE R MATH SYSTEM

One of the main advantages of using this program in your school system or even your home is the ease with which it can be used.

STEP 1: Insert the TEACHER DISK and turn on the computer system. Select 1 (Student Program) from the menu and load it.

STEP 2: Refer to the "Password Manual" to obtain a 7 character password for the type of problems and method (speed, number of problems, total time, etc.) of drill you want the student to do.

STEP 3: Usually students will use this program one at a time. The student types in his name, password (to obtain the specific type of drill you desire), and begins. When the student answers the required number of problems or the specified amount of time is up, a summary of the student's work will appear on the screen.

STEP 4: The student then has the option to save his problem data for a printout. The program then automatically returns to the first display. Everything is set for the next student.

STEP 5: At the end of the day (or period), the teacher can then insert the TEACHER DISK. By turning the computer off/on (or following the directions on page 23) the main teacher program can be loaded from the first menu.

STEP 6: Once the printout program is loaded a printout menu will appear on the screen. The teacher has eight different options with which to obtain the student data on the disk. These range from viewing the results on the screen (TV) to obtaining a detailed report of each student's work.

STEP 7: Once the option has been selected, the teacher will be instructed to insert the STUDENT DISK and press [START]. The desired program will then be run. At the completion of the program the printout menu with the teacher options will appear.

STEP 8: If all data from the disk is obtained, the disk should be cleared by running the "10. CLEAR THE DISK" program from the printout menu. This clears the disk so that the previous students' results will not contineously be printed on the printouts.

STEP 9: If several different student disks are to be used, simply select the option desired, insert the next student disk, and press [START].

STEP 10: There is a gold mine of information on the student's individual printout. By looking at the amount of time it took the student to work individual problems and his correct and incorrect answers, you will be able to pinpoint the student's strengths and weaknesses. With this information you can accurately prescribe the student's next drill.

The ten additional problems at the bottom of the printout can also be useful as pracice problems or used in going over difficult areas the student had with the work.

The mini summary printout and the detailed summary printout are useful for record keeping. Most of the information needed will be available on either one of these printouts.

In everyday practice most teachers will run #6 MINI SUMMARY PRINTOUT AND INDIVIDUAL STUDENT PRINTOUTS or #7 DETAILED SUMMARY PRINTOUT AND INDIVIDUAL PRINTOUTS from the printout menu. The teacher then keeps the summary printout and gives the students the individual printouts.The record sheet(page 68) is an easy way to keep track of the students' cumulative work.

APPENDIX B
DUPLICATING STUDENT DATA DISKETTE

Before the APX MASTER STUDENT DATA DISKETTE can be used it must be duplicated to a notched diskette. The following is the procedure required to do this. This is summerized from the "ATARI 400/800 Disk Operating System II Reference Manual".

HOW TO FORMAT A DISKETTE

1. Insert the ATARI BASIC language cartridge into the left slot of your computer.

2. Turn the disk drive on. Wait for the BUSY light to go off.

3. Insert the ATARI 810 Master Diskette or any diskette with DOS II on it into the disk drive. Close the door.

4. Turn the computer console on. DOS will load into the computer memory.

5. When the READY prompt appears, type DOS and press [RETURN]. After a few seconds the DOS Menu will appear on the screen.

6. Type I for the FORMAT option and press [RETURN].

7. When the prompt message WHICH DRIVE TO FORMAT appears, remove the Master Diskette from the disk drive and insert a BLANK diskette. Close the door, type 1 (one) and press [RETURN].

8. When the prompt message TYPE Y TO FORMAT DISK 1 appears, type Y and press [RETURN]. The BUSY light will come on and the system will format the diskette.

9. When the prompt message SELECT ITEM OR RETURN FOR MENU appears, the formatting is complete, and you can continue with the second part of this operation.

MAKING A DUPLICATE DISKETTE

10. TYPE J AND PRESS [RETURN] for the DUPLICATE A DISK option.

11. When the DUP DISK-SOURCE,DEST DRIVES? appears, type 1,1 (one,one) and press [RETURN].

12A. If you do not have the MEMORY SAVE option on your diskette, the following will appear: INSERT SOURCE DISK, TYPE RETURN.

12B. If you have the MEMORY SAVE option, the following will appear: INSERT SOURCE DISK, TYPE RETURN, TYPE "Y" IF OK TO USE PROGRAM AREA: CAUTION:A "Y" INVALIDATES MEM.SAV.

13. Insert your source diskette (the APX STUDENT DATA DISKETTE) and type [RETURN] (or "Y" and [RETURN]).

14. When the prompt INSERT DESTINATION DISK, TYPE RETURN appears and the BUSY light on the disk drive goes off, insert the destination diskette (the diskette on which you want to make the copy) and press [RETURN].

15. Steps 13 and 14 will be repeated several times until the diskette is completely duplicated.

16. When the prompt SELECT ITEM OR RETURN FOR MENU appears, you have completed your duplication process.

17. STORE THE APX MASTER STUDENT DATA DISKETTE IN A SAFE PLACE SO THAT IT CAN BE DUPLICATED AGAIN IF NECESSARY.

**For the complete list of current
APX programs, ask your ATARI retailer
for the APX Product Catalog**

CPX ATARI*
PROGRAM
EXCHANGE

P.O. Box 3705
Santa Clara. CA 95055
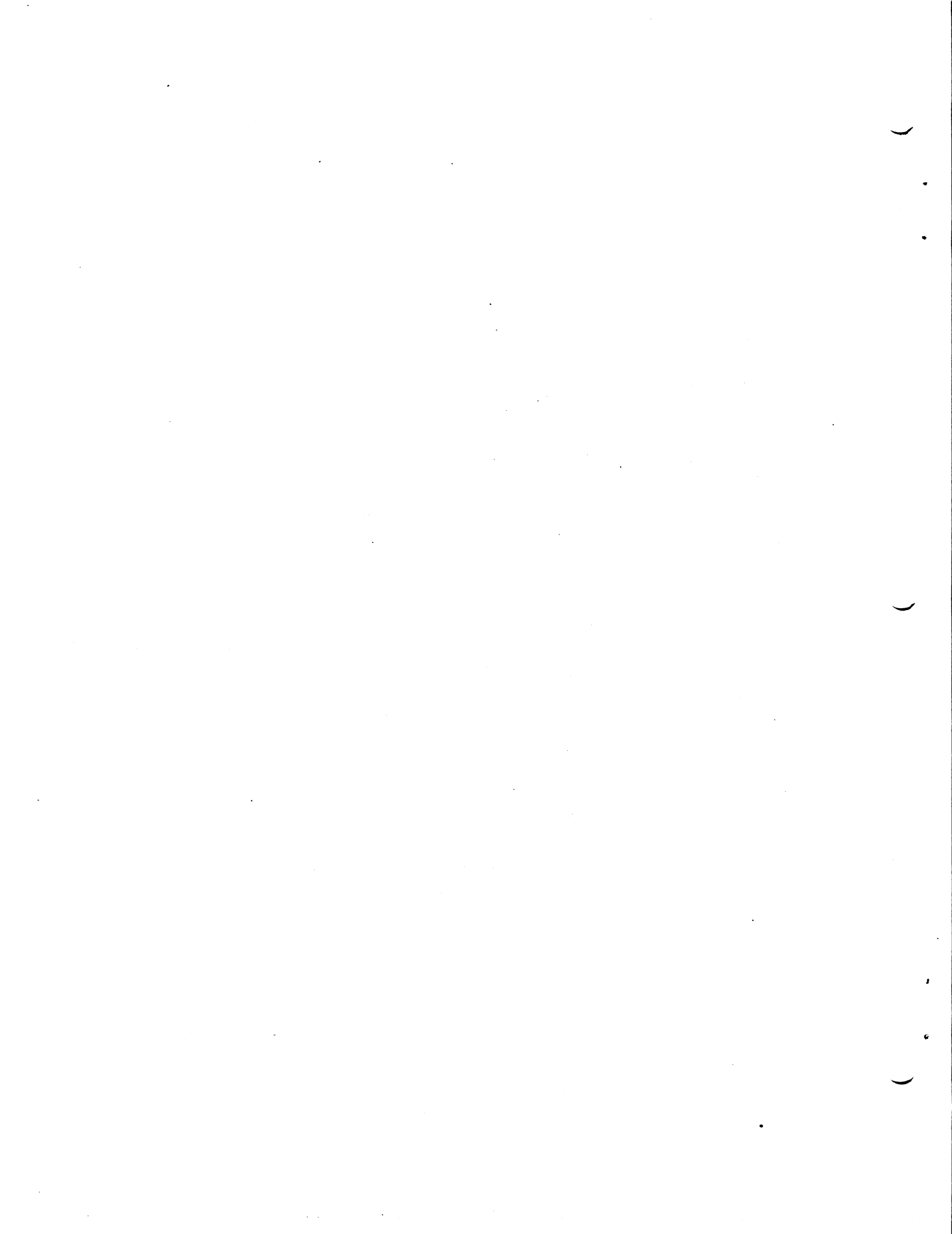
Review Form

We're interested in your experiences with APX programs and documentation. both favorable and unfavorable. Many of our authors are eager to improve their programs if they know what you want. And. of course. we want to know about any bugs that slipped by us, so that the author can fix them. We also want to know whether our instructions are meeting your needs. You are our best source for suggesting improvements! Please help us by taking a moment to fill in this review sheet. Fold the sheet in thirds and seal it so that the address on the bottom of the back becomes the envelope front. Thank you for helping us!

1. Name and APX number of program.

_____

_____

2. If you have problems using the program. please describe them here.

_____

_____

_____

3. What do you especially like about this program?

_____

_____

_____

4. What do you think the program's weaknesses are?

_____

_____

_____

5. How can the catalog description be more accurate or comprehensive?

_____

_____

6. On a scale of 1 to 10. 1 being "poor" and 10 being "excellent". please rate the following aspects of this program:

_____ Easy to use
_____ User-oriented (e.g.. menus. prompts. clear language)
_____ Enjoyable
_____ Self-instructive
_____ Useful (non-game programs)
_____ Imaginative graphics and sound

7. Describe any technical errors you found in the user instructions (please give page numbers).

_____

_____

_____

8. What did you especially like about the user instructions?

_____

_____

_____

9. What revisions or additions would improve these instructions?

_____

_____

_____

10. On a scale of 1 to 10, 1 representing "poor" and 10 representing "excellent", how would you rate the user instructions and why?

_____

_____

11. Other comments about the program or user instructions:

_____

_____

_____

From

_____   ┌─────────┐
                                          │   │
_____   │ STAMP │
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_____   └─────────┘
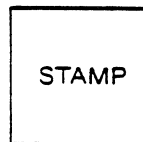

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