The National LOGO Exchange

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Where Does LOGO Fit In?

by

Bonnie Rifkin

Several years ago, school systems began programs for gifted students. These programs tended to be set up (and still are) so that students would leave their regular class for a period of time and either go to a resource room or get on a bus and go to a center for their differentiated learning.

One of the fears with such a set up was that the gifted program would become an entity unto itself, cut off from and in no way relating to the rest of the day's classes. In the majority of cases that fear has been overcome.

The point that I am trying to make is this: as computers make their way into the schools, we must not let them fall prey to the same fear. Just like gifted education, computers are here to stay.

In schools where the gifted students study LOGO, I feel strongly that their experiences should be brought back to the regular classroom and incorporated into the other subjects.

Sharing with classmates is very important. Gifted students often become very excited about what they have done. Why not provide a structured time set aside for them to share their experiences?

Students may explain a new procedure, demonstrate it, or describe how they went about debugging it. Knowing ahead of time that this special period exists, students may even provide visual aids as a part of their LOGO presentation. The activity then doubles as training for presenting in front of a group.

In the case where there are several students that may be feeling frustrated with LOGO, a group project is the perfect solution. Have them pick a theme for a mural, for example. The theme might relate to a science or social studies unit. Split the class into four groups. (For a large class create multiple murals to keep groups small.)

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LOGO and the Single Computer: How to Cope

by

Linda Nix

There has been much excitement in my classroom the past few weeks as we worked with LOGO on the TI 99/4 computer.

Students were eager to come before and after school in order to have extra time to experiment and explore. Several students read ahead in the manual to learn new ways to create programs and then shared their finds with other enthusiastic students. Students excitedly bragged about how they were able to "program" the computer. Students from other grades came before and after school to watch. As a teacher, I, too, was excited because I had become a facilitator rather than just a demonstrator.

The major problem became how to provide time on the computer for everyone who wanted hands-on experience and still work with the established math curriculum. I've tried two different methods so far. Both have been fairly successful. This article's purpose is to share these ideas and possibly stimulate new ideas for time management where only one computer is available.

TWO AND TWENTY

As we began working in the turtle mode, we divided the students into pairs. They took turns acting as secretary (kept records on paper) and programmer (typed in directions). The class period was divided into three twenty-minute sessions and all twenty students were able to use the computer at least three times during a two week period. Students needing more time came before and after school.

The computer was placed in the back of the room. While each group worked, the remainder of the class participated in drill and practice math activities. This gave me time to work with individual students needing help.

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Editor.....Tom Lough

RIGHT 15!

From the spirit of your letters and cards, we are getting indications that the NLX has met many of your needs thus far. For this, we are both pleased and grateful.

However, we would not be serving your best interests if we were not willing to change and grow with you. FORWARD 100, and full steam ahead is great! But it may be time to consider a small change in our direction.

We are all most comfortable doing what we know how to do best. To change and to grow are unpopular ideas with many people. They demand a special effort and some extra time. Yet, it is only by changing and growing that we progress.

In this issue, you will see some new directions, mainly toward the text and list processing part of LOGO. We feel it is time to do this.

Turtle graphics are wonderful! I'm sure there are those who could spend ten years teaching with them and never repeat themselves.

But, unless we help the children discover the added capabilities of LOGO's list processing, aren't we sort of keeping something from them? It is in this part of LOGO that its real power resides. Yes, it can be confusing and complicated. But we are teachers. We can dig it out!

Besides, it seems that the public views LOGO as just turtle graphics. And, why shouldn't they, since almost all the articles have stressed that aspect? Are turtle graphics enough to win the support of the public for LOGO? Perhaps not.

By considering a small change in our direction of LOGO teaching at the right time, we may be turning to a heading with unimagined rewards for you, your children, and your world.

RIGHT 15, FORWARD 100!

Single Computer continued

Most students were able to put their perfected programs in the edit mode by the third session. The edit mode was an excellent way for me to check quickly the accuracy of the student's program without going through the entire thing.

Programs were saved on a disk and recorded in a class LOGO book so students could work each others' programs. This scheduling method worked well, but students did not like the break in sessions before finishing their programs. As they started the second step of programming (this time in the sprite mode), we grouped differently to allow more continuous computer time.

THREE AND SIXTY

Students were divided into groups of three. Each group was given one full class period, approximately 60 minutes, to create and name a sprite program. The computer was put in the hall, so the regular math class could still be conducted without disruption.

When all programs were completed, student groups presented their programs to the entire class. Each group reviewed other groups' programs for debugging and refinements and the programs were stored on a disk.

ALL TOGETHER NOW

For the third programming project students could either work in groups or independently to develop a program which included both the turtle and sprite modes. In most cases they included their own sprites (shapes) in their programs.

Students were scheduled to work on their programs uninterrupted for three entire class periods. This included working out programs on paper, testing them on the computer, and writing up a final copy to turn in. For this project we were able to borrow two additional computers from the high school.

In addition to working on their programs during math class, fifth grade students acted as student teachers for students in first and third grades. These younger students came every day for 45 minutes and were shown the basic LOGO commands. They were then allowed to program the computer. Different fifth grade tutors were used each day so they only missed one or two of their regular classes.

This project was a huge success! The fifth graders worked extremely well with the younger students, thereby gaining confidence and improvement of their computer skills. The younger students had fun and lost their fear of the computer.

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TIPPS for TEACHERS

by

Steve Tipps

The Other Side of LOGO

Turtle graphics have been the subject of my comments and suggestions about teaching with LOGO. The reasons are plain. Turtle graphics are intriguing, creative, compelling, exciting, and form the basis of learning about programming through LOGO. In fact a number of companies market something they call "LOGO" which consists only of turtle graphics. However, turtle graphics is only half (or less) of the power of LOGO.

The other side of LOGO is working and playing with groups or lists of characters such as words, numbers, sentences, and phrases. The list processing capability of LOGO offers new ways for children to learn about language and its rules, just as they learned about geometry and its rules through the turtle. List processing should not be kept on the shelf indefinitely but should be introduced early - along with the turtle graphics. This column suggests some ways which children can prepare to learn about LOGO list processing and use it.

CONTROL AND CORRECTION

Just as children had to know FORWARD, BACK, RIGHT, AND LEFT, a few primitive commands are needed to get started with word play. First, the children need to get the computer to print out messages.

```
PRINT [ I AM SALLY AND I LIVE IN SYRACUSE. ]
PRINT [ THE DAY IS CLOUDY AND GRAY. ]
PRINT [ I AM TALKING TO THE TURTLE.]
```

In the immediate mode, each of the statements will be printed or echoed back to the writer. The writer has the pleasure of seeing what has been written. The computer responds in messages instead of with turtle movements. The editing keys which have been used in turtle graphics (destructive backspace, errors, and delete) can be used to correct any mistakes which are found.

The commands and comments here are directed toward the MIT (Terrapin, Krell) LOGO versions. However, most of them can be used directly with Apple (LCSI) LOGO. The commands for the TI version are similar but not identical.

Remember that <ctrl P> can be used to recall the previous line so that it doesn't have to be retyped every time.

The next step in getting words out of the computer is to write small echo-type programs.

```
TO INVITATION
   CLEARTEXT
   PRINT [ FEBRUARY 3, 1983 ]
   PRINT [ JAMIE, ]
   PRINT [ I AM GOING TO HAVE A
VALENTINE PARTY. ]
   PRINT [ COULD YOU COME? ]
   PRINT [ IT WILL BE AT MY
HOUSE AFTER SCHOOL. ]
   PRINT [ ]
   PRINT [ YOUR FRIEND, ]
   PRINT [ PAT ]
```

The writer produces a message on the screen or on paper with a printer when INVITATION is called. By writing in this delayed mode, the writer now constructs and stores messages for others instead of writing words for immediate personal use. The writing task has changed. Creating a sense of purpose and a sense of audience are important objectives for such creative writing.

The INVITATION may not be right the first time. Corrections in spelling and punctuation are simple. The friendly editor in LOGO allows movement of the cursor to the next line <ctrl N>, previous line <ctrl P>, first of line <ctrl A>, end of line <ctrl E>, and to open a line <ctrl O>. Screen editing in LOGO may not be as sophisticated as WordStar, but it is better than most program editors.

Additions and deletions are also easy. Someone might notice that the day, date, and time of the party, and Pat's home address have been left out. Each could be added into the procedure without having to start from scratch.

Spacing could be improved with blank lines by the insertion of PRINT [ ] between the date and the salutation. However, INVITATION will still print all of the lines starting at the left margin. To adjust the spacing of the letter, often called formatting the letter, CURSOR moves can be used. The textscreen is composed of 40 spaces across (numbered 0-39) and 24 lines down (numbered 0-23). CURSOR needs two inputs to tell it where to start printing. If the date is to start in the center of the page and 10 lines down, then

```
CURSOR 20 10
PRINT [ FEBRUARY 3, 1983 ]
```

in INVITATION would position the date. The closing might be directly under the date but on line 15 with the signature 3 lines under it:

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Tipps continued

```
CURSOR 20 15
PRINT [ SINCERELY, ]
CURSOR 20 18
PRINT [ PAT ]
```

Other page formatting can make the message like a stair step or indented. The important idea in experimentation with PRINT and CURSOR is that the words can be controlled and corrected just as effectively as turtle moves. When children can print out messages in both the immediate mode and the delayed mode, they are ready to move into some more sophisticated uses of LOGO list processing.

AN INVITATION FOR ALL

In addition to controlling printing by editing a program, the writer can also change the message from the keyboard. If Pat wanted to invite 10 friends to the party, ten invitations could be printed with a REPEAT statement. OUTDEV 1 directs the message to a printer assumed to be in slot 1. OUTDEV 0 returns output to monitor.

```
OUTDEV 1
REPEAT 10 [ INVITATION ]
OUTDEV 0
```

Now Pat gets ten invitations, all addressed to friends named Jamie! One further change might be to eliminate the salutation line and write in each name by hand. Or, INVITATION could be edited ten times, changing the name each time. Both of these actions are rather clumsy and do not tap the ability of the computer.

But why not let the children try each of these methods at least once before moving on? I believe that doing things the old-fashioned way builds an awareness of the process which you later want to computerize - rather like walking through turtle commands. I find that having done things the slow or tedious way makes learners less in awe of the process and more appreciative of the product.

The more sophisticated method involves changing the name by using a local variable. Looking into the original INVITATION procedure, the student should be able to see that the line which needs to be changed is PRINT (JAMIE). But, JAMIE is a "value" for a name. What needs to be changed 10 times is the <u>value</u> of NAME, a variable.

The idea of variables may or may not have been introduced formally, although children will have been using the concept since the first time they typed in FORWARD 10. FORWARD is a command which needs a value before it can be executed. From the keyboard we can give FORWARD a value of 10, 20, 100, or anything else. The value can vary or change.

(The debate about how and when to introduce variables continues, but that's an issue which I'm sure Glen Bull will take up in a future column. For now, I'm going to pretend there isn't even such an issue.)

Variable control can be applied to list processing by fixing INVITATION in the first line which states the procedure and in the lines which contain the item to be changed.

```
TO INVITATION :NAME
   .
   .
   PRINT  :NAME
   .
   .
   END
```

The first line says that when INVITATION is called, something else also must be specified as an input. In this case, it is the :NAME of the invitee. The colon tells LOGO you are referring to a variable <u>value</u> rather than a procedure name. Thus, ten INVITATIONs can be printed by:

```
OUTDEV 1
INVITATION "JAMIE
INVITATION "JOHN
INVITATION "DANA
.
.
INVITATION "NATHAN
OUTDEV 0
```

The convention for giving the computer a name to put in INVITATION requires an initial quote mark. The rationale becomes clearer with some of the later list processing capabilities.

The process by which computers automatically insert our names into those all-too-familiar form letters from mailing lists is beginning to emerge. Word processing and file merging are important computing functions which will be used by adults and children. LOGO encourages exploration of such powerful computing ideas by making the process accessible with a simple vocabulary and obvious structure.

Although this example is cumbersome from LOGO's point of view, the ability to specify from the keyboard something inside the program is powerful. List manipulating abilities of LOGO will be treated next month.

WORD PROJECTS

Another classroom project could be composition of poems:

```
TO MARY.POEM
   PRINT [SOMETIMES I'M HAPPY. ]
   PRINT [SOMETIMES I'M SAD. ]
   PRINT [BUT WHEN YOU ARE MY
FRIEND, ]
   PRINT [ I'M ALWAYS SO GLAD. ]
   END
```

continued on page 7

MICROWORLDS

by

Glen Bull

Introducing the Text Screens

When they first begin LOGO, most children use the text screen only as a transition to turtle graphics. However, LOGO also has great potential for activities in the language arts. A number of its instructions are designed to facilitate play with words and sentences.

Many of these activities are dependent on use of recursion. However, stepping stones can be introduced before the concept is treated in detail. Let's examine a few possibilities, using MIT LOGO.

GETTING ACQUAINTED WITH THE TEXT SCREEN

The text screen can be visualized as a grid 40 spaces across and 24 lines down. The spaces are numbered 0 to 39 and the lines are numbered 0 to 23.

The cursor (the blinking square) can be sent to any space or line on the screen. For example, CURSOR 19 1 sends the cursor to a point 20 spaces over in the second line of the screen.

In previous NLX issues, Steve Tipps has noted the importance of familiarization with a concept before applying it at more abstract levels. The user should be allowed to experiment with direct execution of cursor positioning instructions on the text screen before using them in procedures.

Cursor positioning instructions can be combined with PRINT statements to place text at various positions on the screen. Previous text on the screen is cleared by use of the instruction CLEARTEXT.

```
CLEARTEXT CURSOR 19 12 PRINT [HELLO   THERE!]
```

LOGO normally disregards the extra spaces between words. For example, the line above would be executed as:

```
HELLO THERE!
```

Extra spaces will be retained if the text is placed between single quotation marks. Thus, the line PRINT ['HELLO THERE!']will be printed as:

```
HELLO  THERE!
```

A PRINT statement blanks the rest of the spaces on a line beyond the printed text and sends the cursor to the beginning of the next line. For example, REPEAT 4 [PRINT [X]] prints each "X" on a separate line:

```
X
X
X
X
```

In contrast, PRINT1 leaves the cursor at the end of the text printed. Thus, REPEAT 4 [PRINT1 [X]] produces:

```
XXXX
```

These instructions can be executed directly in the text mode without knowledge of any other instruction except the REPEAT statement. Hence, they can be introduced at almost any time after the initial introduction to LOGO. As soon as the user begins to define procedures, these instructions can be combined to produce simple animation effects.

IT MOVES!

Animation can be created by drawing an object, erasing it, and redrawing it in a new place. The object must be erased and redrawn in less than a twentieth of a second to create the illusion of movement. These rates can be achieved with a series of PRINT statements.

In fact, a series of PRINT statements can draw and erase an object so quickly that it may not be seen. Therefore, it is necessary to insert a WAIT statement before erasing the object and redrawing it in a different position.

Other versions of LOGO (LCSI and TI, for example) have a WAIT instruction as a builtin command, or primitive. For versions that do not, it is easy enough to create one.

```
TO WAIT :TIME
   IF :TIME<0 STOP
   WAIT :TIME-1
   END
```

The WAIT statement takes a number supplied to it and repeatedly subtracts one from the number until the number is less then zero. The larger the number, the longer the wait.

To illustrate, an arrow can be constructed from a few dashes and an angled bracket:

```
TO ARROW
   CURSOR 0 10
   PRINT [ --->]
   CURSOR 0 10 WAIT 5
   PRINT [  --->']
   CURSOR 0 10 WAIT 5
   PRINT [          --->']
   CURSOR 0 0
   END
```

continued on page 6

The rate at which the arrow moves across the screen can be increased or slowed by changing the number after WAIT. Since the arrow appears to hang in mid-air at the end of its flight, a backstop provides it with a reason for stopping.

```
TO BACKSTOP
   CLEARTEXT
   CURSOR 18  9 PRINT1 [!]
   CURSOR 18 10 PRINT1 [!]
   CURSOR 18 11 PRINT1 [!]
   CURSOR 0 0
   END
```

The effect is even more satisfying if an impact is heard as the arrow strikes the backstop. There are a number of special characters which do not appear on the screen, but achieve other effects instead.

For example, CHAR 7 is a bell. That is, it was originally a bell on older teletypes and other terminals. On most microcomputers, it now sounds more like a beep instead. Try PRINT1 CHAR 7 in the direct execution mode. If this instruction is inserted as the next to last line in the ARROW procedure, it will produce a sound as the arrow hits the backstop.

If a "balloon" target is placed against the backstop, it will "pop" as the arrow pierces it.

```
TO TARGET
   CURSOR 17 10 PRINT1 [O]
CURSOR 0 0
   END
```

To make use of all three procedures, type them in the following order in the direct execution mode of the text screen:

```
BACKSTOP
TARGET
ARROW
```

ERASING A LINE

Children (adults, too!) derive a great deal of pleasure from powerful effects. One sign of a powerful effect is a large result produced by a small effort. This is one reason children like to use numbers such as 1000 when they first begin with the turtle. This causes the turtle to draw for a long time!

The same sort of effect is found in instructions such as REPEAT 1014 [PRINT1 [+]], which fills the screen with +'s. This also makes it possible to demonstrate the difference between PRINT and PRINT1.

First, fill the screen with a character. Then, observe the effects of the following instruction:

```
CURSOR 0 1 PRINT [ERASE LINE]
```

Compare this with the effect of:

```
CURSOR 0 10 PRINT1 [ERASE LINE]
```

If empty brackets are placed after a PRINT statement, nothing is printed. This has the effect of blanking the line. Observe the effect of the following:

```
CURSOR 0 20 PRINT [ ]
```

LOGO ON BROADWAY!

This capability can be used to draw and erase a marquee which marches across the screen, just like the one in Times Square! Tail recursion is used to make the procedure call itself over and over again, so the sign does not move across the screen once and stop, as the arrow did.

```
TO MARQUEE
   CURSOR 0 10 PRINT [SEE OUR
PLAY]
   WAIT 30 ERASE.MESSAGE
   CURSOR 13 10 PRINT [SEE OUR
PLAY]
   WAIT 30 ERASE.MESSAGE
   CURSOR 26 10 PRINT [SEE OUR
PLAY]
   WAIT 30 ERASE.MESSAGE
   MARQUEE
   END

TO ERASE.MESSAGE
   CURSOR 0 10 PRINT [ ]
   END
```

This marquee moves across the screen 13 spaces at a time. A slight enhancement makes it possible to show the message more than once and to vary the number of spaces moved by altering a single number.

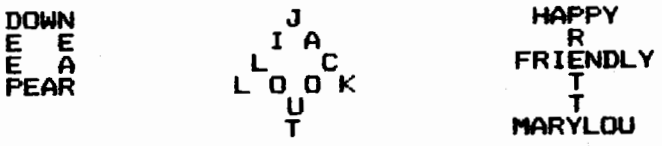
```
TO MARQUEE.I
   CLEARTEXT
   MAKE "POSITION 0
   MARQUEE.II


TO MARQUEE.II
   CURSOR :POSITION 10
   PRINT [SEE OUR PLAY]
   WAIT 10 ERASE.MESSAGE
   MAKE "POSITION :POSITION + 1
   IF :POSITION >27 MAKE
"POSITION 0
   MARQUEE.II
   END
```

The program first sends the cursor to position 0 on line 10 and then prints the message SEE OUR PLAY. After waiting for 10 counts, the message is erased. The position is advanced by 1. The procedure repeats after checking to make sure that the message will not be pushed off the end of the screen, the procedure is repeated. Changing the number in the line MAKE "POSITION :POSITION + 1 will alter the distance the sign moves between recursions.

Glen Bull is a professor at the University of Virginia, and has taught LOGO courses at the graduate and undergraduate level.

Tipps for Teachers continued

Such computerrel will not replace Walt Whitman, but may lead to some projects such as shape play with words using PRINT and CURSOR.



FIRST LAST WORD

The first skill in list processing is getting the computer to print messages which can be controlled, corrected, and changed. Creating word products can be as much fun and may have more utility than turtle graphics.

I recommend that teachers who are working with computers get a word processing program for their own use. The cost is from $70 to $700 with the usual relationship between cost and features.

My one word of bias is against word processors which require changing of "modes" for creating, deleting, inserting, and making capital letters. You will recognize these word processors if you have to hit a key to insert a letter, then a key to exit, then a key to delete, then a key to exit, and so on. All this superfluous key-punching gets in the way of the task.

LOGO sets a good example for screen editing, and experience with it will let you recognize immediately a program which puts barriers in the way of your composing and correcting. When you have used word processing, you will be able to help children use LOGO as an introduction.

Classroom writing with the computer will be an exciting addition to the language arts curriculum. However, one issue needs to be raised, if not resolved. When working with turtle graphics, typing seems to be manageable by the hunt- and-peck method. However, typing with text will not be so easy. Will children need touch typing lessons early or can they be delayed to sixth grade, for example? Are their hunt-and-peck habits going to be as hard to break as those of adults? After you have had some experience with text, let me know what you think.

Steve Tipps is a professor at the University of Virginia, and has presented LOGO workshops for teachers throughout the eastern United States.

Where LOGO Fits continued

Assign each group a quadrant of the mural. Initially, there has to be discussion between groups to decide exactly what will be included in the mural. Then each group separately designs and writes their quadrant procedures.

Once the group has finished, all procedures can be stored on one disk for the final product. This activity will provide positive reinforcement for students needing it along with practice in group problem solving, cooperation, organization, and efficiency. Saving all procedures on one disk may clear up notions of how workspace and disk storage relate.

In language arts we stress the importance of precise spelling and grammar. The same is true in LOGO. Punctuation can also be related to the use of quotes, dots, and square brackets in LOGO. Learning new reading vocabulary can be associated with teaching the computer new words.

There are several class assignments in which planning ahead is very important. When writing reports or stories, students should not simply sit down and write. They must first prepare an outline to help with the organization.

The same type of planning must take place while constructing a LOGO project. Students may not be convinced that it is necessary to write an outline of their report on whales, but a LOGO procedure for a whale consisting of body, flipper, and airhole certainly must be "outlined" first.

There are several ways to do "take offs" on science topics. For example, while studying the solar system, challenge students to write LOGO procedures to draw the planets in their correct order with the proper size relative to one another. While studying food chains, suggest that they develop procedures to draw the animals, fish, and the like in the proper order of the chain. Part of a student science fair project might include LOGO procedures to illustrate a concept.

Of course LOGO and art are a good pair. Use of color, symmetry, asymmetry, and perspective drawing can all be explored.

The subject that obviously has been omitted here is mathematics. I have done this purposely because math is the first subject with which any computer work is associated. Therefore, I hope to encourage teachers to combine other subject areas with the computer and with LOGO.

Bonnie Rifkin is an educational consultant, teacher, and an intern at the Technical Education Research Center (TERC) in Cambridge, MA.

NLX Pen Pals Wanted!

We have two unmatched classes in the NLX Pen Pal Program. If you and your class have interests, grade levels, and experiences which parallel either of those listed below and you would like to be matched up, please let us know right away!

The only suggested requirement is that you agree to correspond with each other at least once a month.

TX-5-TI-1. This is a class of 25 fifth graders in Texas. They have been using TI LOGO since November, and have worked with both the turtle and sprites. They would like to be matched with a school in the south-west, if possible.

AK-78-MIT-2. This class of 15 7th and 8th graders in Alaska has been working with MIT LOGO since September. They are just beginning to write procedures which contain sub-procedures. There are also several other students in the computer club who have worked with the robot turtle and 3-D designs. They are eager to correspond with other students who are also working with LOGO.

If you would like to be matched with either of these classes, or with others which become available, please send us the grade level and age of your students, how long they have been working with LOGO, a brief description of their recent LOGO activities, what computer and LOGO version you have, how many students you have, and your name, address, and school telephone number.

PENDOWN

Sandy Towberman sends the adjacent cartoon of "Tommie Turtle," along with an interesting suggestion for creative writing classes.

Why not have children design and caption their own cartoons drawn with LOGO, similar to the one she sent in? Some years ago, it was popular to put captions with doodles. Use this same idea with LOGO drawings. Since Valentine's Day is coming up, how about some funny quotes to go with a LOGO-drawn heart? (One of Sandy's suggestions had Tommie just finishing a heart on the screen and saying "I'm in the mode for love!")

From a creative writing project such as this, it is a small step to put together a booklet which features cartoons by your class. Perhaps the school could "publish" it and have a copy catalogued into the library. (What a time for a lesson on the Dewey Decimal System!)

Sandy Towberman is an artist, writer, and musician who, with her husband, a Lutheran clergyman, is raising a daughter in Canton, Ohio.

The Single Computer: How to Cope continued

The other teachers also gained confidence about using the computer and several of them now plan to use it in their classroom activities. As we get more computers and as more students and grade levels become involved, the scheduling problem will become even more difficult. But that is something we can work out.

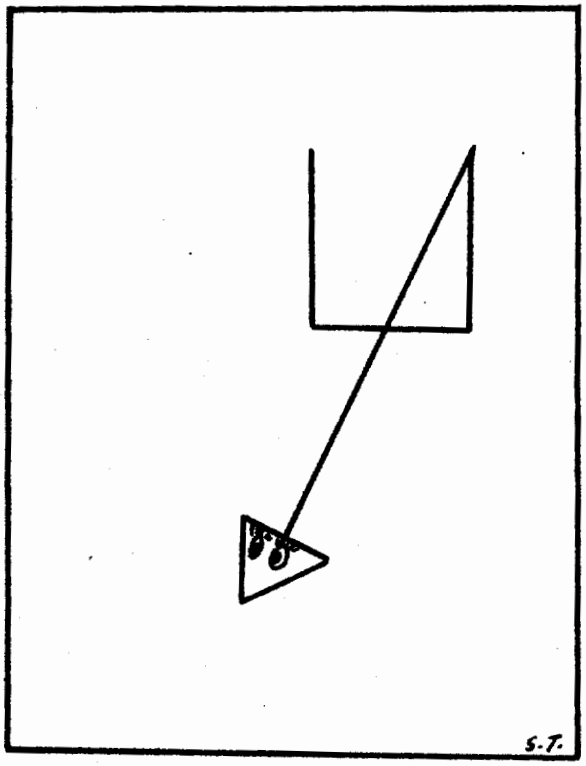
A FINAL NOTE

LOGO has been a great motivator. One boy who could not seem to learn his multplicaiton facts mastered them so he could be allowed time to use the computer, and is now a regular after school "drop in."

The more the students learned, the more they wanted to learn. But, they also learned that programming takes a lot of time and patience. They now appreciate the complexity and time involved to develop the compter games they love to play.

Linda Nix is a fifth grade teacher at Forest North Elementary School in the Round Rock Independent School District, Austin, Texas.

Tommie Turtle by **Sandy Toberman**



"Someone always wants to tell me what to do!"

NLXTRA

FORWARD 100!

WHERE DO I WRITE?

Tell them you read about them in the NLX!!

Digital Research, PO Box 579, Pacific Grove, CA 93950

Atari LOGO, PO Box 50047, San Jose, CA 95150

Mattel LOGO, The LISP Company, PO Box 487, Redwood Estates, CA 95044

Cybertronics International Inc., 1410 Shrader St., San Francisco, CA 94117

Radio Shack Education Division, 1400 One Tandy Center, Ft. Worth, TX 76102-2805

Krell Software, 1320 Stony Brook Road, Stony Brook, NY 11790

Harvard Associates, Inc., 260 Beacon St., Somerville, MA 02143

Terrapin, Inc., 380 Green St., Cambridge, MA 02139

DO YOU GIVE LOGO WORKSHOPS?

Many teachers and school systems are seeking qualified individuals to present LOGO workshops and inservice programs. Do you have such a program to offer?

If so, please contact us so we can publicize your activities. Send us information on your scope, content, and experience. Please be sure to include your address and phone number.

Flyers about The National LOGO Exchange are available for distribution. Teachers everywhere are looking for LOGO reference material. If you would like to help "spread the word," let us know. We will send you copies right away. Thank you! FD 100!

FROM THE NLX MAILBAG

Dear Editor:

I agree with your proposed "new directions!" (NLX February 1983). We should go beyond turtle graphics and explore new uses of LOGO as you indicated.

Dr. Luis M. Salces
Chicago Board of Education

*Thank you! Watch for April's Classroom Computer News. Steve Tipps and I wrote a "nonturtle-like" article for that issue. TL

The first International Computer EdGame Challenge is on! Sponsored by Verbatim Corporation, and administered by CONDUIT and MicroSIFT, this contest seeks entries of imaginative instructional game software which make learning easier for pupils of all ages.

There are 3 divisions, K-8, 9-12, and college, with content categories within each division. Any computer language may be used. We suggest that this is a fine opportunity to show what LOGO can do!

Prizes include $500 gift certificates and IMB PC's. Winning entrants will be eligible for royalty payments also.

We appreciate their rule that only games of a <u>non-violent</u> nature will be considered.

The deadline is March 31, 1983. For more information and a detailed brochure, call 1-800-221-4052. In Oregon, call 248-6800.

Good luck!!

LOGO WORKSHOPS COMING UP!

We have received notices about the following LOGO workshops.

March 22 - Bellingham, WA. Contact TERC, 617-547-3890.

April 4,6 - St. Paul, MN. Contact MECC, 612-638-0626.

April 6 - Raleigh, NC. Contact TERC.

April 13 - Portland, OR. Contact NWREL, 503-248-6800, ext. 551.

April 28 - Cambridge, MA. Contact TERC.

June 9 - Watertown, CT. Contact TERC.

Do you have an Epson MX-80 printer? Here is a nifty procedure to printout in enhanced letters with LCSI LOGO.

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TO ENHANCE
   .PRINTER 9
   (TYPE CHAR 27 CHAR 69)
   .PRINTER 0
   END
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