

# THE NATIONAL LOGO EXCHANGE

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FORWARD 100!

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## Circles, Arcs, and Headaches

by  
Sharon Burrowes

Although we have been using Apple (LCSI) Logo in our elementary schools for more than a year, suddenly we became aware of a problem of the kind that gives a computer coordinator such as myself grey hair, ulcers, and headaches all at once!

The difficulty centered around the built-in arc and circle procedures provided on the Apple Logo master disk. (For NLX readers not familiar with this, there are circle and arc procedures in the STARTUP file on the master disk which can be loaded in after you boot Apple Logo.) Initially, these procedures seemed like a neat idea to speed up programming and make things easier for the students.

### HEADACHE # 1

However, the problems started when quite a few students began using these procedures in their work. The circle and arc procedures are buried; that is, they take up space in memory, but are not listed when you type POTS. Thus, students (and many teachers) are unaware that they are not Logo primitives.

My headaches began with a rash of telephone calls about "sick" computers that were actually in excellent health. The problem was not the equipment at all, but rather these circle and arc procedures.

Here's what typically happens: Student 1 boots Apple Logo, takes out the master disk, puts in a file disk, and presses RETURN. (This process does not load the circle and arc procedures into the workspace.) Later, Student 2 comes to the computer, loads a set of procedures which need the circle or arc procedures, and tries to run them. Messages such as I DON'T KNOW HOW TO CIRCLER appear, and telephones such as mine begin to ring!

### HEADACHE REMEDY # 1

About the fourth or fifth time this happened, I decided that something had to be done. "Aha! I'll just replace the STARTUP file on the master disk with an empty file, and let the teachers know where the procedures can be found in the manual," I thought to myself, and did so.

My solution brought cries of agony from my more sophisticated teachers who had carefully taught their students how to manage the procedures correctly. They wanted them back and couldn't understand why everyone couldn't teach their students how to load them properly.

### HEADACHE # 2

My bright idea of letting students and teachers type in the procedures from the manual brought more cries of agony. Oops! I practically live in front of a keyboard, and had forgotten about the typing speed of fourth graders and teachers with little keyboard experience. My headache was getting worse, and my hair greyer!

I firmly believe that circle drawing is a very important problem solving experience, and that students should explore how to do it for themselves. However, the time had come for a compromise!

### HEADACHE REMEDY # 2

I took apart the STARTUP file and isolated the circle and arc procedures. Next, I saved each procedure in a separate disk file named after the procedure. For example, the CIRCLER procedure was saved under the file name CIRCLER. This made it possible for students to load into their workspace the particular circle and arc procedures they might need. This reinforced the idea that a procedure and not a primitive was doing the circular drawing for them.

## Headaches continued

Then I designed a series of activity sheets to encourage students to explore on their own how to draw curves and circles. Included were suggestions using REPEAT to explore curved lines, closed figure projects to help students deduce the Rule of 360, and some hints on controlling the size of circles. (Ed. Note: For additional arc and circle activity suggestions, see Tipps for Teachers elsewhere in this issue.)

### MORE HEADACHES TO COME?

If you are just getting started with Apple Logo, perhaps you can avoid a few more grey hairs, incipient ulcers, and LOTS of headaches by avoiding my mistakes. Make an appropriate decision about these "built in" circle and arc procedures, and then train both fellow teachers and students in a way which best suits your curriculum. I believe that this particular source of headaches is under control for now, but I wonder what will be waiting for me when I ARCR around the corner!

Sharon Burrowes is the computer coordinator for the Wooster (OH) City Schools, and is a frequent contributor to the NLX and other national educational computing periodicals.

## Logo Depository Established

Educators at Saint Martin's College are establishing a depository of Logo materials as a resource for continued support of Logo teachers. They are soliciting contributions of Logo related materials (software, research articles, workbooks, texts, periodicals, "hands on" guides, etc.) to become part of their permanent collection. The resource material will be incorporated into a Logo Library designed to allow teachers to explore Logo software, literature, and curricula. This Logo Library is the object of a current masters project, and will interface with the Saint Martin's College Microcomputer Resource Center, which boasts the largest software collection on the west coast. For more information, contact Diane McMurdie, Curriculum Library, Saint Martin's College, Lacey, WA 98503, or call (206) 491-4700.

## From the Editor

### Be It Resolved

Each January brings with it an invitation for new year's resolutions. As I was formulating some of mine, I got to thinking about another definition of resolution I learned some time ago. It went something like this:

Resolution - the process of distinguishing between or rendering visible the separate parts of an item under observation.

Granite gives us a straightforward application of this aspect of resolution. When you look at a chunk of granite up close, you notice a "salt and pepper" crystalline texture to its rough surface. The various mineral components are readily visible; you can easily distinguish the icy quartz and sparkly mica from the darker hornblende and the pastel feldspar. At a distance of several meters, however, this same piece of granite appears to be more or less uniformly grayish or pinkish, with a smoother texture. The individual mineral crystals appear to be so small that they are indistinguishable. It's a matter of resolution.

In this issue of the NLX, you find several references to circles. But when we draw a circle, we actually draw a regular polygon. What makes the polygon a circle? We have to draw the sides so small we cannot distinguish them. Only then can we see the full beauty of the form we call the circle. It's a matter of resolution.

In Logo teaching, we are acutely aware of how things seem to be going in our classes from day to day. But sometimes we agonize over details and get deeply involved in specific actions. It is only when we view everything in perspective (at arms length, so to speak), that the specifics begin to merge and we sense the overall progress being made. It's a matter of resolution.

There are times when we want to see the various mineral crystals in granite, the nature of the sides of a polygon, the exact organization of a Logo procedure. But let us resolve not to forget the importance of another point of view, one in which the details fade, allowing more universal characteristics to emerge.

FD 100!

# Tipps for Teachers

by Steve Tipps

## Wonderful Wiggles

Student projects often require the use of circles and curves. Even after students are able to make a circle using the ubiquitous

REPEAT 360 [FD 1 RT 1]

they are often perplexed when they need a larger circle, smaller circle, or part of one. Ocean waves, flying birds, species of flowers, and many other projects depend on facility with wiggles. Helping students understand how circles are made is a continuing process in the Logo classroom. Try some of these ideas to see what kind of wonderful wiggles can be made.

### CIRCLE SENSE

Circles are the source of many puzzles and projects with Logo. Just making a circle is quite a thinking task. (Ed. note: For a different point of view, see the NLXionary in this month's issue.) For both elementary students and adults, playing turtle shows what the screen turtle does when making a circle. One method is to walk a circle drawn on the floor with tape or chalk. Another is to have students work with Cuisenaire rods or kindergarten blocks to approximate a circle.

Different sizes of Cuisenaire rods are different colors. Make circles with white or red rods (which are short) and with the longer black or orange rods. See how many of each sized rod is required to make an "adequate" circle. Typically, the answer is "at least" ten. Fewer than ten makes a figure which is more accurately labeled a square, hexagon, octagon, or other regular polygon.

The size of the circle can also be calculated by relating it to the equivalent number of white rods. A circle shape formed with twelve red rods is equivalent in circumference to twenty-four white rods. Working with rods reveals that the more sides the figure has, the closer it comes to looking like a circle.

Another understanding is more difficult to model. Turn a little or turn a lot provides intuitive understanding, but it is not easy to quantify. Some students get the Rule of 360 quickly, while others need more structure to discern it. Some partial circle probes can be helpful. Have the students guess what each of the following REPEAT statements draw.

REPEAT 10 [FD 5 RT 18]  
 REPEAT 9 [FD 10 LT 10]  
 REPEAT 45 [FD 1 RT 3]  
 REPEAT 24 [FD 4 LT 15]  
 REPEAT 12 [FD 3 RT 10]

Have students test their guesses by typing in statements to see what happens. Many of the guesses will be far off. Have each student (or group) construct a similar REPEAT statement and explore it completely. Make half circles, whole circles, large circles, small circles, quarter circles. Change LEFT to RIGHT and change FORWARD to BACK. Have students keep track of the number of REPEATs, the number of steps FORWARD (or BACK) and the number for the turn commands for the various figures. Then you are ready to probe for a rule about what must be true for angles in circles.

Collect all the information on a chart. Each group of students should have some information to contribute. Here is a sample chart for quarter circles. Use similar charts for half circles and whole circles.

### QUARTER CIRCLE

	REPEAT #	FORWARD #	RIGHT #
Group I	_____	_____	_____
Group II	_____	_____	_____
Group III	_____	_____	_____
Group IV	_____	_____	_____

From the chart, the total turn number (REPEAT # times RIGHT #) needed for a quarter circle, half circle, and whole circle should be apparent for most students. However, actually using the Rule of 360 may not be nearly as easy. Inducing the rule is simpler than the reverse process of deducing what should be done with the rule.

Piaget describes this last step as part of the transition from concrete to formal or hypothetical-deductive reasoning. Inducing the rule is descriptive of what actually happens. Deducing from the rule requires hypothesizing the relationship between variables. One potent line of Piagetian research in Logo would be to see whether students with Logo experience actually make this

## Tipps continued

transition earlier, as Papert suggests. (See Mindstorms, page 174 ff.)

Working with REPEAT statements to make partial circles should generate many projects. Making parts of circles is a good exercise in modularity. Which of the REPEAT efforts is the most effective in making good circles?

The circle needs enough sides to appear to be circular in shape. But the number of sides should not make the circle a trial of patience. Creating a whole family of circle parts means the REPEAT number should be easily divisible by 2, 3, 4, 5, or 6. Therefore, 12, 15, 18, 20, 24, 30, or even 36 or 48 REPEATs could be good choices. Here are examples of part circles using 24 in the REPEAT statement.

```
TO CIRCLE
REPEAT 24 [FD 3 RT 15]
END
```

```
TO HALF.CIRCLE
REPEAT 12 [FD 3 RT 15]
END
```

```
TO Q.CIRCLE.RT
REPEAT 6 [FD 3 RT 15]
END
```

```
TO Q.CIRCLE.LT
REPEAT 6 [FD 3 LT 15]
END
```

Notice that the size for all of these partial circles is based on FD 3. The procedures are limited because they are fixed in size. Instead of writing new procedures for every new size, variable procedures for the circle parts are more flexible.

```
TO Q.CIRCLE.RT :SIZE
REPEAT 6 [FD :SIZE RT 15]
END
```

The explorations are 100 times easier and more fruitful. The results can make curlicues, wiggles, shapes, and designs of many kinds.



One additional step in making wiggles seems necessary. Half circles and quarter circles were fine, but what about 3/10 or 0.75 of a circle? New procedures for each new fraction are possible, but a new variable procedure with an input for the part is better. CURVE.RT seems just right because it uses the part of the circle as input.

```
TO CURVE.RT :PART :SIZE
REPEAT :PART * 24 [FD :SIZE RT 15]
END
```

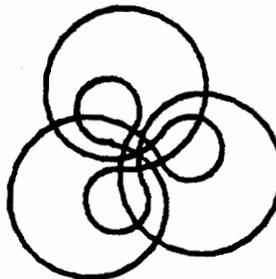
You can write CURVE.LT to draw curves to the left. The variable PART is useful for common fraction input, such as 1/2 and 1/3.

```
CURVE.RT 5/6 4
CURVE.LT 5/6 10
CURVE.LT 1/3 8
```

The above sequence of curves makes a nice wiggle which can be combined into a REPEAT statement

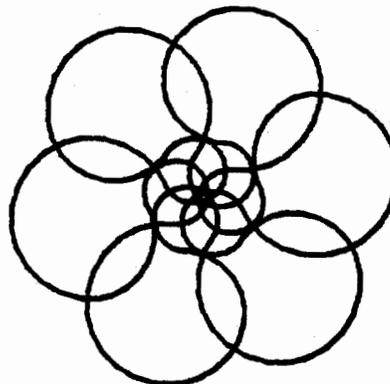
```
REPEAT 3 [CURVE.RT 5/6 4 CURVE.LT 5/6
10 CURVE.LT 1/3 8]
```

to define a TRIFOIL procedure.



A small change in the PART input to the second curve changes the shape into a POSY.

```
TO POSY
REPEAT 6 [CURVE.RT 5/6 4 CURVE.LT 4/6
10 CURVE.LT 1/3 8]
END
```



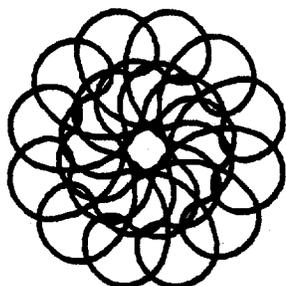
## Tipps continued

Other combinations and changes also make interesting wiggles and flower shapes. Some figures may close, while others undulate across the screen. It is both fun and instructional to try to predict the outcome of the figure in advance.

Decimal fractions can also be used as the PART value. STAR.FLOWER and LACE.EDGE demonstrate both the use of decimal fractions and how slight differences in the commands make major differences in results.

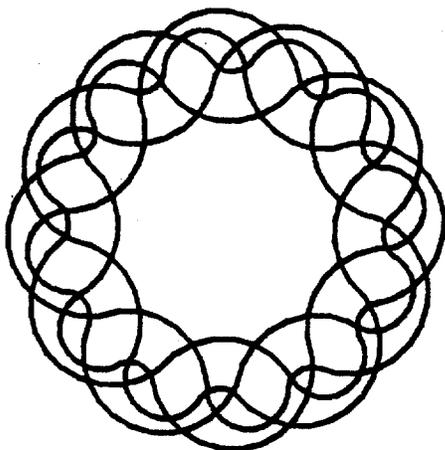
TO STAR.FLOWER

```
REPEAT 12 [CURVE.RT 0.3 3 CURVE.LT 0.5
5 CURVE.RT 0.3 10 CURVE.RT 0.5 5]
END
```



TO LACE.EDGE

```
REPEAT 12 [CURVE.RT 0.3 3 CURVE.LT 0.5
5 CURVE.RT 0.3 10 CURVE.LT 0.5 5]
END
```



These wonderful wiggles should lead to many more. They are the result of playing with fractional ideas. Whether your students are working with common fractions or decimals, parts of circles are a good way of exploring.

For additional ideas and projects, I suggest The Rule of 360, available for \$7.95 from Martin-Bearden, Inc., 1810 Erwin Place, McKinney, TX 75069.

[Note: The procedures in this column were developed with Terrapin Logo and work equally well with the Commodore and Apple MIT Logo versions. However, Apple (LCSI) Logo treats the common fraction input to CURVE.RT and CURVE.LT somewhat differently. Only seven repetitions result from CURVE.RT  $1/3$  8, for example. But PRINT  $1/3 * 24$  gives 8, and CURVE.RT 0.33333 8 works correctly. The cause of this inconsistency is not readily apparent. It seems to stem from the method REPEAT rounds or truncates its input to form an integer. Any ideas?]

### POLY WANTS AN HOUR (OR TWO)

With complete understanding of the Rule of 360 comes the realization that all polygons can be made from a single variable procedure. By setting the numbers of sides with an input variable, all regular polygons can be drawn.

TO POLY :SIDES :SIZE

```
REPEAT :SIDES [FD :SIZE RT 360/:SIDES]
END
```

While this procedure for POLY is often presented as a formula, Logo teachers must resist the easy way. Many students from ages 10 to 15 can create an all purpose regular polygon maker for themselves. After discovering POLY, students typically go back to specific procedures for SQUARE, OCTAGON, and HEXAGON. This doesn't mean that they have forgotten the lesson of POLY. Instead, it indicates the powerful idea of "naming," which is built into Logo. Many different animals are dogs, but they are called collies, spaniels, and schnauzers, or even Lassie, Irma, and Spritz.

Time is needed for this learning. Avoid being impatient with children and adults who need time to play with Poly. Logo is not a timed test. The digression properly built into Logo activities is one of its potent features because trial and mistake are on the route to understanding.

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Krell Logo for the Apple is available for \$73.95 from Software Solutions, 11185 San Pablo Avenue, El Cerrito, CA 94530. (415) 237-5257. Include \$3 for shipping and handling.

# NLXionary

## A Lectionary of Selected Logo Readings

by Griff Wigley

"Computing for Families," by Fred D'Ignazio, Computel's PC & PCjr, October, 1984.

>Here is an article which illustrates the profound misconceptions of Logo still prevalent in today's world of educational computing.

>D'Ignazio reports that experts in the field of educational computing are increasingly negative on both teaching students about the computer as well as teaching them to program, as means of achieving computer literacy. He says teachers and parents see Logo as a "computer-literacy language for themselves and their youngsters." Since today's computers and programming languages will be obsolete by the 21st century, we may be "miseducating" today's students by teaching them programming and how computers work.

>Then, as sort of an aside on the appropriateness of Logo for children and its influence on children's development and learning, he says, "In a study made at the Bank Street College of Education, for example, researchers found that students who learned Logo did no better academically than those who didn't learn Logo at all." There it is, proof positive. Hold on; there's more.

>D'Ignazio contends that all programming languages, including Logo, are inappropriate for children because so much effort must be extended to achieve even a small effect, "such as directing a little screen cursor (called a turtle) to draw a circle. Children don't perceive this as especially meaningful, since they could do the same thing in a couple of seconds on a piece of paper." And his proof? "(I have two small children and know this to be true from personal experience.)"

>Logo is not practical either, contends D'Ignazio, because, even though it can be used for many applications, it requires too much work. "This is because Logo is essentially a graphics language - a language for drawing pictures on the computer's display screen. Making Logo do more than draw pictures is an inappropriate use of the language. And for most families, it's not worth the effort."

>Since D'Ignazio views Logo only as a tool for drawing pictures, it is not surprising that he recommends (for those families who, for heaven only knows what reason, may still be interested in Logo) turtle graphics packages such as Delta Drawing and Turtle Power, because they "may be a great deal less expensive than Logo, and they may have features that Logo lacks."

>Most of what D'Ignazio says about Logo I could agree with if he had been speaking about BASIC. But, somewhere along the line, he missed the boat on what Logo is all about. I'll take a Koala Pad any day over Logo for just drawing pictures. Yup, even for circles! But what about for understanding circles? Coming to know the mathematical concepts underlying the formation of a circle is a bit tough if all you have is a pencil and paper - or a Koala Pad. These are concepts which have been tossed around since the ancients, and will still be worth learning in the 21st century, using Logo or some other appropriate tool to facilitate the learning process.

>D'Ignazio fails to see how Logo can foster an approach and an attitude in a learner towards learning a subject like math that can easily outlast the life of the language itself. He needs to learn that Logo is a philosophy of education more than just a computer programming language.

>The rest of his article has merit in that it emphasizes using computers as application tools. But interspersed in his list of recommended types of software for families (word processing, filing cabinet, communications, music, painting, etc.) he recommends the purchase of "learning software that turns their computer into a teaching machine." Now I understand how he missed the Logo boat.

"Logo: Fad or Fixture?" by Dan Watt, Popular Computing, January, 1985.

>Watt's subtitle says it all: "Popularity doesn't always reflect a true understanding of purposes." How true it is. Oh, sure, Logo is as popular as ever. But, as Watt notes in his article, the use of Logo as a "computer literacy unit" abounds. Here are some thoughts which come to my mind after reading this provocative article.

>Recently, I attended MECC '84 (the annual conference of the Minnesota Educational Computing Corporation), where one woman spoke proudly of the mobile computer laboratory that traveled around to the dozen elementary schools in her district. All 3rd graders at a school got four weeks of Logo,

## NLXionary continued

one hour per day. After that, the mobile lab went to a different school, and the 3rd graders never got to use Logo again.

>This problem is not unique to schools in Minnesota. In too many other systems, having students actually use their new skills is seemingly not important. Exposure and equal opportunity take precedence. And we wonder why students get bored and view school as a trivial experience.

>It is difficult to get people even to talk about Logo's purposes. At the MECC Logo sharing forum, Tom Boe, a MECC trainer and colleague of Marcia Horn, wondered if we were unwittingly creating some kind of monster with our approach to implementing Logo. I wonder what kind of backlash will occur when students, parents, teachers, administrators, and school boards slowly realize just how little effect all this commotion is having. I believe that, unless you have a long range strategy for changing the very nature of how your teachers approach learning, and have the resources to invest heavily in the training and ongoing followup, don't bother implementing Logo. It does Logo and the children a disservice, and, for all the effort required, it's not much fun. Just ask Fred D'Ignazio.

"Sprite Logo," a review by Don Crabb, InfoWorld, December 3, 1984.

>Put another feather in LCSi's hat for its second rave review from InfoWorld within a month. I rejoice that InfoWorld discovered Sprite Logo has many of the features they extolled 3 weeks earlier in their review of Coleco's SmartLogo. I bemoan the lack of collaboration between the two authors. I'm curious why InfoWorld didn't have the same person review both products.

>Logo enthusiasts will not find much substance in this review. Although it includes explanations about Logo in general, and about the materials included in the package, nowhere are the language features described or compared with those of other Logo versions. It is ironic that a highly complimentary review of what I believe to be a fine product seems to do it a disservice.

Griff Wigley is a co-owner of Family Computing, Inc., a facilitator in the Faribault (MN) Public Schools, and a school board member of Prairie Creek Community School.

## Turtle Tips

by  
Donna Lanyi  
and Jane Toth

### Winter Fun

Are you ready for some teacher time-saving Logo hints? Here is a collection of ideas we have found to be helpful in our classrooms.

#### TEACHER HINTS

How many times have you heard, "Teacher, I need your help!" but you have been unable to leave the group you were working with? We could all use an extra hand in the classroom to answer Logo questions. One solution: Student Helpers!

Every classroom has a few students who excel above the others. Utilize their knowledge and skills to be your student Logo helpers. Whenever a problem arises and you can't get to the computer, refer it to a student Logo helper.

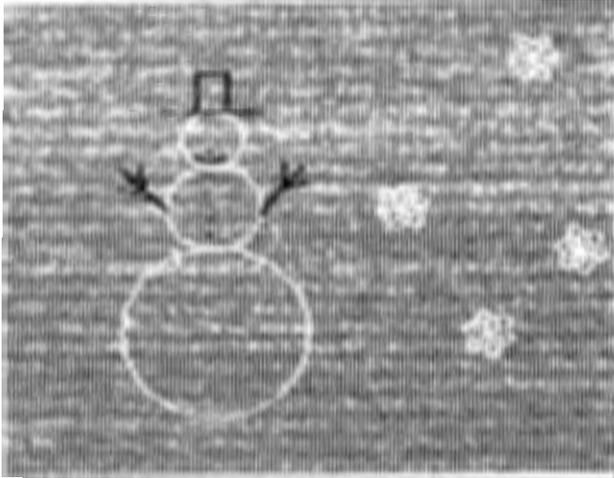
Scheduling the computer in the classroom can at times be more of a hassle than anything else. Some schools are able to utilize a computer lab in their building. Other schools have a computer in classrooms on a rotating basis. A laminated Logo time schedule where the students can sign up or be assigned is a helpful aid. In our personal opinion, the approach that works best is to have the students at the computer for several shorter periods of time more often during a week rather than for longer but fewer periods. Constant reinforcement is essential to grasping Logo concepts.

When introducing a new concept or primitive, we have found using our small groups (reading and math) extremely useful. It allows for an excellent chance to work closely with students. Plus, you already have the groups formed in your classroom.

#### PROCEDURE OF THE MONTH

Winter fun! There are many geometric shapes in winterscapes, especially if you live in an area where snow falls. Encourage your students to create graphics of winter scenes. Here is one as a starter to help generate ideas. The scene below was given to us by Deborah Bartter, a tutor in Wooster City Schools, here in Wooster, Ohio.

## TurtleTips continued



If you are interested in a listing of this procedure, please send us a self addressed stamped envelope. We invite any elementary teachers or students to send their procedures or ideas to be shared. Donna Lanyi and Jane Toth, Beall Avenue School, 716 Beall Avenue, Wooster, OH 44691.

Donna Lanyi and Jane Toth use Logo in their elementary classrooms in the Wooster (OH) City Schools.

## Logo Disserts:

### Dissertations Dealing with Logo

by Barbara Elias

To what extent does a child's developmental level influence the ability to write procedures using Logo? In an exploratory study carried out in 1972, M. J. Folk investigated the relationship between developmental characteristics of children and how they might affect the ability to learn Logo programming concepts.

The developmental stages as described by Piaget served as the theoretical framework for the study. As children progress through the identified states, they are able to deal with the higher level thought processes. Thus, the formal operational thinker would be more likely to be successful with recursion concepts in programming while the child who is at the level of concrete opera-

tional thought would be expected to be successful with less complicated programming tasks.

From a set of rather general relationships, as expressed in the recursion example, Folk developed a set of twenty-eight specific relationships or conjectures. Each conjecture expressed an expected linkage or similarity between performance on Piagetian tasks and performance on Logo programming tasks. He then investigated the validity of the proposed linkages in a five month study involving eight 4th grade children.

Programming tasks were grouped around five categories:

1. Names and things
2. Procedures
3. The concept of "state"
4. Conditionals
5. Recursion

The children attended three 45-minute sessions each week. They were instructed in the language and provided projects which utilized the programming concepts. Performance on developmental tasks was compared to performance on Logo tasks. The results indicate that the developmental level is a factor in learning to use some of the programming concepts.

In fact, the developmental level was a better predictor of performance in the areas included in this experiment than IQ tests and achievement tests.

From a more practical perspective, the results of this study indicate that the concepts of variables, conditionals, and recursion caused the most difficulty for the 4th grade children. They were, however, able to make programs work in all of these areas, but their understanding did not extend to formal type usage of these concepts.

>>>Folk, M.J. (1973). Influences of Developmental Level on a Child's Ability to Learn Concepts of Computer Programming. (Doctoral dissertation, Syracuse University, 1972). Dissertation Abstracts International, 34, 1125-A.

(Ed. note: Each month, Barbara Elias highlights a dissertation or thesis dealing with Logo. She is accepting copies of recent research results for the NLX Dissertation and Thesis Repository. Reports may be mailed to her in care of NLX, PO Box 5341, Charlottesville, VA 22905.)

Barbara Elias is an assistant professor in the Education Department of Virginia State University in Petersburg, VA, and a doctoral candidate at the University of Virginia.

## Listful Thinking

by  
Glen Bull and Paula Cochran

### Adding Delete To Your Tool Kit

By the time you get this month's NLX, you'll probably be wanting to delete some things from your list of New Year's resolutions. We'll show you how to do that, BUT-FIRST, let's look at a game called Sentence Builder.

#### SENTENCE BUILDER

To play the game, first make a phrase.

```
?MAKE "PHRASE [THE SPARKLING SNOW]
```

Now ADD a word to the phrase. (ADD is a list tool from the December column. The procedure listing appears at the end of this column.)

```
?ADD "FELL "PHRASE
?PRINT :PHRASE
THE SPARKLING SNOW FELL
```

The object of the game is to keep adding words that will eventually make a sentence.

#### WORD BUILDER

A tougher game is to keep adding letters to a word. The ADD procedure at the end of the column this month is improved so that you can add letters to a word, as well as words to a list. If you typed in ADD last month, you will want to edit it to include this new capability.

We'll illustrate the game with a sample session between Tim and Sue. Tim begins by making a name with one letter.

```
?MAKE "NAME "T
```

Then Sue has to ADD a letter.

```
?ADD "A "NAME
?PRINT :NAME
TA
```

If Sue is challenged, she has to tell the word she is thinking of. In this case, she might have been thinking of "take". The object of the game is to avoid being the person who finishes the word.

To make the game easier, we could write a procedure called ATTACH. This procedure adds a letter and prints the new result, saving you and your students some typing.

```
TO ATTACH :LETTER
ADD :LETTER "NAME
PRINT :NAME
END
```

Now Tim can add a letter this way.

```
?ATTACH "I
TAI
```

Tim could have been thinking of "tail". However, Sue can't add the letter "l", because that completes the word. Instead she attaches "n".

```
?ATTACH "N
TAIN
```

If Sue is challenged, she has to tell what word she is thinking of. If Sue doesn't have a word in mind, she loses. If she is thinking of a real word, the challenger loses. In this case, Sue could have been thinking of "taint". Now it's Tim's turn. Can you think of a letter Tim could add?

This word game can be a great spelling and vocabulary builder. It is also good for inspiring dictionary use. (The dictionary should be consulted only when a word is challenged.)

#### IMPORTANT WORDS

Not all words are created equal. Some words in a sentence are more important than others. English teachers tell us that nouns and verbs are important ones. But how can they get across the idea of grammatical categories? Diagramming sentences doesn't always work!

Here's a way using Logo. It uses a procedure called DELETE. DELETE is another list tool, just like ADD, PICK, and INSPECT. First make a sentence.

```
?MAKE "PHRASE [THE BIG BROWN BEAR
CAUGHT A TROUT]
```

## Listful Thinking continued

Now use the DELETE procedure to delete a word. (You will find the actual DELETE procedure at the end of the column.) Here is how to DELETE the word "BROWN" from the phrase.

```
?DELETE "BROWN "PHRASE
?PRINT :PHRASE
THE BIG BEAR CAUGHT A TROUT
```

After "BROWN" is removed, the remaining words still make a sentence. The object of the game is to avoid destroying the sentence. Let's delete another word.

```
?DELETE "BIG "PHRASE
?PRINT :PHRASE
THE BEAR CAUGHT A TROUT
```

Almost every word that can be deleted has been removed, but one more can be taken out.

```
?DELETE "A "PHRASE
THE BEAR CAUGHT TROUT
```

A more advanced class will recognize that both "a" and "the" are articles. In this class, we could raise the question:

"Why is it ok to take out "a",  
but not "the"?"

In other words, THE BEAR CAUGHT TROUT is a working sentence, but BEAR CAUGHT A TROUT is not.

Is this because "a" is different from "the"? Does it have to do with whether the article is at the beginning of the sentence, or perhaps the kind of noun the article precedes? These are all good questions for students acting in the role of linguistic investigators.

Now it's Tim's turn again.

```
?DELETE "TROUT
?PRINT :PHRASE
THE BEAR CAUGHT
```

Uh-oh. Tim loses, because THE BEAR CAUGHT isn't a working sentence. Of course, he could argue that it is a sentence, because it has a subject and a predicate. That would be fine, since it leads to a discussion of what it takes to make a complete sentence, the role of transitive and intransitive verbs, and lots more. That was probably what the teacher had in mind all along!

## COPY CAT

One characteristic of DELETE is that it gradually destroys the phrase you are working with. You could type in the list again, but it might be a long one. An alternative is to make a copy of the list and work with that, if you don't want to permanently destroy it.

```
TO COPY :LIST
MAKE "COPY :LIST
END
```

Assume that we have this phrase:

```
?PRINT :PHRASE
THE BIG BROWN BEAR CAUGHT A TROUT
```

We can make a copy of it by using the COPY procedure.

```
?COPY :PHRASE
?PRINT :PHRASE
THE BIG BROWN BEAR CAUGHT A TROUT
?PRINT :COPY
THE BIG BROWN BEAR CAUGHT A TROUT
```

Now when we DELETE a word from the copy, it won't affect the original phrase.

```
?DELETE "BEAR "COPY
?PRINT :COPY
THE BIG BROWN CAUGHT A TROUT
?PRINT :PHRASE
THE BIG BROWN BEAR CAUGHT A TROUT
```

If we don't like the result of the deletion, we can make another copy of the original to work with.

## PLAYING THE GAME

There are a couple of things we can do to make it easier to play the game of deleting words from sentences. To start playing, we have to make a sentence.

```
?MAKE "PHRASE [THE FROSTY SNOWMAN IS A
VERY MERRY SOUL.]
?PRINT :PHRASE
THE FROSTY SNOWMAN IS A VERY MERRY SOUL.
```

That's fine if your students know about MAKE statements. If they don't, an easy way for them to make sentences is needed. Here's a procedure to do that. In Terrapin Logo substitute the command REQUEST in place of READLIST.

## Listful Thinking continued

```
TO GAME
PRINT [TELL ME A SENTENCE.]
MAKE "PHRASE READLIST
PRINT [NOW TAKE TURNS REMOVING]
PRINT [WORDS FROM YOUR SENTENCE:]
PRINT :PHRASE
END
```

When we DELETE a word from a list, we have to use PRINT to see the result. (Incidentally, does it matter whether we delete VERY or MERRY first?)

```
?DELETE "VERY "PHRASE
?PRINT :PHRASE
THE FROSTY SNOWMAN IS A MERRY SOUL.
```

Here is an enhancement which deletes the word, and prints the result in one step, saving you some more typing.

```
TO REMOVE :ITEM
DELETE :ITEM "PHRASE
PRINT :PHRASE
END
```

Here's how to use REMOVE.

```
?REMOVE "FROSTY
THE SNOWMAN IS A MERRY SOUL.
```

We hope that reading this column has REMOVED all thoughts of your New Year's resolutions, at least for a few minutes. Next month we will give you a list tool that will allow you to SELECT new ones!

Here are Apple Logo and IBM Logo procedures for ADD and DELETE:

```
TO ADD :ITEM :LIST
TEST WORDP THING :LIST
IFFALSE [MAKE :LIST LPUT :ITEM THING :LIST]
IFTRUE [MAKE :LIST WORD THING :LIST :ITEM]
END
```

```
TO DELETE :ITEM :LIST
MAKE :LIST DELETE.LOOP :ITEM THING :LIST []
END
```

```
TO DELETE.LOOP :ITEM :OLDLIST :NEWLIST
TEST EMPTY :OLDLIST
IFTRUE [PRINT SE :ITEM [NOT FOUND]]
IFTRUE [OUTPUT :NEWLIST]
TEST :ITEM = FIRST :OLDLIST
IFTRUE [OP SE :NEWLIST BF :OLDLIST]
OP DELETE.LOOP :ITEM BF :OLDLIST LPUT
FIRST :OLDLIST :NEWLIST
END
```

Here are Terrapin Logo procedures for ADD and DELETE:

```
TO ADD :ITEM :LIST
TEST WORD? THING :LIST
IFF MAKE :LIST LPUT :ITEM THING :LIST
IFT MAKE :LIST WORD THING :LIST :ITEM
END
```

```
TO DELETE :ITEM :LIST
MAKE :LIST DELETE.LOOP :ITEM THING :LIST []
END
```

```
TO DELETE.LOOP :ITEM :OLDLIST :NEWLIST
TEST :OLDLIST = []
IFTRUE PRINT SE :ITEM [NOT FOUND]
IFTRUE OUTPUT :NEWLIST
TEST :ITEM = FIRST :OLDLIST
IFTRUE OP SE :NEWLIST BF :OLDLIST
OP DELETE.LOOP :ITEM BF :OLDLIST LPUT
FIRST :OLDLIST :NEWLIST
END
```

---

Glen Bull is a professor in the University of Virginia's School of Education, and teaches Logo courses at both the graduate and undergraduate level. Paula Cochran is a reformed English major who studied linguistics at the University of Cambridge. She is now a speech-language pathologist working with language-disabled children.

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## Logo Notes

The NLX and the University of Virginia have been testing an electronic Logo bulletin board system (BBS) during the past several months. The BBS is configured with sections for each of several types of Logo teaching concerns and issues, and allows participants to communicate with each other anonymously, if desired. While the system is not yet open to the general public, if you are interested in gaining access to the BBS, write for more details. Elaine Bartley, Logo Bulletin Board, Department of Curriculum and Instruction, School of Education, University of Virginia, Charlottesville, VA 22901.

The College of Education of Arizona State University announces its Fifth Annual Microcomputers in Education Conference, to be held in Tempe, AZ, March 13-15, 1985. For more information, write to Gary Bitter, College of Education, Arizona State University, Tempe, AZ 85287.

# Teacher to Teacher

## Guides for Teaching Logo to Young Children

reviewed by  
Anne Cairns Federlein

EZ Logo, Minnesota Educational Computing Corporation (MECC), #975, 3490 Lexington Avenue North, St. Paul, MN 55112. Includes a diskette of EZ Logo and a 79 page notebook of suggested activities, work sheets, and lesson plans.

**AUDIENCE:** Young children, ages four to eight.

**PURPOSE:** Allows young children to direct their own learning of Logo.

**PREPARATION LEVEL OF TEACHERS:** The teachers can learn along with the children.

### FORWARD WITH HUMAN TURTLES

**STRENGTHS:** EZ Logo prepares the child to use the Logo language at a later time by introducing limited one stroke commands for the turtle. Initially, it is suggested that the teacher introduce the child to EZ Logo through concrete experiences, such as giving the RIGHT, LEFT, FORWARD, BACK, and CLEAR commands to a "human" turtle. When this activity is understood, then this information is transferred to the turtle on the computer screen. Important skills developed are trial and error problem solving, alternative thinking strategies, and decision making skills, in addition to reading readiness and pattern recognition skills.

### WORK SHEETS -- WHY?

**CONCERNS:** Activity sheets are used to repeat the learning done on the computer and to give a record for each lesson. The authors suggest that these sheets not be treated as work sheets, but rather to incorporate them into a journal to record the turtle movements. Children learn by doing -- but not a ditto sheet! The mere presence of activity sheets can encourage rote learning and drill and practice teaching methods.

**REACTION:** Overall, this is one of the best books I have found on the market for teaching Logo to young children. It is easy to follow and easy to learn for both child and teacher. Most importantly, the book introduces early childhood learning theory -- that is how to involve young children effectively in their learning. Publishers need creative teachers who understand child development theory to team up with authors of Logo texts to focus on creating such stimulating environments.

Horn, Carin, and Collins, Carroll. Com-Lit Computer Literacy for Kids. Sterling Swift Publishing Company, 7901 South H-35, Austin, TX 78744.

**AUDIENCE:** Children ages seven through nine.

**PREPARATION LEVEL OF TEACHER:** Teachers just beginning to learn Logo.

### ASK THE RIGHT QUESTION

**STRENGTHS:** This text is easy to follow by primary aged children. For example, the illustrations throughout the book allow the child to "read" the book and understand the content even if the words are too difficult. Also, the book is spiral bound, and lies flat on the desk, making it easier to use alone or in group work.

The format of the book includes philosophical questions, such as, "Does a computer solve problems just like a human solves problems?" The answer is easy to read and understand. "NO ... because a computer does not have any feelings or emotions. People have emotions that help them make choices. A computer can do only what it is told to do!"

### HIDE THE ANSWERS

A suggestion to the authors is that the answers to these questions be placed on another page out of view of the child. This will encourage more discussions in the classroom. When children are presented with such answers, they often just recite them, and do not necessarily understand them. There is no one "right" answer, and, as an experienced teacher, I know that many answers children give to open ended questions are thought provoking and often set the stage for problem solving and creative thinking.

## Teacher to Teacher continued

### NOT MORE WORKBOOKS!

**CONCERNS:** The appearance of the book shouts **WORKBOOK!** Such directed activities can be helpful for the beginning Logo teacher in teaching the new subject. However, it takes a creative teacher to risk leaping from the "canned" lessons to those that address the developmental needs of each child in the class. For example, at the beginning of the book, the text begins with an introduction to the computer machine by giving a long vocabulary list of new words to be learned before the child ever touches the computer. Who thinks that learning unknown vocabulary words makes Logo easier?

This format, used in many elementary science textbooks, asks children to memorize the new words of each lesson before they experience what they are! We must question what is best for the child and introduce the vocabulary after each child has had an opportunity to play with Logo and experience the concepts. The new words would then make sense and be understood, rather than memorized and forgotten after the lesson is over. Young children must be actively involved in doing before there is understanding.

### YOUNG CHILDREN ARE DIFFERENT

**REACTION:** If learning is to be meaningful for children and provide a base for future learning, then teachers must be able to allow children to participate actively in classroom learning. Unfortunately, many of the new Logo books and curriculum materials for the early childhood age group directs the child through a series of pencil tasks. Young children learn by doing, that is, through experiencing, exploring, and manipulating. This is not understood by many authors and teachers who are not trained in early childhood. In the past, this structured way of teaching has been for the convenience of the adults in the classroom, rather than for the children.

Sherry Turkle discusses the effects of computers on children and adults in her book, The Second Self, in an interview in The Chronicle of Higher Education (November 14, 1984). "I want educators to accept and exploit the fact that children can master the computer in many different ways. We have to get the widest variety of children to use this personal learning instrument in a positive developmental way. Too often, teachers are not open enough to children who don't seem to be serious or organized - who appear

to be playing around with the computer, when in fact they're really finding their own way into the scientific and technical culture."

"The message I'm trying to get out is that the computer doesn't just do something," she says. "It does something TO US. And we'd better be more interested."

Perhaps teachers, especially those working with younger children, had better be more interested in this new machine and try **NEW** teaching methods. It is easier and more convenient to apply the old teaching methods of drill and practice to something new, rather than **FIRST** watching and listening to the children, and **THEN** designing an effective curriculum.

### OH NO! WHERE ARE THEY?

As I search the book stores, computer stores, libraries, and schools, it is difficult to find materials and books for Logo that are designed to encourage the discovery method of learning. I am becoming more fearful that the new and exciting teaching tool called Logo is falling into the sea of curriculum mediocrity of drill and practice!

### SPEAK UP, TEACHERS!

We in Logo Information For Teachers (L.I.F.T.) are interested in hearing from teachers at all grade levels who are integrating Logo materials effectively into the curriculum. Please send your comments along with your name and phone number, so that we can interview you and share your ideas in future columns. L.I.F.T., Post Office Box 5396, Plymouth, MI 48170.

Anne Cairns Federlein is a professor in the Early Childhood Area, School of Human and Educational Services, Oakland University, Rochester, MI.

## Computer Contest Announced

The University of Wisconsin-Parkside announces its Fifth Annual Computer Problem Solving Contest on April 27, 1985. Student teams compete in one of three divisions: grades 4-6, grades 7-9, and grades 10-12. In the past, there have not been many solutions using Logo. Here is an opportunity to change that. If you are interested in sponsoring a local contest site, write to: Donald T. Piele, ICPSC, Box 2000, University of Wisconsin-Parkside, Kenosha, WI 53141, or call (414) 553-2231.

## Q and A

by  
Jim McCauley

Q. I'm having trouble using INSTANT with my students because they hold the key down so long. The keyboard auto-repeat feature causes too much to happen. Is there some way to fix INSTANT so that it takes only the first key press and not all the auto-repeated ones?

<[-?->

A. This question has caused me to search down any number of alleyways, both in Logo and in the hardware of the Apple IIe. (That must be the computer you are using, I assume.) The answer to the problem is simple, but risky.

The auto-repeat feature of the Apple IIe keyboard is called "n-key rollover," and it was viewed as a desirable feature when the Apple II+ was redesigned. Usually, when Apple (and many other computer manufacturers) include a feature in a new computer model, they make some provision to deactivate the new feature so that the new model can be made to act like the old one. Often, they create something called a "soft switch" (a special location in the computer's memory) which, when accessed, enables or disables the feature.

This is how the Apple controls many of its hardware features. For example, if you want to make the Apple's speaker click:

```
TO CLICK
IGNORE .EXAMINE 49200
END
```

```
TO IGNORE :X
END
```

If you want a "raspberry" from your Apple, try:

```
TO RASPBERRY
REPEAT 40 [CLICK]
END
```

The Apple also controls its text and graphics screens with .EXAMINE and .DEPOSIT, Logo's equivalent to BASIC's PEEK and POKE. For a virtuoso example in Logo, take a look at the LOWRES file in the Apple Logo Tool

Kit, a public domain set of software from Logo Computer Systems, Inc. It's a set of routines which allows the use of low resolution block graphics from within Logo.

Unfortunately, Apple didn't design a soft switch for the n-key rollover feature. There is no way to correct fully the misbehavior of INSTANT from within Logo. If this is really a serious problem for you and your students, you are going to have to modify the Apple hardware.

If that sounds scary, that is because it is a bit scary. If your Apple IIe is still under warranty or if you have a service contract, you should do nothing mentioned hereafter. On the other hand, if you really and truly want to defeat the auto-repeat feature of the Apple IIe, here is what must be done:

1. Turn off the power, but leave the Apple plugged in.

2. Take off the cover and touch the power supply (the large metal box to the left of the circuit board) with your fingertips. You won't get a shock. This lets any static electricity in your body run to a safe electrical ground, and helps prevent damage to the computer components.

3. Find the large chip labeled 3600-PRO; it is located in the lower right corner of the Apple IIe circuit board. (It may be labeled with a variation of this code, such as AY-5-3600-PRO.) Note that the end of the chip nearest the keyboard has an orientation mark (usually a white dot or a semicircular depression).

4. Using a "chip puller" (a special tool designed for the purpose), carefully remove the 3600-PRO chip. This can be difficult, because the chip has a lot of pins.

5. With the orientation mark facing you, count up the right side of the chip until you come to the fifth pin. Bend that pin out carefully and gently so that when you reinstall the chip, this pin will not go into its socket.

6. Reinsert the 3600-PRO chip into its socket with the orientation mark facing the same direction in step 3.

If this sounds like a job for a specialist, you are right. In fact, I do not recommend that you do this unless you are absolutely sure that the auto-repeat feature presents a serious problem to your students. It may not be possible to reverse the process, since the pin is fragile, and can be broken off quite easily.

## Q and A continued

(Ed. Note: If you have a question about Logo programming techniques or the thinking which leads to Logo programming, send it to NLX Q&A, PO Box 5341, Charlottesville, VA 22905. Each month, Jim McCauley answers selected questions in this column.)

Jim McCauley is a Coordinator of Computer Education for the Santa Clara (CA) County Office of Education, and has written Logo articles for many national publications.

## Logo Scouts Wanted

The Chicago Logo Users Group is collecting Logo articles for listing in the bibliography for the Logo 85 conference. If you read an educational or computing periodical not listed below, please register as a Logo article "scout" for that periodical.

Here are the periodicals which are already being scouted.

AEDS Journal  
 AEDS Monitor  
 Apple User (formerly Windfall)  
 Arithmetic Teacher  
 Byte  
 Call A.P.P.L.E.  
 Classroom Computer Learning  
 Creative Computing  
 CUE Newsletter  
 Educational Computing  
 Educational Technology  
 Electronic Education  
 Electronic Learning  
 inCider  
 InfoWorld  
 Journal for Research in Mathematics  
 Education  
 Journal of Computers in Mathematics and  
 Science Teaching  
 Mathematics Teacher  
 Microcomputing  
 PC World  
 Personal Computing  
 Popular Computing  
 School Science and Mathematics  
 Teaching and Computers  
 The Computing Teacher  
 T.H.E. Journal

If you would like to help locate Logo articles in periodicals not listed here, send your name, address, and periodical name to Andy David, 5430 South Harper, Chicago, IL 60615. Thank you!

## This One's for Cary

A workshop entitled "Teaching Physics with the Logo Computer Language" will be presented by Tom Lough and James Hurley in Toronto, Ontario, on January 19, 1985, in conjunction with the joint winter meeting of the American Association of Physics Teachers (AAPT) and the American Physical Society (APS). For more information, write AAPT, 5110 Roanoke Place, Suite 101, College Park, MD 20740, or call (301) 345-4200.

Closing The Gap announces the publication of "Computer Technology for the Handicapped," the selected proceedings from the outstanding 1984 CTG conference held in September 1984. Consisting of 260 pages, the book promises to be a treasury of information for special education and rehabilitation professionals. To order, send \$17.95 to Closing the Gap, PO Box 68, Henderson, MN 56044.

## NLXual Challenges

by  
 Robs Muir

## Notes

It never fails.

You have been asked to give a presentation of Logo to a friend/staff/district. Of course, you want to include the "Logo experience" that your students have every day in your class, so you provide some appropriate challenges for your colleagues. At the end of a great six hours of chalk-talk, philosophizing, and laying-on-of-hands (a.k.a. hands-on), you begin to see the spark of enthusiasm on everyone's faces as they rapidly begin to tame the turtle. Everyone except the person in the back of the room. As you close, asking for any final questions, you see this person slowly rise and ask what you hoped never to hear, "So what?"

### WHAT'S THE BEEF?

Hidden behind this seemingly innocuous eight-character string is a question of awesome import. Consider, if you will, some of the issues raised by this question.

## NLXual Challenges continued

1. How does Logo fit into the (capital C) Curriculum?
2. Why should I change my 10 year old lesson plans to include Logo computer programming?
3. Problem solving? My students won't even read the textbook!
4. Games and fun?! Not in my classroom! Schooling is serious business!
5. Ad etceteram.

Since we are all grown up (aren't we?), some of us have a very difficult time playing games, wasting time, and being childish. If you feel guilty when you work on some of the NLXual Challenges (I really should be grading those papers...), perhaps you need a problem worthy of your time ... a problem whose solution could affect a student's entire life ... a really serious problem.

### A MOST WORTHY CHALLENGE

Cory, age 9, wants to control his turtle. He knows about Instant Logo programs; other students in his class draw things using the F, R, B, and L keys. However, Cory is unable to move from his neck down due to birth defects. He can move his head just enough to operate a single leaf-switch which, in turn, activates the paddle button on his school's computer.

**PROBLEM:** How would you write a Logo program to give Cory a turtle experience?

MIT and LCSI versions of Logo support a primitive called PADDLEBUTTON or BUTTONP, which outputs either "TRUE or "FALSE if a specified paddle button is pressed. An example of the use of this command might look like this:

```
IF (PADDLEBUTTON 1) THEN FD 10
or
IF BUTTONP 1 [FD 10]
```

These commands work for Apple joystick buttons, paddle buttons, or Koala Pad buttons. If you use a Commodore 64, you might choose to use the JOYBUTTON primitive for your joystick.

If you don't have the luxury of owning one of these peripherals, you can still write your program using the RC? or KEYP primitive. These primitives output "TRUE or "FALSE if any keyboard key has been pressed — effectively simulating a button press.

What is a Logo experience? Can you have it only with a computer and a turtle, or only if you can type? What kind of Logo experience can you design for someone who can only press one particular key?

Help give Cory, and others, a more playful New Year!

When you have a working solution (or even a valiant attempt), send a listing of your work and results, along with a stamped self addressed envelope to:

NLXual Challenges  
 Attn: Robs Muir  
 1688 Denver Avenue  
 Claremont, CA 91711

We will compile the contributed solutions, select the most interesting or unusual, and redistribute them to each contributor. Since our "community" already involves NLX subscribers in six different countries, the contributions are quite diverse. Solutions are available for each problem, but you must contribute your attempted solution (however meager) to receive these "answers".

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Robs Muir is a teacher in the Claremont CA Unified School District and Claremont Graduate School. He presents Logo workshops in the southern California area.

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Editor.....Tom Lough

# NLXTRA

前 100

by  
Hillel  
Weintraub

There is no doubt that, in spite of the computer recession the world over, MSX represents some kind of great hope for many countries. While MSX is well known in Japan, its popularity has not really hit the US yet, so perhaps a word of explanation is in order. The MSX systems all have the same microprocessor and can share software; that is, software which can be used on one MSX system can be used on all other MSX systems. Of course, companies here are trying to outdo each other by providing peripherals and other extras without affecting the actual software operation. Several manufacturers here and in Europe feel that MSX developments may be what keeps the industry above water for the next few lean years.

(Ed. Note: For NLX readers who wish more details on the MSX system, I recommend the two-part series of articles in the December 1984 and January 1985 issues of Compute! magazine. Compute!, PO Box 5406, Greensboro, NC 27403.)

The Japanese Logo community is growing by turtle-size leaps and bounds, and an increased awareness of the use of Logo in language development as well as math development has caused the recent emphasis on the production of Japanese language Logo versions. There are several already available. However, until now, none are MSX compatible.

## MSX LOGO

The word from William Kooig of PROMOTECH, the Japanese representatives of Logo Computer Systems Incorporated (LCSI), is that MSX Logo will be available early this spring.

It is described as a "full sprite version," similar to LCSI's Sprite Logo for the Apple computer and SmartLogo for the Adam computer. Mr. Kooig describes MSX Logo as having all the features of these two versions and then some! It runs faster and, according to Kooig, is the next generation of Logo.

Specifically, MSX Logo has features strong in event processing, meaning that conditions can be constantly checked and processes interrupted when certain conditions are true. User input from keyboard or joystick allows collision detection, line crossing detection, and other similar kinds of feedback. These capabilities make this version of Logo suitable for game development, a strong interest of young people the world over.

In addition to excellent graphics capabilities, MSX Logo has the usual full set of list and word handling primitives, including property lists.

## TWO LANGUAGES IN ONE

One especially interesting feature built into MSX Logo at the request of an LCSI advisory committee of educators was to have some of the popular primitives for young children available in HIRIGANA, the phonetic writing system which Japanese children learn first. Thus, when booted, MSX Logo has 80 of its more than 200 primitives available in this Japanese script. And, if this isn't enough, all of the Japanese primitives can be changed into English, using a SELECT primitive!

MSX Logo will be furnished with computers when they are purchased, and will also be available for purchase separately.

This full version of Logo, with 16 colors, 30 definable sprites, list processing capabilities, and 4000 nodes of memory, runs on computers costing typically between \$200 and \$350!

Now, if we can get the price of a good color monitor to drop, students of all ages could have a fascinating mudpie at a most reasonable price!

(Ed. Note: If you wish to communicate with Hillel on any aspect of Logo in Japan, his address is Doshisha International High School, Tatara, Tanabe-cho, Tsuzuki-gun, Kyoto-fu 610-03 Japan.)

Hillel Weintraub is a teacher at Doshisha International High School in Kyoto-fu, Japan, and is the president of the Society for Microcomputing in Life and Education (SMILE).

Logo Hawaiian this summer! Join Glen Bull, Paula Cochran, and Tom Lough for "Logo in the Classroom," a 3-hour graduate Logo course from the University of Virginia, to be taught at the famed Punahou School in Honolulu, Hawaii, July 8-19, 1985. The course concentrates on Logo applications in language arts, science, and mathematics content areas for teachers with Logo experience. For Logo beginners, an outstanding graduate introductory course is offered, taught by Elaine Blitman and Barbara Jamile. Make your plans early for these popular offerings. For more information, call Educational Spectrum, Inc., at (800) 223-2544. New York residents call (212) 686-5810 collect.

Educational Spectrum also announces "Microcomputers in the Elementary Instructional Program," and "Microcomputers in the Secondary School Curriculum," 3-hour graduate courses offered through the California State University at Los Angeles, to be taught July 19 through August 3, 1985. Included will be instruction on Logo and other software, such as word processors and data bases. For more information, call Educational Spectrum at the above numbers.

If you practice or teach senior high school or undergraduate mathematics, you should find out about Crux Mathematicorum, a problem-solving journal published in Ottawa, Ontario. Each issue contains detailed discussions of challenging problems. You will find many ideas which can be explored readily with Logo. For more information, write F.G.B. Maskell, Crux Mathematicorum, Algonquin College, 200 Lees Avenue, Ottawa, Ontario K1S 0C5, Canada.

The Computer Book Review contains short straight-from-the-hip summaries of computer books in print. Books especially useful or unique are clearly marked and reviewed critically. Others are described. Several Logo titles appear in about every other issue, in addition to books in many other categories. This is an outstanding value, at \$18.00 per year for 7 issues. This breaks down to 1000 reviews at less than 2c each! Contact Carlene Char, Comber Press, 735 Ekekelo Place, Honolulu, HI 96817.

Prentice-Hall of Australia's "Learning With Logo" series is being distributed by Reston Publishing Company. The series, initially for Apple computer Logo versions, includes books for students, teachers, and parents. The series is also being rewritten for Commodore Logo. For more information, write Reston Publishing Company, 11480 Sunset Hills Road, Reston, VA 22090.

Brightly colored file diskettes can perk up a Logo classroom. Diskettes in school colors show school spirit. The Professor, 959 NW 53rd Street, Ft. Lauderdale, FL 33309 (305) 771-6498, offers diskettes in over a dozen different colors at \$1.70 each, with a minimum order of 20. Since this offer seemed too good to be true, we ordered a set of 20 to check them out. The order was processed quickly, and the diskettes arrived in good condition. The colored diskettes are quite cheerful, and help us to locate special files quickly.

Algot T. Runeman of King Philip Regional School, Norfolk, MA, sends steps to use Delta Drawing to "jazz up" printouts of Terrapin Logo drawings by filling them with color. The various shades of color are printed as a variety of textures by most dot matrix printers. Here are the steps.

1. Save a Logo drawing as a .PICT file.
2. Restart the computer with Delta Drawing.
3. Even if you do not have a color monitor, answer the color monitor question YES.
4. Load the Logo drawing.
5. Fill the desired areas.
6. Save the drawing once more.
7. Print out the drawing. (Runeman uses Zoom Grafix from Phoenix Software and reports excellent results.)

The filled drawing can be reloaded into the Logo environment or manipulated by a BASIC program. Here is a short one as an example.

```
100 HOME
110 HGR
120 PRINT CHR$(4); "BLOAD LOGO.PICT"
130 REM CHR$(4) TELLS THE APPLE COMPUTER
140 REM THAT THE QUOTED WORDS ARE A
150 REM DISK OPERATING SYSTEM COMMAND
160 POKE 49234,0
170 REM THIS POKE SHOWS THE FULL SCREEN
180 REM HIGH RESOLUTION GRAPHICS DRAWING
```

## **LOGO 85**

### **FIRST ANNOUNCEMENT/CALL FOR PAPERS**

**The Second International Logo Conference  
Massachusetts Institute of Technology  
Cambridge, MA**

**July 22-25, 1985**

LOGO 85 is being organized to give people actively engaged in Logo work a continuing opportunity to share what they have learned, developed and discovered. In order to facilitate the building of networks, the conference will provide a variety of settings: major speakers, presentations, and special interest groups.

**CALL FOR PAPERS:** Themes to be considered during the conference include evaluation, teacher education, and the integration of Logo into the curriculum. A short paper (not more than 5 pages) outlining the major features of the presentation should be submitted to:

**Professor Hal Abelson  
LOGO 85 Program Co-Chair  
MIT Laboratory for Computer Science  
NE43-410  
545 Technology Square  
Cambridge, MA 02139**

no later than 15 February 1985. Papers selected for presentation will be published in the conference pre-proceedings. Proposals from school children are encouraged.

For general information and registration information, please contact:

**Special Events Office  
Massachusetts Institute of Technology  
Room 7-111  
Cambridge, MA 02139**