

KENBAK-1 COMPUTER SYSTEM

The KENBAK-1 computer system is designed specifically for the student who wants and needs hands-on experience. Today, this is the most effective and economical way to gain active student participation, motivation, and understanding within courses on computer concepts and technology, programming, data processing, or mathematics.

Until now the typical classroom computer cost over \$5,000. In a class of 24 students, three would be involved and 21 would be losing interest and motivation. Equip this same classroom with eight KENBAK-1 computers costing less than \$1,000 each and there would be 24 participating and motivated students.

The KENBAK-1 computer system consists of multiple units and training manuals. The additional hands-on experience with multiple units gives the students an understanding of the principles, practice in solving problems,

and experience in using computers. The training manuals, divided into small units of study and work, alternate theory and lab for comprehension and better retention of abstract ideas and computer processes.

The KENBAK-1 is typical of modern computers with its byte-oriented memory, three programming registers and five addressing modes. The instructional material is understandable at lower educational levels while offering a challenge and enjoyment to all levels, even to professional programmers.

The low cost of the KENBAK-1 computer is possible because it is a modern, up-to-date unit using newer circuits and design principles. The innovative way in which fewer components have been used has enhanced reliability. Today, KENBAK-1 computers are in use from Hawaii to Europe, from Mexico to Canada.

FEATURES

- The LOW COST allows multiple units for increased student participation. For the cost of another computer, several KENBAK-1 computers may be used allowing many more students to be engaged, involved, motivated participants.
- BIG COMPUTER FEATURES are illustrated with the KENBAK-1 computer.
- OVER 200 INSTRUCTIONS, including bit tests and manipulations, shifts and rotates, arithmetic and logic, and jumps or branches allow demonstration of these operations and the writing of complex programs in a minimum of memory space. The immediate, memory, indirect, indexed, and indirect-indexed addressing modes show these common operand addressing methods.
- The EASE OF OPERATION by a beginner allows the computer to be used from the very start of a course. All ideas are developed with the KENBAK-1 computer system for a solid understanding of the fundamentals of memory organization, number systems, arithmetic operations, sequencing, command structures, branching, looping, address modification, operand addressing, and subroutines.
- RELIABLE AND TROUBLEFREE operation from the 256 bytes of solid state (MOS) memory, TTL logic, the 100,000 hour light bulbs, and 20,000,000 operation switches will yield uninterrupted classroom service.
- A WARRANTY for one year on the parts and labor is given.
- DURABILITY AND PORTABILITY are provided by the steel case. The student-proof units can be moved to storage readily or taken to the home or office.
- Only STANDARD POWER from a wall outlet is required and no special cooling is required. Wide voltage margins are provided.
- The EXTENSIVE MANUALS on several levels and in different styles allow courses to be tailored to individual requirements and to proceed at different rates. The Workbook, the Guide, the Exercises, the Reference Manual, and the Theory of Operation support the instructor and the student in a wide variety of courses. The complete logic schematics in the Theory of Operation allow the principles of a digital system to be examined and studied.

TECHNICAL SPECIFICATIONS

- General purpose stored program digital computer
- 256 bytes of MOS memory
- Integrated TTL circuits
- Power: 95 to 130 VAC, 50 or 60 Hz, 45 watts
- Weight: 14 pounds
- Size: 19" w, 4.5" h, 12" d

KENBAK CORPORATION

12167 Leven Lane/Los Angeles, California 90049/(213) 472-8347

REPLY TO: P.O. BOX 49324, LOS ANGELES, CALIFORNIA 90049

Data Sheet 091172 The manufacturer reserves the right to make technical, styling, or price changes.

KENBAK-1 COMPUTER

DEMONSTRATOR REQUEST AND AGREEMENT

TO: Kenbak Corporation, P.O. Box 49324, Los Angeles, California 90049

I understand that Kenbak Corporation demonstrates the KENBAK-1 computer by sending units to potential customers for two weeks. I request that a demonstrator unit be sent to our organization for our evaluation. I agree to use and to try the computer. I agree, by exercising reasonable care, to protect the computer. I agree to return the computer upon demand. In particular, I agree to: 1) Let some students try it, 2) Accept responsibility for major damage or theft, 3) Pay the return shipping charges taking care to pack the computer carefully. (Charges may range from \$1.50 to \$8.00 depending on the distance.)

IT IS UNDERSTOOD BY BOTH PARTIES THAT THERE IS NO OBLIGATION FOR US TO BUY, TO RENT, OR TO LEASE THIS OR ANY OTHER COMPUTER FROM KENBAK CORPORATION.

To assist Kenbak Corporation in scheduling the shipping of equipment, we provide the following information.

- ___ We have a computer or terminal (_____) now.
- ___ We have computer or programming courses, but no equipment.
- ___ We have budget monies now to obtain a computer.
- ___ We don't have budget monies now but plan on requesting funds to obtain one or more computers for a program commencing _____.
- ___ We are interested in a general way but don't know when we would be able to buy or rent one.
- ___ Please send us information on your various purchase/rental plans.
- ___ We would like to receive the KENBAK-1 computer on or about _____. Demonstrators shipped subject to availability.
- ___ Please notify us when the KENBAK-1 computer is to be shipped.

Please ship the computer to:

| | |
|--|--------------|
| NAME _____ | SIGNED _____ |
| ADDRESS _____ (Street address please) | TITLE _____ |
| _____ | FOR _____ |
| TELEPHONE _____ | DATE _____ |

HAVE YOUR STUDENTS EVER WORKED WITH A COMPUTER?

If you offer unit record and keypunch courses, you must ask whether this will prepare your students for the new world of data processing. The electronic stored program computer, as it becomes cheaper, is replacing the older mechanical card processing equipment. Even keypunching is being done with equipment that takes the punched card out of the picture.

As the physical reality of the punched card and the plugboard is being replaced by the abstract ideas of electronic data processing, the students still need to feel, to see, and to use actual equipment. The KENBAK-1 computer was designed specifically to fulfill this need. It demonstrates the functions and operations of an electronic computer. But it is priced inexpensively to allow a classroom or laboratory to be equipped with several to give each student long periods of hands-on experience.

Initially schools may use the KENBAK-1 computer to supplement their unit record courses. Advantages of this approach include:

- . It gives the students experience with stored program computers. Many students would make good programmers while others will not appreciate the abstractions and the logic which are involved. The work with the KENBAK-1 computer will help all students.
- . It trains the instructors for the conversion from keypunch to electronic computers. The manuals and instruction material make it possible for a person who has no programming or computer experience to learn and to teach the subject.

Schools who want to go into electronic data processing more heavily will also find the KENBAK-1 computer to be an excellent value. Loaded with features and instructions that are typical of modern computers, the KENBAK-1 computer is a fast, thorough, and effective way to introduce students to computer concepts and programming.

Regardless of whether you are considering the introduction of EDP or whether you are already established in EDP, the KENBAK-1 computer can be of value to you. The reasons that it is such an effective use of dollars originate both from its low cost and its full capabilities. This is why the KENBAK-1 computer has drawn these comments from users:

- . "The manuals are easily understood by the beginner in computer programming. It's varied capability makes it interesting to use and holds one's interest."
- . "Students took their own time to more fully develop their understanding of the concepts. Ideas that we had only talked about came alive to the students."

To investigate the KENBAK-1 computer for your programs, write or call:

KENBAK CORPORATION, P.O. BOX 49324, LOS ANGELES, CA 90049 (213) 472-8347

DO YOU NEED

COMPUTERS IN THE LAB?

Could you enhance your courses on digital theory and computers if you had a computer in the lab? What kinds of opportunities could you create if these computers were priced under \$1,000?

The KENBAK-1 computer, with a price tag under \$1,000, was created specifically for education and is meant to be placed in the hands of the students. Without duplicating the role and the functions of circuit and logic breadboards, it provides a dramatic and motivational method to illustrate computer concepts such as instructions, stored programs, sequencing, memory organization, number systems, looping, subroutines, arithmetic operations, operand addressing, indexing, branching, decision making, and address modification. These ideas are not easy to demonstrate with the trainers. Also the large campus-wide computer using a higher level language doesn't serve the purpose adequately.

Several manufacturers are supplying lab computers which are actually oversized breadboards. In trying to be both breadboards and operational demonstrators they have missed several points. First they increased the price which limited the number purchased. Even if schools are able to buy one lab computer, it is insufficient for the number of students using it. Also the manufacturer has failed to recognize the rate at which technology is changing. The principles of computer organization were established before most of your students were born. The methods for implementing these principles have gone through several complete changes. Therefore it is a wiser investment to separate the breadboard, which will soon be dated because it exhibits the circuit techniques, from the unit which demonstrates the computer concepts.

The objective of the KENBAK-1 computer is to demonstrate computer concepts and programming in your own laboratory. And it does so at a price which allows multiple units to be used. Therefore the students learn more, with better understanding, and faster.

The KENBAK-1 computer contains many features to enhance its value. Things like a single instruction mode to allow students to run a program at an arbitrarily slow rate. Or register/memory entry and display to see what is happening on a detailed level. Or five addressing modes to learn these popular methods of operand addressing. Or overflow and carry detection to extend the usefulness of the computer and to show the difference between these items. Or bit manipulation and test instructions. Or portability. Or the price.

The KENBAK-1 computer has been used alongside \$25,000 computers in a university lab. The conclusion? The KENBAK-1 computer is an easier instrument to learn on, it is faster, it has more internal features, and it demonstrated the computing process more clearly.

Check your petty cash box and investigate the KENBAK-1 computer for creating opportunities in your lab. Write to:

KENBAK CORPORATION, P.O. BOX 49324, LOS ANGELES, CA 90049

WHAT DO YOU OFFER YOUR STUDENTS AFTER

LOGIC TRAINERS

A major application of courses in electronics and digital logic is the stored program computer. Unless your work with digital circuits takes your students into computers, it is incomplete.

In industry, many devices which haven't used the computer before are now using it as their control element. As the price of computers has fallen and continues to fall, computers will be found as the control element in more applications. Today, telephone switchboards, data entry devices, communication terminals, and machine tools use the general purpose computer as a control element. Tomorrow the computer will be used in still new applications as, for example, it is emerging now in auto repair shops.

It isn't enough to take your students through digital circuits and logic without studying computers. The combination of the gate and memory elements in a computer generates a wholly new range of concepts and ideas. Concepts like instructions, stored programs, sequencing, looping, subroutines, arithmetic operations, operand addressing, indexing, branching, decision making, and address modification aren't inherent in or demonstrated by the small group of discrete components in a logic trainer.

The value of the computer in technical education has recently been recognized and a number of computers are available. These devices are quite expensive which has limited their use in education. Consequently, many departments, due to budget limitations, have been able to offer only the limited concepts available through the use of logic trainers. Or the schools which have gone beyond have been restricted by having only one computer for an entire department.

Today this has changed with the advent of the KENBAK-1 computer for under \$1,000. Without attempting to duplicate the function of logic trainers, multiple KENBAK-1 computers can be used in the laboratory to give students experience in using and understanding digital computers. By dividing the class into separate parts - one working with circuits and logic and one working with computer concepts - the total program can be both inexpensive and complete.

Basic computer concepts originated before you students were born. These have changed very little. However, circuit and logic techniques have changed drastically and frequently. If you base your computer concepts on the KENBAK-1 computer and your circuit and logic work on other units, you can maximize the dollar effectiveness of your program. And you'll have a complete program.

For more information on the KENBAK-1 computer, write to:

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Some User Reactions to the KENBAK-1 Computer

"Thank you for the opportunity of using this excellent educational device. I have taken the KENBAK-1 computer to high schools, grade schools, and used it in my own college course. It is a great motivational tool and exhibits most all computer fundamentals. In particular, I felt that its simplicity and excellent choice of instructions were a bonus...May I have your permission to feature the KENBAK-1 computer in an article? I believe that such a machine is ideal for education."

Computer Science Professor, University

"I want to compliment you on both the sophistication and the reliability of the KENBAK-1 computer. For the serious student, it is a great way to learn about machine/assembly-language programming and about the logical organization of a computer."

Mathematics Department Chairman, Private School

"I was extremely pleased at the progress of my students working with the KENBAK-1 computer. Concepts that we had only talked about came alive to them. The one thing that pleased us the most was the definite excitement that the students exhibited in using the computer. They enjoyed working with it and took their own time to more fully develop their understanding of the concepts."

Business Instructor, Junior College

"I spent the last two years working with a Sigma 5/7 computer. It is a little surprising to find a small beast that operates essentially like the larger ones. The fact that the students deal essentially in machine and assembly language when working with the KENBAK-1 undoubtedly gives them considerable insight into how a digital computer operates."

Mathematics Teacher, Private School

"The computer is a fine instructional device for classroom purposes with students beginning the study of computers and/or data processing."

Business Instructor, Junior College

"Received my KENBAK-1 computer in excellent condition and overall I have been very pleased with it. I have found it is rather easy to write programs for it, due largely to the extensive instruction set."

Private Owner

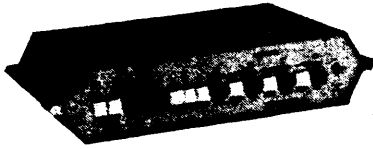
"The KENBAK-1 computer has been evaluated by qualified personnel from a number of agencies here. It has been identified as an excellent inexpensive tool for teaching at the beginning level and would serve to supplement a course in Introductory Data Processing."

Director, Career Development Center, US Army

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Scientific American, September, 1971

DIGITAL COMPUTER



KENBAK-1

FUN EDUCATIONAL

Modern electronic technology created the Kenbak-1 with a price that even private individuals and small schools can afford. The easy-to-understand manuals assume the reader is approaching a computer for the first time. Step-by-step, you can learn to use the computer with its three programming registers, five addressing modes, and 256 bytes of memory. Very quickly you, or your family or students, can write programs of fun and interest.

PRICE \$750.00

KENBAK CORP.
P. O. Box 49324
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