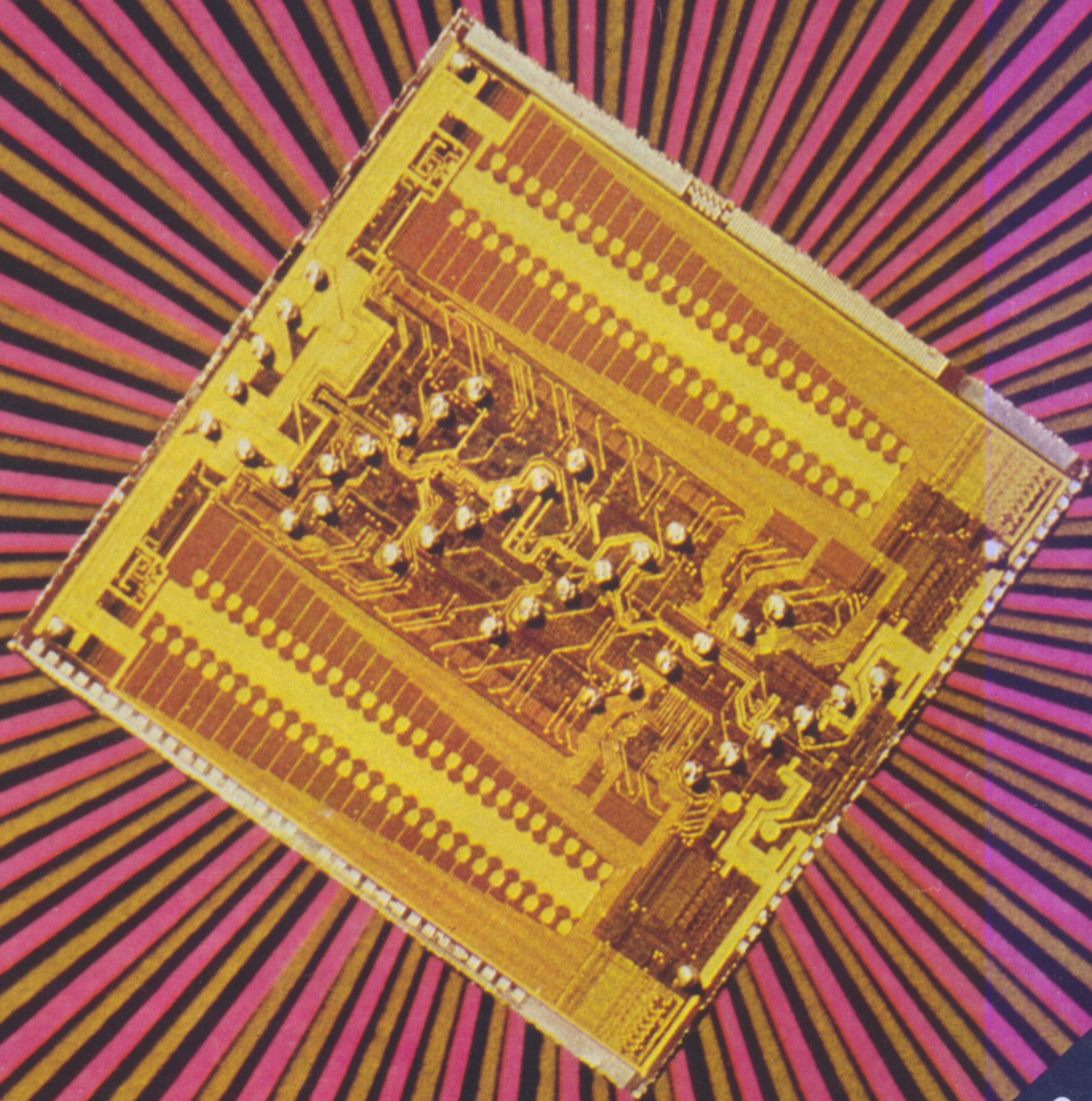


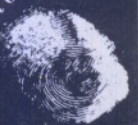
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EXCLUSIVELY FOR 6502 MACHINES



APPLES FOR THE HANDICAPPED



Leigh Lockrey operates an Apple II micro SCAT (Scanner Apple Touch Keyboard) system mounted on a trolley to provide a fully mobile base.

As a result of becoming handicapped, many people will lose their jobs or be demoted simply because they look different, are awkward in their movements, have difficulty in speaking, and are generally regarded as 'lesser beings'.

Programs are being conducted by a variety of organisations throughout the country to help these people maintain as normal a life as possible and to continue their educational studies. One organisation vitally involved in both continuing learning programs and rehabilitation work is the Spastic Centre of NSW.

The Centre operates as a treatment and training division, dealing in the

main with children. It operates two schools for people affected by cerebral palsy. The schools are staffed by Department of Education personnel and the Spastic Centre provides medical back-up.

The Spastic Centre also operates its own manufacturing company, Centre Industries, employing about 600 people, of whom over half are handicapped. A Rehabilitation Department within Centre Industries provides medical treatment, assessment and training, vocational guidance, occupational therapy, physiotherapy, speech therapy and development and service workshops. Through these sections the depart-

ment provides full support services for the induction and training of cerebral palsy affected persons.

The development and services workshop is a specialised section of the Rehabilitation Department. Employees design, manufacture and service special tools, jigs, wheelchairs, splints, and surgical boots and shoes for handicapped people. Other departments within Centre Industries are typical of a manufacturing organisation, and include data processing, accounts, personnel, sales, planning and material control, manufacturing, toolmaking, engineering and quality assurance departments.

In both the Spastic Centre and Centre Industries, specialised equipment is essential to the on-going training and education programs and to achieve maximum effective results.

In December 1980 nine 48k, disk operated Apple II micros were installed. The two schools have three each and Centre Industries has three in its adult rehabilitation division attached to the factory. The major areas of application of the Apples are —

- Education
 - As a means of simulating the pleasurable experiences of life, such as chess and adventure games, which previously were unattainable to the spastic.
 - Conceptual development, enhancing the sensory aspects of learning.
 - Providing vocational opportunities such as programming and on-site administration including accountancy, inventory and stock control at Centre Industries.

In each area, the computer provides the facility for a handicapped person to achieve and experience things normally unavailable, and to experience aspects of life which would otherwise be out of reach.

"The computers enable handicapped persons to simulate normal functions," Mr Bob Gilchrist, Psychologist in the Rehabilitation Centre, said. "For education we have found them to be extremely good motivators. They are non-threatening and provide an excellent learning vehicle which both the children and adults thoroughly enjoy using.

"One of the major problems cerebral palsy handicapped people suffer is that

it is difficult for them to participate in a normal classroom environment. They experience frustration from other children; the teacher doesn't have time to devote to one handicapped individual; they are often absent due to physiotherapy requirements; and so on. Their background education is often lacking and school and learning are not recalled with fondness," he said.

"The computer overcomes these negative feelings. It provides a one to one relationship which is friendly and encouraging. It is gentle and patient, teaching in a fashion which points out errors, or problem areas, in a logical unemotional manner. The children can relate to it without fear and it pays very detailed attention to the learning experience which is usually not possible in a normal classroom setting."

Modifications

A series of modifications, including software and input operational methods have been developed to overcome problems experienced by cerebral palsy sufferers. Lack of muscle co-ordination means control of movements is severely affected resulting in unsteady direction of hands to the keyboard, and sometimes an inability to use the hands at all. Special overlay plates have been designed to fit on the keyboards. They isolate the individual keys and remove the chance of two keys being activated simultaneously by the same digit. Accidental double key presses of the same key may be suppressed. The use of a probe attached to the forehead or a keyboard positioned at the feet overcomes the problem of uncontrollable hands.

"The Apple II is a versatile learning aid for anyone capable of operating a

typewriter keyboard," according to Mr A.R. Lowe of Centre Industries' Electronics Laboratory. "However, there are some who are unable to exert the pressure required by one finger to operate the conventional keyboard or those who can't use a finger at all and are limited to hand or arm movements only."

To overcome this problem Centre Industries recently developed the SCAT (Scanner Apple Touch Keyboard), a self-contained unit which enables children and adults with a wide variety of severe physical handicaps to directly input to the computer. It is designed to be easily moved to different locations within schools and offices.

"The SCAT interface doesn't remove standard use of the keyboard or allow other input devices to be used, but allows several devices to be used at once," Mr Lowe said. "The input devices handled by the SCAT are the standard keyboard, the touch keyboard known as TASA (Touch Activated Switch Array) and a rotary scanner which doesn't require operation of a keyboard at all.

"The interface receives data from the keyboard, checks it for valid character entry, and transfers the characters to the computer. Information from the TASA keyboard is checked in a similar manner although special operations are performed at the touch of a single key and subsequent entries are processed before the final transfer to the computer." The system incorporates the Apple microcomputer plus disk drive, monitor and high speed printer.

The TASA keyboard has a transparent perspex overlay to guide shaky fingers or the head mounted probes through gaps to the keys. The keyboard may be freed and located in the best position for the user (within the

bounds of the connecting cable). All Apple II keyboard operations which normally require the simultaneous use of two fingers (e.g. CTRL/character and SHIFT/character) may be implemented on the TASA keyboard with single key operations.

The rotary scanner is particularly successful with those spastic children who are only able to operate a single input switch. For students of computer studies maths options, the rotary scanner permits the printing and execution of whole Basic commands (e.g. PRINT, LIST, CATALOG), as well as control characters, with single item selections.

The SCAT interface functions independently of the Apple, deriving only its 5V power supply from the main computer. Its electronics are based on the 6802 microprocessor which translates signals from the various input devices into ASCII characters, and multiplexes them. It also allows multiples of input from the same TASA key to be suppressed for a time interval selected by the user and allows CTRL/character and SHIFT/character operations to be implemented by single key operations.

The most complex function of the interface is reception, verification of valid entry and processing of data entered from the rotary scanner. The scanner may be operated by a single pressure switch, air switch, touch switch or by the interruption of a light beam to select a character to function. Data from the scanner is in no way recognisable by the Apple computer and is designed specifically to operate an electric typewriter. The SCAT interface first verifies valid data entry then translates the code into the language used by the computer. There are several complete words used by the computer often enough to make them cumbersome even when the scanner is operating at its quickest rate. The interface assists by transmitting entire words to the Apple on reception of a single character from the scanner.

The system is mounted on a trolley which provides a fully mobile base which will clear all standard doorways. The height of the platform carrying the monitor and the main computer is fully adjustable from 20" (for a child) to 37" (for an adult). All intercomponent leads are covered and concealed, and there is only one power cable to be plugged into a 240V socket. The trolley is designed to give the user good visual access to the keyboard, the monitor, the scanner, the disk drive, the SCAT interface, function lights and the printer. A storage space is provided at the rear.

According to Mr Gilchrist, it is necessary for some of the software to be modified to suit the special requirements of the handicapped and to meet demands not found on a large scale elsewhere. Some program design is done at the Centre. It is also supplied by the Apple Users Group and the Computer Education Group. Commercial software is also used. Any features which may penalise the handicapped must be eliminated from the program.

"Because of problems with vision which are experienced by most cerebral palsy handicapped, we must program to make visual scanning easier."



The TASA (Touch Activated Switch Array) touch keyboard with transparent perspex overlay to guide unsteady hands or head-mounted probes through gaps to the keys.

The keyboard may be freed and located in the best position for the user - within the bounds of the connecting cable.

Mr. Gilchrist explained. "It is necessary to keep read-out lines a reasonable distance apart, increase the size of characters and incorporate similar seemingly simple adjustments which greatly increase effective use of the computer.

"Eye/hand co-ordination and response time is different to that of able-bodied persons. Programs which require real time response and reaction times are therefore not satisfactory," he said. "The handicapped will continually make errors because they cannot keep up physically - although they are coping adequately mentally. Naturally this proves very discouraging and it is necessary for us to adjust the response time realistically."

Vocational applications

Installation of the Apples has provided the handicapped with an opportunity to explore areas of life previously closed to them. New educational, vocational and emotional fulfillment have been introduced. Development and progress in each of these areas is "tremendously rewarding," to quote Mr Gilchrist. The microcomputer area is, however, not the only field in which computers play an important role for the Spastic Centre.

Centre Industries has its own data processing division employing about 20 handicapped persons. The general aims of the installation are to operate as a financially viable unit and to provide training and employment for handicapped people.

The able-bodied people employed in the EDP section overview, tutor and assist the others in the group being trained as key entry operators, computer operators, programmers, and so on. Able-bodied persons are also selected for training, in order to maintain a balance of able-bodied and handicapped employees within the section.

The division began eight years ago when Centre Industries bought a Honeywell G58. In 1976 a second G58 was obtained. The machines have since been field upgraded to level 61. The Honeywell computers were used to implement production and inventory control systems, using the Honeywell AMAP package and Financial Systems supplied by a contractor.

When upgrading was considered necessary a Facom M140F was installed, and the implementation of MAS-I package modules began. All modules of the MAS-I have been purchased including inventory control, order control, manufacturing control, financial control and costing. These are being implemented to replace the systems currently being processed using the Honeywell AMAP System.

Further Systems are being planned to control and report on medical records and the Spastic Centre transport system. It is intended to store the medical records in a highly confidential manner, to provide research statistics and individual case histories for rehabilitation departments and research clinics.

The Transport Section of the Spastic Centre in Sydney maintains a fleet of 38 buses. These provide transport for handicapped persons from home to the Spastic Centre's premises at Mosman



The SCAT (Scanner Apple Touch Keyboard), developed by Centre Industries, the manufacturing division of the NSW Spastic Centre. The SCAT is a self-contained unit incorporating SCAT interface, movable TASA (Touch Activated Switch Array) keyboard and a rotary scanner.

and Allambie Heights. They cover the entire metropolitan area of Sydney. The fittings in the buses are in many instances specialised for the individuals carried, and therefore create unique problems in scheduling. These problems

are currently being investigated and it is intended to use a computer system in planning bus timetables. The major aim is to minimise the travelling time of passengers carried and maximise the fleet's utilization.



I didn't think Puzzle 11 would cause too much trouble, but most people missed the catch. Each, i.e. every, digit from 0 through 9 had to be used. So although everyone who wrote solved the equation $A^3 = B^2$, few used all ten digits. The correct numbers are 4761 and 328509 and the winning entry, chosen at random, came from J. Cameron in Brisbane. Twenty plugs are on their way, barring fire, flood or industrial action.

Prize puzzle

There is a line of 2000 subscribers' post office boxes and there are 2000 enthusiastic postal employees. The first enthusiastic postal worker places a copy of APC in each subscriber's box. The second post office employee, annoyed because they're supposed to be working to rules, comes along and removes every second magazine, starting with box 2.

The third enthusiastic worker, acting on a misplaced sense of duty, walks

along and, starting with box 3, changes the situation in every third box so that if there is a magazine in the box it is removed or a magazine is placed in an empty box. The fourth postal worker, jumping on the bandwagon, changes the situation in every fourth box starting with box 4. And so it goes until every postal worker has done what they thought to be the right thing by APC and its subscribers or their union.

Did the subscribers with Box 1000 and Box 2000 finally receive copies?

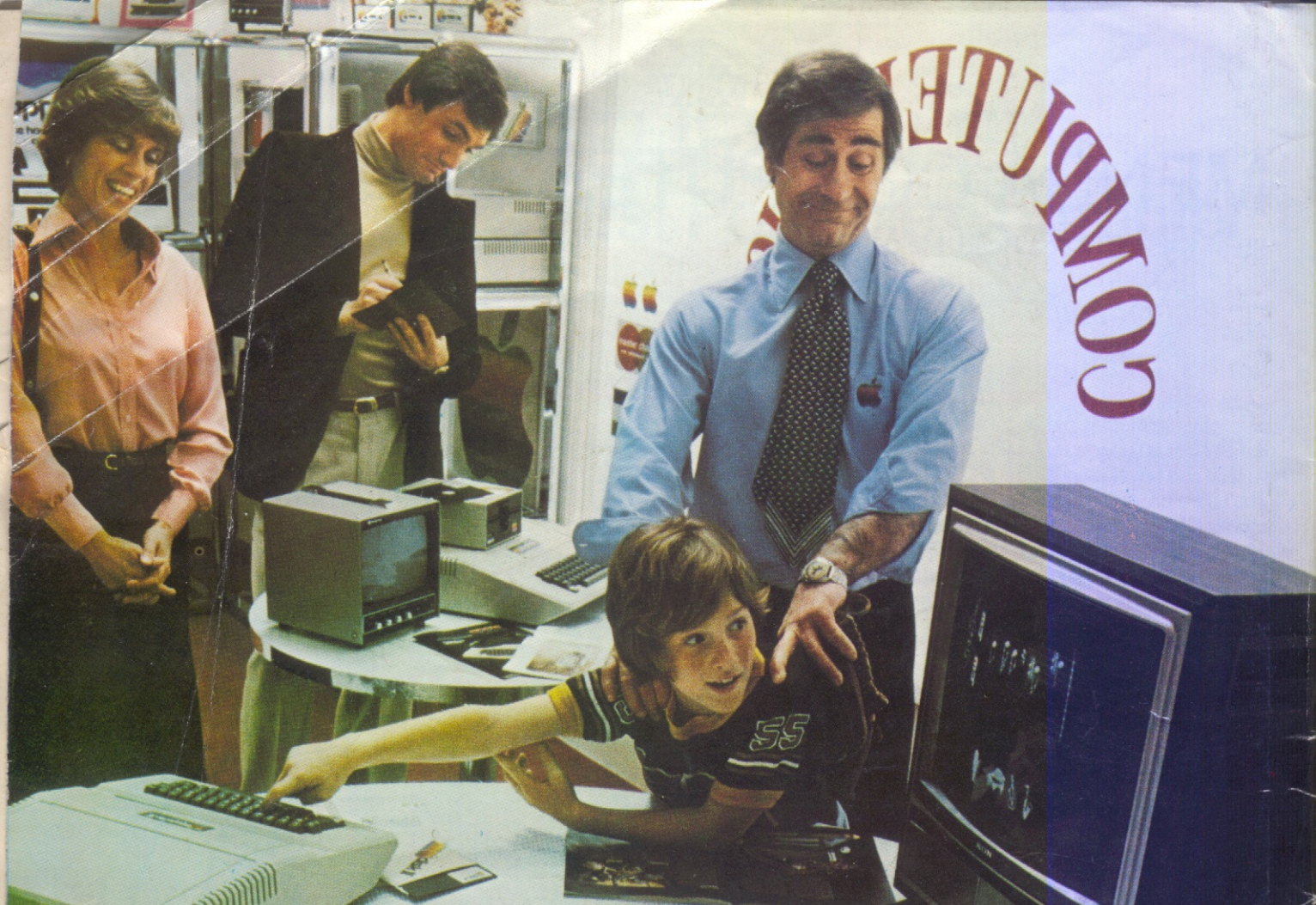
Answers on a postcard please to Puzzle No. 14, APC, P.O. Box 115, Carlton, Vic. 3053.

Prize of the month

Boring, I'm afraid, but from now on I'm giving away a book token each month.

Quickie

As usual, no answers, no prizes for this: Jack's famous beanstalk doubles its height every day. After 21 days it was as high as the Town Hall; after how many days was it half the height of the Town Hall?

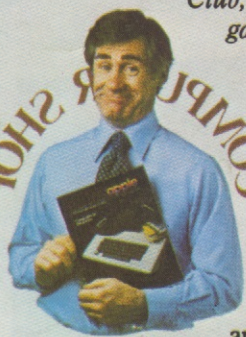


COMPUTER

How to buy a personal computer.

In California, a store owner charts sales on his Apple Computer. On weekends though, he totes Apple home to help plan family finances with his wife. And for the kids to explore the new world of personal computers.

A hobbyist in Michigan starts a local Apple Computer Club, to challenge other members to computer games of skill and to trade programs.



Innovative folks everywhere have discovered that the era of the personal computer has already begun — with Apple.

Educators and students use Apple in the classroom. Businessmen trust Apple with the books. Parents are making Apple the newest family pastime. And kids of all ages are finding how much fun computers can be, and have no time for TV once they've discovered Apple.

Visit your local computer store

The excitement starts in your local computer store. It's a

friendly place, owned by one of your neighbors. He'll show you exactly what you can use a personal computer for.

What to look for

Your local computer store has several different brands to show you. So the salesman can recommend the one that best meets your needs. Chances are, it will be an Apple Computer. Apple is the one you can program yourself. So there's no limit to the things you can do. Most important, Apple's the one with more expansion capability. That means a lot. Because the more you use your Apple, the more uses you'll discover. So your best bet is a personal computer that can grow with you as your skill and involvement grow. Apple's the one.

It's your move

Grab a piece of the future for yourself. Visit your local computer store. We'll give you the address of the Apple dealer nearest you when you call our toll-free number. Then drop by and sink your teeth into an Apple.

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