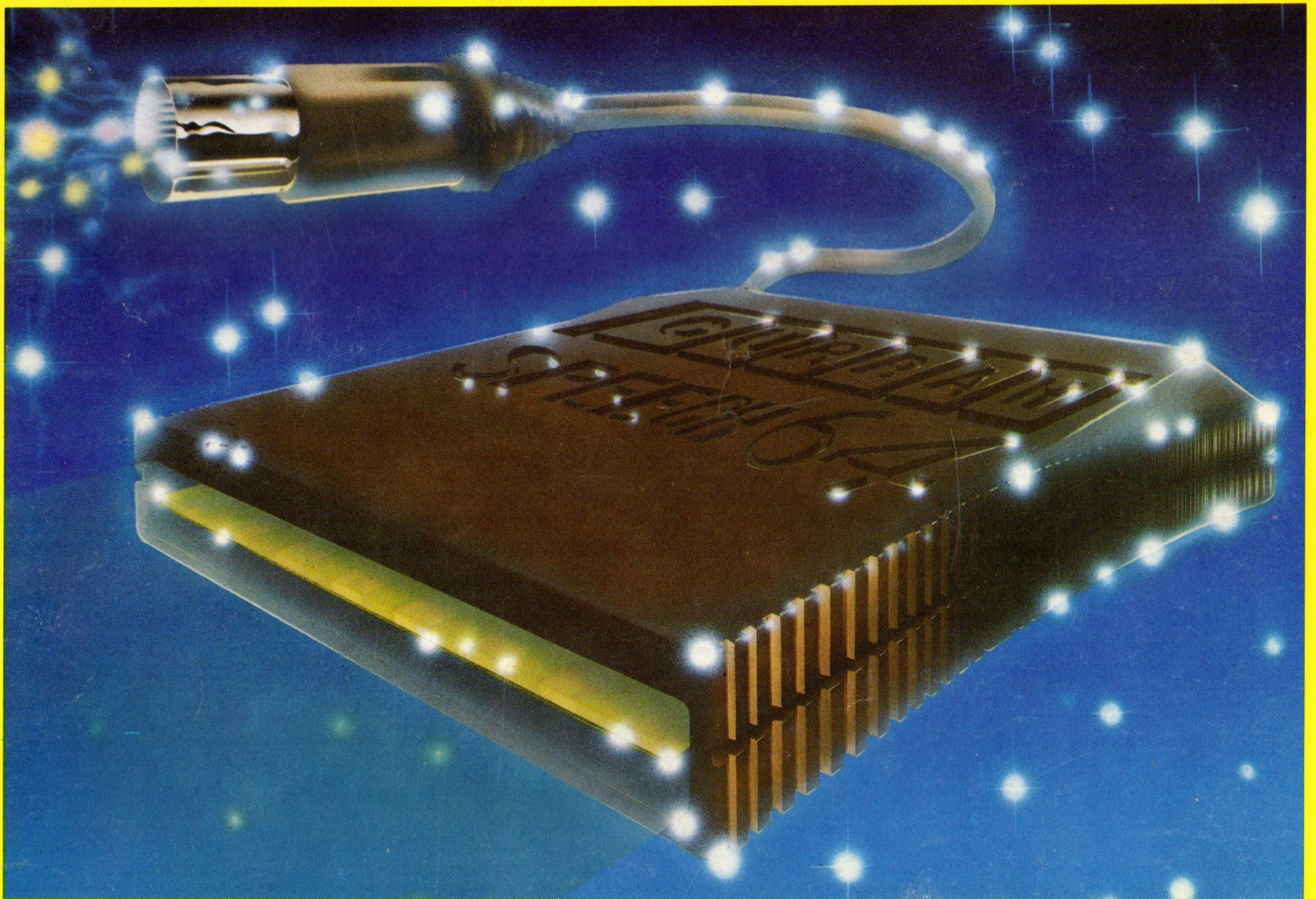


March 1985

Vol 2 No 2 \$3*

A Gareth Powell Magazine

The Australian **COMMODORE** **REVIEW**



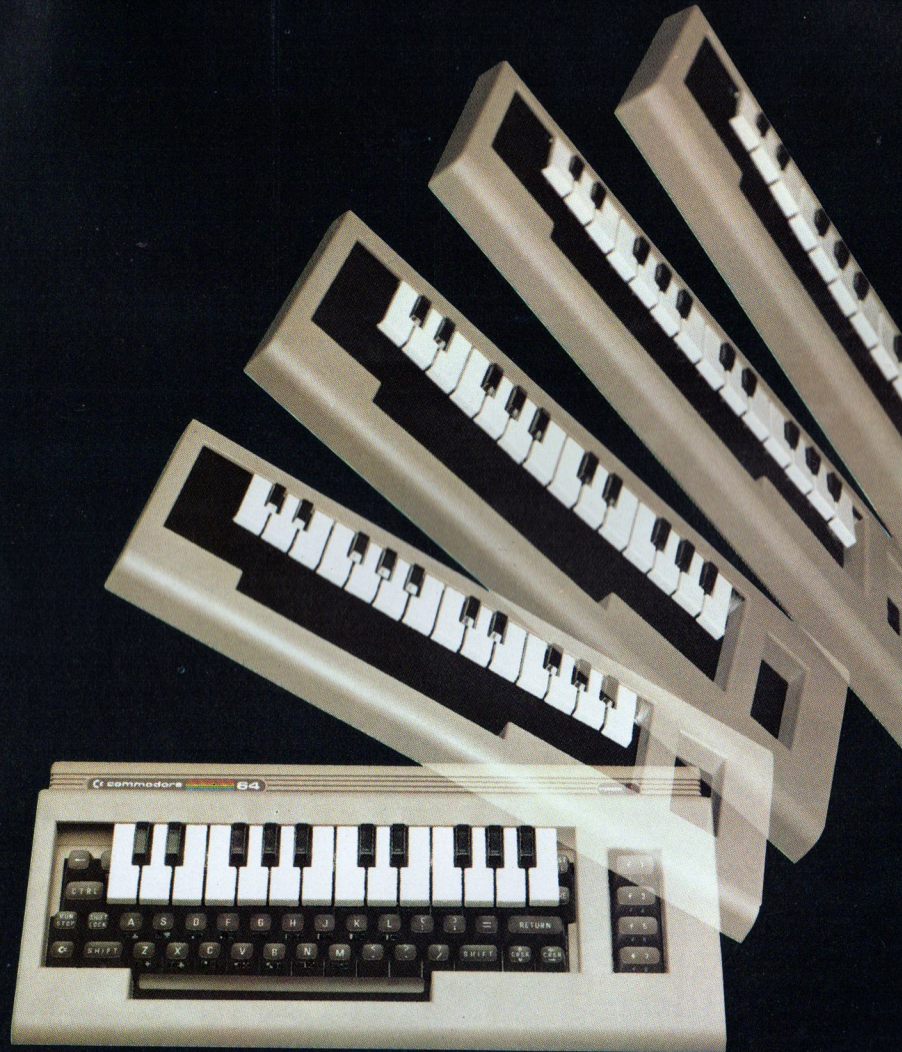
Curragh Speech 64

Special preview – Commodore 128

Networking ★ Greek Alphabet ★ Games

Special – Centronics Printer/Interface

The Commodore 64 Music Maker.



The Keyboard For The Keyboard

Well, it's not exactly 'clip on Chopin', but the Commodore 64 Music Maker certainly adds a new dimension to home computers. It's the 'keyboard' for the 'keyboard'. Just clip on and play. Music Maker comes with instructions and easy-step melody book to enable you to explore the wonderful world of music at your own pace and in your own time. In fact, it's so much fun that music

lessons may never be the same again. Music Maker encourages musical adventure and experiment, and that, in our opinion, is a good place to start experiencing the magic of making your own music.

Talk to your nearest Commodore dealer today about the simple, easy way to turn your Commodore 64 computer into a Music Maker.

 **commodore**
COMPUTER
Keeping up with you.

Commodore Business Machines Pty. Ltd. 5 Orion Road, Lane Cove NSW 2066.

BMS/CC373

The Australian COMMODORE REVIEW



The Australian Commodore Review

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Editorial



Commodore has released many new machines over the past few months, and we can expect to see several more in the near future. Whilst Rick Richardson, our new up and coming ad man, sat devouring another Big Mac on the office balcony, we discussed the various merits of each release and the impact on the PC market.

After several brief arguments and an exchange of blank looks, we decided that although Atari and Apple seemed to offer a fair amount of opposition to any major changes, Commodore was in with a good chance to cause some huge movements in market trends. Other industry experts (probably seated around the Marble Bar beneath the Sydney Hilton) have arrived at similar conclusions.

That is not to say that we now believe we are right. There are other

forces stewing that have not fully revealed themselves at this stage. But what is the significance of all this? I knew you were wondering, so I thought I'd throw that in to get us on the same line of thought.

If it is true that the Commodore 128, for example, is a strong contender for a new market position, then we may see the Commodore 64 thrown into a new light. We may also see many Commodore 64 owners become buyers of the new 128. This in turn would inject a brief but substantial surge of life into the retail end of the Commodore market, which is currently looking very close to drying up. I refer mainly to the specialist dealers, who seem quite prepared to drop Commodore for other brands.

Grace Brothers and K-mart are now selling the Commodore range at substantially lower prices than

specialist stores, and have been for some time. This has dampened the enthusiasm of many small businesses towards Commodore products. We believe that small retailers are an important part of the PC market, and hope to see Commodore support them a little better with these new computers. Commodore, this is your chance to redeem the unsavoury image some have hung around your neck. □

Andrew Farrell

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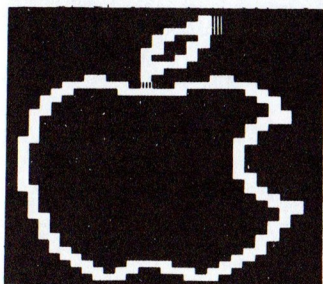
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The Australian Apple Review

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Beginners and new readers

Welcome to the Australian Commodore Review. As a Commodore owner or user I'm sure you'll find this magazine helpful and informative. We aim to provide both serious users and hobbyists with a mixture of reviews, light, tutorial style articles and technical or programming sections. You will also find the occasional general interest story.

Over the past year we have managed to build up quite a following of readers, all of whom deserve a special thanks for sticking by us. As from the April issue, you will notice some new improvements, including a special business section and part one of a tutorial on Basic programming.

This issue is full of some great tips and articles from our columnists: Phil Campbell, Adam Rigby, Peter Gummer and Stuart Kennedy. All have been pushed to the limit getting the March issue out in time for the PC show.

Which Printer?

Choosing a printer for your computer can be a big decision. This month we have devoted a special section on printers in an effort to throw some more light on the subject. Next month we hope to look at the other big decision new owners have to make. Do I Need a Disk Drive? If so, which one? There are plenty of choices to select from, with three new units released recently. We'll be taking a close look at a few of these next issue.

Commodore PC Show Guide

At this year's Australian Personal Computer Show you will find three new machines on display at the Commodore stand. The Commodore 16 and PLUS/4 are getting a big push, and the new IBM compatible will also be there. Last we heard, it would be surrounded by a glass case, so hands off - looking only.

All three machines have been mentioned previously, but for new buyers and shoppers here's a run down on the PLUS/4 and Commodore 16, once more. □



COMMODORE'S NEW MACHINES - THE FACTS

	PLUS/4	C-16
RAM	64K	16K
ROM	32K	32K
Bytes free available to Basic	60671	11519
RS-232 communications interface	Yes	No
Built-in software	Yes	No
Price	\$599	\$249
	Both	
Serial interface (disk, printer)	Yes	
Cassette interface (not 64-compat)	Yes	
Screen size (rows, columns)	25 x 40	
High resolution (pixels)	200 x 320	
Multicolour (MCM)	Yes	
Extended colour (ECM)	Yes	
Sound	two-voice square wave	
Function keys	4 keys, 8 functions	
Cursor movement keys	4 individual	
Reset switch	Yes	
Screen colours	15, each with 8 hues (total 121)	

Special points:

- *The Commodore 16 is available as a learner pack for \$299 (datasette, tutorials and training cartridge).
- *The PLUS/4's keyboard is noticeably better than the 16's.

ADVANTAGES OF PLUS/4 AND COMMODORE 16 OVER THE COMMODORE 64

Vastly expanded Basic, including:

- Disk commands
- Print using commands
- Structured statements
- Graphics and sound commands
- Error trapping, tracing, renumbering.

Individual cursor movement keys.
Wider choice of colours.

Screen windowing, character flashing.
No "garbage collection" pauses.
PLUS/4 - built in software, improved keyboard, memory.

DISADVANTAGES

No sprites!
Sound capabilities are much less powerful.
Software availability.
Commodore 16's low memory, not expandable.

MYTHS ABOUT THE NEW COMPUTERS

Myth 1: The PLUS/4 and C-16 are downgrades of the Commodore 64.

FACT: They are a new kind of

computer, not intended to replace the 64. Some users will prefer the 64, some will like the new machines. Each machine has its own special advantages. The PLUS/4 and Commodore 16 are especially suited for



Beginners and new readers

easy programming of useful applications.

Myth 2: The Commodore 64 will be discontinued.*

FACT: The 64 will continue to be available. Sales of VIC-20 may be affected by the low-priced Commodore 16, but the VIC's communications capability may allow it to survive for a while yet. The C-16 has no equivalent feature.

Myth 3: Software for the PLUS/4 and C-16 is not compatible with the C-64 and the VIC-20.

FACT: Basic on the new machines is the same, but enhanced. Basic programs from earlier computers will load and may run. The major job in converting a C-64 program is to get rid of the Peek and Poke commands by replacing them with the corresponding extended Basic commands. Machine language is the same as before, but you may have to relocate addresses, and the advanced programmer will need to know more about the sophisticated architecture of the new machines. Cartridges that plug into the C-64 are definitely not compatible with the new machines.

Myth 4: The new machines are harder to program.

FACT: Basic programs are much easier, there are more commands, and there's more workspace on the PLUS/4. Depending on program complexity, machine language programs might be about the same level of difficulty, or could call for greater understanding of the architecture.

Myth 5: The new machines have no market; alternatively, they will kill C-64 sales.

FACT: We'll need to see how the market place reacts, of course. The PLUS/4 and C-16 will be useful in a variety of applications. Some purchasers who might otherwise have chosen a C-64 will switch to the new computers; but there will be new markets. Ease of programming, more screen colours and features and new software will generate interest in the PLUS/4 and C-16 within the small-business and educational communities. □

BASIC KEYWORDS FOR THE PLUS/4 AND COMMODORE 16

GENERAL BASIC

BASIC KEYWORDS FOR THE PLUS/4 AND COMMODORE 16

GENERAL BASIC

CLR	PRINT#... USING*
NEW	PUDEF*
CMD	READ
CONT	DATA
DIM	RESTORE
LET	RESTORE line number*
LIST	TRAP*
REM	RESUME*
RUN	DO*
STOP	LOOP*
END	UNTIL*
CONT	WHILE*
SYS	EXIT*
WAIT	FOR*
OPEN	TO*
CLOSE	STEP*
GETKEY*	NEXT
GET	IF*
GET#	THEN*
INPUT	ELSE*
INPUT#	GOTO
PRINT	ON..GOTO
PRINT#	GOSUB
PRINT USING*	ON..GOSUB

VO COMMANDS GRAPHICS AND SOUND COMMANDS

LOAD	BOX*
SAVE	CHAR*
VERIFY	CIRCLE*
DLOAD*	COLOUR*
DSAVE	GRAPHIC*
DIRECTORY*	SSHAPE*
BACKUP*	GSHAPE*
COLLECT*	LOCATE*
COPY*	PAINT*
HEADER*	SCALE*
RENAME*	SOUND*
SCRATCH*	VOLUME*

PROGRAMMING AIDS

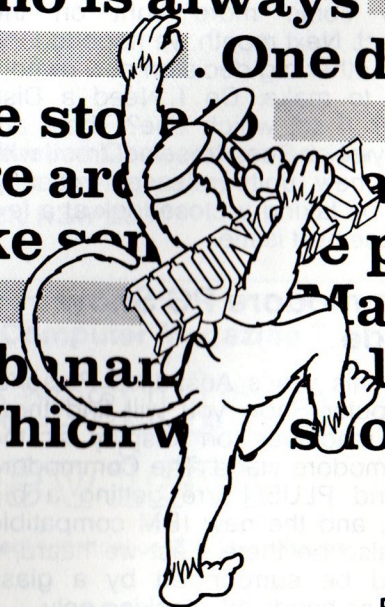
AUTO	DEC*
DELETE	HEX\$*
HELP	ERR\$*
KEY	INSTR\$*
TRON	RCLR*
TROFF	RDOT*
MONITOR	RGR*
RENUMBER	RLUM*
	JOY*
	DSS\$*
	PI*

FUNCTIONS
(same as those for the C-64, plus the following)

* These keywords not available on the Commodore 64



Who is always
One day he
e store
re are
ke son
peanut
Marc wa
left the
which w should I g



Special Preview:

Commodore 128

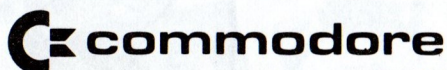
by Andrew Farrell

After months of rumours and speculation it looks like the Commodore 128 is a reality following its release at the Vegas show earlier this year. It has taken us some time to track down the following information, but thanks to a very reliable source not far from home, we managed to get hold of what we wanted.

It should be noted that the following specifications are subject to change and may indeed be a little different by the time they reach our sunny shores. Meanwhile, here they are for you to brood over. In my opinion, this machine looks set to cause a storm. It is nothing short of brilliant. Three processors, CP/M and Commodore 64 compatibility, 80 columns, extra graphics modes and a beautiful Basic all rolled into one computer. This is easily Commodore's most powerful entry into the personal computer market.

Marshall Smith, president of Commodore International in the US, had this to say:- "The Commodore 128 PERSONAL COMPUTER with expandability, compatibility and new peripherals, offers by far the superior price/performance system in the personal computer industry. We feel confident that these advantages position the Commodore 128 ahead of the two other leading comparable computers available."

One would imagine he is speaking of the formidable competition that awaits Atari and the already well established Apple range. Well, Mr Smith mentioned price, so what will it sell for? Initial estimates place the buying price at around the \$700 mark. At that price Commodore may have a very viable system for not only serious users, but hobbyists and schools.



128

PERSONAL COMPUTER

GENERAL FEATURES

64 MODE

128 MODE

CP/M MODE

KEYBOARD

INPUTS/OUTPUTS

RECOMMENDED PERIPHERALS

DIMENSIONS

WEIGHT

COLOR

POWER REQUIREMENTS

- Advanced Styling • 100% Compatible with Commodore 64
- Built-in, Easy to Use DOS support • RAM Expandable up to 512K RAM Using RAM Disk Option • Upper and Lower Case Character Set
- Built-in BASIC • 3 Separate Modes of Operation
- 6510 Compatible Microprocessor (1.02 MHz) • 6581 Sound Interface Chip • 64K RAM • 16K ROM • BASIC 2.0 • 40 x 25 Lines (320 x 200 resolution) • 16 Colors + 8 Sprites
- 8502 Microprocessor (1 or 2 MHz) (6502 Compatible)
- 6581 Sound Interface Chip • 128K RAM (Expandable to 512K Using RAM Disk Option) • 48K ROM + 16K ROM for DOS Support
- BASIC 7.0 • Machine Language Monitor • 40 x 25 Lines (320 x 200 resolution) • 80 x 25 Lines (640 x 200 resolution) • 16 Colors + 8 Sprites (40 Column Only)
- Z80A Microprocessor (4 MHz) • CP/M™ Plus Version 3.0
- 128K RAM (Expandable to 512K Using RAM Disk Option)
- 40 x 25 Lines (320 x 200 resolution) • 80 x 25 Lines (640 x 200 resolution) • 16 Colors
- Full Size Typewriter Style • 92 Keys • 14 Key Numeric Keypad
- 8 Programmable Function Keys • 6 Cursor Keys • Help Key
- 40/80 Column Key • No Scroll • Line Feed • Escape • Tab
- Cap Lock • Alt
- User Port
- Cassette Port
- RF/TV Port
- Audio Input
- Composite Video
- Serial Port
- 2 Game Ports
- Cartridge Port
- Audio Output
- Digital RGBI Video
- MPS 802 or MPS 803 Printers • 1571 Single Disk Drive
- 1901 Monochrome Monitor • 1902 Digital RGBI Color Monitor
- 1660 and 1670 Modems • Fully Compatible with Commodore 64 Software and Accessories
- 56mm x 432mm x 324mm (H x W x D)
- 5 lbs. 6 oz.
- Light Beige
- 117 Volts AC, 60 Hz, 15 Watts



†Specifications subject to change without notice
 *CP/M is a registered trademark of Digital Research, Inc.
 WordStar is a registered trademark of MicroPro Corp.
 dBase II is a registered trademark of Ashton-Tate
 Perfect is a registered trademark of Thorn EMI Computer Software Inc.



A press release from Commodore in the US goes on to state:-

"The Commodore 128 PERSONAL COMPUTER has contemporary styling in a light beige case. It has a 922 key typewriter style keyboard with a 14 key numeric keypad, eight programmable function keys, six individual cursor keys, and a help key. The expandability of up to 512 Kbytes (in increments of 128 Kilobytes) affords the user greater data storage with rapid access and manipulation capabilities.

"It also affords software developers a greatly enhanced programming environment. Commodore is actively working with the major third party software developers to produce programs which utilise the new computer's capabilities."

It all sounds great, but then again you haven't read the specifications yet, have you? □

end	int	tron	sprite
data	abs	troff	sprcolor
input	usr	paint	rreg
input#	fre	char	envelope
dim	pos	box	sleep
read	sqr	circle	catalog
let	rnd	gshape	dopen
goto	log	sound	append
run	exp	volume	dclose
restore	cos	auto	bsave
gosub	sin	pundef	blood
return	bank	graphic	record
rem	filter	sshape	concat
stop	play	draw	dverify
on	tempo	locate	dclear
wait	movspr	color	moveshape
load	tan	scnclr	collision
save	atn	help	begin..bend
verify	peek	directory	window
def	len	dsave	boot
poke	str\$	dload	width
print	val	header	sprdef
print#	asc	scratch	pot
cont	chr\$	collect	bump
list	left\$	copy	pen
clr	right\$	rename	rspos
cmd	mid\$	backup	rsprite
sys	go	delete	rsprcolor
open	rgr	renumber	xor
close	rclr	key	rwindow
get	joy	monitor	for..to..step..next
new	rdot		if..then..else
tab	dec		do..loop..while
fn	hex\$..until..exit
spc	err\$		
not	instr\$		
and	using		
or	resume		
sgn	trap		

64 **apple** **VIC 20** **BIG** **LITTLE BITS**



1. GRAPPLER CD Printer Interface

FOR COMMODORE C64 A NEW ERA IN COMMODORE PRINTING POWER. The Grappler CD may be the most intelligent printer interface available, for ANY MICROCOMPUTER, and is available only to users of the Commodore 64. Over 20 commands, accessible either from the keyboard or software, provide unbelievable versatility in printer operation. Using Grappler CDs 1525 Emulation Mode, your printer will be compatible with virtually all Commodore Software. Special character translations permit easy reading of program listings. There's even a Transparent Mode to pass data to the printer exactly as the Commodore sends it. It also offers the revolutionary dimension of Screen Dumping. A wide selection of commands provides full control over text and hi-res graphic screens. No other Commodore printer interface offers all this. NOTHING ELSE EVEN COMES CLOSE:-

2. UNIVERSAL PARALLEL Printer Interface

FOR VIC-20 & COMMODORE C64. Use your Vic-20 & C64 with any standard Parallel input printer. You don't have to give up the use of your user port (MODEM), or use special printer commands, or load any special software driver programs to do it. Plug in PRINTRON and print away!, with access to all of the advanced functions of today's printers.

3. GRAPPLER + Printer Interface

FOR APPLE THE MOST INTELLIGENT APPLE INTERFACE AVAILABLE! The original Grappler was the first graphics interface to give you hi-res screen dumps from your keyboard. The new Grappler + with Duel Hi-Res Graphics adds flexibility with side-by-side printout of page 1 and page 2 graphics. 4K of exclusive firmware makes the Grappler + the most intelligent, fully-featured Apple Printer Interface made. And, the Grappler + is Apple III compatible.*

*Requires additional software driver.

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RAM RUMBLINGS

1985 is slowly heating up into one of the most turbulent years yet in the microcomputer industry. Hardware releases are starting to take place, with vast improvements in memory capacity, disk speed, graphics capabilities and compatibility. Commodore is no exception to this upheaval with the release of several new computers in the near future. So stay tuned for further developments, they will appear in this column.

Falling \$ expected to push up micro prices

Falling \$ expected to push up micro prices

Australian computer importers expect to be hard hit by the plummeting value of the Australian dollar and delays in clearing goods through customs caused by a Public Service dispute. Worst affected by the fall (down 13% in two months) is

the high turnover, highly competitive micro computer market.

At a time when many distributors are restocking after the Christmas rush, very few are unaffected by the slump. Most vendors will be unable to absorb the drop without some price rises. Software sales may also be affected by the expected price rises; however the increases may be less obvious, as most packages are produced locally.

New Commodore 128 expected soon

Commodore have released their long awaited C128 at the Las Vegas computer show, under the cloud of Jack Tramiel waving his Atari banner.



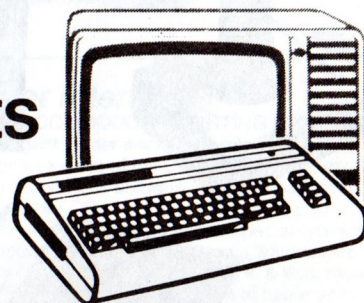
The new machine boasts a powerful 128K of memory and three modes of operation.

Mode one is fully compatible with the Commodore 64. Mode two is Basic 7.0, a zipped up version of Basic 3.5 now with many additional commands to handle every aspect of programming you could ever want.

In mode three it is possible to run CP/M version 3.0 under a new graphic controller which generates 80 columns. The quality is claimed to be superior even to that of the IBM PC. We shall certainly all be waiting with baited breath to see if this is what we have all been waiting for. Until around August-September hang onto your 64s! □



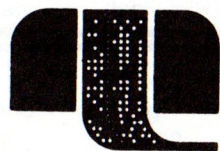
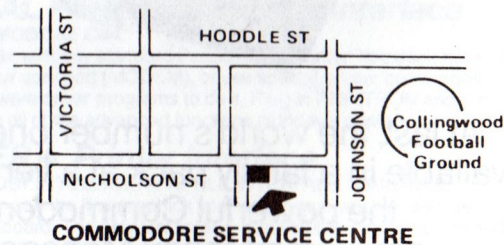
commodore Computer Centre SERVICE VIC-20 & 64 SALES



- Prompt repairs by friendly experts
- Easy Access
- Plenty of parking
- Open Saturday mornings
- Established 1968

3,000 sq ft display. Melbourne's largest range of programs. Monitors, disk drives, accessories. Prompt repairs by friendly experts.

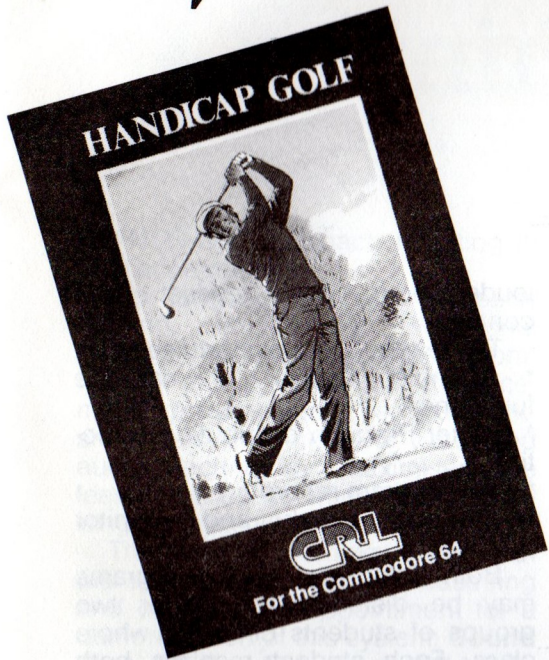
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Abbotsford, Victoria, 3067
Telephone: (03) 419 6811
Offices: Sydney, Brisbane, Adelaide

HOT STUFF



New games and software packages are becoming available every week. In order to help you choose which ones are worth seeing and which aren't, here's a brief description of some of the better titles released recently.

Handicap Golf

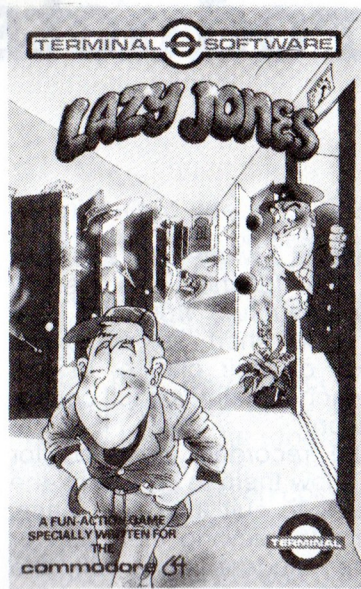
While this simulation is not the fastest program around, it has some very well designed graphics and comprehensive playing options. The game consists of 18 holes on a course 5,444 yards long. You have a complete set of clubs to choose from for each shot, with all the action being fully animated.

It is not necessary to have much knowledge about golf to play, with fairly understandable instructions being included on screen. A pleasant game for a relaxing evening. We gave it a seven. Ozi Soft \$15.95 (c).

Lazy Jones

The game Lazy Jones is actually a series of games all in one game. You are Lazy Jones, the laziest and greatest work dodger in the business. Your object is to improve your game playing ability and avoid work at all costs. Inside the hotel where you work there are 18 rooms, most of which have a game of some description inside for you to play.

Although the idea is good, the



games themselves are far from brilliant. Nevertheless, this is an entertaining program in full machine code. It just earns a seven. Ozi Soft \$19.95 (c).

Suicide Express

A souped up version of the game Loco, now with voice synthesis, and space age graphics. Brilliant animation, sound and graphics make this one an experienced players only game. Blast everything that moves is a good tactic. You must clear the planet of all aliens, who are threatening human life.

Requires fast reflexes, a solid joystick and steady eyesight. Chased by alien hovercrafts and NILMERGE jet bombers, your only hope is your nuclear train (interesting concept) which is fully armed with missile silos, and faster than light speed. I wonder if that means at the end of the game you could theoretically end up before you started? This beauty gets a nine. Ozi Soft \$119.95 (c).

Ghostbusters

You may have read about and seen this one already, but just in case, let me warn you it's not quite as good as it looks - but nearly. Ghostbusters is an all singing all dancing package, exciting to play, though the ending is a bit of a disappointment.

Excellent music and good graphics



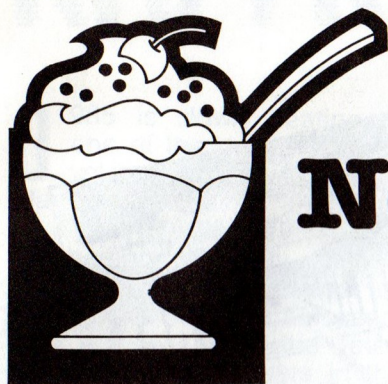
keep it at a high level. Pure curiosity about what happens next is enough to hold your interest, apart from anything else. We gave it a nine.

Wizard

This one is not officially available in Australia as yet, but just to whet your appetite, here's a brief description. Take the graphic variety of Jumpman, add the construction capabilities of Lode Runner, throw in some magic spells and you have a running, jumping, musical masterpiece.

There are some 40 levels in all, the object of each level being to find a key and take it to the keyhole. Determining which key to try is part of the secret. Before you decide it's just another ladders and levels game, imagine this. Every move you make has its own little sound effect, rather like listening to Peter and the Wolf.

Sprites are used for many bad guys including giant rolling rocks, fireballs, bats, rats, witches and snowflakes. Some of the more usual obstacles include lava, trap doors and stairways that disappear. One thing I almost forgot to mention is that on top of the standard 40 levels you can create an additional 60 of your own. Not bad at all. Wizard romps home with a big ten. □



New Products

AVIL

Audio-Video-Interactive-Learning

AVIL - Audio-Video-Interactive-Learning system is an electronic educational aid recently imported from Europe by Sound-plus. This system, unlike many teaching aids, does not eliminate teacher involvement, nor reduce face to face contact with students. Instead it provides a medium for learning utilising the latest in electronic technology and proven educational software.

The system is extremely flexible and can be installed in a normal classroom with control console at one end of the room and student stations divided into two networked groups at the other. This enables two teachers to work with two separate groups, one teacher to work with both groups or one teacher to work with one group.

Because the system can be divided in this way classes or study groups from different levels and age groups can use the system at the one time.

Each student receives a personal and direct lesson via his/her headphone, video monitor or computer terminal. The teacher can monitor each student individually and if required speak to them via the student's headset. In this way a personalised interaction between teacher and student is achieved without interruption from other students.

The student can control their own lesson by recording or repeating a section of the lesson they do not understand. The student can also discuss any problems via his/her own station recorders with the teacher.

The AVIL system gives the student the opportunity to interact and learn on a number of different levels. The video learning programs can be sent

to the class as a whole or to separate groups. The teacher can use a complete sequence from the program or use short self-contained sequences of their choice. In this way the teacher maintains full control of the lesson.

Cassette recorders provided for students allow them to play back the sound track to suit their own pace, before or after viewing the video or both. The student can call the teacher if they require help and the teacher can speak to the student if they think they need help.

The system can also work under full remote control if the teacher does not wish to intervene. AVIL thus provides the teacher and student with at least three basic modes of operation, allowing every opportunity for student use at all levels.

* Language laboratory either as an AA or full AAC system with remote teacher control.

* Video learning system where with the aid of video software the student is motivated to learn by reference to the colour monitor which increases the appeal over conventional systems.

* Computer training. This can apply to some or all of the student positions. It is an add-on feature in which only the individual computer is required. The colour monitor provided is already capable of computer use and the student cassette is suitable for loading and saving a computer program.

Teacher Control Console

The teacher control console is designed for use by one teacher in ALL or GROUP control or two teachers in group control. The console provides housing for two master video cassette recorders, two master source cassette recorders and two colour monitors with smoke grey protective screens. The console fascia contains the ALL and GROUP function control panels as well as the cassette, digital clock, program,

loudspeakers and headset level controls.

The teacher control modules offer:

* Remote Control of cassette functions;

* Master Program distribution selection;

* Inter program recording;

* Student speak and monitor facilities.

Both Video and Audio programs may be distributed to either two groups of students or to the whole class. Each student receives both the sound and picture at the individual booth, the student cassette will record the sound track. This is for use by the student under student control at a later time should it be part of the learning program. The teacher is always in full control during master program, the student being unable to perform any cassette function.

The student may call the teacher for help and the teacher may call each student, a group of students or the class as a whole. The teacher may also monitor each student without their knowledge and speak to that student should they need guidance.

Student Station

Each station contains a colour monitor, cassette recorder and computer power and in/out station. Each student station has been ergonomically designed to provide comfort during learning sessions. Each monitor is protected by a smoke grey screen preventing unauthorised access.

The student cassette functions are fast forward, rewind, play, record, re-cap, stop, call teacher and cassette effect. These being operative only when the teacher has selected student control at the console. Two level controls are provided, one for master track replay and the other for overall headset volume. This local control provides the student with

NEW PRODUCTS

"HANDS-ON" approach resulting in total acceptability.

For language studies, computer training, engineering, vocational training, medical science, commercial studies, technical enhancement presentation, seminar/workshops, etc, the linking of video and audio technology maximises the learning process without dehumanising the student/teacher relationships.

The proven learning curve with this system is impressive. Please ring and organise an appointment for a demonstration of this system: **Sound Plus, PO Box 474, Edgecliff NSW, 2027. Phone: (02) 328 1622.**

New Commodore Maths Program takes the "problem" out of Maths problems

MATH BLASTER could produce a significant increase in the mathematics abilities of children aged 6 to 11 years, by making the learning process both fun and rewarding.

The program performs the work of a private maths tutor and an arcade game at the same time. It's the latest product from Davidson & Associates who also publish the successful WORD ATTACK and SPEED READER educational programs.

MATH BLASTER takes a two-pronged approach in teaching maths skills with around 600 different maths problems. The first stage is to help children memorize the basic facts and operations. This is done with graphic screen presentations and by requiring the student to fill in answers.

Stage two is to increase speed, accuracy and confidence in handling the basics. This is done with an arcade-style game.

Questions are presented and the correct answer has to be indicated by making an animated character run along to the correct position. The character is then loaded into a cannon and blasted into the answer box.

Animation, graphics and sound effects make the process lots of fun. You can choose your own subject including: subtraction, multiplication, division, fractions, decimals and percentages.

You may also select from four different styles of presentation, and five skill levels. The program may be used with a joystick or keyboard.

Students are given colourful score reports when they finish using the program.

MATH BLASTER was designed by Dr Janice Davidson and tested on children in the Upward Bound School in California. Tests showed that even using the program for 15 to 20 minute a day brought about impressive gains in mathematical ability.

The program comes with two disks - one a program disk and the other a data disk. Although the data disk has some 600 exercises on it, this can be increased.

Teachers or parents are shown how to use the simple inbuilt editor to change the examples. This means the number of exercises is almost unlimited.

MATH BLASTER is menu-driven and simple to use, it comes with a detailed manual containing 26 pages of instructions and explanations and a 40 page listing of the data files.

Recommended retail price is \$69.

I Wish I Knew About the Commodore 64

This book is a comprehensive introduction for computer novices of all ages to this versatile micro-computer. Basic ideas about computing and its related uses are presented in an easily readable format and there is detailed discussion about BASIC programming language.

Pitman Publishing Pty Ltd, \$18.95. □

Enhancements for
Commodore



SPEECH 64

\$69.00

New from Currah, the speech synthesiser for the Commodore 64. Speech 64 is ready to talk immediately on power-up, has an infinite vocabulary and extra BASIC commands. Speech 64's advanced features will give you, your family and friends lots more fun with your computer.

Speech 64 is easy to use! It needs no software to be loaded, it does not steal RAM from the BASIC operating system, or stop arcade style action.

With extended BASIC commands like SAY and text to speech facility, Speech 64 can be programmed in plain English, just like this: SAY "to say anything you want".

You can choose from two different voices, each with programmable intonation, and other commands control the voicing of keys as they are pressed - a useful educational aid.

Speech 64 comes complete with full documentation and two free full colour posters.

Other hardware for the **Commodore 64**

Stonechip cassette interface **\$29.95**
Stonechip colour light pen **\$39.95**

VIC-20 enhancements

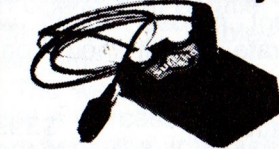
Vixen 16K Switchable RAM **\$79.00**
Full 16K, or 8K or 3K, switchable into desired memory block. Plugs into expansion port. Universal, runs any Basic program without readdressing.

Vixen Switchable Motherboard. **\$65.00**
Up to 4 cartridges usable at the same time. Two rear positions switchable. 4K ROM socket for extra firmware. Housed in custom case.

Make your VIC-20 talk **\$66.50**
The amazing Adman/Currah speech synthesiser. An infinite vocabulary, using the sound amplifier in your T.V. Easy to use. Plugs into cartridge port, no software to load.

Stonechip cassette interface **\$29.95**
Stonechip programmers aid ROM **\$29.95**

Sureshot Joystick



\$29.95

The LONGLIFE joystick featuring positive microswitch action, steel shaft, phosphor bronze bearing, nylon actuator, left and right hand fire buttons. For Commodore 64, VIC-20, Atari, Sinclair, BBC, etc.

Lots more, software too, send SAE for catalogue.



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At discerning computer shops or mail order from Dolphin. Airmail (software) \$1 00, cert mail \$2 50, p/nite courier \$6 00. Enclose cheque/money order/Bankcard details. All prices include sales tax. All products guaranteed.

★ ★ Dealer enquiries welcome ★ ★

all of which are very different. The Commodore standard is serial which is reasonable when using a printer, but slow when used with a disk drive. (NB:- it is possible to speed up the serial bus to a most acceptable speed.) A serial cable is nothing more than a six pin din plug, very simple and reliable.

If you choose to go beyond the Commodore standard you will be faced with two other alternatives. These are CENTRONICS and RS-232. The Commodore 64 does support both these standards from the USER port. (The socket located at the left hand back of the computer.) A Centronics connector is quite different from your average serial cable. It is a great wad of wires, all nicely held together in what is known, due to its width, as ribbon cable.

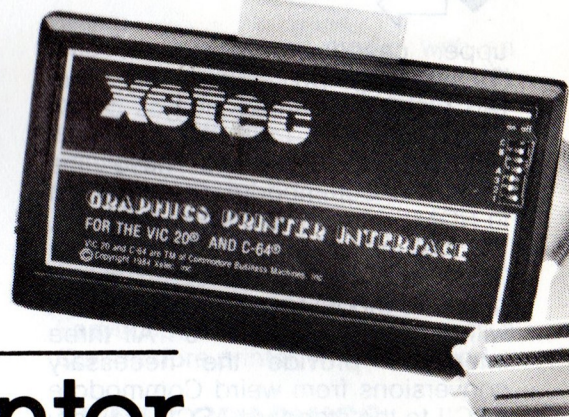
A Centronics cable passes information to the printer in a parallel fashion, which means that a single character is sent all at once instead of one bit at a time. The difference between parallel and serial is much the same as the difference between sending 8000 people through one turnstile at the Easter Show (serial) and sending the same crowd through eight turnstiles (parallel).

RS-232 is serial, tedious to connect and best for communications. Printers do need to communicate. However, in my experience I have found that the variations between printers that use the RS-232 standard are immense, and therefore tend to make it a rather complex way to connect one. If you must do so, you will require an RS-232 cartridge which does a few little changes to what's coming out the user port, and a cable. The rest is a bit of luck setting dip switches, changing baud rates and selecting parities. If none of that made any sense to you, either forget the whole idea, or get an experienced technician to get your system up and running.

Centronics printers don't require nearly as much fussing, and maintain a far greater degree of compatibility with software than do RS-232 printers. Some printers do allow both types of connections, although normally one is optional.

Printers are great tools to have around. I am always finding new

uses for mine and don't ever regret purchasing it. Do shop around, as prices vary greatly. Some distributors are now selling Centronics printers direct for under \$300. These printers are mainly based on the MX-80 type operation standard, which is supported from most word processors and graphics software. □



Which Printer Interface?

by Stuart Kennedy

Commodore, in its wisdom, does not equip the 64 with the standard parallel printer port that many popular printers expect.

A Commodore 64 can talk to Commodore printers, such as the MPS 801, 802 and 803, through its serial bus. This is fine, if a Commodore printer meets your needs and desires. If it doesn't, then you will need to fork out for a black box that converts serial bits into nice fat parallel bytes. Only then will the 64 cooperate with that 180cps dot matrix screamer, or slick printing daisywheel, you've had your eyes on.

There are currently a number of parallel interfaces on the market. This article looks closely at three that are readily available in Australia: the PRINTRON from Ozi Soft, the XETEC GRAPHIC INTERFACE from Abraxas Computers and the TURBOPRINT/GT from Interfaceware.

Two others available, but not reviewed here, are the GRAPPLER CD and the VICSPRINT, both from Ozi Soft. The Grappler CD is an upmarket (read expensive) interface for those who want hi-res screen dumps at the touch of a key, the Grappler was reviewed in a previous issue.

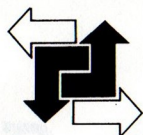
The Vicsprint has been available for some time and shows its age compared to the other four. For one, it ties up the 64's cartridge port. However, if you don't mind losing your cartridge port it could be a bargain at the right price.

Installation with all three interfaces is identical. Take the "D" shaped plug on the end of the ribbon cable and insert it into the connector on the printer. Take the six pin plug and insert it into the serial port on the 64 or the auxiliary serial port on the disk drive. Take the plug which looks like a clone of the cassette port and marry it to the cassette recorder, (cassette operation remains unaffected), then insert both into the cassette port.

Finally, take a deep breath and turn on the disk drive (if applicable), printer, anything else hanging out of your 64's backside and then switch on the computer. After carrying out the above you should be looking at an operational parallel printer and a collection of cables worthy of Telecom.

The weak link on the connection front is the cassette connector, which is where the interfaces draw their power - all three were rather flimsily made. As stated earlier, the primary function of these black boxes is to intercept the consecutive bursts of eight bits transmitted by the serial port and send them a byte at a time to a parallel printer. That's fine as far as it goes, except there are compatibility problems beyond the method of data transmission when using a non-Commodore printer.

One of these is the printing of Commodore character sets, of which there are four. The first one is upper case and graphics, the second is



upper case/lower case and the "business graphics" set. The other two provide reversed images of the above.

Commodore printers have the complete Commodore character set in ROM - other brand printers do not. For instance, if you send CHR\$(115) (the heart symbol in upper case/graphics mode) to a Gemini printer, it will print a lower case "s". All three interfaces provide the necessary conversions from weird Commodore ASCII to the standard ASCII ordinary printers expect. They also have copies of the Commodore graphic characters in ROM which are placed into the printer's download character RAM on the fly.

If your program calls for a string of, say, club symbols to be printed on paper, then the interface can make the printer comply, so long as it is a dot matrix printer with graphics capabilities. A letter quality printer is restricted to printing only those characters which are on its daisy-wheel.

Another compatibility problem lies in the unique Commodore printer control codes. For example, sending a CHR\$(18) to a Commodore printer starts it printing reverse characters, whereas sending a CHR\$(18) to a Gemini printer makes it cancel condensed print mode.

Again, each interface gives the capability of emulating a Commodore printer.

Each has a number of operation modes which are selected by sending a specific secondary address. Secondary addresses are command numbers which have different meanings to different devices. For instance, OPEN [file no.],8,15 tells the disk drive (device eight) that you will be talking to it on the command channel (channel 15).

Similarly, with the PRINTRON, OPEN [file no.],4,3 tells the interface (device four) to intercept characters destined for the printer, convert them to the equivalent hex codes and then send them off to be printed. The interfaces were tested in a Star Gemini 10X dot matrix printer, which is typical of the type most likely to be used by you people out there in PC land.

I also tested the various interfaces with the Easyscript word processor

and put through the Printer Test program which resides on the 1541 DEMO/TEST disk. This program uses all the CHR\$ functions used to control a Commodore printer and gives a good indication of how well an interface can make another brand printer emulate a Commodore printer.

PRINTRON INTERFACE

The PRINTRON has eight DIP switches which are used to set printer type, device number (4 or 5), automatic line feed on receipt of a carriage return (on or off) and whether the interface will allow software selection of ASCII correction, "off" locks in "no ASCII correction". Getting at the DIP switches means unscrewing the casing. An access hole in the case would be better.

There are nine printing modes available with the PRINTRON, corresponding to nine secondary addresses. Modes 1, 5 and 8 are the same as 0, 4 and 7 except that they don't add a linefeed to a carriage return. Adding twenty to a secondary address number "locks" the interface into the relevant mode, no matter what following secondary addresses are sent. To "unlock" the interface you must either switch the computer off then on or momentarily disconnect the cassette connector.

Mode 0 or default mode gives upper case/graphic character output with a line feed. Sending a CHR\$(17) switches to upper/lower case. This mode emulates a Commodore printer, except when listing a program. Listing causes any cursor or colour control codes to be printed in a mnemonic equivalent. For example, if a program line contained a reversed heart, two reversed "Q"s and a reversed "j", then the printer would LIST it as:

```
10 PRINT"[CLR][C/DN][C/UP]"
```

A quick look at a BASIC program listing in this magazine will demonstrate how much clearer this method is compared to cryptic inversed graphic control codes.

Graphics characters, like the diamond or ball symbols, and reversed characters are printed as

they would appear on the screen, albeit a lot slower than ordinary text. This is because they must be downloaded from the PRINTRON's ROM to the printer's RAM. The PRINTRON produces these characters at a pitch of about eight CPI (characters per inch), which means disastrous formatting when combined with the GEMINI's ten pica text.

Print mode 6 causes ALL characters to be printed from the interface's ROM, which fixes the spacing problem but results in print speed slowing to a crawl. The ROM character set looks suspiciously like that on the old Commodore 1515 printer - horrible. You can easily see every dot in the print matrix and there are no true descenders.

Setting a secondary address of 3 puts the interface into hex mode, where all printed output is in the form of a hexadecimal number. For example, a carriage return, CHR\$(13), appears as OD. This feature is useful for debugging print routines.

Modes 4 and 5 allow all character codes to get through to the printer unconverted. What the computer sends is what the printer gets. This allows "transparent" control of the printer and is useful when running applications programs which have a setup file dedicated to your printer or when doing hi-res screen dumps. Mode 7 gives upper/lower case text along with the "Commodore key" graphics characters. Sending a CHR\$(145) will switch to upper case/graphics.

Testing the PRINTRON with Easyscript presented no problems besides the spacing problem with reversed and graphics characters already mentioned. The word processor could be set up to expect a CBM printer and escape sequences sent to control the Gemini's special features such as underlining went to the printer unhindered. Thus, reverse printing, graphics characters and the full range of the Gemini's capabilities could be used together.

The PRINTRON tested in this review was an early model and came with rather muddled documentation. Later production versions come with a comprehensive 127 page manual. The distributors also spoke of a new ROM soon to be released which will speed up graphics printing. This



ROM was unavailable at test time.

TURBOPRINT/GT

A TURBOPRINT/GT will not, as its name suggests, lay rubber or attract members of the opposite sex. It will do a reasonable job of interfacing a parallel printer however. The TURBOPRINT/GT has an LED on the top of the casing to assure you that it is operating and four DIP switches which are accessible through a hole in the case.

The first DIP switch sets the device number (4 or 5) and the remaining three set the printer type. A port in the side of the interface will accept the optional TURBOBUFFER. This is a 16K print buffer which would be of interest to someone who doesn't like taking a coffee break whenever there is a print job over a couple of pages in length. It retails for \$139.00.

The interface has four ways of handling print output. The first is TAG mode, which is designed for use with letter quality printers which have no way of printing non ASCII characters like graphics or reverse field without resorting to a custom daisywheel. TAG mode substitutes a '#' symbol for any unprintable characters sent by the computer. This way formatting is maintained and the user has some means of knowing whether a graphic character or space was sent.

LIST mode substitutes mnemonics for all characters which are not standard ASCII. GRAPHICS mode will print graphics characters on a dot matrix printer with graphics capabilities, colour and cursor control codes are ignored with the exception of cursor up and cursor down which will switch case.

Like the PRINTRON, the TURBO-

PRINT spaced graphics and reverse characters at eight CPI, which resulted in formatting problems when these characters were combined with the Gemini's ten CPI text. These three modes mimic a Commodore printer as far as ASCII conversions and CHR\$(8) functions are concerned.

TRANSPARENT mode sends everything to the printer as straight ASCII.

Seventeen secondary address commands give upper case/graphics, upper/lower case, linefeed on and linefeed off versions of the above modes. Secondary addresses 16 and 18 produce an interface self test and a software reset respectively. The software reset command means that the DIP switches can be changed without switching the interface off.

The only print mode which can be "locked" with this interface is TRANSPARENT. Curiously, there is no auto linefeed version of TRANSPARENT which means that a linefeed must be supplied by software if necessary.

Using the interface with Easyscript gave no problems so long as the word processor was set to expect a non-Commodore printer and the interface was set for transparent operation. Unlike the XETEC and PRINTRON interfaces, the TURBOPRINT would not allow any printer specific escape sequences through, when in an emulation mode. Running the PRINTER TEST program took 15 mins 32 secs, graphics and reverse field printing were particularly slow.

The 38 page manual supplied was well presented and gave clear instruction in setting up and using the interface. Included in the manual is a machine code hi-res screen dump program which, unfortunately for people without one, requires a disk drive to work.

NOTE: The TURBOPRINT/GT now comes with a new ROM, called - believe it or not - the 1.1 ROM. This modification is available free to all present TURBOPRINT/GT owners via the distributors, Interfaceware.

The original ROM had problems working with the following pieces of software: Multiplan, Mirage WP and Doodl. The new ROM will work correctly with them. The new ROM

adds a "transparent mode" with an automatic linefeed and the capability of sending ESC - CHR\$(27) - sequences to the printer while in an emulation mode, so long as the Commodore dot graphics command, CHR\$(8), is not set.

I tested the new ROM with Easyscript and found that sending ESC commands to the Gemini, with Easyscript set up to expect a Commodore printer, would not work.

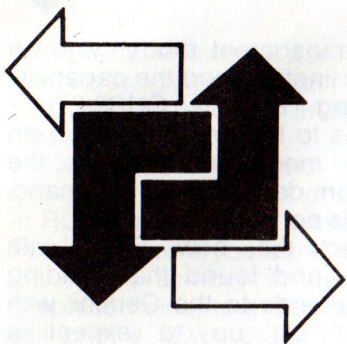
XETEC GRAPHICS INTERFACE

The XETEC (pronounced "zeetek") interface has eight DIP switches, accessible through a cutout in the casing. Three switches are used to set the printer type, three more are used for print functions and the remaining two do nothing. Switches 1, 2 and 3 control device number (4 or 5), automatic linefeed (on or off) and no ASCII correction (transparent) "locked".

Seven secondary address modes allow selection of upper case/graphics, upper lower case and transparent printing either with or without an automatic linefeed. Secondary address three gives hex output. Adding twenty to a secondary address "locks" it in, despite the value of any following secondary address commands. So far the XETEC sounds like a clone of the PRINTRON.

Where the XETEC really starts to show its class is that there are 22 additional commands which can be sent through secondary address 15, the command channel normally associated with the disk drive. By opening two files to the interface you can send print data on one and commands on the other.

The additional commands let you: LIST graphics characters as graphics, ASCII values or keystroke mnemonics; LIST control codes as mnemonics or inverse graphics; set page length, print width and print spacing (6 or 8 lines to the inch); turn line feeds on and off; "unlock" the interface; reset the interface (reread DIP switches); temporarily set transparent mode; print all characters from the interface's ROM character generator; change the device number; and look at the credits.



Another plus with the XETEC is that it has its own 2K print buffer. While this is not much memory in the world of print buffers, I found it to be quite useful. Printing an 80 characters per line, 66 line page took 60 seconds with all three interfaces, with the XETEC the computer was available for use in 30 seconds.

The XETEC ripped through the Printer Test program in four minutes which is over three times faster than the PRINTRON or TURBOPRINT/GT. This interface could make the Gemini do graphics and reverse field printing as fast as ordinary text, which accounts for the dramatic

speed increase over the other two interfaces. Formatting of the output was spot on, due to the fact that graphics and reverse field printing is done at 10 CPI, which is the same pitch as normal "pica" text.

Easyscript and the XETEC got on well with one another. Escape sequences could be sent with the interface in emulation mode, allowing such niceties as underlining and italics to be mixed with reverse field and graphics printing.

The 28 page manual supplied covered all aspects of the interfaces operation, but was a bit light on for detail and examples. A machine code hi-res screen dump program included in the manual failed to work at all. Not good enough.

Conclusions

To save any suspense, I will say straight out that the XETEC is a clear winner. It has more useful commands, more consistent emulation and more speed than the other two interfaces. The XETEC is an all round, good guy, parallel printer interface.

The TURBOPRINT/GT would be a good choice for someone with either a daisywheel printer, a lot of printing to do or both, as its TAG method of operation and optional 16K print buffer would prove quite useful. Bear in mind that the buffer adds \$139.00 to the purchase price.

The PRINTRON, which has been available for longer than the other two, would be worth looking out for on the secondhand market. I would wait until the promised new ROM appears before considering it as a contender for the XETEC's crown.

Fact Sheets

PRINTRON

Secondary addresses: 7
Cable length: 78 ins
Special features: Lifetime guarantee
Distributor: Ozi Soft
Recommended retail price: \$119.00
Warranty: Life of original

TURBOPRINT/GT

Secondary addresses: 19
Cable length: 60 ins
Special features: Optional 16K buffer
Distributor: Interfaceware
Recommended retail price: \$139.00
Warranty: 90 days
Printers supported: Axiom GP100/500/550, BMC, C-Itoh Prowriter, Epson MX/RX/FX, Gorilla/Banana, Juki 2100/2200/6100, Mannesmann Tally, NEC 8023, Olympia Compact 2/RO, Okidata 82/83/84/92/93/94, Panasonic KX-P1090/P1091, Seikosha, Silver Reed, Smith-Corona D200/D300, Star Micronics Gemina/Delta.

XETEC GRAPHICS INTERFACE

Secondary addresses: 7
Cable length: 72 ins
Special features: Extra 22 commands on Channel 15 2K print buffer
Distributor: Abraxas Computers
Recommended retail price: \$129.00
Warranty: 90 days
Printers supported: Banana, C-Itoh 8510/Prowriter, Star Gemini/Delta, Epson, GX-100, NEC 8023, Okidata 82/92, Seikosha 100.

NOTE: The XETEC has a special command which can be sent over the command channel to customize the interface to virtually any parallel printer. This involves sending a sequence of 18 data bytes. The distributor keeps a list of printers and the relevant bytes to send. □





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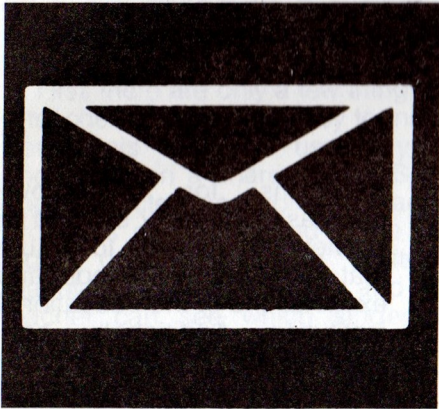
Name

Address

Phone

Postcode

Please send me by return further information Yes/No



Letters

“Rescuing Lost Files”

During the recent Christmas holiday period I purchased a copy of the December 1984 issue of the Australian Commodore Review. I found the magazine very helpful and interesting. The program to allow improved screen editing has proved very useful and a time-saver.

What is the meaning of the symbols <<2 and <<1 shown on page 25, in the text of the article “Rescuing Lost Files”?

**Robyne Hobson
Lakemba**

Ed: Apparently they are due to a mix up at the typesetter. They should be substituted for a “+” on page 25 and on page 24 a “=”.

“Progrenumber”

Reference the program “PROGRENUMBER” in Vol 1, No 7. The following comments are made:-

LINE 30 after FOUND should be [2CU] not [1CU] - CU cursor up.

LINES 2204 & 3204. If the program has line numbers smaller than 10 these lines produce an error signal. This can be corrected in both cases by changing ASC(C2\$)*256 to ASC(C2\$ + CHR\$(0))*256.

The program necessitates creating a new file name and one therefore finishes up with two files on the disk on the same program. If one desires

to have only one renumbered file under its original name this can be done as follows.

LINE 900 Delete End

ADD LINES

```
910 INPUT "LIST PROGRAM  
UNDER ORIGINAL NAME (Y/  
N)";N$
```

```
915 IF N$ = "N" THEN END
```

```
920 IF N$ <> "Y" THEN PRINT  
"[2CU]": GOTO 910
```

```
930 OPEN 15,8,15, "S0:" + IP$
```

```
940 PRINT #15, "R0:" + IP$ + "="  
+ OP$
```

```
950 CLOSE 15: END
```

Hoping this will be of use.

**Dave Belson
Buderim, Qld**

Commodore 16

I have just purchased the new Commodore 16 and am disappointed to find that the saving and loading of programs on tape has taken a backward step, as compared to the VIC 20.

I cannot understand why Commodore have increased the time taken to load and save programs by as much as a half again.

Would there be any way in which the speed or Baud rate could be increased by simple programming?

Also is there any way that VIC 20 programs can be loaded and modified with software programs to make them suitable for running on the Commodore 16?

Last but not least I would like to find out how to operate the machine monitor as no information at all is supplied with the unit!

Apart from the above grievances it looks to be a very promising unit.

**C. W. Catherwood
Lismore Heights, NSW**

Ed: VIC 20 and Commodore 64 may be loaded from disk directly into the Commodore 16 or PLUS/4. It will be necessary to make many changes to make some programs run, whilst others would be impossible to convert without being nearly rewritten.

Potentially, the speed or baud rate could be increased, but not by simple programming.

Documentation for the monitor only appears in the PLUS/4 manual. We will reprint it in a coming issue. □

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Update on Networking

An increasingly complex and controversial issue for educators, software publishers and hardware manufacturers is software compatibility with multi-user networking systems. Many software publishers have resisted making their programs compatible with disk-shared systems because of the loss of revenue. Educators, however, maintain that they cannot afford to pay a single-copy price for each computer in a classroom. Hardware manufacturers are caught somewhere in the middle, pressed to work cooperatively with software developers who want protection and educators who seek computers with low-cost networking capabilities.

Educators, of course, argue that technological advances like networking – designed to make software use more efficient and less costly – are subverted by software protection. In addition, it is also illegal, according to software copyright law, to use one copy of a program to load into several computers without permission from the copyright proprietor. This further complicates the issue.

To avoid the whole problem, a few school districts have resorted to alternatives. One school district, for instance, developed its own word processing program for use in its classrooms and therefore did not have to concern itself with either protection schemes or copyrights. But is there another solution to the dilemma, aside from having districts develop their own software?

Yes, there are some options. Take, for example, a typical protection method sometimes called "lock-and-key". When software is protected with this method, constant disk access often locks up a networked system. It is not hard to modify this protection, however, to allow for networking. Certain program segments that are constantly used can be provided on a separate disk, which is not protected. Thus the master disk remains protected, and, at the same time, the program segments on the

unprotected disk won't work without the master disk.

Some software companies such as Scholastic and DLM have found a workable solution by providing software at two to three times the single-copy price if it is to be used in a networked situation. But the fact still remains that the software provided for networking may need to be unprotected, depending on the sophistication of the networking system – the more sophisticated the system, the less likely it is to work with protected software. This has led to yet a third possible solution – licensing agreements. Special licensing agreements can allow a school district to make unlimited copies for a specific use at a negotiated price. Software companies nevertheless have reservations about this type of agreement. They are reluctant to issue unprotected copies of software, regardless of what kind of guidelines are agreed to by a school district.

A fourth solution to the dilemma might be for software manufacturers to develop products specifically for the purpose of networking. Prices could be adjusted accordingly to cover extra costs of development and to make up for the fact that the buyer will need only one copy.

Educators' responsibilities

A US council said that educators need to face the legal and ethical issues involved in copyright laws and publisher licence agreements and must accept the responsibility for enforcing adherence to these laws and agreements. They do not see budget constraints as an excuse for illegal use of software.

They also said educators should be prepared to provide software developers or their agents with an approved written policy statement including as a minimum:

1. A clear requirement that copyright laws and publisher license agreements be observed.

2. Provisions for on-approval purchases to allow schools to preview the software to ensure that it meets the needs and expectations of the educational institution. Additionally, software developers are encouraged to provide regional or area centres with software for demonstration purposes.
3. Cooperation with hardware vendors to provide an encryption process which avoids inflexibility but discourages theft.
4. Provision for multiple-copy pricing for school sites with several machines and recognition that multiple copies do not necessarily call for multiple documentation.
5. Provisions for network-compatible versions of software with pricing structures that recognize the extra costs of development to secure compatibility and recognize the buyer's need for only a single copy of the software.

Other solutions rely on publishing special versions of the software for the various network systems available. These versions do not run on single computers.

Networking case studies

The Peirce Middle School in West Chester, Pennsylvania, successfully tested three networks, two "passive" and one "active", and came to some interesting conclusions.

The VIC Switch, a network manufactured by Handic Software, allows eight Commodore 64s to be networked with compatible Commodore peripherals. In this case, the model 1541 disk drive and model 1525 were used. (Note: We understand that it can also be used in conjunction with VIC 20s, provided your software is applicable to both computers, but this was not part of our evaluation.) This "passive" network basically allows the loading and saving of programs and access to the printer, and not much

more. We discovered a number of positive reasons to use such a network.

First, there are only a few things for a teacher to learn. It is easy to install. Peripherals can be used by all computers on a shared basis. Some copy-protected and some interactive programs can be loaded (done with legal permission from software manufacturers, of course) and the teacher can see which student is using the peripherals because LEDs (or little red lights for you non-technical types) are located on the front of the VIC Switch. (There are also numerals on the back so you can keep track of how you should number your machines.) The network is affordable for most schools. (Please be certain that you order cables since they are not usually included in the base price. These cables come in four different lengths allowing plenty of different room configurations.) And, finally, no dedicated computers are needed. (In other words, every computer can be used by the students).

The network occasionally becomes hung, however. This can be corrected for the most part by doing one or more of several things. You can shut off the printer. If the red disk drive light will not turn off, you can have a computer load in the directory. This usually overrides the problem. Or you can shut down the computer that is hanging up the system - or shut down everything and start again.

You might think that this kind of network is more than you can handle, but you will soon discover that for most classroom use, it is more than adequate and a needed part of a computer lab which has limited funds.

Sid Wesseldine, a technical advisor for Handic, commented on another positive feature of this equipment. "In the two years I have been working with the VIC Switches, I have never heard of one of them breaking."

The CSI 64 Switch Model 1207, a second "passive" system, is manufactured by Computer Specialities Inc of Melbourne, Florida. It is very similar in appearance to the VIC Switch and has many of the same fine features.

One important difference is that the CSI 64 Switch does not have LEDs on the front of the unit. Therefore, if

the unit gets hung, as all networks will do at times, the teacher is unable to determine which computer is causing the problem and must physically check or ask students if they are having any problems. This may not seem difficult, but it can be annoying, particularly if the student is involved in a game or timed educational program. In some cases it is possible that the teacher may have to have the entire system (including all the computers) shut down if he/she cannot locate the problem. This can be frustrating for both teacher and students.

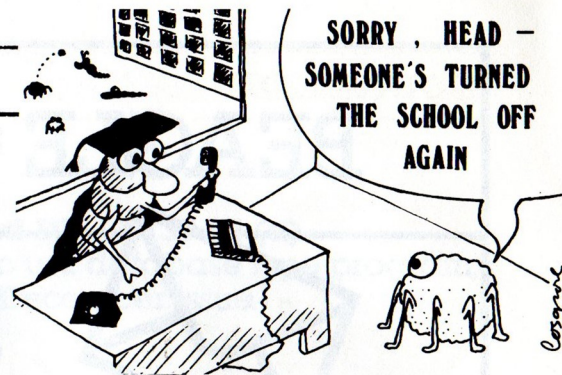
Another minor difference between these two networks is the fact that there are no numerals on the back of the CSI 64 Network. With no LEDs on the front, there is no need to plug in the computers in rotation. However, when installing the network, the teacher may be concerned about this.

Our experience with these two networks showed that the students were less frustrated in dealing with the VIC Switch than with the CSI 64, mainly because the CSI system lacked LEDs. The children also questioned the need for continually disconnecting the cables (as suggested in the CSI direction sheet) on any computer not using the network. They felt that there would be a lot of wear and tear on these cables since students may not be careful in disconnecting them and yet they would not want to wait for the teacher to do this.

A third network, the **Multi-Link**, is manufactured by Richvale Telecommunications Ltd in Canada. This network is much more complex than the other two. Multi-Link is an "active" network, which means it does much more than simply load and save programs and allow use of the printer. However, as a result, it requires more money and needs to be installed by a competent technician. It also requires a dedicated computer, which must be adapted for the network. This computer is called the master and the students' computers are called the satellites.

Now, what makes Multi-Link worth paying the additional costs? The following is only a partial list of what it can do.

- Has extremely quick loading time for the entire network.



- Allows up to 48 Commodore 64s to be networked in groups of six (our evaluation had only fourteen hooked up and running, however).
- Halts (freezes) and continues (unfreezes) any or all satellites.
- Can make the satellites' BASIC programs stop.
- Can duplicate the master screen on some or all satellites.
- Can lock and unlock the master unit for security purposes.
- Can completely reset any or all satellites to power up.
- Can send messages from master to satellites or from one satellite to another.
- Has a security system to protect files from certain satellites.
- Can allow the teacher to get a snapshot view of a satellite screen.
- Can prevent satellites from using peripherals unless they get permission.

We encountered most of our problems with Multi-Link right in the beginning when both teacher and students weren't sure what to do. However, because the manual is very comprehensive, it was easy to locate information we needed.

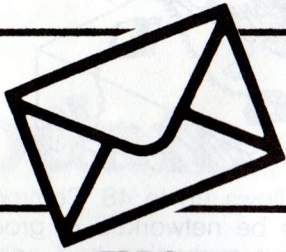
??Multi-Link does require a lot more time in terms of teacher preparation. However, the time is worth it, and after you get used to it, you realize problems are minor considering its complexity.

All things considered, the Multi-Link is probably not suited for a novice teacher who is still having difficulty determining what the computer jargon is all about. However, Multi-Link is definitely worth considering if an experienced teacher with a good cash flow wishes to network. It can allow your network to expand as you purchase additional Commodore computers.

Since there are several other networks on the market and several other prototypes that we know about, more information will be available after we have the opportunity to evaluate them.

??If you are aware of any networks for the Commodore 64, please write to us. We would appreciate your sharing - after all, that's what networks are all about.

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(See review in November issue - this review also says the Music Processor is "probably the most comprehensive and useful program in the series".)

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- | | |
|--|--------------------------------|
| Pogo Joe | \$29.95 (c) \$34.95 (d) |
| Award winning!! Many levels, excellent graphics. | |
| Asylum | \$34.95 (c) \$39.95 (d) |
| See preview in December issue. Graphics adventure. | |
| Institute | \$39.95 (d) |
| From the makers of Asylum - many hi-res pictures. | |
| Suicide Express | \$19.95 (c) |
| (Arcade/speech/excellent graphics) | |
| Potty Pigeon | \$19.95 (c) |
| Pretty graphics, great for nature lovers. | |
| Monty Mole | \$19.95 (c) |
| Blogger type action, ladders and levels. | |
| Decathlon | \$29.95 (c) |
| Olympics | |
| Son of Blogger | \$19.95 (c) \$24.95 (d) |
| Very popular. | |
| Loco | \$19.95 (c) \$24.95 (d) |
| Father of Suicide Express, great pictures. | |
| Eagle Empire | \$19.95 (c) \$24.95 (d) |
| Galaxion type shoot-em-up. | |
| Killer Watt | \$19.95 (c) \$24.95 (d) |
| Another shoot-em-up, novel animation. | |

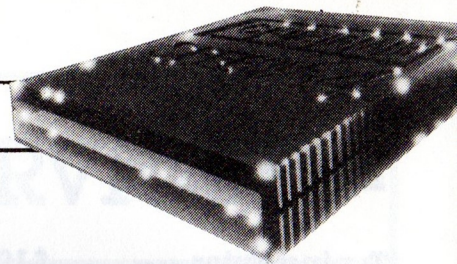
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|---------------------------------------|--------------------------------|
| Guardian | \$19.95 (c) \$24.95 (d) |
| (Brilliant defender imitation!) | |
| Rocket Roger | \$19.95 (c) \$24.95 (d) |
| (Son of Blogger fans will love this.) | |
| Strip Poker | \$29.95 (d) |
| (Adults only?) | |
| Super Skramble | \$19.95 |
| Ye olde original | |
| Solo Flight | \$39.95 |
| Flight simulator. | |

NEW SOFTWARE

- | | |
|--------------------------------------|--------------------|
| Journey | \$19.95 (c) |
| Adventure type ladders and levels. | |
| Henry's House | \$19.95 (c) |
| Multi-screen action. | |
| Jungle Quest | \$19.95 (c) |
| Tarzan, eat your heart out. | |
| Golf | \$16.95 (c) |
| (Full graphics, very comprehensive.) | |
| Cricket | \$16.95 (c) |
| (Simulation.) | |
| Show Jumping | \$16.95 (c) |
| (Here's one for the girls.) | |
| Lazy Jones | \$19.95 (c) |
| (Very entertaining.) | |

I have carefully looked over the entire range of software and hardware being offered in this mail order list, and believe that it is of good quality and excellent value for money.

Andrew Farrell, Editor



Currah Speech Synthesizer

reviewed by
Stuart Kennedy

Want to have meaningful audio experiences with a Commodore 64? Want to be the first one on the block whose computer can swear like a Marine Gunner Sergeant or recite the best soliloquies from Hamlet? Then the Currah Speech 64 is what you've been waiting for.

While speech synthesis by computers is fast becoming passe, it still gave me a vaguely queasy feeling in the stomach when the 64 first started chatting away. Speech used to be the exclusive province of humans and cockatoos. Another sacred cow bites the silicon dust.

The Currah Speech Synthesizer plugs into the 64's cartridge port. A lead from the unit plugs into the audio/video port. It is through this lead that the speech is sent to the 64's sound circuitry and then to the TV speaker. This method of connection makes it impossible to use a video monitor with the speech synthesizer in place, as both use the audio/video port.

The unit comprises three chips. An Uncommitted Logic Array which handles timing and communication with the 64. An 8K ROM containing the software necessary to do text to speech conversion and "voicing" the keyboard. A SP0256-AL2 Speech Processor chip which generates the allophones - speech sounds - which go to make up words.

The speech synthesizer adds five extra commands to BASIC.

To bring the unit into operation you type INIT which prints a sign on message and starts "key voicing". BYE switches the synthesizer off.

Key voicing echoes with speech whichever key is being typed. If "A" is pressed, the phonetic sound for "A" is made over the TV speaker. If CTRL/1 is typed the unit responds with the word "black". Pressing cursor down has the computer saying "cursor down". This is most amusing when heard for the first time, but soon becomes a bit of a drag. Typing KOFF switches key voicing off, KON will bring it back on again.

Two voices

There are two distinct voices to play with. Sufficing a SAY or KON command with a 1 will set the high voice while 0 sets the low voice.

Both voices have a monotonic "metallic" sound, like a robot in a Z grade fifties sci-fi movie. Default is the high voice. Voices cannot be switched within a SAY command.

Making the thing speak from BASIC is simple. The SAY command starts text to speech translation of whatever follows. For example, SAY"GOODNIGHT DICK" does exactly that. SAY also works with string variables.

Speech is produced by allophone synthesis. Allophones are individual speech sounds which produce recognisable words when strung together. There is no limit to vocabulary with allophone synthesis because any word can be made by finding the right allophones.

Some of the allophones are difficult to distinguish between, especially "b" and "d".

Inside the unit's ROM is a Text to Speech Interpreter which looks at the text inside a SAY command and converts it to the correct allophones according to a set of logical rules. This works well until a word that doesn't conform to the rules is encountered. English has a lot of spelling pronunciation irregularities like "plough" and "cough". There are two ways around this problem. One is to spell the word phonetically - a la George Bernard Shaw. "Plough" becomes "plow" and "cough" becomes "coff" or "koff".

Alternatively, speech can be coded into allophones by the programmer. This is the only way to create the correct pronunciation for a word like "physiotherapy".

Coding allophones is done by enclosing the word in square brackets and using the relevant mnemonic allophone from a chart in the manual. Mnemonics are delineated by enclosing them in round brackets. Physiotherapy would look like this; [fi(zh)(ee)(eau)(th)(aer)ap(ee)].

Adding emphasis

Rising intonation and emphasis can also be added when direct allophone coding is used. Rising intonation is given by using uppercase letters while lowercase is not intoned. Emphasis is created by using a double letter allophone such as (gg). This gives a "harder" sound.

Allophones are queued for processing by the unit in a 256 byte buffer which starts at \$CF00 in the 64's memory map. This works out at between 25 and 30 seconds' worth of speech before the buffer overflows and extra incoming allophones are ignored. The unit maintains a system variable called SP% which gives the amount of buffer space used. If a long list of words is to be spoken, then a delay loop must be inserted at a point in the list where the buffer is going to overflow. The delay allows the buffer to empty before any more allophones are received.

Speech generation is interrupt driven so that normal BASIC processing can continue in parallel with "conversation".

The documentation supplied with the Speech 64, though rather sparse in volume, is very thorough. Installation and operation of the unit from BASIC is covered clearly, plus there is a good section on machine code programming. A sample program which drives a speaking clock - I couldn't think of anything more annoying - is included.

What do you do with it? The obvious applications are in education. Spelling drill and typing programs can now involve an extra sense in the learning process. Blind computer users could benefit a great deal. All great stuff, but the most common use will be in games and general mucking about. Talking adventures are a snap to program with Speech 64.

At \$69.95 - the cost of a good quality game - the Currah Speech 64 is an inexpensive, yet fully functional, introduction into the world of speech synthesis. Our review copy came from the Australian distributors, Dolphin Computers. □

Kids say the Darndest Things ... to Computers

Kids Say the Darndest Things to . . . Computers is an educational program which claims to teach word skills with a smattering of down home ethics thrown in. The program uses the services of an American radio and TV hack called Art Linkletter. While Art may be a household word in the US, his relevance to Australian children is zero. Perhaps the Australian distributors could alter the program code slightly and throw in a local ersatz uncle like John Laws.

The program is only available on disk as it uses large data files which are loaded in as needed. Initial loading of the program takes close to three minutes with two flashy musical title screens being presented - amusing the first few times and then a bore. There should be a method of quick loading the program if desired.

The program plays in three parts. First off, Art asks the player's name, age and a few family details. Names are stored in a disk file so that Art can appear to remember the child next time round.

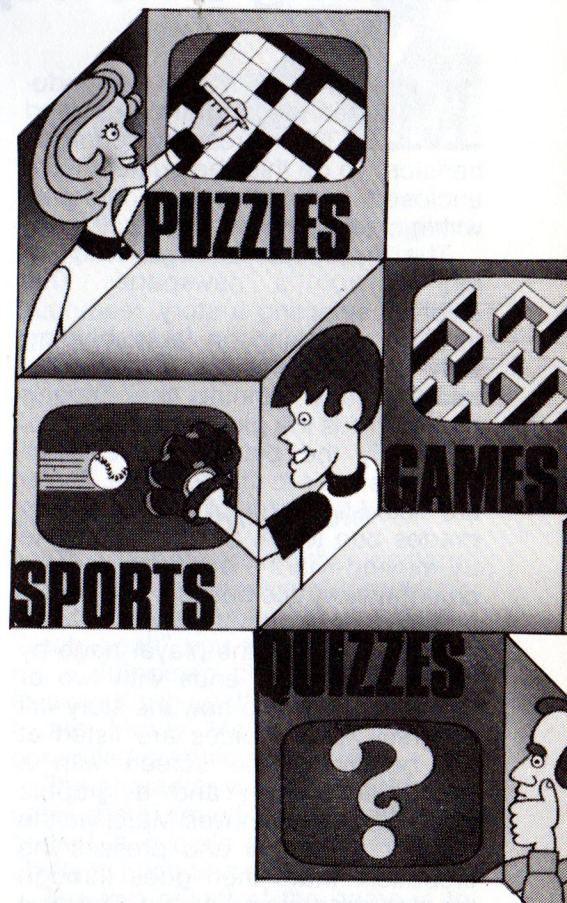
Next, Art loads his storybook from disk and presents the player with 10

story choices. The stories are graded in complexity from one to ten. The final section of the program depends on whether the player decides to participate in building the story or leaves the process to Art. Each story outline can be filled with variable objects and descriptive phrases. The program either accesses a disk library of these to create a story automatically or prompts the player to supply them. The latter is known as "interactive fiction" in computer jargon.

With the interrogation over, the story is displayed on the screen or printer as desired. The stories can take very amusing twists depending on how warped an imagination the player has.

Each story serves to illustrate a lesson in "life". Topics include dealing with people different from oneself, moderation and the value of patience.

After the story has been displayed, the player is asked whether he/she wants to "know more about what this means". If the answer is yes, uncle Art gives a short lecture on the ethical idea the story serves to illustrate. The program encourages



discussion of the topics with parents and friends.

In America you can buy anything in a can, or on disk, even morality.

I tested Kids Say the Darndest Things to . . . Computers on a rather freethinking eight year old. He liked to give unprintable replies to the prompts. The stories he and the program came up with would do well in a humour magazine like National Lampoon. The documentation to Kids Say the Darndest Things to . . . Computers recommends adult supervision in use. No doubt this is to stop the program becoming Kids Say the Most Revolting Things to . . . Computers.

Kids Say the Darndest Things to . . . Computers will stimulate a child's imagination and pump some novelty into the business of reading and writing. The program has shortcomings in the limited number of story outlines available and the inability to vet the child's responses. □



Monkeynews

Know News Is Good News

Monkeynews – running a newspaper

MONKEYNEWS is an educational program designed to teach reading comprehension. To do this, the authors have enclosed educational techniques within a game theme.

The player has to help Marc the monkey run a newspaper. This involves selecting a story, reading it through, checking on facts, helping with the typesetting, writing the headline and running the printing press. This is the game theme.

Initially the player is presented with six stories to choose from. These are listed in order of difficulty from grades one to six. Selection is done by moving Marc – a simian sprite – onto the story title desired.

The story is then loaded from disk and presented to the player page by page. Each page ends with two or three choices as to how the story will progress. The choices are listed at the bottom of the screen with a verbal description and a graphic “door”. The child moves Marc, via the joystick, to a door and presses the firebutton. Marc then goes through the door and slams it shut. The next page of the story is determined according to the door chosen.

While there are only six stories, the variable twists in the plot enable the stories to be recycled many times and still retain interest.

Factfinder Tree

Once the story is finished the child can either turn pages back and reread or go on to the fact checking section.

This section is graphically represented by the “Factfinder Tree”. The tree has three branches on which appear the multiple choice answers to the question asked at the top of the screen. The child moves Marc to an answer – if it is correct the monkey gets a banana, if not he falls off the tree. Three questions are asked per story.

Next comes the “Typesetter”. This is a computer cute version of an educational technique called the Cloze Procedure.

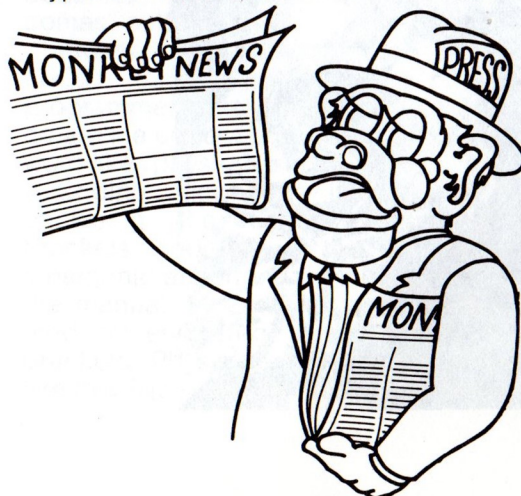


The story is printed on the screen page by page with eight words missing from each page. The place for the missing words is highlighted by a yellow coloured block.

At the bottom of the screen an animated conveyer belt brings the missing words in four at a time. Moving Marc to a word and pressing the fire button causes a boot to kick the word up into Marc's hands. The player then moves the first letter of the word onto the block where he/she thinks the word should be. If it fits, the word snaps into place, if it doesn't, the word falls to the ground.

Printing press

The last section of the program shows the front page of a newspaper with the first page of the story and a relevant picture. The child is asked to type a headline, which the monkey



centres on the page. Then the program creates a simulation of a rolling printing press, complete with whirrs, clanks and newspapers scrolling past on the screen. This is the “reward” for completing a lesson.

The number of newspapers “printed” depends on the speed and accuracy with which the child has completed the comprehension sections.

Now for some criticisms.

Six stories are not enough, even though each story has permutations within it. The documentation spoke of having extra story disks becoming available at some time.

The STOP key is not disabled. The lesson can be brought to a halt by a missed keystroke.

The screen is blanked while sections of the program are loaded in. I know this speeds up disk processing marginally, but it's not the best thing for holding short-read young attention spans.

The program is packaged with a colouring-in poster and a short booklet on operation. No backup disk is provided, but as the program disk is not copy protected there is nothing to stop you making your own.

Monkeynews is a useful educational tool. It uses tested educational techniques dressed up in a theme which is novel and stimulating for children who might otherwise find reading to be hard going. □

Gremlin Graphics Games

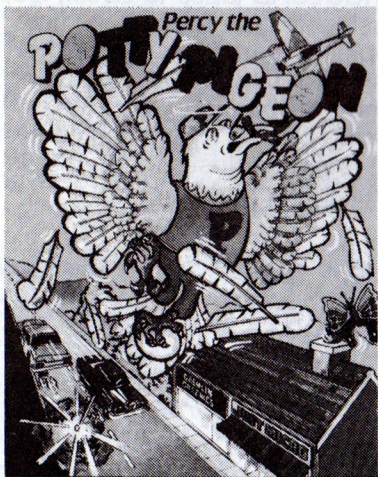
by Stuart Kennedy

Both **Percy the Potty Pigeon** and **Wanted: Monty Mole** are the work of a talented young Pom by the name of Tony Crowther, also responsible for *Blogger*, *Son of Blogger* and *Loco*.

Tony recently transferred his talents from Alligata Games to Gremlin Graphics, where his programming savvy has gone from strength to strength.

This guy must have organic versions of the 6502, VIC and SID chips implanted in his brain – both games feature excellent graphics and great sound. He uses fine scrolling onto multiple screens, good graphic detailing, sound tracks which nicely fit the mood of the games and best of all, originality.

Sick of endlessly saving or destroying the Universe? Tired of playing "find the right word" in adventures? Try life as a mole, or a pigeon.



Percy the Potty Pigeon

You are a pigeon somewhere in the quaint – but currently freezing – English countryside, and like all socially acceptable pigeons you'd like to build a nest. Sounds simple? It might be, if you didn't have to

contend with thieving sparrows, low flying planes, pigeonocidal motorists, hungry cats and a time limit.

To build your nest and progress to another level you must collect ten twigs which lie scattered along the motorway right in the path of some heavy traffic which is intent on squashing you into pigeon pate.

Once a twig is in your possession it has to be airlifted back to the nest. At this stage the sparrows become a pain in the behind with their kleptomaniac. If they manage to steal a twig, you must return to the part of the scenery where you first found it and start back to the nest again. On the first level they are fairly innocuous, on subsequent levels their canny and mobility increase.

Meanwhile the game's clock ticks by.

The only weaponry at your disposal is the ability to drop explosive eggs which are effective on cars, cats and sparrows. Points are scored by "egging" nasties, eating the butterflies that cruise past, getting twigs to the nest and completing a level.

There are ten levels to forge through and three levels to lose, with a bonus life at 10,000 points. In the time I had the game I could only manage to get as far as level 3, so I missed out on grappling with the ferrets and balloons that the game's instructions speak of. More intrepid palm and thumb jockeys will no doubt find and defeat them.

This is a class game. Cynically, it could be seen as a (dare I say it) whimsical version of something like *Defender* with a pigeon instead of a starship. But I think it's a sight for space weary eyes. The fine scrolling scenery, complete with Olde English castles and a small village, the realistic way the pigeon flies and swoops as well as the pace and variety of action combine to make a

game that will make you feel good about owning a Commodore 64.

Theme	****
Entertainment	****
Use of graphics	****
Music/Sound	****
Addictiveness	****
Value	****

Wanted: Monty Mole

"This is not just another platform game but an adventure" proclaims the title screen for *Monty Mole*. "Yeah, yeah" you think, "what will it be, a *Jumpman* clone or maybe a *Donkey Kong* ripoff. Well, it is neither. I rate *Monty Mole* as a joystick controlled graphic adventure.

The character you manipulate is a small mole armed only with a coal bucket, a miner's hard hat and the ability to jump and run.

The first object of the game is to steal thirteen lumps of coal from the bowels of a South Yorkshire mining pit. Naturally the pit is not a particularly healthy place for larcenous moles. There are coal crushers to scamper under, acid baths to sizzle the paws in, a maze to blunder through, clouds of poisonous gas, disappearing walkways, energy sucking "pickets" (these things are reminiscent of *Pacman* "ghosts") and more.

Numbered master switches indicate the correct direction to travel in – exploring off the beaten track leads to dire consequences. Once the coal is collected, the game progresses to a new stage involving *King Arthur*, his castle and a fresh batch of meanies.

What has *Arthur* got to do with a coal mine? I have no idea, but it makes for a good sense of the bizarre.

This is an "energy level" game where obstacles and monsters



Tony Crowther



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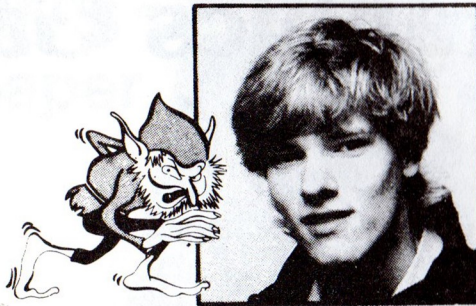
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GAMES REVIEW



encountered drain your life force in varying degrees. Energy can be topped up by devouring boxes of worms which lie hidden throughout the game board. Monty has only one life to lose, which means starting the game from the beginning after "death". The maze section is generated randomly every game which makes for variation (and fresh frustration) at each play.

I like the attention to detail in Monty Mole. The graphics have had a lot of work put into them. Playing this game is more like travelling through a weird cartoon than jabbing away at a run of the mill arcade game. Many of the traps and obstacles require considerable savvy to work out, which is why I only managed to explore four of the 13 coal lump containing scenes.

Monty Mole features smooth scrolling in all compass directions, with the TV screen acting as a window onto a very large game area. At the edges of a section you get scintillating glances of things to come.

A musical theme plays throughout, along with the whirrs and thumps of coal mining machinery and the usual bells and whistles when some form

of action is happening. I thought the sound track fitted the mood of the game to a tee. However, if you don't like it there is always the censorship of the volume knob.

I had a ball playing Monty Mole, even more so than Potty Pigeon. This game will keep you occupied and entertained for a long time. Tony Crowther programs a mean game.

Theme	*****
Entertainment	*****
Use of graphics	*****
Music/sound	***
Addictiveness	*****
Value	*****

Percy the Potty Pigeon

\$19.95 (c)

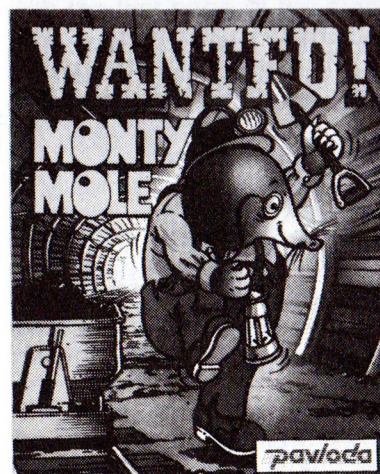
Wanted: Monty Mole

\$19.95 (c)

Distributed by OziSoft

NOTE: Both these games use the TURBOLOAD fast, cassette loading system and both had problems loading. It would seem that TURBOLOAD is sensitive to cassette head alignment and motor speed.

Frankly I would rather wait the 15 minutes it takes to load a 40K program at standard speed, if I could be sure of having a successful load at the end. These are not the first TURBOLOAD tapes to exhibit loading hassles and I think it is time the problem was fixed - either by trashing TURBOLOAD and using the standard 300 baud transfer rate, or coming up with a fast loading system that is much closer to the magic 100% reliability mark.



WANTED: MONTY MOLE

With a long cold winter and bone chilling Christmas ahead, Monty Mole makes a daring, coal snatching raid to his local South Yorkshire pit. Grabbing a miner's bucket he heads off into the darkness, soon to wish he'd caught a cold instead. Alas there's no turning back. Onward to do battle with flying pickets and moaning eating fish, filling his bucket as he dodges the trundling coal crushers and roaming coal drills, keeping an eye on the constantly disappearing floor.

With his bucket filled, Monty makes his escape, only to surface in Arthur's castle where his way is blocked by a fiery figure seated on a graphite throne. Seizing his only chance of topping the great man Monty collects the secret ballot papers and vote casting scroll. But Arthur's no fool when it comes to the heavy stuff and his personal bodyguard of super fit pickets and deadly flying hairsprays, put up an almighty struggle with our valiant Mole.



Two way scrolling action. Following the master switches, collect the coal on the way, 14 points builds your bridge of escape.

INSTRUCTIONS FOR PLAY

Features Flying pickets, Poisonous gas, Deadly hairsprays, Coal drills, Coal crushers, Underground railway, Miners helmets, Acid baths, Candles, Springing jacks, Bats and many more devious distractions. Protective shields, Coal truck (shield) and Energising boxes of worms (look in tree!).

How to score
1 point - collect bucket
1 point - each coal nugget collected. Maximum 13.

How to play
Left [Z] Up [] Fire [Space]
Right [X] Down [77] Jump Left [A]
Change level (easy/hard) [F1] Jump Right [S]
Re-run game [Restore] or Joystick Port 2

How to load Switch machine off then on
Press [Shift] / [Run/Stop] Keys together

Tony Crowther
One of today's brightest and most successful software games developers, author of such outstanding hits as Lock Bliagger and Son of Bliagger. A "Crowther classic" is not just a game but an enthralling opportunity to challenge one of the liveliest minds in modern games computing circles.



Jargonaut - how to deal with compuspeak

by Phil Campbell

Technology breeds jargon. Whether it is inspired by the need to find words to describe new functions and processes, or merely the desire to create a mystique around the new breed of technocrats, the tide of technical terminology shows no sign of ebbing. In the computer industry, for example, the yawning chasm between the expert and the layman has grown to such proportions that it no longer matters what is being said, just so long as it sounds suitably technical and is pronounced with the appropriate air of confidence.

How then does the average man in the street succeed in such a rarified atmosphere? Indeed how does the Young Upwardly-mobile Computer Kid (Y.U.C.K) even begin to relate to the technical world? And what of the poor senior executive invited to speak at the Data processing Section Christmas party? Fear not... all these problems, and more, are solved by JARGONAUT. Simply run the program and sit back while up to one million individual and unique examples of 'compuspeak' are generated before your very eyes. String a few together and you have the perfect speech. Memorize a couple and impress your friends. Print them in bussiness letters, or automatically generate University reports. Print formatting is included in the program to minimize the need to provide any human intervention. After all why bother?

In closing I would like to point out the characterisation of specific criteria adds overriding performance constraints to the systematised incremental projection. Thus a large proportion of the interface coordination communication requires considerable systems analysis to provide suitable synchronised reciprocal flexibility.

Finally, I must acknowledge the

inspiration given by a Honeywell Information Systems publication, the "Buzzphrase and Buzzword generator" in creating JARGONAUT.

I wonder why Honeywell haven't written a similar program...it would sure save them a lot of time preparing manuals. □

```

ready.
0 goto6*****
****
1 *****jargonaut*****
****
2 ***** phil campbell *****
****
3 ***** 1985 *****
****
4 *****
****
6 input"<CSD>printer (y/n) y<CSL><CSL><
CSL>;ip$:ifp$="y"thenp=1
7 ifp=1theninput"left margin";lm:input"r
ight margin";rm:open4,4,7:cmd4
8 poke53272,23
9 rem***phrase 1***
10 data "In particular","On the other ha
nd","However","Similarly"
20 data "As a resultant implication","In
this regard"
30 data "Based on integral subsystem con
siderations","For example","Thus"
40 data "In respect of specific goals"
45 rem***phrase 2***
50 dataa large proportion of the interfa
ce coordination communication
60 dataa constant flow of effective info
rmation
70 datathe characterisation of specific
criteria
80 datainitiation of critical subsystem
development
90 datathe fully integrated test program
100 data the product configuration basel
ine
110 data any associated supporting eleme
nt
120 data the incorporation of additional
system constraints
130 data the independent functional prin
ciple
140 data a primary interrelationship bet
ween system and subsystem technologies
145 rem***phrase 3***
150 data must utilise and be functionall
y interwoven with the
160 data maximises the probability of pr
oject success and minimises the

```

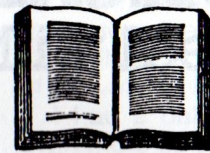




```

170 data adds explicit performance limits to the
180 data necessitates that urgent consideration be applied to the
190 data requires considerable systems analysis to provide the
200 data is further compounded when taking into account the
210 data presents extremely interesting challenges to the
220 data recognises the importance of other systems and necessity for the
230 data effects a significant implementation of the
240 data adds overriding performance constraints to the
245 rem***phrase 4***
250 data integrated, total, systematised, parallel, functional, responsive
260 data optical, synchronised, compatible, balanced
270 data management, organisational, monitored, reciprocal, digital, logic
280 data transitional, incremental, fifth generation, policy
290 data options, flexibility, capability, mobility, programme, concept
300 data time phase, projection, hardware, contingency
1000 rem fori=0to9:printb$(i):next
1300 fori=0to9:reada$(i):next
1310 fori=0to9:readb$(i):next
1320 fori=0to9:readc$(i):next
1323 fori=0to9:readd$(i):next
1324 fori=0to9:reade$(i):next
1325 fori=0to9:readf$(i):next
1326 fort=1toss
1330 x=int(1000000*rnd(ti))
1340 a=int(x/100000):b=int(x/10000)-10*a
:c=int(x/1000)-(b*10)-(100*a)
1350 d=int(x/100)-(a*1000)-(b*100)-(c*10)
1360 e=int(x/10)-(a*10000)-(b*1000)-(c*100)-(d*10)
1370 f=x-(a*100000)-(b*10000)-(c*1000)-(d*100)-(e*10)
1380 m$=a$(a)+" "+b$(b)+" "+c$(c)+" "+d$(d)+" "+e$(e)+" "+f$(f)+". "
1385 ifp=1then gosub 1500 to format printout: goto1396
1390 printm$
1395 print
1396 nextt
1400 ifp=1thenclose4
1410 stop
1500 rem***print format subroutine***
1510 l=len(m$)
1520 fori=1to m$:ifmid$(m$,i,1)=" "thenvv=i
1525 next
1530 l$=left$(m$,vv):r$=right$(m$,l-vv)
1531 printtab(lm)l$
1535 iflen(r$)>80thenm$=r$:f1=1:gosub1500
1540 iff1=0thenprinttab(lm)r$
1545 iff1=1thenf1=0
1550 return
ready.

```



BOOK REVIEW

The Big Fat Book of Commodore 64 Games

by Tim Hartnell and Brett Hale
Interface Publications (London and Melbourne)

Finding it financially difficult to keep your 64 fed with a supply of fresh, prepackaged games? A book such as **The Big Fat Book of Commodore 64 Games** is what you need.

Firstly, it will give you plenty of typing and debugging practice as your fingers wade through 10 page program listings. Then the pleasure of playing a game which you have had a hand – or a finger – in creating.

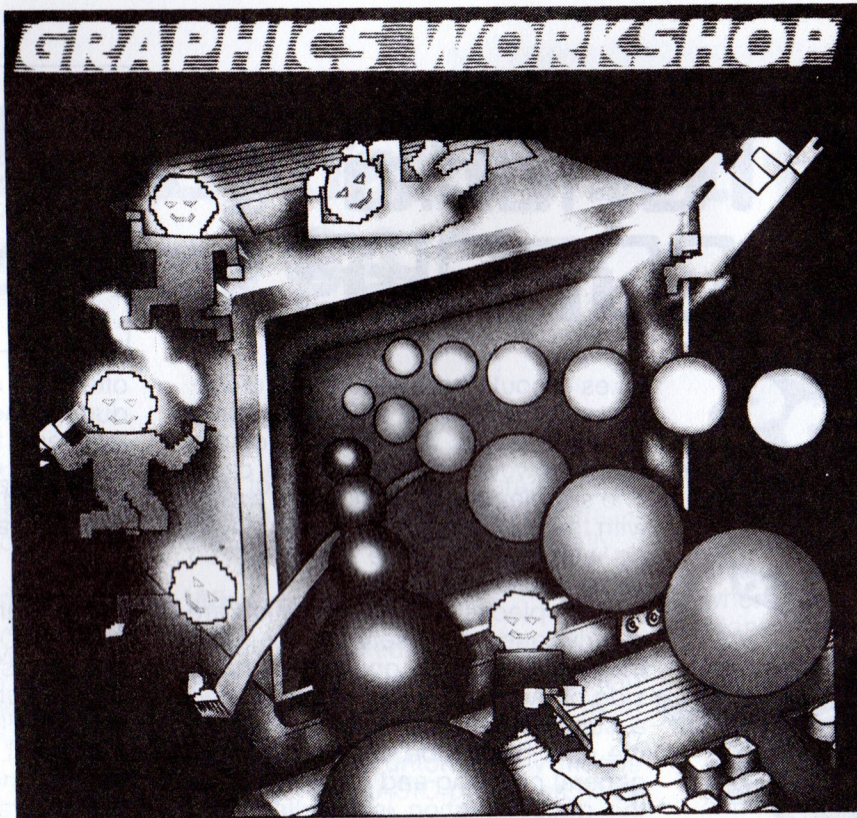
Every game cliché in the known computer universe is covered. There are Star Trek type games, card games, board games, historical wargames, a flight simulator and the odd shoot-em-up. Machine code subroutines were not in evidence in the listings, so don't expect anything too flashy in the way of speed or graphics.

Titles include *Starbore 2000*, *Disaster Flight*, *The Voyages of Magellan* and *CPU Prisoner*.

Each game has a good description of play preceding it, along with occasional hints on tactics. Programs are listed with mnemonic representations of control characters and REM statements delineate the main segments. This makes for good read/typeability.

The BFB0C64G (abbreviation for the Big Fat Book of Commodore 64 Games) runs to 410 pages and will certainly keep you occupied one way or another while you save up for something like *Sublogic's Flight Simulator II*. □

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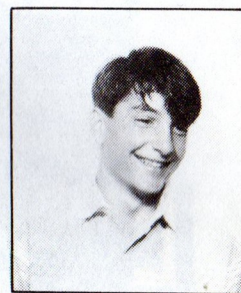
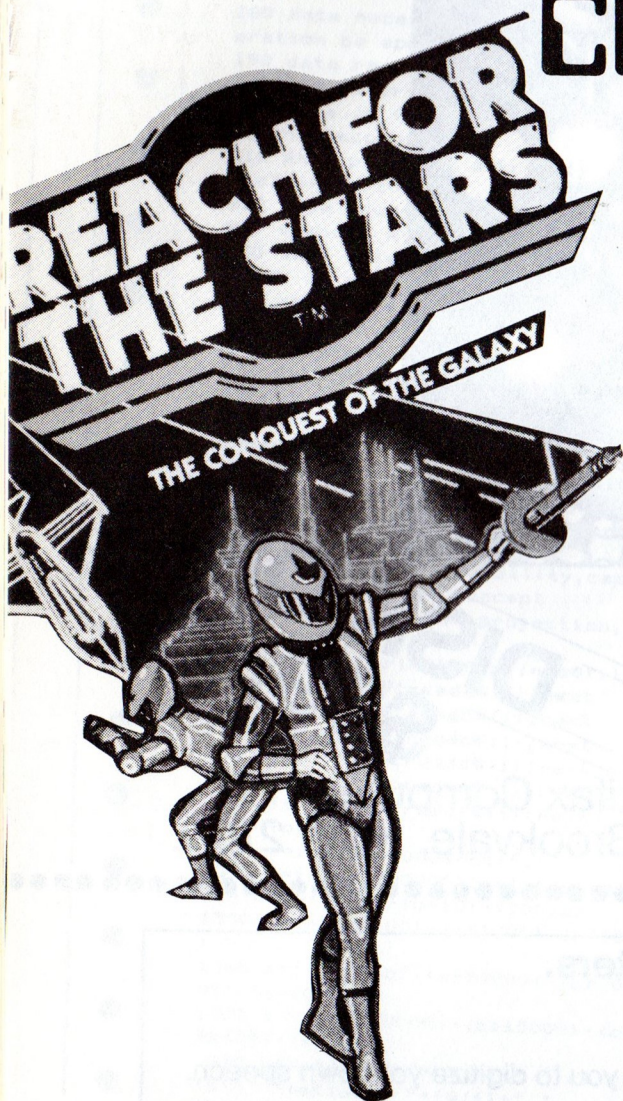
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ADVENTURER'S CORNER



by Adam Rigby

takes about three hours of cross-referencing to read and understand a single page. With Reach for the Stars, however, this is not the case. The supplement lists all that is wrong with the main manual (it's basically to do with loading since it was written on an Apple computer).

Both pieces of documentation are clearly and concisely written. The main text appears on the left hand side of the page while examples and a summary is displayed in blue on the right hand side of the page. The general planning and presentation of the documentation is excellent and what you expect but never get with most software.

The game

You are responsible for the survival of a race. You must explore new Star Systems and colonize the most promising ones. The resources produced by your planetary economies are used to build starships, transports for emigrating populations, planetary defences and increased industrial capacity. In addition, resources are required to improve the planetary environment, to research and develop new starship technologies and to provide the consumer services so necessary for your population's willing cooperation.

The game consists of two major phases, the production phase and the movement phase. During the production phase you allocate RPs (Resource Points) to certain areas of production, such as starship development. After the RPs have been allocated then you may either move on the next planet or use an option where the computer finishes all your moves for you.

During the movement phase you can explore the other planetary systems, form task forces and raid other colonies or land your transport ships on other worlds to colonize.

I found the basic trick is finding the correct balance between industry,

offence and defence, although during the production phase you may ask the computer for help by pressing CONTROL-C (or the run/stop key) whereby the computer allocates all your RP's for you.

A nice touch to the game is the variations available to the player. Some examples are:-

NOVAS. On going nova everything in the star system is obliterated. Task forces subsequently plotted to that system will never be heard of again
 NATURAL DISASTERS. Plague, famine, meteorites, pollution; in fact any natural disaster can visit a planet in the course of a thousand years. These disasters reduce the overall effectiveness of a planet in one way or another.

These are just some of the remarkable variations in the game. I must say that it is a pleasure to see such a well presented piece of software which is home grown - yes, it was designed by Roger Keating and developed by Ian Trout right here in Oz. If you like strategies buy it.

Imagination	****
Difficulty	***
Lasting appeal	****
Value for money	****

Journey

I had a quick peek at a graphic adventure game called JOURNEY this weekend. The idea of the game is to discover the 11 treasures from the centre of the earth and bring them back to the surface. There are transporters, one with a key, one which goes up and down depending on how many items you are carrying. There are dragons, a clockwork bridge, dynamite, detonators, oxygen pills, water jugs, boomereggs and guns. Half of which I didn't even manage to find. A nice little game with one fault - you go back to the start when you die (AAARRRGGG, how annoying). Journey is distributed by Ozi Soft. □

Just the other day my flatmate was commenting on how she was addicted to strategy games, and that I should get one for the 64. Anyway I decided that it was something worth investigating. I trotted off to Pittwater Distributors and came back with a game called **Reach for the Stars**.

The software package comes in a box containing one manual, one CBM 64 supplement manual, one game diskette and two galaxy maps.

Documentation

The supplement worried me at first, because when software does have two manuals they usually conflict with each other so much it

A Greek Alphabet for the Commodore 64

by Peter Gummer

One interesting aspect of the Commodore 64 is its ability to display characters other than those provided by the standard character set. Programming the computer to display a Greek alphabet, for example, involves two stages: reprogramming the character set, then placing these new characters in a safe place in memory. Many books, including the Programmer's Reference Guide, provide clear explanations of both stages, but fall down on two points: no example is given of actually redefining a character set, and the method described invariably leaves a mere 10K for your BASIC program. This article and its accompanying program demonstrate how to give your 64 a completely new set of characters, without taking a single byte of memory away from BASIC.

The first step in redefining the character set is to produce a set of DATA statements, as in lines 500 to 930 of our program. Each newly-defined character will consist of 8 bytes of information, which can be POKEd into memory from the DATA. You may have noticed, however, that each DATA statement contains nine, not eight numbers. This is because the first of each group of numbers is not to be POKEd into memory; rather, it will be used by the program as an index, telling it just where in memory the other eight numbers belong. Compare these first numbers with the screen codes of the characters at the end of each line (these characters are REMarks): the codes and the numbers should be the same.

Working out exactly what numbers to POKE into memory is a tedious job, involving a lot of trial and error. The method is described in many books, including the Programmer's Reference Guide (pages 111 to 113). I'd suggest that anyone undertaking

this job acquire a character font editor, preferably one which generates the DATA statements automatically.

Where to POKE

Having created our DATA, the next step is to decide where to POKE it in memory. As already noted, most books opt for placing it low in memory, which unfortunately means less room for BASIC programs. They do this for simplicity. When you turn the computer on, the video chip, which controls everything displayed on the screen, expects to find all of its data somewhere in the 16K block of memory between locations 0 and 16383. This area is known as Video Bank 0. You may already know that Commodore 64 BASIC programs start at memory location 2048, which is near the bottom of Bank 0. Normally, the video chip looks for the standard character set in locations 4096 to 8191. This, believe it or not, is just where a hefty chunk of any decent-sized BASIC program is going to be found. But the program and character set don't get in each other's way because, by some piece of trickery in the 64's internal circuitry, the video chip is not really receiving its character data from Video Bank 0: it is, in fact, looking at the character generator ROM between locations 53248 and 57343.

Unfortunately, this tidy trick doesn't work for redefined character sets. If you want the video chip to continue using Bank 0, then that's where the data must be POKEd. Since changing to a different Video Bank is a slightly complicated matter, most books take the easy way out by sticking to Bank 0. In this article, we'll be braving the unexplored lands of Video Bank 3, far beyond the usual confines of the BASIC programming space.

Our program begins by copying the normal upper and lower case

character sets from the character generator ROM to a spare area of memory between 57344 and 61439. This is the area in Video Bank 3 where we'll be POKEing our data. Many of you will be surprised by this: after all, the whole of the Commodore 64's memory above location 53248 is already occupied by input/output devices and the operating system. However, by another neat trick in its internal circuitry, the computer provides plenty of free memory "underneath" these occupied territories. A simple POKE is enough to store our data there; and happily, no special programming is needed to make the video chip ignore the operating system to look at our data.

Nevertheless, telling the video chip to look at this area of memory does require care. After copying the normal character sets in lines 120-150 (using basically the method described on page 106 of the Programmer's Reference Guide), line 180 switches the video chip to Bank 3. This follows the method shown on pages 101 and 102 of the Reference Guide.

Line 170 performs three particularly tricky tasks. First of all, POKEing location 648 tells the operating system's screen editor where to find screen memory. Screen memory normally starts at location 1024, which is in Video Bank 0. Because we've changed to Bank 3, the screen will have to be moved to some location above 49152.

We could put it under the operating system, just as we did with the character data. However, because this would make it difficult for a BASIC program to PEEK at screen memory, it's probably better to leave it somewhere in the exposed free memory from 49152 to 53247. I've chosen the area between 51200 and 52223. This places it just below the DOS Wedge, and should keep it out

Α Β Γ Δ Ε Ζ Η Θ
Κ Λ Μ Ν Ο Π
Σ Τ Υ Φ Χ Ψ Ω

**ΑΒΓΔΕΖΗΘΙ
ΚΛΜΝΞΟΠΡ
ΣΤΥΦΧΨΩ 1**

of the way of most machine language programs starting at 49152. Placing the screen here requires POKEing location 648 with $51200/256 = 200$. So now any PRINT statements know what part of memory they're sending characters to.

Line 170 also tells the video chip where the screen is. Using the method described on pages 102 and 103 of the Reference Guide, location 53272 is POKEd with 32, meaning that the screen starts 2K (2048 bytes) above the start of the Video Bank. But location 53272 also tells the video chip where the new character set is: for this we add another 10, meaning that we're using the character set starting 10K above the start of this Bank (at location 59392).

Demonstration screen

Everything is now set up to start POKEing in the data. But first the program sets up a demonstration screen, showing the newly defined Greek alphabet in both upper and lower case characters, together with the keys which will produce the different characters. Of course, when

this first appears on the screen all we see is the normal character set. As the data is POKEd in, the redefined characters will be seen gradually replacing their normal counterparts.

Line 340 does this POKEing. Notice that we aren't using DATA statements for every single letter of the Greek alphabet. Instead, the letters which differ from our alphabet are POKEd on top of the copy of the normal character set which was made in line 140. This reduces the number of DATA statements needed in the program by about two-thirds.

An interesting aspect of the program is the way it enables normal characters and Greek characters to appear simultaneously on the screen. To understand this, it must be realised that the reverse-video characters normally available make up half of the standard character set. In our redefined character set, these reversed characters have been replaced by the Greek alphabet. This is why the copying of the character generator ROM was done in two stages rather than one. Line 130 copies the entire upper case set and the unreversed lower case set. Line 140 ignores the reversed lower case set, instead copying the unreversed lower characters all over again. So only a quarter of the total character set is actually being modified.

Sharp-eyed readers will have noticed that the entire upper case/graphics set has been left unchanged. This means that, simply by holding

down the SHIFT and Commodore keys together, you can switch from a combination English-and-Greek character set to the standard upper case set, which appears when the computer is first switched on.

The new character set has a few peculiarities. First of all, the range of accents used by the Greek language has been restricted to a tiny horizontal bar over each of the vowels. These accented vowels are produced by holding down the Commodore key while typing the letter's corresponding key: for example, Commodore-W produces an accented omega.

A second peculiarity is that, because there are no reversed characters, the flashing cursor does some strange things, and is frequently invisible. To prevent this from becoming a huge nuisance, the Greek character set's space character has been made a solid square. This causes the space bar to produce an ugly side effect if you are typing Greek characters; but this can be avoided by holding down the SHIFT key whenever typing a space.

Of course, a disadvantage of combining character sets on the screen like this is that you have to keep typing CTRL-9 to access the Greek alphabet. Hopefully this won't discourage people from finding applications for this interesting technique: someone may even find a use for the particular redefined character set presented here. □

```

10 rem greek alphabet for commodore64
20 rem * peter gummer january 1985 *
30 rem
100 print:print"      setting up greek
    alphabet"
105 :
110 rem copy character set to ram under
    kernal
115 :
120 poke56334,peek(56334)and254:poke1,pe
    ek(1)and251
130 fori=57344to60415:pokei,peek(i-4096)
    :next
140 fori=60416to61439:pokei,peek(i-5120)
    :next
150 poke1,peek(1)or4:poke56334,peek(5633
    4)or1
155 :
160 rem set up screen memory at 51200, c
    haracter memory at 59392
    
```

```

165 :
170 poke648,200:poke53272,2*16+10
180 poke56578,peek(56578)or3:poke56576,(
    peek(56576)and252):rem bank 3
185 :
190 poke 53280,14:poke 53281,15
200 print"<CLR>":rem clear the new scree
    n memory
205 :
210 print "<CSD><LT BLU>-----<BL
    U>GREEK ALPHABET<LT BLU>-----";
220 print"<ORNG>      with correspondi
    ng keys<CSD><GRY 1>"
230 print"<CSD> <RVS ON>A a<RVS OFF>:A
    <RVS ON>H h<RVS OFF>:H <RVS ON>N
    n<RVS OFF>:N <RVS ON>T t<RVS OFF>:T"
240 print"<CSD> <RVS ON>B b<RVS OFF>:B
    <RVS ON>Q q<RVS OFF>:Q <RVS ON>C
    c<RVS OFF>:C <RVS ON>Y y<RVS OFF>:Y"
250 print"<CSD> <RVS ON>G g<RVS OFF>:G
    <RVS ON>I i<RVS OFF>:I <RVS ON>O
    o<RVS OFF>:O <RVS ON>F f<RVS OFF>:F"
    
```



```

260 print"<CSD> <RVS ON>D d<RVS OFF>:D
    <RVS ON>K k<RVS OFF>:K    <RVS ON>P
p<RVS OFF>:P    <RVS ON>X x<RVS OFF>:X"
270 print"<CSD> <RVS ON>E e<RVS OFF>:E
    <RVS ON>L l<RVS OFF>:L    <RVS ON>R
r<RVS OFF>:R    <RVS ON>V v<RVS OFF>:V"
280 print"<CSD> <RVS ON>Z z<RVS OFF>:Z
    <RVS ON>M m<RVS OFF>:M    <RVS ON>S
s<RVS OFF>:S    <RVS ON>W w<RVS OFF>:W"
290 print tab(24)"<RVS ON>@<RVS OFF>:@"
300 print"<CSD><CSD><RED> - Commodore-k
ey adds vowel stress -<CSD><GRY 1>"
305 :
310 rem poke dot-data for redefined char
acters
315 :
320 forj=1to44:read char
330 fori=0to7:read dots
340 poke60416+char*8+i,dots:next:next
350 end
500 data 1,0,0,62,102,102,102,62,0:
a
510 data 2,60,102,102,108,102,102,124,96
: b
520 data 7,0,0,102,52,24,48,48,48:
g
530 data 4,60,96,48,60,102,102,60,0:
d
540 data 5,0,0,62,96,120,98,60,0:
e
550 data 26,126,48,96,96,96,60,6,60:
z
560 data 8,0,0,124,102,102,102,102,6:
h
570 data 17,0,60,102,126,102,102,60,0:
q
580 data 9,0,0,56,24,24,24,28,0:
i
590 data 11,0,0,102,120,120,108,102,0:
k
600 data 12,0,112,24,24,56,108,102,0:
l
610 data 13,0,0,102,102,102,126,96,96:
m
620 data 14,0,0,102,102,54,60,24,0:
n
630 data 3,124,48,60,112,96,60,6,60:
c
640 data 15,0,0,60,102,102,102,60,0:
o
650 data 16,0,0,127,54,54,54,54,0:
p
660 data 18,0,0,60,102,102,124,96,96:
r
670 data 0,0,0,63,102,102,102,60,0:
@
680 data 19,0,0,62,96,96,60,6,60:
s
690 data 20,0,0,126,24,24,24,14,0:
t
700 data 25,0,0,102,102,102,102,60,0:
y
710 data 6,0,0,44,218,218,218,124,24:
f
720 data 24,0,0,102,60,28,56,60,102:
x
730 data 22,0,0,214,214,214,124,16,16:
v
740 data 23,0,0,99,107,73,73,119,0:
w
750 data 112,60,0,62,102,102,102,62,0:
"r"
760 data 113,60,0,62,96,120,98,60,0:
"l"
770 data 116,60,0,124,102,102,102,102,6:
"j"

```

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```

780 data 98,60,0,56,24,24,24,28,0:
"u"
790 data 121,60,0,60,102,102,102,60,0:
"u"
800 data 119,60,0,102,102,102,102,60,0:
"--"
810 data 115,60,0,99,107,73,73,119,0:
"j"
820 data 71,255,193,192,192,192,192,192,0:
"G"
830 data 68,24,56,60,102,102,195,255,0:
"D"
840 data 81,60,102,102,127,102,102,60,0:
"q"
850 data 76,24,28,60,54,102,99,99,0:
"L"
860 data 67,126,66,0,60,0,66,126,0:
"C"
870 data 80,127,102,102,102,102,102,102,0:
"P"
880 data 82,124,102,102,124,96,96,96,0:
"R"
890 data 83,126,96,48,24,48,96,126,0:
"S"
900 data 70,24,126,219,219,219,126,24,24:
"F"
910 data 86,219,219,219,126,24,24,24,0:
"V"
920 data 87,126,195,195,195,102,36,231,0:
"W"
930 data 32,255,255,255,255,255,255,255,255

```


Modified 1541 Disk Directory

by Peter Gummer

Disk directories can become difficult to read once a disk accumulates more than a dozen or so files. This is especially so if files are being added and removed, since file names appear in the first space available at the time of being saved. The resulting order of file names is often messy, with completely unrelated files appearing next to each other.

The program accompanying this article provides a simple way of arranging related files next to each other. In addition, it permits a disk's name and "ID" to be changed, without having to re-format the disk. The program was written on a Commodore 64 for the 1541 disk drive. This may mean that people with other computers or drives will have to modify the program to suit their system. More on that later.

After typing in the program and saving it to disk, select a disk for testing purposes. This disk should contain expendable files only! If it contains anything important, be sure to have another copy on another disk. Now use the program to modify this disk, going through all of the options described below. This way, you can check that no errors were made while typing in the program, without the risk of accidentally destroying a valuable disk.

The program begins by asking you to insert a disk into the drive. This done, it reads the name and type of each file from the directory into the array NAME\$ (lines 4000-4110). The actual reading of the directory is done in machine language, so this stage takes only about five seconds for a disk containing 50 files. Lines 1100-1340 make up the loop where the first half of the program spends most of its time. Twenty-three file names are displayed on the screen, with the disk name and "ID" appearing at the top.

A back-arrow to the right of this list points to the current file, which initially is the first. To move the arrow

to a different file, press cursor up or down. The list will scroll up or down, if necessary, to keep the new current file on screen. Note that trying to move beyond either the first or last file causes the cursor to "wrap around" to the opposite end of the list. This can save time getting from file to file, as also can the HOME key, which moves the arrow to the file at the top of the screen.

A similar function is performed by pressing SHIFT-CLR. This goes to the very top of the list, scrolling if necessary, to leave the arrow pointing not at the first file, but at the disk name and "ID". The point of this is to distinguish between the two functions of the f5 key. If the arrow points at the header rather than a file, you are choosing to modify the disk name and "ID". On the other hand, if you wish to change the position of the current file, you will press f5 with the arrow pointing at the file to be moved.

Moving a file

Moving a file to a new position is simple. Once you've worked out where the file is to go, position the arrow next to it and type f5. You will be asked to enter the number of the new position. Do this, type return, and the screen will be refreshed to show the new order of the files. If the screen is not refreshed, it means you gave an illegal value, either out of range or the same as before, so no change was made.

It may sometimes be useful to have another look at the original order of the files while part way through organising a disk. This can be done at any stage by pressing the f7 key.

Once you have everything in order, press f1 to store the changes on disk. This begins the second part of the program, between lines 2000 and 2770. The bottom line of the screen clears, and as each file's directory entry is repositioned an asterisk appears on screen. Relocat-

ing the files may take anything from ten seconds to five minutes, depending on how many files there are and how many changes have to be made.

After all of the files have been correctly positioned, the program reads the directory once more and displays it on the screen. Take especial notice of this listing the first time you use the program, ensuring there are no errors.

One other task which may not be immediately obvious is performed by this program. When you scratch a file from a disk, a gap is left in the directory. The fact that this gap will be filled by some other file is one of the reasons why messy directories occur in the first place. Using this program, any gaps are automatically closed. Simply running the program and pressing f1 is sufficient to prevent a well-ordered directory from becoming untidy due to gaps.

Vic-20 and C16

Vic-20 and Commodore 16 owners may have difficulties with this program, due to its length and the large arrays used. The Vic's 22-column screen will also cause problems. Obviously, removing the REMarks will shorten the program considerably, and long variable names (CURRENT, COUNT, SCTR\$, etc) could be shortened to two characters. But the only real solution for an unexpanded Vic is to eliminate all but the essential file ordering routine (lines 2000-2770). For this to work, you would also have to replace lines 2000 and 2010 with the following:-

```
10 INPUT "HOW MANY FILES IN THE DIRECTORY":COUNT, 20 DIM PSN(COUNT); 30 FOR I=1 TO COUNT 40 PRINT "MOVE";I;" TO POSITION #"; 50 INPUT J: PSN(I)=J: NEXT.
```

Although this, together with modifications to lines 2080, 2210 and

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2220, would be sufficient to make the routine work, there are disadvantages. First of all, it is much more convenient to work out the order interactively with the computer than having to write it out on paper first. Secondly, you would make a mess of the directory if you accidentally gave a wrong value for COUNT or J:- the full program guards against this. Hopefully this won't deter Vic owners: or anyone else who doesn't want to type in the entire program.

```
ready.
```

```
100 print"<CLR><CSD><CSD>"
110 print"_____";
120 print"change the order of 1541 directory files";
130 print"_____";
140 print"<CSD>                peter gummer
1985"
150 print"<RVS ON><CSD><CSD><CSD> press
any key when disk is in drive <CSD><CSD>"
190 :
200 blank$="
<CSU>" :rem 31 spaces
210 dim name$(144): name$=left$(blank$,22)
220 dim help$(18)
230 for i=0 to 18: read help$(i): next
240 for i=880 to 938: read j: poke i,j: next
290 :
300 begin=0: yes=0
310 wait 198,1: get a$
320 open15,8,15
330 gosub 4000 :rem read the directory
340 if count then gosub 1000
350 if begin then gosub 2000
360 q$="<RVS ON>another disk to work on"
: gosub 1800
370 if yes then run
380 end
990 : ::::::::::::::::::::::::::::::::::::
991 rem - display and reposition files -
992 rem - interactively with user -
993 : ::::::::::::::::::::::::::::::::::::
1000 dim file(count) :rem index into array name$
1010 for i=0 to count: file(i)=i: next
1020 def fn tb(i)=4-len(str$(i))
1030 plot=65520 :rem kernal plot routine
1040 current=1: low=255
1050 header$=name$(0)
1090 :
```

```
1091 rem main loop for display and input
1092 :
1100 if low<=current and current<=high goto 1220
1110 low=current-11: if low<1 then low=1
1120 high=low+22
1130 if high>count then high=count: low=high-22: if low<1 then low=1
1135 :
1140 print"<CLR>                "header$
1150 for i=low to high
1160 :print tab(fn tb(i));i:name$(file(i))
1170 next
1180 print"<HOME>"
1190 for i=0 to 18
1200 :print tab(30);help$(i)
1210 next
1215 :
1220 b$="←": gosub 1700
1230 print"<RVS ON>to move: crsr up/down, clr/home<CSU>"
1240 wait 198,15: get a$
1250 b$=" ": gosub 1700
1255 :
1260 if a$=chr$(17) then current=current+1: if current>count then current=1
1270 if a$=chr$(145) then current=current-1: if current<1 then current=count
1280 if a$=chr$(19) then current=low
1290 if a$=chr$(147) then current=0
1300 if a$=chr$(136) then gosub 4500: low=255
1310 if a$=chr$(135) then print blank$: on 1-(current=0) gosub 1500,3000
1320 if a$=chr$(134) then q$="<RVS ON>quit without any changes": gosub 1800
1330 if a$=chr$(133) then q$="ready to begin": gosub 1800: begin=yes
1340 if not yes goto 1100
1350 return
1490 : ::::::::::::::::::::::::::::::::::::
1491 rem - input file's new position -
1492 : ::::::::::::::::::::::::::::::::::::
1500 print"move";current;"to position #"
:
1510 ln=3: gosub 1900: psn=val(b$)
1520 if psn=current or psn<1 or psn>count then return
1530 if psn>current then k=1
1540 if psn<current then k=-1
1550 j=file(current)
1560 for i=current to psn-k step k
1570 :file(i)=file(i+k)
1580 next: file(psn)=j
1590 low=255
1600 return
1690 : ::::::::::::::::::::::::::::::::::::
1691 rem - screen formatting and
1692 rem - keyboard input routines -
1693 : ::::::::::::::::::::::::::::::::::::
1700 poke 781,current-low+1: poke782,28
1710 poke 783,0: sys plot: print b$
```



```

1770 poke 781,24: poke782,0
1730 poke 783,0: sys plot
1740 return
1790 :
1800 print blank$: print q$? (y/n)<CSU>
"
1810 poke 198,0: wait 198,1: get a$
1820 if a$<>"y" and a$<>"n" goto 1800
1830 yes=(a$="y"): print blank$
1840 return
1890 :
1900 b$="":c$=chr$(0)
1910 if asc(c$)and96 then print c$;: b$=
b$+c$
1920 print"*(CSL>";: i=len(b$): wait 198
,15: get c$
1930 if c$=chr$(20) and i then i=i-1: pr
int c$;: b$=left$(b$,i)
1940 if c$<>"," and c$<>chr$(13) and i<1
n goto 1910
1950 if len(b$)<1n then b$=b$+chr$(160):
goto 1950
1960 return
1990 : ::::::::::::::::::::::::::::
:
1991 rem - move files in disk directory
-
1992 rem - according to the new order
-
1993 : ::::::::::::::::::::::::::::
:
2000 dim psn(count) :rem new position of
each file
2010 for i=0 to count: psn(file(i))=i: n
ext
2020 def fn loc(j)=32*(j-8*int(j/8))+2 :
rem 32*(j mod 8)+2
2030 open 15,8,15: print#15,"u;"
2040 open 2,8,2,"#1": open 3,8,3,"#2": g
osub 4200
2045 :
2050 dim pntr(144), sctr(144)
2060 for i=0 to 144: pntr(i)=0: sctr(i)=
255: next
2070 j=1: sctr=1: i=0
2080 print#15,"u1:"2;0;18;sctr: gosub 42
00
2090 for j=j to j+7
2100 :sctr(j)=sctr
2110 :print#15,"buffer-pointer:"2;fn loc
(j-1)
2120 :get#2,a$
2130 :if a$ then i=i+1: pntr(j)=i
2140 next
2150 print#15,"buffer-pointer:"2;0
2160 get#2,track$,sctr$
2170 if track$=chr$(18) then sctr=asc(sc
tr$+chr$(0)): goto 2080
2190 :
2191 rem file ordering loop
2192 :
2200 for i=1 to count
2210 :if psn(i) then gosub 2500
2220 next
2290 :
2291 rem scratch any trailing files
2292 :
2300 sctr=sctr(i): if sctr=255 goto 2400

```

```

2310 print#15,"u1:"2;0;18;sctr
2320 j=fn loc(i-1): i=i+1
2330 print#15,"buffer-pointer:"2;j
2340 print#2,chr$(0);
2350 if j=226 then print#15,"u2:"2;0;18;
sctr: goto 2300
2360 goto 2320
2390 :
2391 rem load and list the new directory
2392 :
2400 close2: close3
2410 print: gosub 4000: gosub 4500
2420 return
2490 : ::::::::::::::::::::::::::::
2491 rem - file ordering subroutine -
2492 : ::::::::::::::::::::::::::::
2500 j=i: current=i
2510 if current<>pntr(j) then j=j+1: got
o 2510
2520 gosub 2700 :rem get current entry f
rom disk
2525 :
2530 j=psn(current): if j then print"*";
2540 if current=pntr(j) then psn(current
)=0
2550 if psn(current)=0 then return
2554 :
2555 rem put current entry into its new
position
2556 :
2560 print#15,"u1:"2;0;18;sctr(j)
2570 print#15,"buffer-pointer:"2;fn loc(
j-1)
2580 print#2,entry$;
2590 if psn(pntr(j)) then gosub 2700 :re
m get next entry from disk
2600 print#15,"u2:"2;0;18;sctr(j)
2605 :
2610 psn(current)=0
2620 current=pntr(j)
2630 goto 2530
2690 :
2691 rem place a directory entry into en
try$
2692 :
2700 print#15,"u1:"3;0;18;sctr(j)
2710 print#15,"buffer-pointer:"3;fn loc(
j-1)
2720 entry$=""
2730 for byte=0 to 29
2740 :get#3,a$: if a$="" then a$=chr$(0)
2750 :entry$=entry$+a$
2760 next
2770 return
2990 : ::::::::::::::::::::::::::::
2991 rem - modify disk name/id -
2992 : ::::::::::::::::::::::::::::
3000 print"new disk name,id: ";
3010 ln=16: gosub 1900: header$=b$: prin
t",";
3020 ln=2: gosub 1900: id$=b$
3030 open 15,8,15: open 2,8,2,"#"
3040 print#15,"u1:"2;0;18;0
3050 print#15,"buffer-pointer:"2;144
3060 print#2,header$;chr$(160);chr$(160)
;id$;
3070 print#15,"u2:"2;0;18;0
3080 print#15,"i0": gosub 4200

```


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```
3090 close2: close15
3100 header$="<RVS ON>"+chr$(34)+header$
+chr$(34)+chr$(160)+id$+" "
3110 return
3990 : ::::::::::::::::::::::::::::
3991 rem - input directory into name$ -
3992 : ::::::::::::::::::::::::::::
4000 count=0
4010 print#15,"i0":gosub 4200
4020 open1,8,0,"#0":gosub 4200
4030 get#1,a$,a$
4040 if name$ then sys 880
4050 name$(count)=name$
4060 if status=0 then count=count+1: got
o 4040
4070 if status<>64 then gosub 4200
4080 name$(0)="<RVS ON>"+name$(0)
4090 close1: close15
4100 count=count-1
4110 return
4190 :
4200 input#15,err,err$,t,s
4210 if err=0 then return
4220 print err,err$,t,s
4230 close1: close2: close3: close15
4240 end
4490 : ::::::::::::::::::::::::::::
4491 rem - list the directory -
4492 : ::::::::::::::::::::::::::::
4500 print" pause listing with space bar
";
```

```
4510 for i=0 to 500: next: print
4520 for i=0 to count
4530 :print tab(fn tb(i));i;name$(i)
4540 :get a$: if a$=chr$(32) then wait 1
98,1: get a$:rem pause
4550 next
4560 q$="<RVS ON>view the directory agai
n"
4570 gosub 1800: if yes goto 4500
4580 return
4990 :
4991 rem data for array help$
4992 :
5000 data "<RVS ON>f1<RVS OFF> store","
changed"," listing"," on disk",
5010 data "<RVS ON>f3<RVS OFF> abort:","
make no"," changes"," to disk",
5020 data "<RVS ON>f5<RVS OFF> modify","
name/id"," or file"," position",
5030 data "<RVS ON>f7<RVS OFF> view"," o
riginal"," listing"," again"
8000 :
8001 rem ml routine to read directory in
to name$
8800 data 162,1,32,198,255,160,1,177
8880 data 71,133,99,200,177,71,133,100
8960 data 162,32,32,207,255,202,224,27
9040 data 208,248,32,207,255,201,34,240
9120 data 5,202,208,246,240,17,160,0
9200 data 145,99,32,207,255,200,192,22
9280 data 208,246,32,207,255,208,251,32
9360 data 204,255,96
```

Listing explanations

If you have entered programs from various publications you will have often encountered numerous symbols and strange characters which are unique to Commodore computers.

These are usually special control codes which might tell your computer to clear the screen, change colours or position the cursor. They are difficult to reproduce in a magazine and can often lead to mistakes in entering a program.

Here is a handy list of the control code abbreviations used throughout this issue and all subsequent issues of this magazine. Without them we would have to fill up the program pages with the usual illegible reverse graphics symbols produced by Commodore printers.

Because so many readers have misunderstood this in other magazines let us spell it out in detail.

When you are entering any of the other programs in this issue – or any other issue for that matter – type in the program as normal except when any abbreviations appear in brackets in a listing.

Then type the corresponding key strokes as listed in the example below.

```
10 rem explanation of listing
12 rem
14 print"{CLR} - shift and clr/home"
16 print"{HOME} - clr/home"
18 print"{C/DN} - cursor down"
20 print"{C/UP} - cursor up"
22 print"{C/RT} - cursor right"
24 print"{C/LF} - cursor left"
26 print"{BLK} - ctrl and black"
28 print"{WHT} - ctrl and white"
30 print"{RED} - ctrl and red"
32 print"{CYAN} - ctrl and cyan"
34 print"{PURP} - ctrl and purple"
36 print"{GRN} - ctrl and green"
38 print"{BLUE} - ctrl and blue"
40 print"{YELQ} - ctrl and yellow"
42 print"{ORNG} - commodore and blk"
```

```
44 print"{WHT} - commodore and white"
46 print"{RED} - commodore and red"
48 print"{CYAN} - commodore and cyan"
50 print"{PURP} - commodore and purple"
52 print"{GRN} - commodore and green"
54 print"{BLUE} - commodore and blue"
56 print"{YELQ} - commodore and yellow"
58 print"{RVDF} - ctrl and rvs/off"
59 print"{RVON} - ctrl and rvs/on"
60 print"{F1} - function one"
61 print"{F2} - function two"
62 print"{F3} - function three"
63 print"{F4} - function four"
64 print"{F5} - function five"
65 print"{F6} - function six"
66 print"{F7} - function seven"
68 print"{F8} - function eight"
```


Enhance your *BASIC* game with an interrupt

Good games can be written in BASIC. The Commodore 64, with its programmable sprites, is especially suited for BASIC game writing. But, as we all know, it's a challenge. Speed becomes paramount to everything else. The result is, all too often, a stripped-down, bare bones contest with few graphics extras.

The program listed here helps solve that problem. It is an interrupt-driven routine that, once installed, goes about its business completely independent of your program. It won't slow you down one iota. And the nicest thing about it, you don't have to understand it. Just type it in, attach it to your BASIC masterpiece and it's off and running.

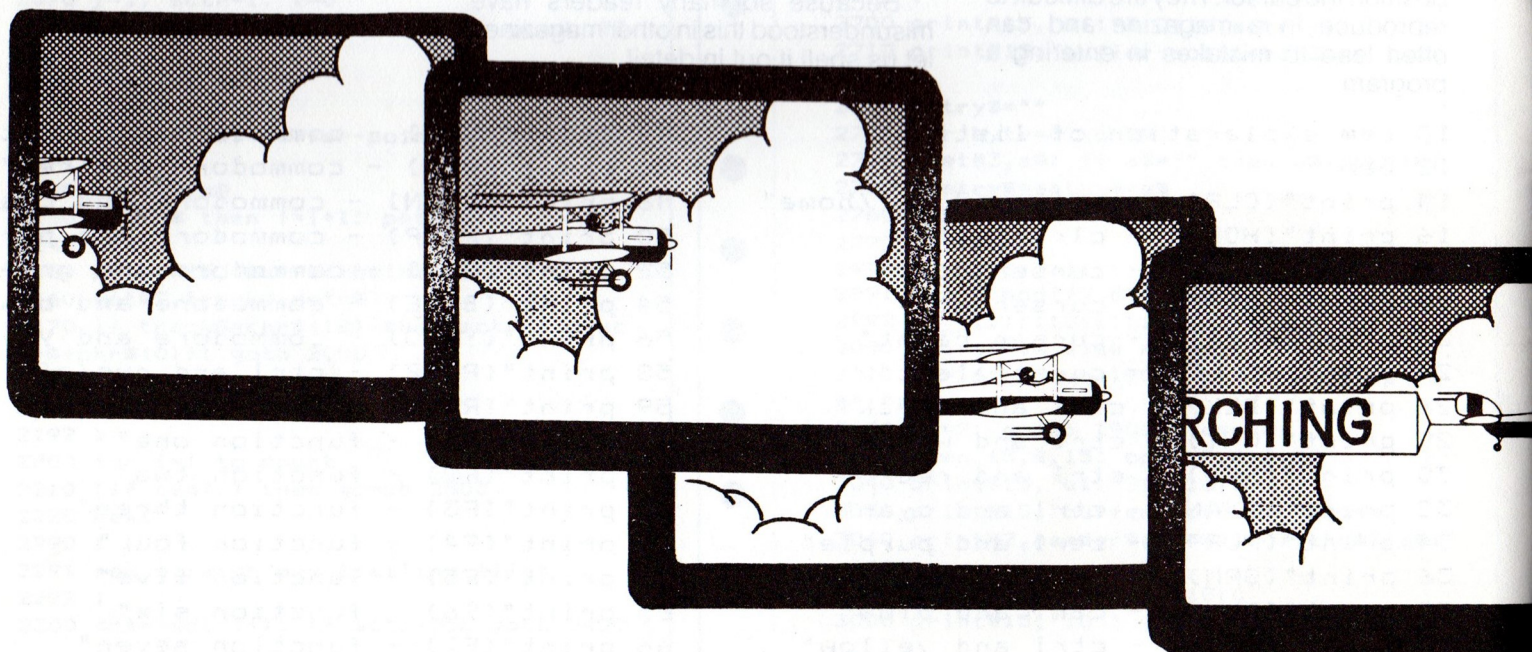
This routine will move a sprite

(number seven) across the screen over and over again. It will not be flustered by the invisible seam in the Commodore screen but will glide smoothly across it. You may use any sprite shape you wish: a star, a hot air balloon, a tumbleweed or a jet. In the companion routine listed, a cloud is chosen to drift silently by.

You won't need the entire program listed below for use in your game, but to see and understand the effect, do it anyway. Then play around with it. Use different data in lines 100-120 to achieve a different sprite shape. Or POKE a number other than three into 252 (line 40) and see what happens. (Here's a hint: a lower number will make the cloud go faster. Now what do you think a higher number will do?)

To use this clever interrupt program in your BASIC program, you only need line 40 and lines 500-550. Put them somewhere in your program so the SYS 49152 will occur before the game starts. You will also need to define a shape for sprite seven and POKE in all the other necessary numbers. If you hit RUN/STOP and RESTORE, you'll lose the effect. SYS again to get it back.

Someday, when you learn enough about machine language, you can disassemble this and see how it works. But for now who cares? Go back to your basic endeavour and let the clouds roll on. □



An Interrupt-Driven Cloud

```

5 REM THIS IS CLOUD ROUTINE
10 FOR T=12736 TO 12798:READ A
:POKE T,A:NEXT
20 V=53248:POKE 2047,199
:POKE V+21,128:POKE V+46,12
:POKE V+14,0:POKE V+15,55
30 POKE V+29,128
40 POKE 251,5:POKE 252,3
100 DATA 0,0,0,0,48,0,1,248,0,3,
248,0,7,254,0,31,255,0,63,
254,0,63,255,0
110 DATA 31,255,192,127,255,192,
255,255,192,255,255,128,127,
255,128,31,254,0
120 DATA 15,254,0,15,252,0,1,240,
0,0,240,0,0,96,0,0,0,0,0,0,0
500 REM THIS IS INTERRUPT
ROUTINE
510 FOR T=49152 TO 49229:READ A
:POKE T,A:NEXT:SYS 49152
520 DATA 120,169,13,141,20,3,169,
192,141,21,3,88,96,198,251,
165,251,240,3,76
530 DATA 74,192,173,16,208,41,
128,240,23,173,14,208,201,
101,208,31,173,16,208
540 DATA 37,127,141,16,208,169,
0,141,14,208,76,67,192,173,
14,208,201,255,208
550 DATA 8,173,16,208,5,128,141,
16,208,238,14,208,165,252,
133,251,76,49,234,0
    
```



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