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DATA STATEMENTS

Lighthearted Pleasures

Although this isn't really the time of year for masses of games releases there are still quite a few new titles around for you to choose from.

Sky Runner for the C64 from Cascade Software (29.95 cassette, £12.95 disk) is a futuristic game which deals with drug wars. The drug is Sky which makes the population completely docile. Your job is to terminate the drug harvesting operation and thus free the populace from their soul destroying existence.

According to the authors the game was inspired by such movies as *Dune* and *Action of the Ark* and is the culmination of several month's work. It was launched in the new year.

On a completely different historical level, *The Three Musketeers*, a new game from Swedish Software House, Computer Movels. The new game is available for the C64, C128 (with enhanced graphics) and the Amiga. Tape version is priced at £8.95, the 5.14 version on disk at £14.95 and there is even a 32-bit disk version at £24.95. The well known *Three Musketeers* story is the theme and the setting is 17th century France in turmoil. The game is built up around digitized pictures and contains six original music scores.

If you think that this all sounds a



bit tame then maybe you'd rather have a go at *Blood 'n Guts* for the C64 (£8.95 tape and £14.95 disk). This is an ancient barbarian decathlon game which features such imaginative events as ale drinking, human biting and joust out throwing. Probably not recommended for the faint hearted.

Football:

Cascade Games: Harrogate, N Foris, Tel: 0427 527323, *American Action and Computer Novels Inc* (1989), 5-700 43 *Adalen, Sweden*, Tel: (1-40) 40 23 25 20.



Sport Simulations

New from US Gold is a 3D pin bowling simulation entitled *3rd Frame*. The game is by the authors of *Leaderboard* and aims to recreate the fun on 3D pin bowling for all the family.

Select league play and you can take the option of playing in teams of up to four people, or open bowling will allow up to eight individual players.

Features include scoreboard position, automatic scoring, power and hook control, outstanding sound and pin action several different skill levels.

It's available for the C64 and will be released shortly on the Amiga.

On a totally different level,



DATA STATEMENTS

**Car!**

Konami is releasing *RAC Le Mans 24*, a fan racing car simulation. Look out for more details.

Touchline:

478 Golds Dale 2/3, Redford Way, Redford, Birmingham B11 7AE. Tel 0217 255 1988. **Konami:** Newcastle, Sand Buildings, Sand Street, Newcastle, Devon TR17 2L.

Pet Revival

Owners of PET computers have responded enthusiastically to the news that Supersoft is spearheading a revival of this once popular Commodore machine.

**Car!**

Supersoft bought up Commodore's last remaining stocks of the PET range in 1986. Since then enquiries from existing users have been flooding in.

However most of the stocks purchased were the older 4032 and 8032 computers and many users who enquired were hoping to expand their systems with the 8296 computer, the last produced in the PET range.

Supersoft has now managed to locate stocks of brand new 8296 computers in a Commodore warehouse in Europe. These have now been imported and are available from Supersoft at a price of £585 plus VAT.

Hewson Future

Hot on the heels of the new year, Hewson is releasing a new C64 title. Named *Amazons*, it's due out at the end of March and is a multi-level game

combining strategy and basic shoot 'em up in order to appeal to all gamers fans.

The game is set in a labyrinth of rooms viewed from above. Intrigue and suspense is added since the rooms only become visible upon being entered.

You control Myron a sorcerer's apprentice who has evaded the evil warlocks by turning himself into a frog whilst trying to construct a body-building potion. You must combat 12 guarded wizards on each of eight levels to obtain wizard power and shields.

Amazons was written by Steve Tannis, a regular Hewson programmer who has written several very popular games including *Dragons*, *Arkan*, *Arre Close* and more recently, *Quaxton*.

Touchline:

Hewson: 56b Milton Trading Estate, Milton, Abingdon, Oxon OX14 4BE. Tel 0215 812839.

Welsh Winners

Konic, the company which produced the *Speed King* joystick, has been awarded the New Enterprise Award in the Welsh National Business Awards 1986.

The award was presented to the managing director of Konic, Wyn Holloway (left of picture), by Sir John Harvey-Jones the chairman of ICI and was won just over 18 months after the company was formed.

Konic was the only company to reach three finals, the Design Technology Award, the New Enterprise Award and the Business Achievement of the year. Competing companies included Laura Ashley and British Acropress.

Touchline:

Konic: Unit 15, Strydom Mill Industrial Estate, Penrhyon, Gwent NP24 4QE. Tel 049325 5911.

**Car!**

S D A T A S T A T E M E N T S

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New products include kits for 3½ inch disk drive heads, ½ inch data cartridge heads, keyboards and casing and printers and typewriters. Kits are designed to clean away dust and grime as well as old ink from ribbons on golfballs and daisy wheels.

Also from Accodata is a three product range made up of a surge protector, a two way power filter and a four way power filter.

Power line disturbances, known as spikes and surges can damage sensitive equipment, wipe clean a computer's memory and produce garbled data.

Prices are £62.95 for the two way filter, £84 for the four way filter and £12.95 for the surge protector plug.

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Sport on Channel 64

Sport games have been an immensely popular area of software ever since the first crude ping pong. Here's a round up of the best simulations.

By Tony Hetherington

If you're fed up with watching Liverpool playing every weekend, Steve Davis winning another match or yet another contest between Clark, Coe and Over, then why not tune into Channel 64. We've got over 40 sporting challenges ranging from world football to America's cup sailing.

Multiple Events

Activision released *Decathlon* in 1983 which was quickly followed by Ocean's *Only Thompson's Decathlon*. The race to the Olympics was on. Both featured the 10 sporting events that form the Olympic Decathlon. *Decathlon* was the more accurate simulation as each competitor frantically waggled his joystick in all 10 events whilst in Ocean's game demanded success in one event before you could compete in the next.

Now joystick athletes can tackle the sprints and hurdles of *Summer Games* (seven events), high jump, explosion and canoeing of *Summer Games II* (seventeen events), the superb hotshot, ski jump, hot dog aerial, skating and bushbail of *Water Games* (six excellent events), the usual bit world tour of logging, rolling, barrel jumping, weight lifting and some wrestling of *World Games* (eight events) and the budget priced sprinting, archery and diving of *Go for Gold* (seven events). All of these are from US Gold.

Soccer

Football fans had a field day last year with the World Cup in Mexico and we feature five football games. The first was the literally basic conversion of the Spectrum hit *Football Manager* by Addictive Games that has been recently re-released. Unfortunately, C64 owners reported more of a game than their rubber kayed cousins and it failed to score.

The best C64 football game is still Commodore's own *International Soccer*. Its simple gameplay let's you control the action against either human or nice computer oppo-

nents. The system is simple as you control the man that is nearest to the ball with the computer controlling all the "all the ball running".

World Cup Carnival caused the greatest uproar from the crowd when it was released in time to capitalise on the World cup fever. Promising a badge, poster and a game that took six months to develop. However on release the game looked too familiar and turned out to be a slightly revamped version of Artic's *World Cup '87*. This earned US Gold a yellow card and boosted sales of *New Games 2* that also carried Artic's *99000*.

After the World Cup the papers were dominated by the incident when Diego Maradona punished the ball past Peter Shilton to knock England out of the cup. Now that incident has been immortalised in *Granada's* (Argos) *Peter Shilton's Handball Maradona* game. However, the game itself is dull and uninspiring although it does contain the classic phrase "a game of two halves" in its instructions.

Graphics new *Footballer of the Year* shows more promise as you battle your way through poverty, low divisions and defences in your struggle to become the best footballer of the year. The game plays a computerised board game with goal attempts coming from bought goal cards and transfers, points won and business profits from chance "insider" cards. Despite a few annoying bugs such as league points being counted twice in your tally the game is relatively addictive.

American Football

Football fans who enjoy the game American style can recreate the 1986 Super Bowl when the Bears destroyed the patriots in Ocean's *Super Bowl* as well as play individual games in Big Bytes budget *American Football*, Articsoft's *Touchdown Football* and *The Super Bowl* Sandy. You can also recreate the entire season in the gridiron version of Addictive's *Football Manager*, *Weekend*.





My pick of the bunch is *Super Bowl Sunday* that presents some complex accurate statistics in a highly playable form for a selection of football's greatest teams. Now you can be crunched by Chicago's 86 defence, throw touchdown passes with Dan Marino and the 87 Miami Dolphins and watch as John Riggs rips through defences to lead the Redskins to victory.

Baseball

US Football's American brother baseball is also well represented as digital pitchers and hitters can appear over the strikes, balls, base hits and home runs in *Marshall* (US Gold/Arcade), *World Series Baseball* (Imagine) and Activision's *Star League Baseball*.

Arcade's debut game, *Hardball*, is the leader both in graphics and gameplay giving novice and expert a run for their money. Simple joystick moves select from the available sinkers, fastballs, curveballs, sliders and changeups that the hitter must hit over the fence for a home run. Nine innings of non-stop action.

Golf

Golf has never been my favourite sport and has always prompted me to swap channels but *Charmed 64* has two handlings better: Aristocrat's simulation, *Golf Course* set and the "hit and see" action of US Gold's *Arcade Leader Board*.

The GCS golfer selects his clubs and then battles against his own handicap on one of four accurately simulated courses represented on screen both as a plan to choose your shot and in a 3D view of the action.

There is nothing realistic about the *Leader Board* courses as they consist of a series of islands surrounded by ball dumping lakes. Both games are fun to play and better than the sport they represent. GCS is the more accurate game and suitable for a lengthy campaign to reduce your handicap from beginner (28) down to pro (0). *Leader Board* fans that drive the game to the top of the charts can replay all their best shots as US Gold releases four more courses in its *Leader Board* Tournament expansion set.

There are other golf games such as Mastertronic's budget *Me in One* and the Argus Avid. *Radio Plays the Open* but *Leader Board* and GCS are the clear leaders.

Cricket

Two famous names battled it out for the cricket honours as Graham Good's *Test Cricket* (Androgynic) took on Tynesol's *Am Beckham*.

I found *Beham's* to be the better game once you'd played yourself in but poor graphics let the appalling *Good's* cricket take the honours. The graphics are quite impressive but soon lose their appeal as you realise they are just a series

of set patterns that interrupt the action. The game itself is dreadful and can be played in both arcade and simulation modes. The simulation mode is the game you can actually play and win while you're asleep! How well you do in the arcade version depends solely on the skill level. Choose the highest and you'll be all out in two overs but at the lowest you can score four and steal off your bat, leg and nose!

And the others

For a change from the "popular" sports why not try wrestling in Melbourne House's *Road 'N' Brawl* that features 25 home crushing moves in another game that outclasses it's sport. The same is also true of Activision's *Two on Two Baseball* that adds excitement to a dreary sport or *Scrap, Fry and Spike* your way through a volleyball match courtesy of Mastertronic or punch your opponent into a pulp in *Frank Bruno's Boxing* (Elite - now available as part of Hitpack), *Barry McGuigan's World Championship Boxing* (Activision) and US Gold's *Fight Night* is the pick of the pugilists.

Whatever your sport you're sure to find a game to recreate your favourite handicaps (sailing), *America's Cup - US Gold*, table tennis (*Superstar Ping Pong - US Gold*) and *Jet Hockey* (Team Amos).

Franklin

Activision: 23 Pond Street, London NW3 2PN. Tel: 01 453 7331.

Imagine: 6 Central Street, Aldershot MJ1 3NS. Tel: 041 832 6633.

US Gold: Unit 2/3, Midford Way, Midford, Birmingham B9 7AU. Tel: 021 356 3388.

Advision Games: 19 Abbey Road, Bournemouth BH1 1BZ. Tel: 0202 266494.

Commodore: *Members Only*, Welton, Cusby, Norfolk NR17 7QE. Tel: 0336 265353.

Argus: *Grandstand*, *Big Spike*: Victory House, Leicester Place, London WC2V 7NR. Tel: 01 439 0800.

Granite: *Alpha House*, 19 Carter Street, Sheffield S1 4PS. Tel: 0742 534323.

Aristocrat: 68 Long Ace, London WC2E 9AM. Tel: 01 826 3471.

Nexax: *D&B House*, 20 High Street, Beckenham, Kent BR3 7AU. Tel: 045 658 3723.

Androgynic: 29 Saxtons Industrial Park, London Road, Reading RG1 6AE. Tel: 0734 664646.

Fynaght: *Avilion Industrial Estate*, Blinworth, York & Wrex 962J 9TE. Tel: 081 614 4611.

Melbourne House: 60 High Street, Hampton Wick, Kingston-upon-Thames, Surrey KT7 4DB. Tel: 01 843 3811.

Mastertronic: 8-10 Paul Street, London EC2A 4AM. Tel: 01 477 6688.

Elite: 53 Roadford Street, Watford WF1 3JD. Tel: 0452 53812.

Amos: 15 West Hill, Buryford, Kent DA1 6L. Tel: 0322 82511.

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Spelling Checker

An ingenious program to help you provide yourself with a personalized dictionary to avoid those embarrassing mistakes.

By W.J. Sellers

Proof reading a word-processed document is probably not most people's idea of an enjoyable way of spending an hour or so. Thus, any device that can make this job even a little easier is to be welcomed.

A spelling checker helps by comparing every word in the document with a list of common words, and indicating any that it does not find. This is obviously not infallible since the misspelling of a word can produce another word that will be recognized by the spelling checker and so the mistake will not be spotted. Also, it is not possible for the machine to know every word, therefore uncommon words will always be indicated as misspelled.

Normally, this is not the sort of program that can be typed in from a listing in a magazine since the on-line dictionary will contain several thousand words. However, this program is self-teaching and can quickly obtain words for its list from documents it is used to check. This is achieved by allowing the user to ask the computer to remember correctly spelled words that it does not yet know. In this way, the computer gets its word list without the user needing to type in any extra words at all.

In Use

The program shown is for use with a disk drive and running it causes a machine code program called 'SPELL-CHECK' to be created. To run the program, type 'LOAD'SPELL-CHECK',2,1 and then RUN it. The following menu will appear:

- (1) Spelling Check
- (2) Options
- (3) Load Dictionary
- (4) Save Dictionary
- (5) Delete Word
- (6) Directory

'SPELLING CHECK' prompts for a filename and proceeds to perform a spelling check on that file. 'OPTIONS' allows the user to set up spelling check parameters. Thus, the option to add words to the dictionary can be selected; whether or not a printout of the misspelt words is required; and whether the file is Plus/4 built-in word processor format or standard ASCII. The 'LOAD' and 'SAVE DICTIONARY' options are for (believer's or not) loading and saving dictionary files. 'DELETE WORD' allows the user to delete an unwanted word from the dictionary - a misspelling that has got in by mistake perhaps. 'Directory' prints out the disk directory.

On first running the spelling

checker, the dictionary is empty and so it is necessary to type '2' to get to the 'OPTIONS' menu. Typing the relevant letter will toggle the parameter; thus pressing 'C' will switch the program to add word mode. Then type 'D' to exit back to the main menu and then press '1' to initiate the spelling checker. This prompts for the name of the file to be checked.

When a word is not found, you are asked whether or not it is to be added to the dictionary. Using through a few lengthy files, getting the computer to add any not too common words to its dictionary will rapidly generate a sizeable list of words that can now be used as a dictionary file. This can be added each time a file is spelling checked until the limit set by the memory size of the Plus/4 - about 38K bytes or around 7000 words. If these words have been fairly carefully selected, then most words that the checker fails to recognize will indeed be errors. 25

PROGRAM: CHECKER.CHEAT

```

10 OPEN# 0,0,"SPELLCHECK.P,M"
20 PRINT#0,CHR$(13);CHR$(10);
30 @=1000;L=100
  @=0
40 FOR#1=100
50 READ# 1;F#--1;THEN#10
70 PRINT#0,CHR$(13);@*2;L;F#
  @#
80 NEXT
90 READ# 1;F#--1;THEN#10;CL=0;F#
  F#*50;PRINT#0;CHR$(10);L;F#
  L;S=0;S#0
100 L=L+20;S=S#0
110 IF#0;F#>0;1;THEN#PRINT#0;S#
220 ERROR#;S=0;S#0
230 CL=0
240 END
250 S=S#1;S# 10,10,0,100,52,99,
  90,200
260 S=S#2;S# 150,100,0,100,0,100,01
  ,200
270 S=S#3;S# 200,25,250,100,01
  ,100,10,1000
280 S=S#4;S# 100,52,30,200,200,
  201,10,200
290 S=S#5;S# 0,30,200,10,70,21
  ,10,21
300 S=S#6;S# 100,200,0,20,100,1
  
```

7, 75, 500	550 DAT4255, 240, 20, 500, 240, 80	10, 100, 700
200 DAT4261, 10, 201, 51, 200, 0, 30	13, 13, 1007	210 DAT4140, 30, 100, 20, 20, 70, 70
130, 807	200 DAT4264, 00, 00, 00, 00, 30, 80,	30, 707
210 DAT4269, 70, 31, 10, 200, 00, 00	80, 800	220 DAT4149, 70, 70, 70, 0, 100, 200,
0, 0, 500	170 DAT4262, 57, 00, 30, 00, 70, 30,	100, 700
220 DAT4270, 110, 10, 70, 20, 10, 20	17, 400	230 DAT4150, 30, 100, 00, 30, 00, 10
1, 00, 500	200 DAT4273, 70, 00, 73, 70, 00, 00,	100, 000
230 DAT4280, 0, 30, 00, 10, 70, 00	17, 500	240 DAT4151, 100, 00, 1, 10, 107, 01, 3
10, 007	200 DAT4281, 100, 000, 100, 30, 30,	1, 000, 000
00, 000	10, 00, 000	250 DAT4200, 100, 4, 000, 00, 1, 200
010 DAT4281, 04, 000, 100, 30, 30,	000 DAT4282, 00, 100, 00, 30, 00, 1	100, 1, 001
17, 70, 000	0, 100, 700	260 DAT4204, 3, 30, 100, 00, 100, 0
000 DAT421, 10, 100, 147, 13, 13, 1	010 DAT4237, 100, 17, 00, 000, 00,	0, 170, 000
3, 30, 113	100, 00, 000	270 DAT4200, 30, 100, 000, 30, 100
000 DAT422, 30, 30, 30, 30, 30, 30,	000 DEX1000, 00, 30, 00, 10, 100, 0	1, 000, 000
30, 000	1, 000, 000	280 DAT4202, 000, 001, 0, 000, 007
070 DAT422, 77, 00, 70, 00, 00, 13,	030 DAT410, 30, 000, 00, 100, 00, 1	1, 000, 0, 1000
13, 400	00, 00, 010	290 DAT420, 001, 000, 100, 100, 13
000 DAT423, 30, 30, 30, 30, 30, 30,	040 DAT420, 00, 10, 100, 00, 100, 1	3, 3, 000, 1000
30, 000	00, 30, 001	1000 DAT400, 100, 4, 100, 0, 100, 1
000 DAT424, 30, 30, 40, 10, 01, 30,	050 DAT420, 00, 30, 000, 000, 000	01, 00, 010
00, 00, 01	000, 000, 1000	1010 DAT4000, 177, 3, 100, 00, 000
200 DAT426, 00, 70, 70, 73, 70, 71,	000 DAT421, 173, 00, 00, 73, 1, 111	00, 30, 1010
30, 500	00, 000	1020 DAT421, 000, 000, 3, 000, 0,
310 DAT427, 70, 00, 07, 70, 13, 13,	070 DAT42, 70, 100, 17, 001, 00, 0	000, 4, 1000
30, 000	00, 11, 700	1030 DAT425, 4, 000, 100, 00, 000
200 DAT422, 30, 30, 30, 30, 30, 30,	000 DAT4270, 00, 00, 73, 1, 141, 00	070, 100, 1100
30, 000	00, 00, 000	1040 DAT42, 000, 100, 00, 000, 003
700 DACK30, 40, 00, 01, 30, 70, 00,	000 DAT420, 100, 17, 001, 07, 000,	1000, 0, 1000
00, 400	01, 170, 000	1050 DAT420, 100, 000, 30, 000, 00
210 DAT423, 70, 70, 00, 13, 13, 30,	200 DAT429, 00, 73, 1, 140, 00, 00,	3, 30, 00, 1110
30, 000	70, 000	1060 DAT420, 00, 73, 100, 00, 00, 0
700 DAT420, 30, 30, 30, 30, 30, 30,	210 DAT420, 17, 000, 00, 000, 000	0, 00, 000
00, 400	00, 100, 1000	1070 DAT420, 00, 73, 000, 00, 00, 00
000 DAT420, 01, 01, 30, 70, 70, 00,	200 DAT423, 13, 13, 30, 30, 30, 30,	70, 000
00, 700	30, 100	1080 DAT420, 00, 13, 13, 0, 100, 1,
070 DAT420, 00, 70, 07, 07, 73, 70,	700 DAT420, 30, 30, 30, 30, 70, 00,	141, 000
70, 500	01, 300	1090 DAT4207, 00, 100, 10, 100, 10,
000 DAT400, 00, 000, 13, 13, 30, 30,	700 DAT420, 00, 00, 73, 70, 00, 00,	30, 000, 000
00, 200	00, 000	1100 DAT420, 30, 100, 10, 000, 0, 0
000 DAT420, 30, 30, 30, 30, 30, 30,	750 DAT420, 30, 30, 0, 13, 13, 30, 3	00, 000, 000
00, 000	0, 100	1110 DAT420, 001, 00, 100, 0, 100,
000 DAT420, 11, 30, 00, 00, 00, 00,	700 DAT420, 30, 30, 30, 30, 30, 30,	07, 00, 000
00, 400	30, 000	1120 DAT420, 147, 00, 70, 00, 00, 0
210 DAT400, 73, 07, 00, 73, 70, 70,	770 DAT420, 00, 01, 30, 00, 00, 00, 07,	0, 000, 000
00, 007	73, 407	1130 DAT420, 000, 100, 00, 100, 100
700 DAT420, 00, 13, 13, 30, 30, 30,	700 DAT423, 30, 30, 30, 30, 30, 0, 1	00, 100, 000
30, 000	3, 070	1140 DAT420, 100, 0, 100, 3, 000, 0,
700 DAT420, 30, 30, 30, 30, 30, 30,	30, 007	000, 000
00, 000	000 DAT420, 30, 30, 30, 30, 30, 30,	1150 DAT420, 000, 4, 100, 4, 000, 00
00, 000	00, 001	0, 00, 001
210 DAT420, 07, 70, 00, 00, 13, 13,	010 DAT420, 00, 30, 07, 70, 00, 00,	1160 DAT4200, 00, 100, 0, 000, 00
13, 000	30, 010	0, 00, 000, 000
000 DAT420, 30, 30, 30, 30, 30, 30,	020 DAT420, 0, 13, 13, 30, 30, 30, 3	1170 DAT42007, 170, 00, 00, 000, 00
30, 000	0, 100	0, 000, 00, 1000
070 DAT420, 10, 00, 11, 30, 00, 73,	030 DAT420, 30, 30, 30, 30, 30, 40,	1180 DAT4200, 00, 100, 100, 00, 00
00, 400	00, 300	1000, 000, 0010
000 DAT420, 00, 00, 70, 00, 00, 13,	040 DAT421, 30, 00, 00, 73, 00, 13,	1190 DAT4200, 100, 100, 00, 00, 00
13, 400	13, 410	000, 000, 0010
000 DAT423, 30, 30, 30, 30, 30, 30,	050 DAT423, 13, 13, 30, 30, 30, 30,	1190 DAT4200, 100, 100, 00, 00, 00
30, 007	30, 100	00, 10, 710
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07, 000	70, 000	101, 100, 1000
210 DAT420, 30, 70, 00, 70, 07, 00,	070 DAT420, 07, 00, 30, 70, 00, 00,	1020 DAT420, 30, 100, 00, 100, 0, 0
73, 000	73, 000	0, 000, 000
200 DAT420, 70, 0, 100, 117, 00, 01	080 DAT420, 70, 0, 100, 0, 100, 0, 1	11, 000, 1100
0, 000, 000	00, 000	1030 DAT420, 000, 100, 13, 30, 01
030 DAT420, 100, 000, 30, 00, 17, 0	00, 000	0, 000, 00, 1000
0, 100, 700	000 DAT420, 177, 0, 000, 0, 100, 110	2000 DAT420, 73, 70, 00, 70, 00, 77
000 DAT420, 100, 17, 00, 100, 00, 3	1, 00, 000	00, 000
0, 000, 000	000 DAT420, 30, 100, 00, 00, 100, 1	

```

1268 DATA37,53,8,162,189,168,
18,38,888
1270 DATA100,52,32,218,15,162
,8,38,888
1280 DATA108,288,168,176,133,
1,125,52,1675
1290 DATA13,4,168,8,32,138,2
9,152,571
1300 DATA8,888,18,168,170,83,
255,175,551
1310 DATA3,171,88,888,88,838,
3,888,888
1320 DATA2,838,4,78,187,18,18
5,8,888
1330 DATA52,155,255,32,284,85
5,88,147,1858
1340 DATA78,78,85,88,32,88,73
,88,874
1350 DATA88,87,84,78,82,83,13
,13,788
1360 DATA8,32,84,18,138,282,5
2,288,558
1370 DATA3,32,888,888,188,8,1
78,188,284
1380 DATA32,168,285,32,188,88
8,38,188,1187
1390 DATA25,285,8,288,288,88
,167,187,1787
1400 DATA188,28,32,185,52,32,
218,78,888
1410 DATA188,147,32,818,288,1
82,18,32,188,5
1420 DATA188,888,173,88,22,88
8,13,152,1138
1430 DATA188,188,8,32,287,88,8
32,888,2874
1440 DATA1,288,182,1,888,888,
884,47,1118
1450 DATA28,278,162,8,78,285
,285,288,1383
1460 DATA8,32,138,28,152,8,2
88,52,783
1470 DATA8,178,82,882,88,178
,15,881,818
1480 DATA88,178,11,187,81,3,8
32,284,285
1490 DATA8,288,18,78,88,88,8
29,8,888
1500 DATA94,3,38,182,88,38,8
88,788,888
1510 DATA78,23,32,138,28,188
8,888,888
1520 DATA8,32,178,88,881,88,
178,237,888
1530 DATA81,82,178,238,168,8
,78,52,881
1540 DATA2,188,8,32,188,888,
32,881,815
1550 DATA88,88,147,88,83,88,
88,32,814
1560 DATA88,88,88,84,13,13,8,
178,881
1570 DATA88,788,38,188,888,3
8,188,888,1887
1580 DATA8,32,287,285,78,32,
183,88,1138
1590 DATA188,184,86,172,35,22
,288,8,873
1600 DATA88,32,178,1,84,185,
87,88,788
1610 DATA22,188,174,881,88,8

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78,174,88,1381
1620 DATA88,174,88,285,178,2
88,52,182,1885
1630 DATA8,188,81,3,88,833,88
,38,887
1640 DATA11,88,88,178,188,14
8,88,133,887
1650 DATA88,174,181,88,888,188
,178,82,888
1660 DATA13,4,171,188,88,188
,8,177,738
1670 DATA2,278,82,171,88,88,8
88,188,881
1680 DATA2,288,16,288,177,3,
217,88,888
1690 DATA8,888,8,888,188,52,8
18,23,888
1700 DATA78,818,88,88,88,87,
173,88,237
1710 DATA2,278,181,3,138,3,18
5,4,888
1720 DATA28,8,133,1,78,188,8
8,173,388
1730 DATA27,22,278,3,78,28,18
,171,874
1740 DATA8,888,88,32,128,52,
182,88,777
1750 DATA888,8,38,288,88,88,
38,78,888
1760 DATA78,84,32,78,78,88,78
,88,874
1770 DATA3,13,8,38,8,174,88,
888,814
1780 DATA88,188,13,88,218,888
,88,818,1888
1790 DATA25,188,5,32,218,888
,78,178,1888
1800 DATA22,188,288,32,218,28
4,188,18,1888
1810 DATA188,81,32,188,88,173
,57,52,838
1820 DATA88,4,38,88,17,88,17
3,28,788
1830 DATA2,278,13,32,171,288
,188,4,888
1840 DATA28,188,28,182,4,32,8
81,288,888
1850 DATA2,128,52,888,13,32,
818,888,881
1860 DATA888,4,32,188,288,32,
174,888,1118
1870 DATA2,284,285,162,8,32,
188,285,1178
1880 DATA288,3,88,188,888,173
,84,27,888
1890 DATA288,1,88,188,188,188
,21,37,888
1900 DATA88,88,28,284,888,38
,285,888,1338
1910 DATA88,11,38,888,888,88
1,88,888,1288
1920 DATA27,881,78,888,288,18
8,8,38,888
1930 DATA88,288,58,58,58,88,58,
38,87,888
1940 DATA78,88,88,38,84,78,38
,78,528
1950 DATA888,83,84,38,88,88,47
,78,888
1960 DATA88,38,83,13,13,8,188
,8,383

```

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1970 DATA88,188,888,188,8,88,
237,188,1178
1980 DATA2,174,188,88,188,88
3,237,188,1278
1990 DATA2,174,188,88,881,8,
888,88,788
2000 DATA173,188,88,881,88,17
8,83,188,888
2010 DATA278,168,21,32,185,88
88,78,738
2020 DATA78,32,82,78,78,77,88
,78,578
2030 DATA88,78,84,13,13,8,188
,171,888
2040 DATA83,888,173,188,88,13
3,3,173,1888
2050 DATA188,22,133,4,288,188
,88,188,878
2060 DATA,177,3,172,188,52,1
78,3,888
2070 DATA888,1,288,188,28,288
,7,188,878
2080 DATA18,288,181,52,888,11,
188,3,788
2090 DATA888,8,188,4,188,3,78
,8,888
2100 DATA888,188,8,888,188,88,
278,188,788
2110 DATA22,174,3,888,188,88,
3,178,788
2120 DATA13,281,188,52,888,878
2130,288,1188
2140 DATA2,174,88,52,232,232
,284,84,1888
2150 DATA288,288,178,178,28,274
,188,188,888
2160 DATA28,237,188,88,282,18
8,178,52,888
2170 DATA188,8,187,188,88,78,
88,87,888
2180 DATA171,88,888,88,88,8,8
,8,888
2190 DATA8,8,8,8,8,8,8,8,8,8
2200 DATA74,5,132,8,188,8,17
7,8,818
2210 DATA88,18,38,218,288,23
8,8,888,1188
2220 DATA8,888,888,88,111,82,88
,152,788
2230 DATA8,888,188,188,88,888,88,
188,11,888
2240 DATA8,232,88,88,188,78,
188,87,888
2250 DATA888,888,88,881,22,888
,52,288,888
2260 DATA2,88,88,288,28,888,88,818
,88,877,888
2270 DATA888,888,88,888,88,818
,88,871,888
2280 DATA888,818,88,813,88,874
,88,878,888
2290 DATA888,818,88,817,88,818
,88,878,888
2300 DATA22,228,22,221,22,888
,88,873,874
2310 DATA2,88,88,288,28,888
,22,8,783
2320 DATA8,8,8,8,8,8,8,8,8,8
2330 DATA8,8,8,8,8,8,8,8,8,8
2340 DATA8,8,8,8,8,8,8,8,8,8
2350 DATA8,8,-1

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USA Today

There are a lot of strange peripherals available for C64s in the States. Here's a cross section just to whet your appetite.

By Lewis Tilley

Do you have that tired, run-down feeling? Does the big guy kick sand into your face at the beach? Do you want to compete better? Plug a *Bodylog* into your Commodore's cartridge slot and hook into the latest in sports training. This peripheral consists of the program plus a "standard EMG screen and lead set, head band and three electrodes" which you place against the part of the body you wish to monitor. The result reads out on your screen with the aid of the two software cartridges included.

Computerized Muscle Exercise and Toner or COMET is an electronic muscle builder which comes as an extra. A cardiac exercise and stress reduction package are also available. Prices run from \$149.95 for the basic package up to \$239.95 for the stress reduction gear. Mail orders to: *Bodylog Inc.*, (see Touchline for address).

There is an italicized sentence in the firm's advertisement which will be reading more often as the use of computers expand into the mass markets: "Knowledge of computers or computer programming is NOT necessary to use *Bodylog*." That, for you, fellow!

To continue your physical education course, don't forget the latest in footware: *Puma's RS Computer Shoe* has a computer chip built into its heel. After each training run you connect up to your 64 for a readout of the run record. The time, distance and calories you need will be fed in for a comparison with your past data and future dreams. Only \$199.99 for a pair.

Now, let's see. We have the electrodes on your head, a computer chip on your feet, if you'll just stick your hand into this lightweight cotton glove its sensors will do everything a joy stick will do for you and more. It's

called *Man/Command* and comes from *Shan Data* and costs \$40.

Gone Fishing

Maybe you aren't a "jock", which is an Americanism for "athlete" coined from their supporters. Maybe you like to fish. Got just the thing for you. *The Computerized Fisherman's Fight Recorder* fits on to your pole to use its chip to remember how long and how hard you needed to catch that fish. Available from the US manufacturer, *Hammacher Schlemmer*, for \$75.

But seriously Folks

Heavy, heavy, heavy is this very different printer interface, *Driver* (see from *Progressive Peripherals* and Software at a price of \$119.95). The price is high, but the features overwhelmed the reviewers of this new attachment. It contains 12K bytes, a 6809 8 bit microprocessor and its own power source. 16K of that memory is used as a print buffer but it doubles in bytes when it stores eight different fonts in that buffer as well. A utility disk comes with these fonts plus 22 variations of the standard 8 x 8 font and an editor so that you can design your own. This graphics interface which links a Commodore printer to the serial bus of the Commodore deserves a thorough review of its abilities.

Driver One is a challenger to *Super Graphix* by NETEC which has offered its high technology to Commodore users for some time now. You might check it out from NETEC Inc. at \$99.95. Their disk includes 27 fonts to be used with the interface.

If your major printer problem is impatience, you can get three versions of *Serial Box* which stores in a 64K buffer while printing to a Commodore Compatible printer. The *Serial Box-Plus* is serial to parallel with 64K

buffer, and the *Box-Max* is two parallel printers and gives a massive 256K buffer. All of these include a font design and utility program called *Font Factory*. They are GOSYS-compatible. *R.J. Bushman Associates Inc.* sell these at \$79.95, \$149.95 and \$299.95 respectively.

Kahok Labs., down in Puerto Rico, have devised an inexpensive way to scan a photo or drawing without the use of a TV camera. You attach a scanning head to your printer, or any typewriter, and connect to the 64's user port. The Commodore system takes over to produce an image with its software which can be manipulated. The resolution is no better than might be expected, but it can be adjusted in total levels, exposure and contrast. Price for the complete kit is \$249.95 from *Kahok Labs.*

The best is yet to come. *Bekeley Software*, which revolutionized the new 64C, is working on an Apple LaserWriter driver for GEOS. The *LaserWriter* is a \$5000 printer which responds to a font language from Apple called *PostScript*. It prints typeset quality text. Here in the States, some shops are offering the services of print-printouts on their *LaserWriter* for your 64K.

Touchline:

Bodylog (INC) 31 Maple Ave., Ansonia, CT 06340.

Shureline 7121 Study Oak Road,

Eden Prairie, MN 55344.

RAM Computers PO Box 2672,

Carson, CA 91078.

Progressive Peripherals 464

Kalamath Street, Denver CO 80204

NETEC INC 2894 Grand Road,

Sollis, VT 05401.

R.J. Bushman Associates PO Box

1877, Hershey, PA 17033.

Kahok Labs/Alphanta, PO 80607,

New Canaan PO Box 8042, Chicago,

IL 60685.

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I.Q.

In this new regular feature we bring you the best of strategy and adventure games together with some useful hints on how to improve your play.

The Pawn

Originally written for the Atari ST, *The Pawn* had rare reviews both for its graphics and for its complex parser.

Rambard is the apocryphal son of British Telecom's software engineers and as with *The Assets of Darkness*, this program is so cheap at £19.95 that, considering that you get two disks, plenty of supporting written matter and an A3 sized poster, it is not bad value.

Instructions to play the game come in two small booklets, one Commodore specific and the other a general gameplay guide. There is also a very well produced 25 page book containing the background story and several pages of mythologised hints for the difficult bits.

The first option, that is highly recommended, is to make copies of two Pawn disks, henceforward to use these copies and retain the originals safely stored away. There is even a copy program included so that you need no additional utilities to achieve this.

This story is a strange mixture of ancient and modern, with old favourites such as dwarves, a missing princess, and all powerful magicians and an ice castle with no doors. What this kind of Kerroonia also has, are many oblique references to a more modernistic society that tends to replace the classic framework with a satirical identity which is both amusing and scary.

The final aim of the game is not spelled out, but with an unpopular king, a general physician in the office, some marly trading in the drinks market and groups of hunched dwarves in the wings not to mention Kerroon the Magician — anything is possible.

In common with those superb adventures from Infocom, this program makes a great deal of use of the disk drive. This regular disk access at most keyboard entries does mean that each move takes time to reach some form of conclusion, especially when large pictures are to be created.

The graphics are excellent but the full picture only allows three lines of text beneath it — so even more time is lost as you try to assimilate a number of lines of text, three at a time.

The instructions acknowledge this problem and recommend using another graphics mode, with only occasional perks at the large pictures! One thing is certain, *The Pawn* offers a great variety of viewing and editing controls that should satisfy the most demanding player.

It is possible to get into quite a muddle with all the picture controls, whereby you are looking at a picture that is not that of your present location. GRAPHICS NORMAL



puts everything right and you may then start your choice of graphics mode all over again.

The Pawn gives you a number of editing controls, a most useful one being the facility for calling back your last command for re-editing. Communicating with the game is fairly easy, as the parser recognises many different ways of saying the same thing. Leaving the Guard's bar may be accomplished by any of the following: LEAVE HUT, GO EAST, E, GO E, OUT, G, EXIT, EXIT HUT or EXIT EAST.

These are very simple commands but an example given in the instructions shows that the parser will also accept such a verbose command as GET ALL EXCEPT THE CASIS BUT NOT THE VIOLIN CASE THEN KILL THE MAN EATING SHREW WITH THE CONTENTS OF THE VIOLIN CASE! The parser will also understand when an object already specified, is to be used again: GET SHIRT THEN TIE IT TO BARE.

Although this all sounds wonderful and indeed makes life that much easier in most cases, do not assume that the command interpreter is all powerful. You must still retain the true adventurer's cynical attitude and double check your surroundings.

An example of this may be found when you first arrive in Kerroonia. You are wearing jeans and a T-shirt and have a mysterious silver band staked around your wrist. Obviously you immediately run an inventory check, this tells you nothing more. You know the program is intended for its

parade as my **FUEL IN POCKETS** - great, the answer is "The pocket is soft". However it takes three more commands to ascertain what it is there.

If you get stuck, there are a number of hints given to help you. These are in the form of a series of two-character blocks: AN YS SE DO GO SE. Type in HINT and you will then be asked to type in this code. There are usually three sets of code for each potential question, the first often gets a flippant response, the third is usually quite useful.

There will be several times where you have to talk to characters you meet along the way. The parser again offers you a choice of how to go about this. There is a useful command **EXITS** that will list all possible directions of movement from your present location. **AGAIN** repeats the previous command and **SCORE** gives you your current score and the maximum possible score.

With all these facilities to be shewn off, what is the adventure itself like? There are lots of laughs, plenty of traps to check out and a reasonable difficulty level. Draw maps carefully as movement from one location to another is not always quite as you would expect it to be. **SAVE** your game position regularly (you'll need a previously formatted blank disk).

Altogether an interesting experience with a true adventure dressed up in the most modern mixture of programming technique and offbeat humour. We will have to wait and see if these higher priced super-products can stand the competition from cheaper and less elegantly programmed adventures. For Magnetic Scrolls, The Floor's programmers, I hope so - I'm looking forward to seeing their next offering. **P.J.**

Quantum

Those of you who enjoy the Ultima series of adventures may well feel that US Gold have come up with another winner in the same mould. *Quantum* is a fantasy adventure game written by Strategic Simulations Inc in the USA. It is a disk only but this is two sided - so there is plenty of program there to be explored.

The land of *Quantum* has had a distinctly turbulent past. Everything fell apart as the various some hundreds of years ago when one of the King's two chief wizards finally took the left hand path and became completely evil.

From that moment on, a greater and greater number of vile monsters invaded the countryside. The population began to seek shelter in underground towns, as these were the only places they could be sure of defending. Many were the knights that went out in the hope of defeating the evil Master, but none returned.

The countryside and towns are shown in plan view and depicted in 3D. The symbols representing plants, jungle, mountains and villages also look familiar.

This plan view takes up about two-thirds of the display, with a number of action options to its left together with a level status of the character's vital statistics. Reports of what is happening and your input commands appear out for four lines at the bottom of the screen.

Control may be entirely from the keyboard or a mixture of joystick and keyboard. All keyboard action commands are single key presses, so the system is quick and simple to master. Whilst revving around you have such commands as **Arm** (choice of weapon), **Drink**, **Rest**, **Fight**, **Hold Item** (for

use by **Operate**, **Speak**, **Wear**, **Rob**, **Unlock**, **Take** and **Examine**).

As you move your character, the screen scrolls past, disclosing further areas of the country. There are a number of towns to visit and in each you will find shops that sell different means of transport ranging from horses and lamas to rafts, clipper and eagles.

The towns also have two other places of great importance, **Jails** and **Casinos**. Bribe the warden and he will let you talk to one of the prisoners.

The **Casinos** offer three types of gambling 'double or nothing', 'blackjack' and 'roulette'. A cool head and careful strategy can make you a rich man fairly quickly. **Gold** is an important part of the game and the two main sources are by killing monsters and by gambling.

Food has to be bought at regular intervals and as you progress, you may also find a use for various weapons and equipment. Be wary in the **Casinos** of winning too much, too soon. With over 2000 gold pieces, the gambling is closed and the town guards will attack you. They are fairly tough and if you have not yet built up your hit points, you may come to an early end.

There are several **Cathedra** to visit. These contain **enigmas** and **magicians** from the past and they are able to help you in various ways.

You start out with 12 points of your five main attributes: strength, stamina, dexterity, intelligence and charisma. These attributes may be modified as play proceeds and you become wiser to the ways of *Quantum*.

There is one other main site for you to find on the mainland and that is the King's Castle. Here you will find the wizard **Melcor**, almost equal in power to the evil Master. Talk to him and he may well help you on your way.

Eventually you will want to talk to others in the castle but as they are behind locked doors, this is no easy task. First you will have to steal the right keys and this will bring any nearby guards hotfoot for the kill. You will have to have found a means of replacing your certain loss of hit points.

Once you have reached a high enough position in the land, you will be requested to seek out and destroy **Manor** in his land of evil across the seas. Now you will have to find a way through those areas of thick choking fog that have so far cradled your exploration.

This evil land far to the west, has even today, got a few trading posts. Here you can buy various magical items and



several weapons that may be useful against the many new varieties of monsters found above and below ground. The Dungeons are rife with traps and all manner of nasty things, fortunately there are a fair number of treasure chests and magical caskets. You may even be lucky and find a compass.

For all those physical types that delight in roaming off into the great blue yonder, polish your boots and get that sword, Quasran needs a hero. Just remember, gubas really gold as you can, never talk to the guards and leave pinching the King's gold until you are sure of yourself. P.F.

Moonmist

You receive a letter from one of your old friends Tamara Lynd in which she can't wait to tell you her news. She has become engaged to an English Lord no less and is going to live in Tremplin Castle out in Cornwall—a lovely old place and reputedly haunted.

How things change! Eight days later, a second letter arrives and the tone of happiness has been replaced by one of sheer terror. Tamara is convinced that someone is trying to kill her. There have been two attempts on her life so far. Also, several of the guests at the castle have reported seeing the White Lady, especially after the unfortunate drowning of one of Lord Jack Tremplin's former girlfriends. As you have a reputation as something of an amateur sleuth, she begs you to come over and see if you can clear things up.

So the story is set for *Moonmist*, the latest detective story from these masters of the adventure game *2 Infocom* (distributed in the UK by Activision). The game is set at introductory level and is ideal for those of you who don't quite fancy yourselves as Sherlock Holmes just yet. At the beginning, you are prompted for your name and title, thus determining your sex. All the responses within the game are then adapted around your answer. You are also prompted for your favourite colour for there are no less than four different variations within the game so that it is not something that you just play once and forget about.

The game starts with you dining up outside the castle gates. You quickly meet some of the other guests before going to your room to dress for dinner. No sooner have you taken a couple of bites than the plot thickens when a secret tape recorder plays a message from Lord Jack's late, eccentric uncle in which he states that there is treasure

hidden somewhere within the castle and grounds.

Treasure, a ghost with some very odd behavioural habits, the death threat to Tamara and the mystery of Doctor's dressing while no body was ever discovered should keep even the most brilliant detective quiet for a bit. You will have to go round the castle, searching for clues and secret passages and asking the guests what they know about various people or objects.

For once, the atmosphere created within the game is not up to the usual Infocom standards. The main reason for this is that the Americans have no idea how the British upper classes behave save what they have seen in the pictures. A Coldstream Guards officer sounds more like Elias Doolittle's father in *My Fair Lady* whilst the butler does a very good impression of Bertie Wooster rather than Jeeves. These idiosyncrasies aside, the rest of the game is well up to standard with rooms of excellent text descriptions and (thank goodness!) no graphics.

Infocom is also famous for the way in which the games are packaged and *Moonmist* is no exception. A book on the ghosts of Cornwall, a tourist brochure to the castle, Tamara's two letters and an iron-on transfer for a tee-shirt are all included. If you have always fancied yourself solving a major crime, or fear in this case, you could do a lot worse than discover why *Moonmist* has helped to make Infocom the best adventure writers in the business by a long way. G.R.H.

Silicon Dreams

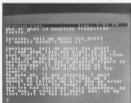
For some reason or other, most adventure plots have been more concerned with ores and wizards rather than spacings and lasers. For the discerning sci-fi buff, there has been a distinct lack of *silicon* games. Now, their wait is over for Rainbow! has put together three of Level 9's old games into one large compilation.

Silicon Dreams is the title and the games included are *Snowball*, *Avatar* to *Eaten* and *The Wagon in Paradise*. The games have been re-written and expanded to make use of Level 9's latest parser and compression techniques. In the case of *Snowball*, graphics have been included for the first time.

You play the part of Kim Kimberley, secret agent extraordinaire. In *Snowball*, you are charged with protecting an interstellar from your liberation, you are aware that something is dreadfully wrong but have no idea what. sinister nightingales bark and pursue you as attempt to make your way to the control room and stop *Snowball 9* from crashing into the planet Edoen. The fate of a mere two million people lies in your hands.

Although you managed to save the ship, it was sabotaged and several powerful people have put two and two together and made five miles they found you guilty of sabotage. Sentenced to death, you managed to escape and became the first of your race to land on Eden. You must reach the robot city of Enoch and stop them from destroying *Snowball 9*. As if that wasn't enough, the crew of *Snowball* are still after your blood.

In *Avatar* or *Paradise*, the setting is the city of Enoch 100 years later. The organisation of the city is some what strange being based on zero taxes, instant fines for crime and a booming business in spare parts for transplant surgery—so are immortal if you can keep replacing the necessary bits.





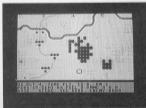
You start off trying to make money but there is something definitely wrong. Can you, a mere citizen manage to save the world?

The games allow complex sentences to be input and the parser supports such phrases as 'get all' and the use of 'it' as in 'get box and open it'. You can save the game to tape or disk as well as save temporarily to RAM. Another useful command is 'OOOPS' which allows you to correct those irritating little mistakes that just happened to kill you by stepping back a move. The games come complete with full instructions and a 42 page novella entitled 'Eden Song'.

Even if you already own one of the adventures, you should still seriously consider this package in its updated form. If you haven't got any of the games, then *Silhou Divers* has got to be one of the bargains of the year at £14.95. G.R.H.

Battalion Commander

If you've ever fancied yourself as a tank commander, here's your chance to prove that you really are a latter day Rommel. Not only do you get to control a tank, but a whole armoured battalion.



The setting for this latest wargame from the US Gold/SSI stable is a land battle at some stage in the near future. You can choose to play American, Russian and, unusually, Chinese forces over a set of variations that is absolutely mind-blowing. If the problems of controlling an entire battalion was not hard enough in the first place, the whole game takes place in real time so there is no sitting back sipping a cup of coffee and pondering over your next move.

There are five basic scenarios. Victory is just there to let you get used to the controls. Pursuit and exploitation is an intense threat into enemy territory. Meeting engagement is a chance encounter. Attack sees you trying to break through the enemy lines as you try to reach a key objective and defence is the exact opposite. You can choose which side you want to be, which of 48 different terrain you wish to fight over and whether or not you want to alter the relative strengths of the two sides.

Control of your units is very straightforward. One letter to designate the unit and a second to issue the order. There is also a moving cursor to designate the area you wish to shoot at or move to etc. You can command include moving, firing normally, providing, suppressing fire or creating a smoke screen. Enemy units only appear on the map when they have actually been discovered.

Apart from your tanks, you may also find yourself in control of supply trains, anti-tank units, scouts, heavy mortars and engineers.

The game looks deceptively easy. Starting at novice level, nothing happened for a few moves until I found the enemy and destroyed it without taking any damages. As soon as I started playing for real, everything was on a much grander scale and I got wiped out without any apparent effort on behalf of the enemy, most of whom I never even saw. Coming complete with an excellent 28 page instruction booklet, *Battalion Commander* is one of the best wargames yet produced for the C64. G.R.H.

Developer:
US Gold: Unit 2/3, Bedford Way, Bedford, Buckinghamshire MK42 9AF. Tel: 051 256 2486.
Distributor: First Floor, 70 New Oxford Street, London WC1A 1PS. Tel: 01 240 8826.
Architect: 21 Paul Street, Wimpool, London NW1 2PN. Tel: 01 437 1181. G

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Hack Pack 128

An excellent extension package for the C128

By Stuart Cooke

When the C128 was launched, its improved version of Commodore Basic was widely acclaimed. It was now possible to produce sound and graphics with far greater ease than with the outdated Basic of the C128's little brother the C64.

A plethora of Basic extensions are available for the C64 to make it easier to use, even. Your Commodore has published some in the past. However, with the new powerful Basic of the C128 you would think that it would be unnecessary for anyone to produce an extension package for the C128. Systems Software obviously think differently as they have produced an excellent extension for the C128 called *Hack Pack*.

Hack Pack can be split into three distinct sections and it is up to you which ones you actually LOAD and use. Available for use are a Basic/programming toolkit, a RAM-Disk and a program compressor.

The RAM-Disk

This is probably the strong point of the package and a must for anyone who requires instant access to small programs.

The C128 has, as its name suggests, a large amount of memory. In most applications not all of this memory is required by the user and is wasted. The RAM-Disk option of *Hack-Pack* allows you to set up this area of memory as a disk-drive, of course it has no moving parts but it is possible

to SAVE programs in this area, you can get directions of files that are stored in there and most of the normal disk commands work.

If you are using Basic the RAM-Disk is allocated two blocks of memory at the top of banks zero and one. This does mean that the amount of memory that is used for Basic is reduced but this doesn't affect your programs that much since you would be very unlikely to have a Basic program that takes up all of the available memory.

Should the RAM-Disk clash with your own programs then commands do exist that allow you to locate it

wherever you want in memory. I wouldn't expect a novice programmer to understand how to go about this but should you feel competent the manual is very clear and you should have no problems.

As you are no doubt aware the Commodore disk drive is set up as device number eight. To avoid a clash with this the RAM disk is accessed as device number nine, again this can be changed by the user.

So what is the advantage of using a RAM-DISK? Firstly there is the advantage of speed. A program can be SAVED and LOADED into and from a RAM-Disk almost instantly. This has the advantage that if there are a number of programs that you are going to require a lot you can swap the one that you are using very easily.

The COPY command has been extended to allow you to copy between the RAM disk and a normal disk drive. It is possible to COPY single files between both the normal and RAM disk however the most useful feature is the ability to make copies of all the files on the RAM disk on a normal disk with one simple command.

Toolkit

As I have already stated it is difficult to think what commands are missing from the C128's Basic. System Software has however managed to select some extremely powerful and useful commands for this extension.

Should you want to make change

```

00 REM *****
01 REM * THIS IS A DEMO PROGRAM *
02 REM *****
03 FOR X = 1 TO 1000
04 PRINT "THIS IS A DEMO PROGRAM"
05 NEXT X
06 FOR Y = 1 TO 1000 STEP 2
07 PRINT Y
08 NEXT Y

AFTER COMPACTING

00 REM*****PRINT"THIS IS A
01 DEMO PROGRAM",NEXT:PRINTRE
02:FOR Y=1TO1000STEP 2:PRINT Y:NEE
  
```

FIGURE 1

within a Basic program then it is actually quite difficult to find the area of the program that you wish to make changes in. Wordprocessors get around this with a SEARCH and REPLACE command which allows you to search through a document for the occurrence of any word and turn it into another one. Mark Park has a FIND command which will allow you to search through a file for a specific word. There is even an option that allows you to specify which section of the program is actually searched.

An extension of the FIND command CHANGE, allows you to search a program for a specific word and change it into a another.

DUMP will print a list of all variables, functions and arrays that have been set up to be printed out. This is extremely handy when debugging a program since it allows you to see at a glance the state of all variables.

INFO will give you some interesting data about the status of the compiler. Printed out after an INFO command are:

Number of bytes occupied by Basic.
The number of bytes occupied by variables.

Number of bytes occupied by arrays.
Number of bytes occupied by strings.
The number of bytes available for Basic text.

The number of bytes available for variables, arrays and strings.

MERGE will allow you to MERGE two files together in memory. This is extremely useful if you have a number of subroutines stored on disk since you can add them to your latest masterpiece with this command.

TYPE will take an ASCII file from disk and print it on the screen. SIZE will display the size of the specified file in bytes and can be used with any type of file and the QUIT command will deactivate the toolkit.

Compressor

When you are writing a program in Basic it is useful to space the program out as much as possible with a small number of statements on each line. To

make it even clearer you may even REM the program to make debugging easier. A more efficient and memory saving method of program writings is to place numerous statements on one line. What a compressor does is take a specified file, remove all unnecessary spaces and all REM statements then it reduces the number of lines in the program by placing as many statements on each line as possible.

Figure 1 shows a program before it has been passed through the compressor and after it has been compressed.

Mark Park is an extremely useful addition to the collection of a serious C128 owner. Even in the short time that I have had it for review I have found it indispensable and use it regularly, the RAM-Disk being exceptionally useful.

Toolkit

Name: Mark Park, Machine: C128.
Supplier: Systems Software (Oxford) Limited

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Gauntlet

The most popular arcade game in the last 12 months has been brought to the small screen. Enter a world of heroes, magic and lurking danger.

By Mark Curry

Gauntlet is a two player arcade game which is totally addictive, as many of you will know from the hours you've spent shooting your hard earned pennies into arcade machines.

Now it's been released for the C64 by US Gold and is set to be a number one.

It's a one or two player game, but take my advice and stick to the two-player option. There are two reasons for this, the first is that you'll get much further with it and the second is that it's a great deal more fun. You can decide to help or hinder each other (you play simultaneously) but watch out for treachery if you're supposed to be co-operating. If you're both low on health points then there could a mad dash for the nearest magical meringue to pop you up and the loser may dwindle away to a pile of bones!

When you start you are given a choice of four characters. You can choose to be either Thor the Warrior, Tryta the Valkyrie, Merlin the Wizard or Quaxtar the Elf. Each has different attributes and strong weak points. For instance, Thor's got great armour and is very good at hand to hand combat, however he's pretty poor on the magic front. Merlin, on the other hand, has no magic, can't fight very well with his bare hands but good at sniping people.

Once you've decided which persona you want, then you can go straight into the game. Monsters abound, Ghost, Giants, Demons, Lobbers, Sorcerers and Death. Each have different ways of draining your energy and they all come in droves except Death, although numbers of these increase on the higher levels.

When you first play the game you may be quite daunted by the numbers of villains which you are expected to destroy in order to work your way around the maze. The best way to get around this problem is to head for the generators. These are little square blocks which look different depending on which kind of monster they are draining out. Smash these and the number of monsters can be controlled. Get rid of all of them and you can safely walk around a section to explore.

In and around the dungeons are objects to pick up to increase your chances of success. Potions are very useful as they are the only thing which can kill Death (which stands like a contradiction in terms but not in this context). Special Potions give the player special abilities. You can also grab extra armour, magic power, shot speed, shot power, light power and pick up power which are pretty self explanatory.

Food is probably the most important thing to collect as this keeps you going. There are joints of meat lying around and bottles of cider. Be careful not to shoot the cider, before you can get to it. Poisoned cider looks slightly different so

watch out for it since it decreases your health points. There are keys to open doors and loads of treasure to pick up. An amulet will make you invisible for a while. Traps are glowing patterns on the floor which remove some walls and teleporters take you from one area of the maze to another. Keys are labelled black squares which move you to another level. It will not necessarily be the next one, you can skip around quite a lot which means that the game has little chance of getting boring as there are hundreds of levels. There are also 1 minute Rooms which you stumble on at random. These are bonus screens with no enemies but there is a time limit. You must collect as much treasure as possible and find the exit. The limit is usually 10 seconds.



The whole game is impossible to map, there are just too many mazes and it wouldn't help very much anyway. All the dungeons are very different in layout and some of them are extremely complicated. Some have only one exit, others have several.

There are many different ways to play the game. You can go for a high-score, you can try and get to the very high levels, you can work alone or in partnership, all have their own advantages and all are fun. It's a fascinating game and well worth every penny.

Available

Title: Gauntlet, Supplier: US Gold, Units: 2/5 Modified Wild Wooded, Birmingham B6 7AX, Tel: 051 255 1588, Released: C64, Price: £9.95 tape, £14.95 disk.

Originality: 6/10, Graphics: 7/10, Playability: 10/10, Value: 10/10.

Up to date Info: C64/C128

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Welcome

Merlin Assembler

*Assemblers aren't very common for the C16 and plus/4.
However we've managed to have a look at this one from
Wizard Software.*

By Paul Eves

Merlin Assembler is a full 7801, two pass assembler for the Plus/4 and C16. It comes both on Tape and Disk. Wizard have gone for a green screen display since the assembler is activated. This is for 'eye comfort'.

The program assumes that the user has a knowledge of 6802 machine code, so if you are not familiar, I would suggest you acquire some before attempting to use this package. Because Merlin resides at \$1000 to \$21000, Basic has been moved to \$2104. Once you have a source listing ready to assemble, you just type ASM and press return.

Once loaded, Merlin leaves the Basic intact. Therefore you may still use the already familiar editing features of Basic. Basic may also be integrated in the source listing. However, all Basic lines must be after the END statement, and are activated by GOTO and not RUN.

Program Designing

When designing a program using Merlin, the first instruction must be the COM command. This command tells the assembler where to start assembling in memory from. If this command is missing then your program will not be assembled e.g.

```
10 COM $5000
20 LDA # 5FF
30 END
```

This would begin assembly from \$5000 onwards. In other words the instruction line # 50 would be the first instruction at \$5000.

As COM is the first instruction of any assembly program, END must be

the last. If END is missing the assembler will not know when to stop assembling. In this event, should you have a Basic program after your source code, the assembler will flag every unrecognised line as a syntax error.

The LIST command allows you to see what has just been stored into memory. If you do not wish to see everything, you may insert a STOP command e.g.

```
10 COM $5000
20 LIST
30 LDA # 5FF
40 STOP
50 LDA # 520
60 STA $05
70 END
```

The above program would produce the following display on the screen after the copyright notice:

```
5000 AD FF LDA # 5FF
READY
```

Note that lines 50, 60 and 70 have not been listed, this is because of the STOP command. If you wish to LIST the whole program then leave the STOP instruction out.

Labels

The use of labels in assembly language programming is essential. Notice I said Assembly Language programming and not Machine Language programming. Nobody in their right minds would attempt Machine Language programming these days, unless they were from the old days of large complex machines.

Labels can be used anywhere within your source code, but must be after the first COM command. All

labels must be preceded by a full stop, e.g. LOOP and GOT are valid labels, but LOOP and GOT are not. The use of labels makes the task of the programmer that much more enjoyable. Consider the following small program

```
10 COM $5000
20 LDA # 5FF
30 INC DELAY
40 LDA # 501
50 LDX # 500
    ; rest of program here
200 DELAY DEC
230 INC DELAY
240 RTS
240 END
```

Instead of having to calculate forward to backward addresses, you just put in your labels and the machine does the hard work for you. Labels also make for better program design in my opinion.

Two instructions that are pretty useful are *TX and *DA. These allow for the storage of data as either ASCII values or NUMBER values e.g. ,

```
*TX "YOUR COMMODORE IS
TEXT"
*TX "50 IS THIS"
```

This would store the above two sentences in memory under their ASCII codes.

```
*DA $50,5FF,255,500FF,25566
```

This would store the hexadecimal values into memory. Note the mixture of both hex and decimal numbers. As is standard, the 'F' is put in front of any number that you wish to be taken as hex.

Comments

Another important feature of assembly programming is to scratch out comments within the program. This is so that both the programmer and anyone reading the listing can see what's going on. This is far more important in assembly programming than in Basic programming. The way we achieve this with Move is by the use of remarks. A `"` denotes a remark. A remark can be left in the source listing on a line by itself. Alternatively, you can put a remark at least one space after the instruction with either `"` or without it, e.g.

```
10 LDA # 800 ;Zeroise the X reg
20 JSR# for indexing a list
30 LDA # 800 ;Zeroise the Y reg
```

All the above are valid remarks. On assembling, any errors found are reported back to the user on screen. The format being LINE:NUMBER THEN THE ERROR. For example:

30 LDA # 800

would produce the error

LINE:20SYNTAX ERROR.

Obviously there is no instruction LDA.

Although this program is not as powerful as the Assembler I am used to (HEX4 and PAL, to name but two), I found it easy and quick to use. Beginners to Assembly programming will find Move a very good aid to the development of their programs.

Extra

There are two extra points where I think this particular assembler scores over most others, that is the assembler has some intelligence of its own. To make this more understandable, look at the following short program.

```
10 LDA # 800
20 LDY # $D000
30 LDA ($DCLX)
40 LDA ($DCLY)
```

Line 10 is legal and valid. Line 20 is not valid, however the assembler would assume that you meant LDY

\$00, in other words it ignores the HI order byte and loads the accumulator with the LOW order byte. Lines 30 and 40 are both common errors that you will make. (Indirect index addressing always manages to confuse people). On encountering these types of errors, the assembler would assume that you meant 30 LDA (\$DCLY) and 40 LDA (\$DCLX) respectively. This feature of the assembler is, in my opinion, its greatest asset.

I have to be totally honest, and say that as my knowledge of the Plus/4 and C18 is somewhat restricted, I could not give this package the kind of in-depth trial that I would prefer. However, from what I have seen of it so far I have no hesitation in saying that it is a good buy.

Tweezer

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Games Reviews

As always there is a wide variety of games currently available. We've picked out a selection for you to peruse.

EREBUS

I know you're not going to believe this. Earth is in danger again and you've got to save it!

Erebus is a distant planet used by man to reprocess dangerous waste. Now some unpleasant aliens have reprogrammed it to produce a killer nerve gas to wipe out mankind. Naturally you, alone, are sent to obliterate these Haxxans and save the world.

The refinery is split into circular levels that you must enter, rapping aliens as you go, until a dimension door opens letting you through to the next level.

Each level consists of raised barriers and objects designed for you to crash into while being chased by mischievous aliens.

In between levels a bonus screen helps you to practice your shooting skills but it doesn't save the game from becoming yet another Urduium inspired shoot-em-up. T.H.

Touchline

Title: *Touchline*. Supplier: *Virgin*. 3+4 *Erasmus Ford, Portsmouth Road, London W11 2SSJ*. Tel: 01 727 8070. Machine: *CDi*. Price: *£8.95*.

Originality: *4/10*. Graphics: *4/10*. Playability: *5/10*. Value: *6/10*.



DESTROYER



Take the helm of a US Fletcher class Destroyer as well as the guns, depth charges, torpedoes, sonar, radar, navigation and damage control stations in a Dambusters style multi-screen game.

Thirteen stations all together must be monitored and performed if you are to complete one of the seven scenarios in which you must escort convoys, hunt submarines, rescue pilots and run blockades.

Each station has its own controls and impressive graphics ranging from the bridges bank of controls to the blip on the sonar screen.

After a mission briefing, you're on your own. Typing in two letter commands moves you between stations where you can plot courses or set depth charge depths ready for a submarine attack.

As the action heats up you will have to assign damage control crews, fight the enemy and keep the ship off dangerous reefs.

The game plays very well and soon you'll be fighting your way through the difficulty levels earning your stripes as a Destroyer captain.

Destroyer is very similar in play and style to Microsoft's short (upper 16-bit) *Star Trek* only this time you keep your head above the waves. **T.H.**

Touchline

Title: *Destroyer*. **Supplier:** US Gold (Eyre), Data 2/E, Midway Way, Holford, Birmingham B6 5AE. **Price:** £9.99. **Machine:** C64. **Originality:** 6/10. **Graphics:** 5/10. **Playability:** 6/10. **Value:** 9/10.

FLASH GORDON

Flash, you're only got 24 hours to save the world! The evil Emperor Ming has targeted planet killer missiles at earth and you must stop him.

Unfortunately, the only way you can do this is to kill Ming before he fires (he from the controls he always carries with him).

The mission hasn't started well as your ship crashed into a jungle instead of blowing Ming's palace apart. Now you have to search out Prince Barin and win his confidence (by beating him senseless) and ride to Ming's Palace on a bike he'll give you while fighting Ming's minions.

All this must be completed within 24 hours which isn't easy as you lose valuable time whenever a jungle monkey or snake chomps you or Prince Barin defeats you.

Luckily this 24 hours doesn't include loading time as the game plays in three parts and you must complete them in order.

Tit another excellent game in Mastertronic's M.A.D. series. **T.H.**

Touchline

Title: *Flash Gordon*. **Supplier:** Mastertronic, 8-10 Paul Street, London EC2A 4AW. **Machine:** C64. **Price:** £2.99. **Originality:** 8/10. **Graphics:** 8/10. **Playability:** 6/10. **Value:** 8/10.



INFODROID

Prepare for the ultimate in excitement. A game based on motorbike messengers that pick up and deliver parcels! OK, so the bikes are in fact custom built droids and it's set in the future but the action delivered by those futuristic Postman Pats is pathetic.

The transport system used by the infodroids is extremely silly and consists of caneways split into four lanes travelling in each direction. Each lane consists of a series of platforms that travel faster the further it is from the central caneway. Down the centre of the caneway are lift entrances to the companies that you deliver to and from, garages to repair your droid and junctions to get to the 14 other caneways.

The result is that the droids must hop around these speed platforms like demented doggers until they finally find their destination. As for this game, it's going nowhere. **T.H.**

Touchline

Title: *Infodroids*. **Supplier:** Beyond Wellington House, Upper St Martin's Lane, London WC2H 9MM. **Feb:** 01 379 7788. **Machine:** C64. **Price:** £8.95. **Originality:** 6/10. **Graphics:** 5/10. **Playability:** 6/10. **Value:** 5/10.



TRIVIAL PURSUIT — YOUNG PLAYERS' EDITION

This is the first of Denmark's additional question packs planned for its Trivial Pursuit game.

This one's for the younger specialists and contains two sets of questions for seven to 11 year olds and 12 years up.

The gameplay is identical to the original Census edition except the categories have now changed to Nature, Science/Technology, Art/Culture, Good Times, Games/Hobbies and People and Places.

While playing the game you can find out such fascinating facts as that silver is used to make film, who introduced Thai's Life, that the *Alan-Grude* is Heidi's grandfather and the colour of a cricket ball.

This edition is available in two different versions either

as a complete game or as a 2000-question expansion pack for the original game.

Obviously this one's for the youngsters and will be good training for the Genus edition but who wants to be beaten by an eight year old?

Other planned editions include the Genus II and Baby Review packs. **T.J.L.**

Touchline

Title: *Touchline - Young Players Edition*, Supplix Design, 264 Weyple Road, London SW20 8PN. **Machine:** C64. **Price:** (£12.95 (full game) £7.95 (question pack)). **Originality:** 1/10. **Graphics:** 6/10. **Playability:** 9/10. **Value:** 8/10.



MEDIATOR

When the American label was first launched, most people saw it as the label on which US Gold would dump all their games which failed the grade, thereby accepting some, if not all, of their losses. Time, however, has shown that although there have been some poor releases, on the whole, the label has maintained a very high level of quality; and with releases such as *Go For Gold*, the label has become a firm favorite with Commodore 64 owners.

All this said, the latest release, *Mediator*, may well be remembered by some of you as it was released, admittedly more than a few months ago, by English Software, a company which, in its time, has had quite a few hits. Why *Mediator* was not a hit is a matter for conjecture, but at £29, it really does deserve to make the grade.

The game is set long ago, when a doomsday machine was placed in high orbit above the satellites *Nylon* and *Phobos*, with a sole role to deter further attacks of nuclear war between the empires of the galaxy. If this satellite detects solar levels of nuclear activity, it will be activated, and it will then destroy both civilisations.

As the various of the galaxy, it is your task to locate the legendary *Good Mediator* to acquire the mythical time crystal, which will then allow you to solve all the problems of your galaxy. Graphically, *Mediator* shows its age in more ways than one. The actual animation is very good, but the



split screen has some raster problems, and the backgrounds are less than perfect.

The music too reflects the age of the game, especially the background music which is nothing short of nauseating. The fact is that this game is not trying to be sold at full price, therefore many criticisms must be ignored, purely because the game represents such excellent value for money. If you can stand the graphics and sound, then the game is as good as many more recent full priced games, with more than enough problems to last the average arcade game fan happy for many an hour. **T.J.L.**

Touchline

Title: *Mediator*, Supplix: US Gold, Units 2/3, Weyford Way, Hoyleton, Birmingham, B6 7AE. **Tab:** £21. **ISBN:** 3388. **Price:** £29. **Machine:** C64. **Originality:** 6/10. **Playability:** 6/10. **Graphics:** 6/10. **Value:** 6/10.



DEFCOM

By the year 2006 the Strategic Defense Initiative "Star Wars" system was in position and had been installed, worked and captured by aliens that turned it into a weapon

against the new powerful birds.

Landing you as Nick "Daring" Diamond can still fly the only surviving anti-aircraft weapon and warp off to save the world.

Unfortunately, you only have a single firing laser and must blast away at the attacking aliens and the killer satellites over the planet rotating below.

The action is fast but also non-descript as you'll soon tire of this and look to the extra options such as a main firing laser and displaying your score on the screen! However, these are selected from a menu while the game continues so you won't live long enough to appreciate them.

Yet another game where a good idea has been let down by a poor game. **T.H.**

Tarzan

Title Defcon. Supplier: Quicksilver. Primary Name: Locomotor Play. London WC2M 7NB. Tel: 01 439 6666. Machine: C64. Price: £8.95.

Originality: 8/10. Graphics: 5/10. Playability: 4/10. Value: 4/10.

TARZAN

From the western coast of the Congo, to the palm-fringed shores of Zanzibar, African folklore tells of the legendary exploits of one man, that man was Tarzan, Lord of the Apes. Left as an orphan in the jungle, Tarzan was raised by a shagape, Kala, and Tarzan learns the laws and language of the jungle.

Only later in life was it discovered that Tarzan was really some other than John Clayton, Lord Greystoke. Whether or not he was a Peer of the Realm, Tarzan was still himself at heart, and whenever necessary he would don his leather loincloth and swing, Weissenhof-style through the trees.

Even as we speak, however, needs drove Tarzan to drag off the thin cover of civilisation and brave the perils of the jungle once again. Lady Jane Greylock (her of "we Tarzan, you Jane" fame) has been abducted by Uanga, chief of the Wamutos, and she will meet a terrible and agonising death, unless Tarzan retrieves the totem-pemstones which have been stolen from the tribal shrine.



This is the setting for Marnoch's latest romp, and it could be the beginning of the end for anyone who loves addictive arcade adventures with a necessary (but maddening) map. In three computer days, you must control Tarzan until you have finally collected all seven gems, and only then will you have any chance of saving Jane.

To help Tarzan, there are various animate and inanimate objects that must be collected, including ropes, monkey and different coloured shields. Without these items, Tarzan will never complete his mission, so a keen eye is essential.

The first thing anyone will notice upon loading the game is Rob Hubbard's incredible soundtrack, which, technically, must be his most impressive to date. With only 4k free, Rob has managed to get the whole Tarzan theme, complete with incredibly authentic bongos, as well as a host of effects including a nightmare section complete with chirping crickets!

Once loaded, the quality of the graphics is also apparent. Nice backgrounds and an excellently animated Tarzan all add to the feeling of the game, although the time taken to fill-screen the screen, and the manner in which it is done is less than impressive.

Tarzan is an excellent arcade adventure which together with games such as Amstrad, show the way for software companies to go. Even if the game was costing the Rob Hubbard music would justify the price, however it isn't, so how can you lose? **P.L.**

Tarzan

Title: Tarzan. Supplier: Marnoch, Marnoch House, Box Terrace, Primary Way, E. Sussex. BN24 6DL. Tel: 0323 78644. Machine: C64. Price: £8.95.

Originality: 8/10. Graphics: 7/10. Playability: 5/10. Value: 8/10.

THEY STOLE A MILLION

Ever wanted to plan the perfect crime from the comfort of your living room? Now you can using the S.W.A.G. (SoftWare for Aspiring Criminals) disk available through "What Crime?" magazine.

This database of hoodlums for hire, targets to be robbed



and hence to sell the goods allows you to plan and execute enough jobs for you to rise from small time crook to Mr Big.

Using window menus you can buy information and blueprints of your chosen target and select your team to do the job. Characters such as Charlie Fish and Detonator D'Arny have specialist skills that can be hired for a fee and usually a cut of the profits so you should shop around to find the right team.

Using the blueprint and a simple set of icons you can plan every step of the raid from disabling alarms to blowing the safe.

During the raid the Boss usually is the lookout (it's safer) and must freeze the action if a police patrol comes into view.

Success will lead you on to bigger and better jobs until you make a top security bank as you go for the million.

T.R.

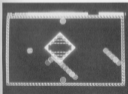
Touchline

Title: *They Stole a Million*, **Supplier:** Aristonsoft, 58 Long Acre, London WC2E 6NW, **Machine:** CIB, **Price:** £8.95.

Originality: 6/10, **Graphics:** 6/10, **Playability:** 7/10, **Value:** 5/10.

STARBLURST

The CIB boom seems to have slowed down slightly, and with it, the number of really good games. One of the few games that really made the best of the little Commodore's graphics and colour was an offering from Aristonsoft, called *Hypocrite*, and programmed by Tony Takasaki.



Therefore, when the latest Aristonsoft offering was released, I was eager to get my grubby little hands on to the joystick and put it through its paces. However, if first impressions count, then this game failed to impress me. It seemed to me that the author had tried to cover up for the game's obvious roots by overcomplicating the gameplay, something that has seen many people fall flat on their faces.

Only after a few hours play did I start to find myself hooked, although why I was hooked I'm not totally sure. *Starburst* is basically a breakout derivative with some new touches and added gameplay. In order to keep the game interesting for more than a few minutes, there are three

different levels, all of which take some time to master.

The first level involves blasting at two balls at the top and bottom of the screen until they have been hit so many times that they become 'active'. Your ship then stops firing and turns into a large pong type bat, with which you must guide these two balls into their respective home slots. The moral of this screen is speed, as the faster it is completed, the more points are built up. If this level sounds too easy, there are some rogue balls to complicate it, and if you fail to achieve the objective before the two active gauges run out, then you must start a completely new game (no lives on this level!).

If you successfully complete level one, you are thrown into a bonus level, and it is here that points come free and easy, until time runs out. Level two involves blasting through a force field, from either the bottom or the top of the screen. As the forcefield shrinks, a number of coloured balls appear, and must be avoided at all costs, and at one point it gets so bad that there are eight balls flying around at break-neck speeds! As with level one, completion leads to a bonus level, which lasts as long as the amount of gauge time you have remaining.

Level three ought to be the most difficult, but it isn't! All you need to do is round up the Photon Bombers by shooting them. Points are flying around here, with 500 available every time you complete the game. Reimbursement in many ways of an early *Mirror* game, *Starburst*, at £2.99, represents excellent value for money, and should not be missed by any CIB/Plus 4 owner looking for a challenge.

F.J.

Touchline

Title: *Starburst*, **Supplier:** Aristonsoft, 58 Long Acre, Covent Garden, London WC2E 6NW, **Tel:** 01 836 3411, **Machine:** CIB/Plus 4, **Price:** £2.99.

Originality: 8/10, **Graphics:** 6/10, **Playability:** 7/10, **Value:** 5/10.



CHAMPIONSHIP WRESTLING

Over the past couple of years, one company above all others has stood out when it comes to sport simulations. That company is Egys. Once again they have proved their

worth with Championship Wrestling. In general I am not a great sports fan. However, when computers are concerned, I find that sports programs offer a fine medium of entertainment.

Basically the objective in Championship Wrestling, is to get rid of all opposition and become the Champion wrestler. As in most Epps games, the more people that partake in the festivities the better. On loading up you are asked if you want to either practice, compete or see world records.

Obviously, to start with you choose the practice option. This allows you to get acquainted with all the various moves and joystick positions that are required. (I would suggest you get plenty of practice before doing battle with someone else.)

In the competition mode, if you are playing alone, you select a wrestler and then play each of the seven others in turn. With more than one player, each player will be asked to choose a wrestler. The computer then organizes the matches and battle begins.

When playing in competitions, judicious selection of who you want to be is crucial. Each wrestler has his own style and strong points. Also each has one specialised move that none of the others have. So once again practice is recommended to discover each wrestler's effectiveness. (This move is known as the custom move.)

Overall, there are some 30 moves possible that each wrestler can perform. Unfortunately, there is not enough space here to go into each one in detail. Basically they are in eight groups: close to opponent, far from opponent, custom move, headlock, lift, airplane spin, opponent on mat and walking around ring. The use of certain moves depends upon your previous move. For example to give your opponent an airplane spin you need to be lifting him in the air. To be able to lift him, you need to have him in a headlock. To get him into a headlock you have to be close in. It's this interaction of moves that makes the game that much more enjoyable.

There are one or two nice touches within the program. For instance, if you take your time the crowd will boo and hiss and wave banners. Then your opponent out of the ring and the crowd go wild. All in all, this is a nicely presented game that with practice is quite playable and fun.

Touchline

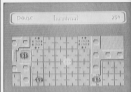
Title: Championship Wrestling. Supplier: US Gold, Data 2/3 Redford Way, Redford, Birmingham, B9 7AL. Price: £9.95. Originality: 7/10. Graphics: 7/10. Playability: 8/10. Value: 8/10.

PARADROID

For those of you that missed them first time round, Hewson has re-released two very popular '88 hits, Paradroid and Uridium, both programmed by Andy Braybrook. Paradroid is the same as before, except that it is much faster, while Uridium has lots of new ship designs. So what do you have to do?

Paradroid is simple, you are ordered to destroy a monstrous crew of Droids that have taken over a galactic freighter. To aid you in your task, you are issued with a 'Droid Inflator' device. With this device you can take over and control Droids. (You can also simply blast them out of

their existence). The droids are scattered around the ship, which is made up of several decks. Obviously, things are not that easy. The droids are made up of varying power



strength. The higher the droid number the better it is. Once you destroy all droids on one deck, the deck computer shuts down, and therefore all lights go-out. In other words the deck goes dark. One word of caution here. Do not think that it is simply a matter of blasting everything in sight on each level. There is a lot more strategy involved. My only real tip for you is proceed slowly.

Next question is, what weaponry have I? The inflator device is fitted with low power twin lasers. However as the droid number becomes higher, then its firepower increases. Two types of battle droids have disruptors, these you have to take over; you cannot shoot them. Transferring to droid is quite involved, but most of the strategy is applied to this part of the game. Decide which droid you wish to take over, stop and centre the joystick. Press the fire button and hold it down, then turn the chosen droid. The screen will now change to what resembles a circuit diagram. The idea being to connect the rectangular blocks by having your colour represented inside the block. You gain control of a block by moving your pulsars up or down, then pressing the fire button at the required place. If after the time limit you have more of the blocks coloured in your colour transfer is complete. The higher the droid number, the more pulsars are made available to it.

To move around the different decks, first one of the lift and press the button while you are standing on it. You may view decks, the whole ship, or droid capabilities by standing in front of one of the deck consoles that are scattered around.

I fairly enjoyed Paradroid the first time, but now that it has been made slightly faster in play, it becomes even more enjoyable.

Touchline

Title: Paradroid. Supplier: Hewson, Hewson House, 148 Milton Road, Luton, Bedfordshire, LU1 3AB. Machine: C64. Price: £9.95 with Uridium. Originality: 8/10. Graphics: 8/10. Playability: 8/10. Value: 8/10.

TRACER

As Chardon, leader of an unscrupulous group of space pirates and mercenaries, you have been given a tough assignment. The outcrop complex on the planet of Zogma IV has gone berserk. The computer that controls all facets of life on this planet of pleasure, has decided that it no longer needs human controllers. No problem, just switch it off! Wrong. This computer has a few tricks up its sleeve — if computers have sleeves — to stop you pulling the plug.

Not least of these are the Cycloid patrolcraft, over which it has total control. These craft patrol the trackways that surround the computer complex, destroying anything in their path, this can be a problem if you are on the trackway at the time. Therefore, to aid you in your mission, you have been equipped with the best ships that Calibus can provide. To reach the computer centre it is necessary for you, along with a maximum of seven other ships, to traverse the trackways, knocking out communication centres and the cycloids.

Your ships are equipped with ion bombs, and forward firing lasers to accomplish this task. The bombs have very short fuses, so do not hang about too long. The C.P. complex consists of 22 interconnecting sectors, each with its own communication centre. You are initially beamed down to three 'Safe Sectors', and can go on knocking out a centre, beam down additional ships.



The game itself is displayed in three sections. At the top of the screen is a scrolling map centred on the current ship being controlled. Any enemy forces are also displayed on the screen. Half way down the screen is the status window. Shows here are the current conditions of all eight ships. Also show here are whether they are under attack or not. On the left of this window, is a more informative display of your current ship in use. Along with this, there is an audience rating, a sort of score which continuously counts down. The better you do, the more points you clock up. Inward this is when most of the action takes place.

This screen has two functions. Firstly, it displays one of four maps, of varying scales. These are selected via the function keys. Alternatively, a 3D view through the cockpit can be called up. This is where all combat takes place. This screen is used when dropping bombs on Comm centres, and when destroying the computer itself.

This game comes well packaged, with a short novella, to get you into the right mood. It is a good attempt at an

original game. The game itself is a very cunning and strategically orientated game, with undertones of the Star Wars trench sequences. At £17.95 this may be a little pricey for some people, but if you can afford it, you could do a lot worse than purchase this program.

Touchline

Title: *Tracer*. Supplier: *Acinbred Software, Writington House, Upper Street, Morriston Lane, London WC1M 6DL.* Price: £17.95. Machine: C64.

Originality: 8/10. Graphics: 8/10. Playability: 8/10. Value: 5/10.

URIDIUM

The second of Hewson's re-releases is *Uridium*. Fans of the game will only need to be told that this is the same as before but with some new superbships. For those of you that are new to this game let me expand.

The solar system is under attack from metal seeking ships, known as Super-dreadnoughts. These ships seek out and drain precious metal ores from the planets within your sector. Your task is to destroy the dreadnoughts before they exhaust all the different ores. Firstly, you must destroy its defences both on the surface of the ship, and those that fly around in attack groups. Control is by the joystick and is as follows. Up and down control your height above the ships surface. Left and right control your direction. Avoid structures on the ships surface that cast shadows, this means that they are high up. The dreadnoughts fighter defences deploy in waves, so be prepared for some nifty flying.

On the ship, the small coloured squares that flash, are also for the homing mines. These can be fairly easily avoided if they appear singly. Destroy as many of the surface defences as you can, whilst avoiding the fighters. Keep flying right, and be on the look out for a landing strip. Once the 'LAND NOW' signal is seen, land your craft as quickly as possible. The surface fighters become very intelligent at this point.

On safely landing, you are then presented with the bonus screen. It is up to you to gain as many points as possible, before flying over the dreadnought for the final strafe run. I have to be honest, and say that normally, I am not into shoot and blast run type of games. My kate being that only *Infocom*. However, when *Uridium* first came out, I must confess I could not stop playing it. There is something about this program that puts it in the same class as *Doublethink 1, 2 and 3*. I am pleased to say that this re-release lives up to its predecessor. The new dreadnought designs are done really well. And quite a few of them will have you pulling your hair out. The designs are in the same *Big Red* as before, with one or two extra characters re-defined.

Touchline

Title: *Uridium*. Supplier: *Hewson, Hewson House, 260 Abchurch Lane, London, Abchurch, Chanc 02/14 4RA.* Machine: C64. Price: £8.95 with *Finaloid*.

Originality: 7/10. Graphics: 8/10. Playability: 8/10. Value: 8/10.

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Nine Line Matrix

This C128 utility will make your 80 column display a lot clearer and it's short and easy to use.

By A. Miller

Quite a while back, Commodore brought out the 4008 series Pets. Like their predecessors and the subsequent Commodore range, they suffered from ROMs (called "Basic 4.0") that were incompatible with all the other Commodores. This caused many programmers like myself the unnecessary pain of wading through and modifying our programs, and many others the bigger pain of having to fish out large amounts for new Basic 4.0 compatible goodies that, I believe, was the point of the exercise.

That aside, one nice little feature this machine possessed was a vertically-spaced mode, with an extra raster line between each line of text on the screen. This routine will allow C128 users to do this in 80 column mode!

Operation

Operating the program is pretty self-explanatory. Just load and run it, use cursor up and down to control the screen, and hit RETURN. You can now continue to use the 80 column screen as normal with other column programs, and the screen will remain in vertically-spaced mode until the machine is switched off.

Note that I have used high line numbers so that you may incorporate the program into your own programs. To do so, change the END statement in line 1050 to RETURN and call the routine at the beginning of your own

program with GOTO 10, 9900.

If you are interested with experimenting with the 80 column chip, you will find the SYS's I have used very interesting. Even though the SYS REED command (yes, that's REED) is unused in this particular program, I

have left the variable and some REM's in so that you may experiment with reading the 80 column registers.

I hope you find this routine as useful as I have. The tops of these '90 don't touch the bottom of these '90 any more!

PROGRAM: 9 LINE MATRIX

```

10000 SYS 9 BY 9 MATRIX FOR
80 COLUMNS BY THE C128
10000 SYS 9 BY 9 M3
10100 IN TULLETT
10200 SYS
10300
10400 SYS 15
10500 SYS WRITE=9999,9000 C= 100
C 9000,9000,9000 TO BE
T 90 COLUMN CHIP REGIS
TER
10600 READ=9999,9000 C= 100
C 9000,9000,9000 DATA
TO READ REGISTER.
10700 SYS 1
10800 SYS WRITE,9,9 -9000 C=
10900 SYS WRITE,99,9-9000 C=
11000 SYS WRITE,99,9-9000 C=
11100 SYS WRITE,7,9-9000 C=
11200 SYS WRITE,99,9-9000 C=
11300 SYS WRITE,99,9-9000 C=
11400 SYS WRITE,99,9-9000 C=
11500 SYS WRITE,99,9-9000 C=
11600 SYS WRITE,99,9-9000 C=
11700 SYS WRITE,99,9-9000 C=
11800 SYS WRITE,99,9-9000 C=
11900 SYS WRITE,99,9-9000 C=
12000
12100 SYS 97000,9,9 SYS 97000,
9,9000 C= EQUILIBRIUM OF 999
PRIC 9,999999 9
12200
12300
12400
12500
12600
12700
12800
12900
13000
13100
13200
13300
13400
13500
13600
13700
13800
13900
14000
14100
14200
14300
14400
14500
14600
14700
14800
14900
15000
15100
15200
15300
15400
15500
15600
15700
15800
15900
16000
16100
16200
16300
16400
16500
16600
16700
16800
16900
17000
17100
17200
17300
17400
17500
17600
17700
17800
17900
18000
18100
18200
18300
18400
18500
18600
18700
18800
18900
19000
19100
19200
19300
19400
19500
19600
19700
19800
19900
20000

```



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Joystick Read

*Here's a time saving and invaluable joystick routine for
Basic programmers in league with a C64.*

By Nick Samner

How many sleepless nights have you spent wishing that there was an easier way to read the Commodore's joystick ports through Basic. One that was much faster and easier to understand. Well, hardly enough, here is that routine! Read on to find out more.

subroutine, BIT, they must be in that order, and before any other variables.

Next, do not call the routine twice within your program or the computer may crash or BASIC may be corrupted!

For all us enthusiasts, there is a disassembly included. The interrupt routine shown can be used for smooth

scrolling, more than eight sprites or other master tricks.

The test programs included allow you to move a white block around the screen with the joystick, and the fire button will make the border color change (well, it's only a demo!).

I hope you enjoy using this routine in your own programs.

In Use

The Joystick utility has been designed to help those who are Basic programmers, but who want to add the professional touch to their programs. Using this routine for a joystick in Port 2 could just do that!

The actual routine is on an interrupt and so doesn't waste Basic's time for GOSUBS etc.

Two Basic string variables are used to store the joystick information, so no PEEKing is needed either!

However there are a few things that you will need to know before you can use the routine, or read on!

Because the routine uses two string variables, these need to be set up by the programmer, before any other variable codes are defined or the machine code routine is called. This is what to do:

In your program:

```
B% JOG=" " : FIRE$="OFF":SYS  
5174
```

JOG and FIRE\$ must be set like this either at the first line or in a

JOYSTICK ROUTINE DISASSEMBLY

```
JOG=" " : FIRE$="OFF"  
SYS 5174
```

```
10000          B2          | GET INTERRUPT SIGNAL STATUS  
10002          LDA #0000 | CLEAR CIA CONTROL REGISTER A  
10004          STA $DC00  
10006          LDA #10 | CLEAR REG FOR PORTER  
10008          STA $E010 | SET PORTER POSITION  
1000A          LDA #00 | CHANGE JUMP LOCATION  
1000C          STA $E014  
1000E          LDA #001 | GET CIA 3RD CONTROL  
10010          STA $E018 | FIRE FOR CO-ORDINATES  
10012          LDA #0014  
10014          LDA #0014  
10016          LDA #0014  
10018          LDA #0014  
1001A          LDA #0014  
1001C          LDA #0014  
1001E          LDA #0014  
10020          LDA #0014  
10022          LDA #0014  
10024          LDA #0014  
10026          LDA #0014  
10028          LDA #0014  
1002A          LDA #0014  
1002C          LDA #0014  
1002E          LDA #0014  
10030          LDA #0014  
10032          LDA #0014  
10034          LDA #0014  
10036          LDA #0014  
10038          LDA #0014  
1003A          LDA #0014  
1003C          LDA #0014  
1003E          LDA #0014  
10040          LDA #0014  
10042          LDA #0014  
10044          LDA #0014  
10046          LDA #0014  
10048          LDA #0014  
1004A          LDA #0014  
1004C          LDA #0014  
1004E          LDA #0014  
10050          LDA #0014  
10052          LDA #0014  
10054          LDA #0014  
10056          LDA #0014  
10058          LDA #0014  
1005A          LDA #0014  
1005C          LDA #0014  
1005E          LDA #0014  
10060          LDA #0014  
10062          LDA #0014  
10064          LDA #0014  
10066          LDA #0014  
10068          LDA #0014  
1006A          LDA #0014  
1006C          LDA #0014  
1006E          LDA #0014  
10070          LDA #0014  
10072          LDA #0014  
10074          LDA #0014  
10076          LDA #0014  
10078          LDA #0014  
1007A          LDA #0014  
1007C          LDA #0014  
1007E          LDA #0014  
10080          LDA #0014  
10082          LDA #0014  
10084          LDA #0014  
10086          LDA #0014  
10088          LDA #0014  
1008A          LDA #0014  
1008C          LDA #0014  
1008E          LDA #0014  
10090          LDA #0014  
10092          LDA #0014  
10094          LDA #0014  
10096          LDA #0014  
10098          LDA #0014  
1009A          LDA #0014  
1009C          LDA #0014  
1009E          LDA #0014  
100A0          LDA #0014  
100A2          LDA #0014  
100A4          LDA #0014  
100A6          LDA #0014  
100A8          LDA #0014  
100AA          LDA #0014  
100AC          LDA #0014  
100AE          LDA #0014  
100B0          LDA #0014  
100B2          LDA #0014  
100B4          LDA #0014  
100B6          LDA #0014  
100B8          LDA #0014  
100BA          LDA #0014  
100BC          LDA #0014  
100BE          LDA #0014  
100C0          LDA #0014  
100C2          LDA #0014  
100C4          LDA #0014  
100C6          LDA #0014  
100C8          LDA #0014  
100CA          LDA #0014  
100CC          LDA #0014  
100CE          LDA #0014  
100D0          LDA #0014  
100D2          LDA #0014  
100D4          LDA #0014  
100D6          LDA #0014  
100D8          LDA #0014  
100DA          LDA #0014  
100DC          LDA #0014  
100DE          LDA #0014  
100E0          LDA #0014  
100E2          LDA #0014  
100E4          LDA #0014  
100E6          LDA #0014  
100E8          LDA #0014  
100EA          LDA #0014  
100EC          LDA #0014  
100EE          LDA #0014  
100F0          LDA #0014  
100F2          LDA #0014  
100F4          LDA #0014  
100F6          LDA #0014  
100F8          LDA #0014  
100FA          LDA #0014  
100FC          LDA #0014  
100FE          LDA #0014
```

```

1362 LDA #0000          1 PLACE #0000 '0' INTO MEMORY
1364 STA #0010
1400 CLT                1 CLEAR INTERRUPT DOUBLE STATUS
1420 RTN                1 RETURN TO BASIC
1500 RT                1 CHECK FOR INTERRUPT OCCURRING
1502 BIT #0000
1510 BNE #0000
1512 BSR #0001          1 JUMP TO SWEEP ROUTINE
1517 #0010 LDA #0001          1 GET REGISTER FOR ADDR
1519 LDY #0000
1520 STY #0001
1521 LDA #0000
1523 LDA #0000
1524 STY #0010, Y        1 CLEAR JOB
1527 LOOP1 LDA #0000          1 MAKE JOYSTICK
1528 BND #0001          1 GET JOY DIRECTION
1530 BNE #0001          1 IS JOY DIRD TO SW
1540 LDA #0010, X        1 GET #0010 VALUE
1542 STA #0000, Y        1 STORE IN JOB
1550 JMP #0001          1 GOTO FIRE BUTTON CHECK
1552 NEXT #00, #0001     1 DOUBLE COUNT
1554 INC
1556 CPY #0000          1 ALL DIRECTIONS CHECKED
1558 BNE LOOP1
1561 FIRE LDY #0000          1 GET FIRE TO "OFF"
1562 LDA #0000          1 GET SWEEP LENGTH TO 0
1564 STY #0010, Y
1566 LDY #0000
1568 STY #0010, Y
1570 LDA #0000          1 MAKE JOYSTICK
1572 BND #0001          1 GET FIRE BUTTON
1574 BNE #0000          1 IF NOT PRESSED THE GOTO STOP
1576 CPY #0000          1 CHECK FIRST 10 "0"
1578 LDA #0000          1 INCREASE LENGTH OF FIRE TO 20
1580 STY #0010, Y
1582 LDY #0000
1584 LDA #0000
1586 STY #0010, Y
1590 LDA #0000
1592 LDA #0000
1594 STY #0010, Y
1596 LDA #0000
1598 LDA #0000
1600 STY #0010, Y
1602 STOP LDA #0000          1 GET NEW REGISTER POSITION
1604 BSR #0002
1610 LDA #0010
1612 STY #0011
1614 LDA #0011          1 RESET INTERRUPT FLAG
1616 STY #0010
1617 JMP #0001          1 JMP TO SWEEP ROUTINE
1620

```

```

00 0, 000, 000
01 000 DATA 0, 1, 177, 76, 000, 000, 000
02 000 DATA 1, 177, 76, 000, 000, 000, 000
03 000 DATA 1, 177, 76, 000, 000, 000, 000
04 000 DATA 1, 177, 76, 000, 000, 000, 000
05 000 DATA 1, 177, 76, 000, 000, 000, 000
06 000 DATA 1, 177, 76, 000, 000, 000, 000
07 000 DATA 1, 177, 76, 000, 000, 000, 000
08 000 DATA 1, 177, 76, 000, 000, 000, 000
09 000 DATA 1, 177, 76, 000, 000, 000, 000
10 000 DATA 1, 177, 76, 000, 000, 000, 000
11 000 DATA 1, 177, 76, 000, 000, 000, 000
12 000 DATA 1, 177, 76, 000, 000, 000, 000
13 000 DATA 1, 177, 76, 000, 000, 000, 000
14 000 DATA 1, 177, 76, 000, 000, 000, 000
15 000 DATA 1, 177, 76, 000, 000, 000, 000
16 000 DATA 1, 177, 76, 000, 000, 000, 000
17 000 DATA 1, 177, 76, 000, 000, 000, 000
18 000 DATA 1, 177, 76, 000, 000, 000, 000
19 000 DATA 1, 177, 76, 000, 000, 000, 000
20 000 DATA 1, 177, 76, 000, 000, 000, 000
21 000 DATA 1, 177, 76, 000, 000, 000, 000
22 000 DATA 1, 177, 76, 000, 000, 000, 000
23 000 DATA 1, 177, 76, 000, 000, 000, 000
24 000 DATA 1, 177, 76, 000, 000, 000, 000
25 000 DATA 1, 177, 76, 000, 000, 000, 000
26 000 DATA 1, 177, 76, 000, 000, 000, 000
27 000 DATA 1, 177, 76, 000, 000, 000, 000
28 000 DATA 1, 177, 76, 000, 000, 000, 000
29 000 DATA 1, 177, 76, 000, 000, 000, 000
30 000 DATA 1, 177, 76, 000, 000, 000, 000
31 000 DATA 1, 177, 76, 000, 000, 000, 000
32 000 DATA 1, 177, 76, 000, 000, 000, 000
33 000 DATA 1, 177, 76, 000, 000, 000, 000
34 000 DATA 1, 177, 76, 000, 000, 000, 000
35 000 DATA 1, 177, 76, 000, 000, 000, 000
36 000 DATA 1, 177, 76, 000, 000, 000, 000
37 000 DATA 1, 177, 76, 000, 000, 000, 000
38 000 DATA 1, 177, 76, 000, 000, 000, 000
39 000 DATA 1, 177, 76, 000, 000, 000, 000
40 000 DATA 1, 177, 76, 000, 000, 000, 000
41 000 DATA 1, 177, 76, 000, 000, 000, 000
42 000 DATA 1, 177, 76, 000, 000, 000, 000
43 000 DATA 1, 177, 76, 000, 000, 000, 000
44 000 DATA 1, 177, 76, 000, 000, 000, 000
45 000 DATA 1, 177, 76, 000, 000, 000, 000
46 000 DATA 1, 177, 76, 000, 000, 000, 000
47 000 DATA 1, 177, 76, 000, 000, 000, 000
48 000 DATA 1, 177, 76, 000, 000, 000, 000
49 000 DATA 1, 177, 76, 000, 000, 000, 000
50 000 DATA 1, 177, 76, 000, 000, 000, 000
51 000 DATA 1, 177, 76, 000, 000, 000, 000
52 000 DATA 1, 177, 76, 000, 000, 000, 000
53 000 DATA 1, 177, 76, 000, 000, 000, 000
54 000 DATA 1, 177, 76, 000, 000, 000, 000
55 000 DATA 1, 177, 76, 000, 000, 000, 000
56 000 DATA 1, 177, 76, 000, 000, 000, 000
57 000 DATA 1, 177, 76, 000, 000, 000, 000
58 000 DATA 1, 177, 76, 000, 000, 000, 000
59 000 DATA 1, 177, 76, 000, 000, 000, 000
60 000 DATA 1, 177, 76, 000, 000, 000, 000
61 000 DATA 1, 177, 76, 000, 000, 000, 000
62 000 DATA 1, 177, 76, 000, 000, 000, 000
63 000 DATA 1, 177, 76, 000, 000, 000, 000
64 000 DATA 1, 177, 76, 000, 000, 000, 000
65 000 DATA 1, 177, 76, 000, 000, 000, 000
66 000 DATA 1, 177, 76, 000, 000, 000, 000
67 000 DATA 1, 177, 76, 000, 000, 000, 000
68 000 DATA 1, 177, 76, 000, 000, 000, 000
69 000 DATA 1, 177, 76, 000, 000, 000, 000
70 000 DATA 1, 177, 76, 000, 000, 000, 000
71 000 DATA 1, 177, 76, 000, 000, 000, 000
72 000 DATA 1, 177, 76, 000, 000, 000, 000
73 000 DATA 1, 177, 76, 000, 000, 000, 000
74 000 DATA 1, 177, 76, 000, 000, 000, 000
75 000 DATA 1, 177, 76, 000, 000, 000, 000
76 000 DATA 1, 177, 76, 000, 000, 000, 000
77 000 DATA 1, 177, 76, 000, 000, 000, 000
78 000 DATA 1, 177, 76, 000, 000, 000, 000
79 000 DATA 1, 177, 76, 000, 000, 000, 000
80 000 DATA 1, 177, 76, 000, 000, 000, 000
81 000 DATA 1, 177, 76, 000, 000, 000, 000
82 000 DATA 1, 177, 76, 000, 000, 000, 000
83 000 DATA 1, 177, 76, 000, 000, 000, 000
84 000 DATA 1, 177, 76, 000, 000, 000, 000
85 000 DATA 1, 177, 76, 000, 000, 000, 000
86 000 DATA 1, 177, 76, 000, 000, 000, 000
87 000 DATA 1, 177, 76, 000, 000, 000, 000
88 000 DATA 1, 177, 76, 000, 000, 000, 000
89 000 DATA 1, 177, 76, 000, 000, 000, 000
90 000 DATA 1, 177, 76, 000, 000, 000, 000
91 000 DATA 1, 177, 76, 000, 000, 000, 000
92 000 DATA 1, 177, 76, 000, 000, 000, 000
93 000 DATA 1, 177, 76, 000, 000, 000, 000
94 000 DATA 1, 177, 76, 000, 000, 000, 000
95 000 DATA 1, 177, 76, 000, 000, 000, 000
96 000 DATA 1, 177, 76, 000, 000, 000, 000
97 000 DATA 1, 177, 76, 000, 000, 000, 000
98 000 DATA 1, 177, 76, 000, 000, 000, 000
99 000 DATA 1, 177, 76, 000, 000, 000, 000

```

```

PROGRAM JOYSTICK ROUTINE LOADER
00 000 *****
01 000 *****
02 000 *****
03 000 *****
04 000 *****
05 000 *****
06 000 *****
07 000 *****
08 000 *****
09 000 *****
10 000 *****
11 000 *****
12 000 *****
13 000 *****
14 000 *****
15 000 *****
16 000 *****
17 000 *****
18 000 *****
19 000 *****
20 000 *****
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26 000 *****
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29 000 *****
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32 000 *****
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37 000 *****
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39 000 *****
40 000 *****
41 000 *****
42 000 *****
43 000 *****
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71 000 *****
72 000 *****
73 000 *****
74 000 *****
75 000 *****
76 000 *****
77 000 *****
78 000 *****
79 000 *****
80 000 *****
81 000 *****
82 000 *****
83 000 *****
84 000 *****
85 000 *****
86 000 *****
87 000 *****
88 000 *****
89 000 *****
90 000 *****
91 000 *****
92 000 *****
93 000 *****
94 000 *****
95 000 *****
96 000 *****
97 000 *****
98 000 *****
99 000 *****

```

```

PROGRAM TEST ROUTINE
00 0 000
01 0 000
02 0 000
03 0 000
04 0 000
05 0 000
06 0 000
07 0 000
08 0 000
09 0 000
10 0 000
11 0 000
12 0 000
13 0 000
14 0 000
15 0 000
16 0 000
17 0 000
18 0 000
19 0 000
20 0 000
21 0 000
22 0 000
23 0 000
24 0 000
25 0 000
26 0 000
27 0 000
28 0 000
29 0 000
30 0 000
31 0 000
32 0 000
33 0 000
34 0 000
35 0 000
36 0 000
37 0 000
38 0 000
39 0 000
40 0 000
41 0 000
42 0 000
43 0 000
44 0 000
45 0 000
46 0 000
47 0 000
48 0 000
49 0 000
50 0 000
51 0 000
52 0 000
53 0 000
54 0 000
55 0 000
56 0 000
57 0 000
58 0 000
59 0 000
60 0 000
61 0 000
62 0 000
63 0 000
64 0 000
65 0 000
66 0 000
67 0 000
68 0 000
69 0 000
70 0 000
71 0 000
72 0 000
73 0 000
74 0 000
75 0 000
76 0 000
77 0 000
78 0 000
79 0 000
80 0 000
81 0 000
82 0 000
83 0 000
84 0 000
85 0 000
86 0 000
87 0 000
88 0 000
89 0 000
90 0 000
91 0 000
92 0 000
93 0 000
94 0 000
95 0 000
96 0 000
97 0 000
98 0 000
99 0 000

```

Hard Copy

One of the biggest investments which a computer user makes is inevitably a printer. For this reason we've put a new Citizen model through its paces.

By Mycroft Appleby

The Citizen LSP-70 printer is one of the low end price bracket printers that is making Citizen a very big name in the peripherals world at the moment.

It's easy to see why Citizen has come so far so fast. The LSP-70 is a full width printer with all the facilities found on the more expensive Epsons along with NLQ and tractor/friction feed options. Externally, the machine is a lot smaller than its immediate opposition, its dimensions being 180mm wide, 235mm deep, and 98mm high. The control buttons comprise a wheel on/off line, line feed, and form feed. With indicators for power, paper out, and ready. The controls trend towards setting the print options (i.e. bold, italics, NLQ etc.) from the front panel is not supported here, which is a shame - but this is a low cost printer.

Paper and Print

The paper advance knob is well mounted on the right of the machine immediately above the interface connector. Having the interface on the side of a printer is most unusual as most printers have them on the back. But when you think about it, the side is a most logical place to attach cables as they then don't foul the paper feed. The power cable does attach at the back, but it is at one corner and has a 90 degree bend on it to make the cable emerge sideways.

The printer comes as standard with friction feed, but a tractor option is available. This feeds the paper in very easily and is one of the most trouble free paper feeds that I have come across. The friction feed can also be supplemented by a sheet feeder that can feed correspondence quality paper to complement the NLQ print. Paper loading is trouble free to an extent that I hadn't thought existed after using the Epson method of loading paper. When there is no paper in the machine, the

form feed button doubles as an auto-paper load button that takes the paper from the back of the machine to in front of the print head.

Print speed varies between 24 characters per second in NLQ mode and 120 cps when printing draft. The draft output isn't bad, but obviously isn't as good as you would expect for a printer whose main selling point is that ability. With the LSP-70 it is more of a bonus. The NLQ in this case should be considered as just an option to read mail in font, you wouldn't write a letter to your bank manager with it.

Interfacing

As is becoming common nowadays the interface is on a cartridge. The one I had was a centronics parallel type, but I believe a Commodore serial one is available. The cartridge is flush fitting and is shaped in the same way as the bottom of the case. Unless you know that it is there, you wouldn't even suspect it. A well thought out point with the cartridge is that the dip switches are on it. These are the switches that set up the different start up options and functions on the printer. Usually you have to scrape around the inside of the printer or even open up the case with a screwdriver. But with the LSP-70 you can remove the cigarette packer sized unit and have it in front of you whilst you consult the manual.

The dip switches in this printer are more important than in most as they set the emulation mode of the machine. The printer is capable of emulating the popular (i.e. around 60% of the market) Epson range of printers to a greater or lesser degree. This means that if you ever have some-clone software for example, you may find that it has an Epson option on it. One of the three Citizen

emulation modes should suffice. It can also emulate the less popular, but business standard, IBM graphics printer. But as you don't often find these on Commodores, you probably won't ever need it.

Documentation

The manual is a sturdy tome, in a spiral binding that lays flat (very useful). The concept and features of the printer are introduced in a logical manner with worked examples, sample outputs, and diagrams. At the end of the manual there is a tear-off card with all the most common escape codes indicated. This saves a lot of time as I usually have to delve through the manual, making it extremely dog-eared, to extract the relevant information.

All the escape codes and functions are based around the common Epson standard with the usual bold, double strike, compressed, expanded, italic, or correspondence quality styles supported. The graphics capability is also good with three graphics densities up to around 1820-dots on an eight inch line. There is also two speeds for the medium density print to improve quality at the cost of reducing speed. You can also define your own characters on the 1189 print buffer if you discard the 2K printer buffer.

Verdict

Overall I can safely say that having used the printer on regular basis for the last month, that I am extremely happy with it. It provides most of the facilities of the most popular printer in the world, with none of the little idiosyncrasias that put the name of Epson covered cost, and at a much more reasonable price. Definitely the top of my list for printers at the moment. **BT**

COMMODORE

plus-4/16

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COMMODORE 64

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Hex Data Entry

Introducing the Your Commodore Hex Data Entry Program to make our listings even more accessible.

By M.C. Stretton assisted by P.A. Ever

The Your Commodore Hex Data Entry program has been written with you, the reader in mind. No longer will it be a painstaking ordeal, typing in all the long lists of data. This program will ensure a 100% correct entry, each and every time you use it.

I have made this routine as streamlined as possible so as to save you having to type in a large program. There are only four options in this version: LOAD DATA; SAVE DATA; ENTER DATA; PRINT DATA. There will be a much larger version coming shortly which will give you more options and will have Windows, Redefined Char's, Scrolling Text etc.

On first entering the Hex Data Entry, only the LOAD DATA and DATA ENTRY options are available to you. This is because the buffer is empty, and the other two options require data to be present. On selecting the LOAD DATA option, you are asked for TAPE or DISK. Press either 'T' or 'D' then RETURN. The program remembers that last input/output, and so it is possible to just hit RETURN if the correct device type is being displayed. You are then required to enter a filename.

Type users please note, to cut down on errors for disk users, you will not be allowed to enter a blank filename. Filenames can be a combination of any characters, except graphics, up to 45 in number. If you should make an error in your filename entry, you may either delete single characters by the DEL key, or SHIFT/CLEARHOME will delete the whole filename. Be extremely careful when typing in your filename, errors can be fatal, so make sure you only use filenames that are stored on whatever device you are using. After the prompt, hit return and the file will be loaded into the buffer. The program will allow files up to 99 blocks in length to be loaded in. If you want larger programs entered, you will have to split them into two or more parts first. After the load, control is passed back to the main menu.

The save option is identical to the load, except that it takes the contents of the buffer and saves them out to the given start address. This will save an executable file, that can be loaded and

run, independent of the input program.

Data Entry

The Data Entry option is the option by which you can enter data from Your Commodore, or your own creations. Once this option is selected you are asked if you want to continue from the given address. If you have just 'LOADed' a file, this address will be the next available byte in the buffer. (Allowing you to add more data to the end of the loaded file. This is also true of the program currently in memory. Therefore if you wish to continue typing in at the last address, type 'Y'. If 'N' is pressed the program assumes you are starting a fresh entry. When this happens the buffer is reset to zero, thus losing any program currently in memory. If you have chosen \$C000 as the normal start up address purely because most M/C prog's reside here.) After pressing 'N', you are then asked for the starting address, in Hex. Any valid hex number is acceptable, e.g. \$400, \$C08, \$8480. In this example, the first figure, \$400, would be interpreted as \$8480 by the program, likewise \$285 is taken to be \$0285.

Once the start address is given, you are asked if you want checkboxes or not. If you are typing in a program from Your Commodore your response will be 'Y'. If you are entering your own program then select 'N'.

The screen display now changes to show the current address being pointed into. Type any valid hex number and the program automatically skips the next byte without the need to type commas, spaces or returns. If you make a mistake, one press of the DEL key will erase the whole number. If in the so checkbox mode, when you get to the end of the line, the line will automatically scroll up ready for your next input.

If in checkbox mode, after eight bytes are entered you must type the two digit checkbox at the end of the line. Unlike the no checkbox mode you now press return to enter the line.

If the program finds that the checkbox does not match the line entered, a warning tone will be sound. You will then be asked if you wish to either: a) Re-enter the line or b) Re-enter the checkbox.

After checking your line, if you do you have entered it wrongly, then press 'L'. The line will be erased and so there re-enter it correctly. If you find that you have only made a mistake typing in the checkboxes, then press 'A' and re-enter it. Should you wish to stop entering data, simply press return or space bar on a blank line to get you back to the main menu. Here you can save your program so as to re-use another day, or you may wish to exit program.

On choosing the print option, you have a choice of hard copy or save copy. The listing can be printed at any time by pressing down and holding down any key. Pressing the RUN/STOP key and holding a dot will load out of the print mode and return you to the main menu.

The left arrow key 'top left of a keyboard', acts as a cursor when typing your data. The space bar acts as it returns key when entering data, thus leaving you free from searching for it return key.

The load option allows in programs, less than 99 blocks, to be loaded into the buffer, so it is possible to load a basic program, obtain a file dump, then re-use the program on another tape or disk without having to do it any way.

I hope that this program will help to take the drudgery out of typing in the lists of data statements.

```

Please use SYSTEM CHECKER
when entering their program

00 10 HEX ----- INPUT
01 20 FOR HEX $E, CLR
02 30 DATA $A1-$D999, PENDING, 0
   (PENDING, 0) PENDING, 0
   (DATA, 0), PRINT "CLR, HEX 0
   0 00"
03 35 HEX GET WAITED ON CREW 0
04 40 LISTINGS FOR DETAILS ON
05 50 GET HEX CHARACTER
06 60 CREW="RECORD", CR="LINE, 0
   0 10"
07 65 ENDINPUT
08 66 PRINT "CLR?"
09 70 GET ----- OPTION
10 75 PRINT "HOME, PENDING, 0
   (PENDING, 0)"
11 80 PRINT "HEX, BLKED FOR
   (COMPOSED) HEX INPUT - 0
   1000 "
12 90 PRINT " (DATA, 0) - (DATA, 0)

```


WIMPS and Much More

*For those of you who found our WIMP Program useful,
here are a couple of additions to make it easier and
more enjoyable.*

By Allen Webb

Ease of use is often a major factor taken into consideration by programmers when they are summing up a program's usefulness. This is why I have decided to provide this addition to the Wimp program which appeared in the December 1986 issue of *Time Commodore*.

After writing the demonstration routine, I felt that, while it has restricted, it didn't give you anything to work from. I have therefore prepared a universal menu routine to use with the package. This routine is given in Listing 1.

The main of the routine occupies lines 60000 onwards. To use the routine you must first pass the following parameters:

MS: MENU STRING
MW: MENU WIDTH
MH: TOTAL MENU HEIGHT
ML: X COORDINATE TOP LEFT CORNER
YL: Y COORDINATE TOP LEFT CORNER+1
CLC2: MENU COLOURS

The routine will then draw the menu and set up the pointer. The routine detects the movement of the pointer and highlights the menu options or "last page" icon when they are pointed to. The button press is detected if an option has been selected and the routine exits with the following information:

TASK=OPTION SELECTED
LP=0 IF MENU ITEM
LP=1 IF LAST PAGE

You can use the values of TASK and LP to direct the logic of the rest of your program.

Input Instructions

The idea of this series is to provide a set of routines which can be used in more serious applications to reduce the toil of programming.

One pain in the neck is the INPUT instruction. Most software requires the input of information and it is of course that such operations are both user friendly and idiot-proof. The Basic INPUT has several drawbacks and is not suitable for serious software. Many programmers use either GET or INPUT using a logical file opened to the screen.

It becomes particularly irritating if you want to limit the characters to be accepted. For example, what if you want to prompt for a response using only Y or N? One way is the routine:

```
10 GET @: IF @ < > "Y" OR
15 < > "N" THEN 10
20 IF @="Y" THEN...
```

This is simple enough but if you want to accept a larger group of

characters, the routine becomes messy.

The use of a user defined input routine appeared to be the answer. Such a routine should have the following features:

- 1) The routine should provide a flashing prompt, easily placed at a specified screen position.
- 2) A list of acceptable characters should be easily set up.
- 3) The routine should ignore the input to screen to allow the user to see who has been input. The ability to delete incorrect characters should be available.
- 4) The input should be easily limited to a specified length. The input should ignore the screen contents. This will allow the use of formatted displays.
- 5) The input should be returned in a specific string variable.
- 6) The routine should ignore a null input.

Such a routine is given in Listing 2. This routine provides all of the features described (the DEL key is used in correct inputs).

This routine has a rather peculiar syntax:

```
515 @="4096,80,48,8,Y,N
```

where:

@: string to hold input
AB: string specifying acceptable



characters

X,Y coordinate of input prompt
Y,Y coordinate of input prompt
L: length of input

Listing 3

```
100 A$="ABCDEFGHIJKLMN0P
QRTUVWXYZ"
110 AS=AS+"(123456789+-*/%)"
120 L:=LEN(AS)***"FORM=(1)COL:BS=
H+CHR$(32)NEXT
140 SYS(2)+4096,BS,AS(1),L
150 PRINTCHR$(16)BS
160 GET:IF IS="*" THEN GOTO
```

In Listing 3 lines 100 and 110 set up the list of acceptable characters in AS. The input length is limited to 10 in line 120. This string will hold the input and must clearly be long enough to hold the 10 input. Line 140 gets the input with a prompt at the start of line 11.

The routine will put the input at the place where BS is defined. If, for example, you replaced line 140 with:

```
140 L:=LEN(AS)***"SPC"
```

After using the routine, you were in for the program, you would find that line 140 had been altered. The reason is that if a string is defined in a program, then Basic doesn't bother saving up the string elsewhere. Using the form given in Listing 3, you can Basic test up the variable BS and therefore prevent corruption of the program.

Listing 4 gives a demonstration of a simple menu requiring a single key input. It should show how easy the routine is to use.

Listing 4

```
100 A$="DESP"
110 L:=LEN(CHR$(32))
120 PRINTCHR$(147)CHR$(17)
TAB(0)"MAIN MENU"
140 PRINTCHR$(17)TAB(14)"L..
INITIALISE"
150 PRINTCHR$(17)TAB(14)"E..
ENTER RECORD"
160 PRINTCHR$(17)TAB(14)"D..
DELETE RECORD"
170 PRINTCHR$(17)TAB(14)"S..
SEARCH"
180 PRINTCHR$(17)TAB(14)"F..
PRINT REPORT"
190 PRINTCHR$(17)TAB(17)TAB
(7)SELECT OPTION BY ENTERING"
```

```
200 PRINTTAB(7)"INDICATED
KEY & PRESSING"
210 PRINTTAB(7)"RETURN"
230 SYS(2)+4096,BS,AS(14),L(1)
240 PRINTCHR$(17)TAB(1)
CHR$(16)BS " WAS SELECTED"
```

That's all for this month. I haven't decided what to tackle next time but I'll think of something. Don't forget, let me have your comments (preferably no abusive) and suggestions via the editor.

```
PROGRAM LISTING 1
% 1 000 *****
% 2 000 0 1 LISTING 1
% 3 000 *****
% 4 00 00-000000
% 5 00 00 00-00 00000 000 0000
0000
% 6 00 00 00 00-00 00000 000 0000
% 7 00 00 00 00-0000 0000 00000
% 8 00 00 00 00-0000 0000 00000
% 9 00 00 00 00-0000 0000 00000
% 10 00 00 00 00-0000 0000 00000
% 11 00 00 00 00-0000 0000 00000
% 12 00 00 00 00-0000 0000 00000
% 13 00 00 00 00-0000 0000 00000
% 14 00 00 00 00-0000 0000 00000
% 15 00 00 00 00-0000 0000 00000
% 16 00 00 00 00-0000 0000 00000
% 17 00 00 00 00-0000 0000 00000
% 18 00 00 00 00-0000 0000 00000
% 19 00 00 00 00-0000 0000 00000
% 20 00 00 00 00-0000 0000 00000
% 21 00 00 00 00-0000 0000 00000
% 22 00 00 00 00-0000 0000 00000
% 23 00 00 00 00-0000 0000 00000
% 24 00 00 00 00-0000 0000 00000
% 25 00 00 00 00-0000 0000 00000
% 26 00 00 00 00-0000 0000 00000
% 27 00 00 00 00-0000 0000 00000
% 28 00 00 00 00-0000 0000 00000
% 29 00 00 00 00-0000 0000 00000
% 30 00 00 00 00-0000 0000 00000
% 31 00 00 00 00-0000 0000 00000
% 32 00 00 00 00-0000 0000 00000
% 33 00 00 00 00-0000 0000 00000
% 34 00 00 00 00-0000 0000 00000
% 35 00 00 00 00-0000 0000 00000
% 36 00 00 00 00-0000 0000 00000
% 37 00 00 00 00-0000 0000 00000
% 38 00 00 00 00-0000 0000 00000
% 39 00 00 00 00-0000 0000 00000
% 40 00 00 00 00-0000 0000 00000
% 41 00 00 00 00-0000 0000 00000
% 42 00 00 00 00-0000 0000 00000
% 43 00 00 00 00-0000 0000 00000
% 44 00 00 00 00-0000 0000 00000
% 45 00 00 00 00-0000 0000 00000
% 46 00 00 00 00-0000 0000 00000
% 47 00 00 00 00-0000 0000 00000
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% 99 00 00 00 00-0000 0000 00000
% 100 00 00 00 00-0000 0000 00000
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25 0000 IF L=1 THEN GOTO 200
26 0000 PRINTCHR$(16)BS+
" "
27 0000 GOTO 100
PROGRAM LISTING 2
% 0000 FOR L=1 TO 1000 STEP 100
% 01 0000 PRINTCHR$(16)BS+
" "
% 02 0000 NEXT L
% 03 0000 PRINTCHR$(16)BS+
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% 04 0000 PRINTCHR$(16)BS+
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% 05 0000 PRINTCHR$(16)BS+
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Checksum Program

The hexadecimal numbers appearing in a column to the left of the listing should not be typed in with the program. These are merely checksum rules and are there to help you get each line right. Don't worry if you don't understand the hexadecimal system, as long as you can compare two characters on the screen with the corresponding two characters in the magazine you can use our line-checking program.

Type in the Checksum Program, make sure that you've not made any mistakes and save it to tape or disk

immediately because it will be used with most of the present and future listings appearing in *Your Commodore*.

At the start of each programming session, load Checksum and run it. The screen will turn brown with yellow characters and each time you type in a number will appear on the screen in white. This should be the same as the corresponding value in the magazine.

If the two values don't relate to one another, you have not copied the line exactly as printed so go back and check each character carefully. When you find the error simply correct it and

press RETURN again.

If you want to turn off the checker simply type STOP and the screen will return to the familiar blue colours. You can then do whatever it was you wanted to do and if this doesn't suit the area where Checksum lies you can go back to it with the same STOP command.

No system is foolproof but the chances of two errors cancelling one another out are so remote that we believe our listings are more reliable than any other magazine in the world. So get typing! □

and just printing

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Mnemonic	Symbol	Keypress
[RIGHT]		CTRL left/right
[LEFT]		SHIFT & CTRL left/right
[DOWN]		CTRL up/down
[UP]		SHIFT & CTRL up/down
[F1]		F1 key
[F2]		SHIFT & F1 key
[F3]		F3 key
[F4]		SHIFT & F3 key
[F5]		F5 key
[F6]		SHIFT & F5 key
[F7]		F7 key
[F8]		SHIFT & F7 key
[HOME]		CLR/HOME
[CLR]		SHIFT & CLR/HOME
[AVSON]		CTRL & +
[AVSOFF]		CTRL & -

Mnemonic	Symbol	Keypress
[BLACK]		CTRL & 1
[WHITE]		CTRL & 2
[RED]		CTRL & 3
[CYAN]		CTRL & 4
[PURPLE]		CTRL & 5
[GREEN]		CTRL & 6
[BLUE]		CTRL & 7
[YELLOW]		CTRL & 8
[FOUND]		F
[LARBROW]		←
[RARBROW]		→
[F1]		SHIFT & ↑
[INST]		SHIFT & INST/DEL
[REV T]		see text
[K'letter]		CTRL + letter
[S'letter]		SHIFT + letter

Software for sale

If you think that one of our programs looks very interesting, but you can't afford the time to type it in then our software service will help you out.

It's three o'clock in the morning. You sit at the computer keyboard just finished a marathon typing session creating one of the superb programs from Your Commodore. Your fingers reach for the keyboard and press the letters R, U and N. You press RETURN, sit back and nothing happens.

Everyone has probably faced this problem. When it does happen it's a matter of spending hours searching through the program for any typing mistakes. No matter how long you look or how many people help you, you can usually guarantee that at least one little bug slips through unnoticed.

The Your Commodore Software Service makes available all of the programs from each issue on both cassette and disk at a price of \$5.00 for disk and \$4.00 for cassette. None of the documentation for the programs is supplied with the software since it is all available in the relevant magazine. Should you not have the magazine then back issues are available from the following address:

INFONET LTD, Times House, 179 The Marlowes, Hemel Hempstead, Herts. HP1 1BB.
TEL: (0442) 48435

please contact this address for prices and availability.

The Disk

Programs on the disk will also be supplied as totally working versions, i.e. when possible we will not use Basic Loaders thus making use of the programs on each side. Unfortunately at the moment we cannot duplicate C16 and Plus/4 cassettes. However programs for these machines will be available on the disk.

What programs are available?

At the top of each article you will find a strap containing the article type, C64 Program etc. So that you can see which programs are available on which format you will also find a couple of symbols after this strap. The symbols have the following meaning:



This symbol means that the program is available on cassette.



These programs are available on disk.

Please Note

Since the programs supplied on cassette are total working versions of the program, we do not put disk only programs on tape. There is no sense in placing a program that expects to be reading from disk on to tape.

OCTOBER 1986

CROSSWORD — Put your wits against your computer.
POP UP MENUS — A superb routine that allows you to add pop-up menus to your C64.
PILOT — A full implementation of this extremely popular educational language for your C64.

ORDER CODE
DISK YOC10T86 06.00
TAPE YOC10T86 04.00

NOVEMBER 1986

Into The Eighties — now you can give your C64 80 column capability, with this program. You have access to 80 screens rather than the 40 column version or the new 80 column one.

C16 SOUND SAMPLER — now your C16 or Plus/4 can sound like any instrument you like with this sound sampler! Available on disk only.

C64 AUTOSAVE — You've been programming for hours and your computer crashes taking all of your work with it. Well, you can prevent this with our C64 Autosave. This will save your programs to disk or tape every five minutes automatically so you won't have to make work to catch up on.

DATAMAKER 128 & C64 — Two excellent character programs one for the C128 and one for the C64.

ORDER CODE
DISK YOC11N86 14.00
TAPE YOC11N86 04.00

READERS SERVICE

DECEMBER 1986

WOP - Create your own graphics operating system in your own programs. Complete with pull-down menus and sample icons.

REMEMBER THE PLUS/4 - An assembler for Plus/4 owners. Complete with a couple of nice Basic commands including a MERGE facility.

ORDER CODE

DISK YDDEC86 £6.00

TAPE YDDEC86 £4.00

JANUARY 1987

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DISK ARCHIVE - Now you can make a total backup of all your disks on to cassette for safe keeping. A complete disk set in five minutes of tape (C64).

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DUMPER - Produce copies of your Plus/4 text and Hi-res screens with this handy screen dump program (Jan disk only).

ORDER CODE

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TAPE YDDEC86 £4.00

FEBRUARY 1987

TURBO MENU MAKER - Add menus and high speed loading to your disks (C64 - disk only).

HEX DATA ENTRY - Your Commodore program entry system.

X-RAY FILE - Get more information from your disk drive (C64 disk).

ADVENTURE AID GRAPHICS - Easy graphics for our Adventure Creator system.

LABELLER 84 - Easy addressing with this label printer for the C64.

WORD PRO ADD ON - Add descriptors to your MPS 881 printers with the Plus/4 word processor.

NURSERY RHYME LAND - An educational adventure for the young ones.

ORDER CODE

DISK YDFEB87 £6.00

TAPE YDFEB87 £4.00

Cassettes on disks are available back to March 1986. Please ring the Editorial office (01-437-0626) for details of these.

ORDER FORM - PLEASE COMPLETE IN BLOCK CAPITALS

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March '87		DISK (£6.00)	YC MAR 87	
OVERSEAS POST (£1)				
			TOTAL	

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Please allow 28 days for delivery.

CP/M: The Third Facet of the 128

The C128 has three modes - 64, 128 and the much neglected CP/M. In this article we bring you a pocket guide to CP/M and shed light on its uses.

By Mycroft Appleby

The Commodore 128 comes with CP/M+ as the operating system for the built-in 280 second processor. However, the documentation is sparse and confusing, and information on the supplied utility software is rare. Read on and, you may hear something to your advantage.

CP/M started life as a monitor for the newly introduced Intel 8088 processor evaluation kit and was written by one of its employees. CP/M in those days (in 1979) stood for Control Program/Monitor. This monitor handled things like the paper tape reader and writer, punched cards, and a line printer, as well as the teletype console to which it was attached.

After a short while, Shugart came on the scene. Shugart had just developed the mini disk drive by shrinking the normal eight inch IBM drives down to a handier five inch size. The problem was that they had no real software to make them work. So Shugart asked the chap who wrote CP/M if he could do something with them and make the whole system work together. This was duly done, and the early CP/M had taken shape.

Intel however, didn't want to market this program, so the chap left

Intel, worked off the bugs in the program and, set up his own company, and CP/M 1.4 was launched on an unsuspecting public.

The company started out life called Intergalactic Digital Research, but a bank manager probably talked them into dropping the 'Intergalactic'. CP/M was further refined into CP/M 2.2 and the 'standard' CP/M system was defined as a 280 processor, 64K of memory, between one and eight disk drives, and an 80 x 25 screen. As long as your system had these minimums, software would run. This held immense attractiveness for software houses as instead of writing dozens of different versions of a program for all the different machines, they could just write a CP/M program and put a little program on the same disk that would ask the user to describe what was different about the CP/M system from everybody else's, and you're away.

At about this time CP/M was deemed to mean 'Control Program/Microcomputer', as it was thought that convincing people that this program was just an easy way to hook up paper tape punchers to 8088 development systems in development system looks like a cruel board, with

a calculator display and a small keypad - that's it! would just confuse them - they were probably right though when you know that, explains a lot of things!

In around 1980 memory is getting a bit cheaper and all sorts of badges were being used to get memory into CP/M systems that 64K allowed for (64K in 1979 is uncomprehendingly huge). So D (Digital Research) wrote CP/M 3.0 CP/M+ to cater for it. Up until CP/M contained a number of components. A boot-ROM that took CP/M off disk and into memory, BIOS or Basic Input/Output System to handle the paper tape/keyboard/printer etc, a BIOS to handle the disks, and the CCP - or Control Program Area, which does all the dirty work. All the together take up about 12K - though can vary depending on the machine. Take out the screen and a small set for variables and the TPA or Trans Program Area (the place in memory that the programs actually get loaded into) starts to shrink. So even with 48K TPA, running a business program may only give you 18K to play around with - not a lot at all.



What CP/M+ does is to allow the 280 to have 128K in a banked system. It puts the screen, BIOS, BDOS, CCP, and RSNs (more of those later) out of the way, and leaves TPA, of course 80K. This will may not sound like a huge application program can also use the banked memory — so you may still have around 20K to play around with for data, — a much better state of affairs. DR also took the opportunity to 'clean up' some of the dodgier bad points of CP/M 2.2 and make it work a lot more user — friendly. CP/M+ also uses BIOS more efficiently by storing them out of the way when the main program is working, what's an RSN? It's Resident System Extension. This will expand the capabilities of CP/M in some way. It is mainly used for the DOS system which is a logical, machine independent way of handling files.

DR also launched a number of new products at this time — CP/M+ for networks, MP/M — for multi user applications, and Personal CP/M — for smaller machines without disk drives. However, their drive for world domination in the business operating system market was killed stone dead in a couple of months by the emergence of the IBM PC and it's operating system called MS-DOS — written by DR's arch rival Microsoft (who started in a very similar way to DR, except that they were called The Kinnearly Fried Salt-water Company, and began by writing a program called Basic — but that's another story). MS-DOS was written from scratch as a 'real' operating system, and not as a box monitor, and

it showed. It was friendly, fast, (relatively) bug-free, and could access 640K of memory. Business men looked to it in droves. DR eventually recovered with a program called GEM (Graphics Environment Manager), but that's also another story!

The C128 and CP/M

Most people know that a C128 has two processors a 280 and an 8502. Both can have access to the 128K of main memory, and both can have access to the 16K of video memory (yes, that's right — your C128 is actually a C144, but that would probably only confuse people). What most people don't realize is that the 280 is the main processor and has priority, and that the 8502 is actually the second processor! When you turn on a C128 (with a disk drive attached) the disk whirrs. This is the CP/M boot ROM trying to load CP/M off disk. If it doesn't manage it, it gives up and grudgingly lets the 8502 have its evil way.

Remembering what I said about the minimum system configuration for CP/M I will assume that you are using a C128 with at least one disk drive, and the 80 column screen facility. You can use the 40 column screen, but this is a window on a logical 80 column screen — much better to use the real thing — also as the 80 column screen has its own 80K memory, you don't loose the odd couple of K here and there.

So pop in your system disk (that with CP/M on it) grind your C128 screaming and kicking into life and hey presto! Nothing particularly exciting

happens at all. In fact all you get is a version number, a copyright message, a TPA size, and the letter 'A' followed by a little prompt '>'. Fantastic! Stupendous! Incredible! What happens next? Who cares?

But What does it do?

When you see the prompt, it is telling you three things. Firstly, that the drive you are using is drive A. That you are logged on as user zero, and that the CP/M is waiting for input from you. What do these terms mean? Well, CP/M drives are designated by letters from A to P, and you have a drive that all disk operations happen to unless you specify a different one. This is called the default drive. In CP/M the default drive always starts off as 'A'. In the CP/M disk system on the C128 the attached disk drive is always 'A', but it also has a 'RAM Disk' assigned to 'B', this is an area of memory that behaves just like a disk drive. This is to help you with disk copping etc. More about this later.

The user number is a way of keeping 16 different directories on the disk at once. Perhaps you will have WP files on one, Basic programs on another, and a database on another one. These are called user numbers and can be from zero to 15. Like the default drive, CP/M has a default User number. This starts off as zero. If the user number is changed to get at another directory, you will still be able to get at User zero, this works like a global directory that can be accessed by all the others.

If you change the default drive then the display may look like this "B>" - indicating drive B, and if you change the User number it could look like this "BC2>" - indicating User Four.

Now the CP/M system is waiting for your input. This is very much similar to the Basic/Ready prompt. It means that the current operation is finished and it is waiting for a new one. From here you can type in commands to make CP/M do things.

In CP/M there are two types of command - resident and transient. Resident commands are the ones built into the system. Transient commands are loaded off disk before they are executed. It is these transient commands that take up most of the CP/M system disk.

So, What Happens Next?

The resident commands are fairly simple and are detailed as follows. You can change the default drive by typing in the new letter followed by a colon. So to change to drive 'C' you would type in 'C'. User numbers can be changed by typing in 'USER n', where 'n' is the new number. DIR displays a directory of disk contents, sorted into alphabetical order, following it with a drive letter and a colon will directory that drive. No letter and the default drive gets it. REN will rename a file. ERA will erase a named file. TYPE will display a named text file on the screen. And DIRSYS will display the system files in a similar manner to DIR. System files are files that are usually loaded in when CP/M is booted and do not normally appear in the directory. This command forces them to be displayed.

These commands also have transient versions. These are extended versions of the commands, whilst due to memory space the built in commands perform only the basic function. Remember that these commands must be present on a disk in the drive for them to function.

DIR, DIRSYS commands can now have a filepec after them using the CP/M wild card system. This wild card system is identical to the Commodore one. In that a '?' stands for any letter, and a '*' stands for anything else in the filename - but remember the file extension that must be specified in all CP/M operations (similar to the PROG, SUC, USB labels on Commodore drives). So

typing in 'DIR FRED*.?' will list all files beginning with 'FRED', or 'DIR *.COM' will list all command files. Including a drive letter followed by a colon before the filepec will direct CP/Ms attention to that drive. Hence 'DIR B:*.BAR' will list all backup files on drive B. You can use multiple filepecs.

You may also include an option list after the filepec. The options list is a list of commands enclosed in square brackets and separated by commas. These tell CP/M that something out of the ordinary is to be done with the directory listing. Options are as follows:

ATT - Displays user defined file attributes (don't worry about this - it's of absolutely no use what so ever.)
DATE - Displays the date and time that the file was last changed. Date stamping must have been initialised previously though.

DIR - Only displays files that have the 'DIR' attribute.
DISK=ALL,DIR=ALL - (either will do) Displays files on all available drives.

DIRV=(A,B,C) - Displays directory from specified drives only.
DIRV=A - Only from drive specified.
EXCLUDE - Displays all files except the files specified.

FF - Sends a form feed before listing out the directory. Only really used for printers.

FULL - Displays masses of status information about the file as it is displayed - how long in Kilobytes, how many 128 byte records it takes up, the password protection mode, and the date/time stamps.

LENGTH=n - Outputs 'n' blank lines before printing the directory, mainly used for printers again.

MESSAGE - Give out status information as CP/M searches various drives etc. Gives you something to watch what it's all happening.

NOPAGE - Overrides the CP/M paging system.

NOSORT - Displays files in the order that they are found rather than alphabetically sorting them.

RO - Displays only files that have the read only attribute set.

RW - Displays only files with the read/write attribute set.

SIZE - Shows the length in K of the files.

SYS - Displays only system files.

USER=ALL,USER=n,USER=(A,B,C) - Similar functions to 'DRIVE' except

refer to the 16 user numbers.

Device redirection is a very delicate piece of software. Say you wanted to use a RS232 interface to be your printer or plot rather than the normal port. When you can then do it is to set a printer output to the RS232 interface simple. But, how do you do it?

As well as all these logical device CP/M also has physical devices. The are:

CON - Screen.

CRT1 - Keyboard.

LPN - Printer.

DISK - RS232.

NULL - Nothing (used for named something off).

To alter the direction of something you simply assign it, take our example earlier: 'DEVICE LIST=CON'. This will set up a default printer output to go to the RS232.

Almost any device can be assign to any other device with a few exceptions that are handled by the transient commands GET and PUT. So we could quite easily attach a terminal to the computer, type in 'DEVICE CON=CON'. And the computer suddenly being operated by remote control. 'DEVICE CON=CRT' change it back to normal.

You can also change option code devices with this command. Change the screen has been discussed earlier. But as far as the RS232 interface concerned DEVICE AUXIN[NO] will set the RS232 interface to the non protected and 600 baud. Various baud rates are accepted. A NO/NOCON controls the hand shaking. These options can be included in the same statement as assignments, and multiple assignments are also allowed. So 'DEVICE LIST=CON,NOCON,14200,CRT=CON' is acceptable.

FORMAT - Is the transient command to format a CP/M disk prior to use. Type in 'FORMAT' and then file instructions.

INITDIR - This command organises the disk directory slightly allow date/time stamping. This is that whenever a file is written to, the time and date when this happens recorded - but remember to set a date using the DATE command or a system will use the date when CP/M was written!

SAVE - Will save a program's memory to disk - not for the usual. SET - This is a very powerful and

and that lets you set a number of attributes for a file or group of files. The SET command basically works in three ways. The first is just setting the attribute as mentioned before. SET "BACKUP,SYN" will change all backup files to read-only and system files. This can be used with any of the BIFF,STX,DIR attributes.

You may have noticed the word "attribute" appearing above. This refers to certain characteristics that can be set in a file. RO and RW set the file to read only or read/write depending, and will prevent the modification of a file. SYN will turn a file into a system file, and DIR enables directory listing. These attributes will be discussed later in the "SET" command which is the command used to change files.

The transient versions of ERA, TYPE, and REN are not nearly as complex as DIR. They merely allow the use of file-specs rather than disk name. So "ERA B:*.BAK" will erase all backup files on drive B. DIR has no transient equivalent.

Now What?

Now the fun starts. On your system disk you will find a good few program names. Most of them are transient commands, but a few of them are better considered as discrete programs.

First let us consider the "quicky" commands. These are accessed in the same way as the resident commands, by just typing them in. The only difference is a slight delay before they take effect due to their being loaded off disk.

DATE - Sets or displays the date and time, used for date stamping of CP/M files when enabled (see MIRROR). To display the date use "DATE"; or to have a continuous display of date and time use "DATE CONSOLE" or "DATE C"; to set the date use "DATE SET".

DUMP - Displays a hex dump of a named file.

GET - Gets console input from a disk file rather than from the keyboard. Rather like the BBC micro's "EXEC" command.

PUT - Writes everything that would have gone to the screen into a disk file instead. Rather like "SPOOL" on a BBC micro.

REDF - This command allows you to set or change physical and logical

devices around, and set the characteristics for those devices. Device names are three letters long with a trailing colon. They may also have the suffix "IN" or "OUT" to change only that characteristic.

CONF (CONFIG, CONFIG?) - is the console.

DEVICE CON (COLUMN=40, LINE=14) - will set the size of the screen.

DEVICE CON(PAGE) - will display the current size.

AUX (AUXIN/AUXOUT) - is the auxiliary in/out usually attached to the RS232 interface.

LIST - is the printer output name. It has no options.

The second function changes the drive attribute and name. The drive attribute is either RW or RO, in normal operation it is RW. SET A[RO] will stop you writing to that drive. In addition each disk can have a name conforming to the same rules as CP/M file names (i.e. eight letters a dot and three letters). SET A[NAME=GAME.BOX] will label the disk with that name.

The last function is used with the password system that CP/M uses. Firstly you can assign a password to the entire disk. This will prevent anyone using the SET command on that disk at all. It takes the form "SET [PASSWORD]=miles" where "miles" is the password. To remove the password "SET [PASSWORD]= " is needed. Note that you need the password to get that far, and that you don't need the trailing bracket - Return will do.

To enable password protection on the files on a disk, the password system must first be initialized. "SET [PROTECT]=ON" will alter this.

To change or set the passwords the command taken on the system "SET FREQ#. # [PASSWORD= miles]" where "miles" is the password and "FREQ#. #" refers to any normal file-spec.

Passwords can also be selectively used on certain functions, these are READ, WRITE, DELETE, NONE. One of these functions can be selected. READ affects everything so that you need a password for almost every access of the file.

WRITE needs a password for writing, renaming, or deleting. This allows the file to be read but not tampered with.

DELETE allows you to do

anything to the file except delete it or rename it. NONE turns off the password protection. The option is "SET WP.COM [PROTECT=READ]."

Default passwords can also be selected. Say all the files on the disk had the password "fred". SET [DEFAULT=fred] would remove the need to type in the password every time a file was accessed. Normally the password has to be included in the file-spec after a trailing semi-colon. Say a file called "private.doc" with a password of "miles" was to be accessed, then the file-spec would be "private.doc;miles".

The final function of the SET command is to alter the way that date stamping is used (assuming that date stamping has been initialized). The three options ACCESS, UPDATE, and CREATE are used. Access will stamp the file every time that you do anything with it, create only stamps it the first time you write it to disk, and update everything that you alter the file. Create and Access are mutually exclusive and having one on will turn the other one off. Syntax is "SET [UPDATE=ON]."

SHOW will display certain information about the disk depending on the option list given. SHOW on its own or with a drive name will give you the read/write space remaining. SHOW with an option after it will perform one of the following functions:

LABEL - Will show the disk name, whether the disk is password protected, the stamp create/update status, and the date that the disk name was created or updated.

USERS - Will list the active user numbers and their respective number of active files and free directory entries.

DIR - Displays the number of free directory entries.

INFO - Will output a comprehensive list of the characteristics of that drive.

So typing in "SHOW A[DIR]" will give you the number of free directory entries on drive A.

I think that wraps it up for this month. Next month I will be telling you about one or two special modifications made to the C128 version of CP/M like the virtual drive and the user defined keyboard. Also I will be detailing some of the really complicated commands, as well as explaining some of the more obscure concepts that CP/M uses. So if you are confused (I know I am) you will be revealed next month.

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This is a...

For more...
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Diskits 1, 2 and 3

Here we start a series of very handy utilities written specially

for disk users.

By Les Allan

DISKIT 1

Memory Saver is a useful routine aimed at saving all your machine's memory from \$0000 to \$FFFF. It is not intended to promote piracy, which may be the immediate conclusion which you leap to, because unlike commercial Freeze Frames, to name but one, the user can only work with material which is under his control. Without the knowledge of a start address it is of no use to you whatsoever.

The Facts

Two machine code routines are located at \$0247 and \$050C which provide the means to save memory between \$0000 and \$FFFF. The program saves three files as follows:

1. Main part - from \$0001 to \$CFFF
2. Kernel - from \$D000 - \$CFFF

In order to make use of the kernel routines for saving etc, this part is relocated to \$1000 and then saved between \$1000 - \$4FFF.

3. Boot part - from \$0001 - \$4FFF

This part contains the character and kernel RAM which is saved between \$1000 - \$4FFF. Two sub-routines are included to perform the following:

- (1) relocates the character/kernel area to \$1000 - \$4FFF
- (2) loads in the MAIN file and then runs it.

OK, so how do you go about using it?

Point number one is that you must know the start address of the program or you're lost before you start.

Instructions

1. Load in the program to convert into two parts
2. Press reset switch if required (Quickdisk preferred)
3. Load "MEMI" \$,1.
4. Load "MIBI2" \$,1.
5. Type in Basic SYS call
i.e. 10 SYS\$004 (if that's the start address, of course). A JMP... command can be used to replace the RUN command in the \$0000 file but you will need to use a m/c monitor or disk monitor to do this.
6. SYS \$28 to save memory.
7. The two files \$BOOT and \$MAIN are now a complete working copy which can be individually crunched to save working space.
8. If, when the \$MAIN part is crunched, it crunches to less than 150 blocks then the \$KERN part \$1000 can be appended to this.

Remember that it is illegal to pirate software so this routine is for use with your own software!

The program as listed must be typed in exactly as written and saved prior to running. Error trap routines are included to ensure that the data as read is correct. The program when run stores the relevant code at a temporary address of \$8000 and when prompted relocates the working programs to Basic, warm start area and the cassette buffer and saves the programs to disk.

DISKIT 2

When programs are saved to disk very often there is a considerable duplication of adjacent data in memory which can be compressed by the use of a code compressor.

This Turbo-Cruncher will work with either Basic or machine code programs providing that the program resides in memory from between \$0000 and \$D000.

The utility provides the user with the facility to view the directory via the F1 key or go straight to the number with the F7 key. The program is then read in at turbo rate, common code compressed and re-saved back to disk at turbo rate prefixed with a '+'.
The skill of the user will determine the results that are available but it is possible to (1) memory with common code, SEA for example, load in the machine code to memory and finally add a Basic boot to provide a simple file that may exist between \$0000 and \$D000. The finished file can then be Turbo-Crunched to produce a small working routine which could be a small as 17 blocks which, considering the saved file was 200 blocks represents a considerable saving of disk space.

Remember that it is illegal to pirate software so make sure that you only do this to your own programs!

The program must be typed in exactly as written and saved prior to running. Error trap routines are included to ensure that the data as read is correct. The program when run stores the relevant code at a temporary address of \$8000 and when prompted relocates the working program to Basic (\$0000) and saves the program to disk.

The program must be typed in exactly as written and saved prior to running. Error trap routines are included to ensure that the data as read is correct. The program when run stores the relevant code at a temporary address of \$8000 and when prompted relocates the working program to Basic (\$0000) and saves the program to disk.

DISKIT 3

This machine code program resides in the cassette buffer at \$53C and enables a program to be made into two parts from the (less-called "MAIN" or "KERN".

The program works by taking its results from the MEMORY SAVE routine which creates three files 'MAIN' 'KERN' and '\$BOOT'. If when the \$MAIN file is Turbo-Crunched the total length of the file

3

less than 134 blocks (i.e. 131 blocks max) then sufficient room exists from 8000 — 82000 in which to fit the 'KERN' part of the program.

It is most important, because of the way in which this routine is written, so in the Turbo C translator remember that a character by a two tone gray fading border and a row out of 8535 201.

Instructions

1. Convert program into three parts 'MAIN', 'KERN' and 'BOOT' using MEMORY SAVER.

2. Turbo-Crunch the file 'MAIN' and IF the resulting file '+MAIN' is less than 134 blocks THEN this routine can be continued ELSE crunch the 'BOOT' file to provide a low memory usage of the program, one part make can not be used with this program.

3. The files to be used must be resident on disk with at least 302 blocks free and called '+MAIN' and 'KERN'.

4. Load 'MEMORY.SAV' to load m/s routine.

5. SYS 828 to start transfer process which loads '+MAIN', relocates the 'KERN' to 82000, transfer kernel relocation program to 99FD0 and

saves the final 'ONE PART' file.

6. Turbo-Cruncher the 'ONE PART' file to further reduce disk space.

Remember that it is illegal to pirate software so make sure that you only do this to your own program!

The program as listed must be typed in exactly as written and saved prior to running. Error trap routines are included to ensure that the data as read is correct. The program when run shows the relevant code at a temporary address of 8000 and when prompted relocates the working program to Base (8000H) and saves the program to disk. 75

PROGRAM MEMORY SAVER CRUNCHER	
01	00 00000000 00000000 0000
02	00 00000000 00000000 0000
03	00 00000000 00000000 0000
04	00 00000000 00000000 0000
05	00 00000000 00000000 0000
06	00 00000000 00000000 0000
07	00 00000000 00000000 0000
08	00 00000000 00000000 0000
09	00 00000000 00000000 0000
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12	00 00000000 00000000 0000
13	00 00000000 00000000 0000
14	00 00000000 00000000 0000
15	00 00000000 00000000 0000
16	00 00000000 00000000 0000
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87	00 00000000 00000000 0000
88	00 00000000 00000000 0000
89	00 00000000 00000000 0000
90	00 00000000 00000000 0000
91	00 00000000 00000000 0000
92	00 00000000 00000000 0000
93	00 00000000 00000000 0000
94	00 00000000 00000000 0000
95	00 00000000 00000000 0000
96	00 00000000 00000000 0000
97	00 00000000 00000000 0000
98	00 00000000 00000000 0000
99	00 00000000 00000000 0000
100	00 00000000 00000000 0000

UTILITIES INDEX

67	124	2474	77.24	87.18	85.18	19	742	2474	87.27	77.54	77.75	11	68	189	2474	85.85	77.77	77.89	14
68	125	2474	78.18	88.12	86.12	20	743	2474	88.28	78.55	78.76	12	69	190	2474	86.86	78.78	78.90	15
69	126	2474	79.12	89.06	87.06	21	744	2474	89.29	79.56	79.77	13	70	191	2474	87.87	79.79	79.91	16
70	127	2474	80.06	90.00	88.00	22	745	2474	90.30	80.57	80.78	14	71	192	2474	88.88	80.80	80.92	17
71	128	2474	81.00	90.94	89.00	23	746	2474	91.31	81.58	81.79	15	72	193	2474	89.89	81.81	81.93	18
72	129	2474	82.00	91.88	90.00	24	747	2474	92.32	82.59	82.80	16	73	194	2474	90.90	82.82	82.94	19
73	130	2474	83.00	92.82	91.00	25	748	2474	93.33	83.60	83.81	17	74	195	2474	91.91	83.83	83.95	20
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75	132	2474	85.00	94.70	93.00	27	750	2474	95.35	85.62	85.83	19	76	197	2474	93.93	85.85	85.97	22
76	133	2474	86.00	95.64	94.00	28	751	2474	96.36	86.63	86.84	20	77	198	2474	94.94	86.86	86.98	23
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82	139	2474	92.00	101.28	100.00	34	757	2474	102.42	92.69	92.83	26	83	204	2474	101.00	92.92	93.00	29
83	140	2474	93.00	102.22	101.00	35	758	2474	103.43	93.70	93.84	27	84	205	2474	102.01	93.93	94.00	30
84	141	2474	94.00	103.16	102.00	36	759	2474	104.44	94.71	94.85	28	85	206	2474	103.02	94.94	95.00	31
85	142	2474	95.00	104.10	103.00	37	760	2474	105.45	95.72	95.86	29	86	207	2474	104.03	95.95	96.00	32
86	143	2474	96.00	105.04	104.00	38	761	2474	106.46	96.73	96.87	30	87	208	2474	105.04	96.96	97.00	33
87	144	2474	97.00	105.98	105.00	39	762	2474	107.47	97.74	97.88	31	88	209	2474	106.05	97.97	98.00	34
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89	146	2474	99.00	107.86	107.00	41	764	2474	109.49	99.76	99.90	33	90	211	2474	108.07	99.99	100.00	36
90	147	2474	100.00	108.80	108.00	42	765	2474	110.50	100.77	100.91	34	91	212	2474	109.08	101.00	101.00	37
91	148	2474	101.00	109.74	109.00	43	766	2474	111.51	101.78	101.92	35	92	213	2474	110.09	102.01	102.00	38
92	149	2474	102.00	110.68	110.00	44	767	2474	112.52	102.79	102.93	36	93	214	2474	111.10	103.02	103.00	39
93	150	2474	103.00	111.62	111.00	45	768	2474	113.53	103.80	103.94	37	94	215	2474	112.11	104.03	104.00	40
94	151	2474	104.00	112.56	112.00	46	769	2474	114.54	104.81	104.95	38	95	216	2474	113.12	105.04	105.00	41
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97	154	2474	107.00	115.38	115.00	49	772	2474	117.57	107.84	107.98	41	98	219	2474	116.15	108.07	108.00	44
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19	191	1914	19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32
20	201	2014	20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32
21	211	2114	21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32
22	221	2214	22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32
23	231	2314	23, 24, 25, 26, 27, 28, 29, 30, 31, 32
24	241	2414	24, 25, 26, 27, 28, 29, 30, 31, 32
25	251	2514	25, 26, 27, 28, 29, 30, 31, 32
26	261	2614	26, 27, 28, 29, 30, 31, 32
27	271	2714	27, 28, 29, 30, 31, 32
28	281	2814	28, 29, 30, 31, 32
29	291	2914	29, 30, 31, 32
30	301	3014	30, 31, 32
31	311	3114	31, 32
32	321	3214	32

UTILITIES UNLIMITED

Table with multiple columns of numbers. The first column contains numbers from 17 to 59. The rest of the columns contain numerical data points, possibly representing utility costs or rates for various categories.

61	71, 71, 71, 71, 71, 71, 71, 71, 71, 71	68	21	20, 20, 20, 20, 20, 20, 20, 20, 20	65	75, 75, 75, 75, 75, 75, 75, 75, 75
62	71, 71, 71, 71, 71, 71, 71, 71, 71, 71	69	20	20, 20, 20, 20, 20, 20, 20, 20, 20	66	75, 75, 75, 75, 75, 75, 75, 75, 75
63	71, 71, 71, 71, 71, 71, 71, 71, 71, 71	70	19	19, 19, 19, 19, 19, 19, 19, 19, 19	67	75, 75, 75, 75, 75, 75, 75, 75, 75
64	71, 71, 71, 71, 71, 71, 71, 71, 71, 71	71	18	18, 18, 18, 18, 18, 18, 18, 18, 18	68	75, 75, 75, 75, 75, 75, 75, 75, 75
65	71, 71, 71, 71, 71, 71, 71, 71, 71, 71	72	17	17, 17, 17, 17, 17, 17, 17, 17, 17	69	75, 75, 75, 75, 75, 75, 75, 75, 75
66	71, 71, 71, 71, 71, 71, 71, 71, 71, 71	73	16	16, 16, 16, 16, 16, 16, 16, 16, 16	70	75, 75, 75, 75, 75, 75, 75, 75, 75
67	71, 71, 71, 71, 71, 71, 71, 71, 71, 71	74	15	15, 15, 15, 15, 15, 15, 15, 15, 15	71	75, 75, 75, 75, 75, 75, 75, 75, 75
68	71, 71, 71, 71, 71, 71, 71, 71, 71, 71	75	14	14, 14, 14, 14, 14, 14, 14, 14, 14	72	75, 75, 75, 75, 75, 75, 75, 75, 75
69	71, 71, 71, 71, 71, 71, 71, 71, 71, 71	76	13	13, 13, 13, 13, 13, 13, 13, 13, 13	73	75, 75, 75, 75, 75, 75, 75, 75, 75
70	71, 71, 71, 71, 71, 71, 71, 71, 71, 71	77	12	12, 12, 12, 12, 12, 12, 12, 12, 12	74	75, 75, 75, 75, 75, 75, 75, 75, 75
71	71, 71, 71, 71, 71, 71, 71, 71, 71, 71	78	11	11, 11, 11, 11, 11, 11, 11, 11, 11	75	75, 75, 75, 75, 75, 75, 75, 75, 75
72	71, 71, 71, 71, 71, 71, 71, 71, 71, 71	79	10	10, 10, 10, 10, 10, 10, 10, 10, 10	76	75, 75, 75, 75, 75, 75, 75, 75, 75
73	71, 71, 71, 71, 71, 71, 71, 71, 71, 71	80	9	9, 9, 9, 9, 9, 9, 9, 9, 9	77	75, 75, 75, 75, 75, 75, 75, 75, 75
74	71, 71, 71, 71, 71, 71, 71, 71, 71, 71	81	8	8, 8, 8, 8, 8, 8, 8, 8, 8	78	75, 75, 75, 75, 75, 75, 75, 75, 75
75	71, 71, 71, 71, 71, 71, 71, 71, 71, 71	82	7	7, 7, 7, 7, 7, 7, 7, 7, 7	79	75, 75, 75, 75, 75, 75, 75, 75, 75
76	71, 71, 71, 71, 71, 71, 71, 71, 71, 71	83	6	6, 6, 6, 6, 6, 6, 6, 6, 6	80	75, 75, 75, 75, 75, 75, 75, 75, 75
77	71, 71, 71, 71, 71, 71, 71, 71, 71, 71	84	5	5, 5, 5, 5, 5, 5, 5, 5, 5	81	75, 75, 75, 75, 75, 75, 75, 75, 75
78	71, 71, 71, 71, 71, 71, 71, 71, 71, 71	85	4	4, 4, 4, 4, 4, 4, 4, 4, 4	82	75, 75, 75, 75, 75, 75, 75, 75, 75
79	71, 71, 71, 71, 71, 71, 71, 71, 71, 71	86	3	3, 3, 3, 3, 3, 3, 3, 3, 3	83	75, 75, 75, 75, 75, 75, 75, 75, 75
80	71, 71, 71, 71, 71, 71, 71, 71, 71, 71	87	2	2, 2, 2, 2, 2, 2, 2, 2, 2	84	75, 75, 75, 75, 75, 75, 75, 75, 75
81	71, 71, 71, 71, 71, 71, 71, 71, 71, 71	88	1	1, 1, 1, 1, 1, 1, 1, 1, 1	85	75, 75, 75, 75, 75, 75, 75, 75, 75
82	71, 71, 71, 71, 71, 71, 71, 71, 71, 71	89	0	0, 0, 0, 0, 0, 0, 0, 0, 0	86	75, 75, 75, 75, 75, 75, 75, 75, 75

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Nursery Rhyme Land

Adventure games are a useful asset to education via a computer. Here we bring you the graphics for our own educational game.

By Margaret and Allen Webb

There's nothing that enhances an adventure game so much as some eye-catching graphics, providing that suitable memory allows for this indulgence.

Our Nursery Rhyme Land game is aimed at the very young and so the graphics have additional importance in keeping the interest going and also aiding recognition of locations.

In the February issue of *Four Commodore*, we brought you the leaders for the first part of this game. This month—in the final part—we are providing the graphics drivers.

Getting in the picture

The method of creating a binary file is as follows:

1. Turn on or cold reset your 64.
2. Enter this line in direct mode:

POKE 44,0; POKE 80*256,0; NEW

3. Load and run Listings 3, 4 and 5 (in that order).
4. Load and Run Listing 2. Save the block starting at 8192 and finishing at 11136. Listing 1 (PC Feb 87) assumes that the file is called PICTURE.BLOCK.
5. If you have already tried the textual part of the adventure on its own, don't forget to reset line 40 of the adventure header so that given in Listing 1 (PC Feb 87).

PROGRAM, LISTING 3

```

00 1 000
01 2 000 : nursery rhyme land
02 3 000 : 00000 0
03 4 000
04 5 000
05 0000 0001-0000 00 00 00 00 00 00 00 00
06 0000 0000 00 00 00 00 00 00 00 00
07 0000 0000 00 00 00 00 00 00 00 00
08 0000 0000 00 00 00 00 00 00 00 00
09 0000 0000 00 00 00 00 00 00 00 00
10 0000 00 0000 00 00 00 00 00 00
11 0000 00 0000 00 00 00 00 00 00
12 0000 00 0000 00 00 00 00 00 00
13 0000 00 0000 00 00 00 00 00 00
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15 0000 00 0000 00 00 00 00 00 00
16 0000 00 0000 00 00 00 00 00 00
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18 0000 00 0000 00 00 00 00 00 00
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26 0000 00 0000 00 00 00 00 00 00
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28 0000 00 0000 00 00 00 00 00 00
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35 0000 00 0000 00 00 00 00 00 00
36 0000 00 0000 00 00 00 00 00 00
37 0000 00 0000 00 00 00 00 00 00
38 0000 00 0000 00 00 00 00 00 00
39 0000 00 0000 00 00 00 00 00 00
40 0000 00 0000 00 00 00 00 00 00
41 0000 00 0000 00 00 00 00 00 00
42 0000 00 0000 00 00 00 00 00 00
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58 0000 00 0000 00 00 00 00 00 00
59 0000 00 0000 00 00 00 00 00 00
60 0000 00 0000 00 00 00 00 00 00
61 0000 00 0000 00 00 00 00 00 00

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00 00 00 00 00 00 00 00 00 00 00 00 00
01 00 00 00 00 00 00 00 00 00 00 00 00
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03 00 00 00 00 00 00 00 00 00 00 00 00
04 00 00 00 00 00 00 00 00 00 00 00 00
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06 00 00 00 00 00 00 00 00 00 00 00 00
07 00 00 00 00 00 00 00 00 00 00 00 00
08 00 00 00 00 00 00 00 00 00 00 00 00
09 00 00 00 00 00 00 00 00 00 00 00 00
10 00 00 00 00 00 00 00 00 00 00 00 00
11 00 00 00 00 00 00 00 00 00 00 00 00
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13 00 00 00 00 00 00 00 00 00 00 00 00
14 00 00 00 00 00 00 00 00 00 00 00 00
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55 00 00 00 00 00 00 00 00 00 00 00 00
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57 00 00 00 00 00 00 00 00 00 00 00 00
58 00 00 00 00 00 00 00 00 00 00 00 00
59 00 00 00 00 00 00 00 00 00 00 00 00
60 00 00 00 00 00 00 00 00 00 00 00 00
61 00 00 00 00 00 00 00 00 00 00 00 00

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03	2 2001 2 20001 20001 20001	03	4 200 210 2
04	3 2001 2 20001	04	000 000 000 000 000 000 000 000
05	4 2001 2 20001	05	1 20 20 200 200 200 20 20 2
06	5 2001 2 20001	06	200 200 200 200 200 200 200 200
07	6 2001 2 20001	07	3 20 20 200 200 200 20 20 2
08	7 2001 2 20001	08	4 20 20 200 200 200 20 20 2
09	8 2001 2 20001	09	5 20 20 200 200 200 20 20 2
10	9 2001 2 20001	10	6 20 20 200 200 200 20 20 2
11	10 2001 2 20001	11	7 20 20 200 200 200 20 20 2
12	11 2001 2 20001	12	8 20 20 200 200 200 20 20 2
13	12 2001 2 20001	13	9 20 20 200 200 200 20 20 2
14	13 2001 2 20001	14	10 20 20 200 200 200 20 20 2
15	14 2001 2 20001	15	11 20 20 200 200 200 20 20 2
16	15 2001 2 20001	16	12 20 20 200 200 200 20 20 2
17	16 2001 2 20001	17	13 20 20 200 200 200 20 20 2
18	17 2001 2 20001	18	14 20 20 200 200 200 20 20 2
19	18 2001 2 20001	19	15 20 20 200 200 200 20 20 2
20	19 2001 2 20001	20	16 20 20 200 200 200 20 20 2
21	20 2001 2 20001	21	17 20 20 200 200 200 20 20 2
22	21 2001 2 20001	22	18 20 20 200 200 200 20 20 2
23	22 2001 2 20001	23	19 20 20 200 200 200 20 20 2
24	23 2001 2 20001	24	20 20 20 200 200 200 20 20 2
25	24 2001 2 20001	25	21 20 20 200 200 200 20 20 2
26	25 2001 2 20001	26	22 20 20 200 200 200 20 20 2
27	26 2001 2 20001	27	23 20 20 200 200 200 20 20 2
28	27 2001 2 20001	28	24 20 20 200 200 200 20 20 2
29	28 2001 2 20001	29	25 20 20 200 200 200 20 20 2
30	29 2001 2 20001	30	26 20 20 200 200 200 20 20 2
31	30 2001 2 20001	31	27 20 20 200 200 200 20 20 2
32	31 2001 2 20001	32	28 20 20 200 200 200 20 20 2
33	32 2001 2 20001	33	29 20 20 200 200 200 20 20 2
34	33 2001 2 20001	34	30 20 20 200 200 200 20 20 2
35	34 2001 2 20001	35	31 20 20 200 200 200 20 20 2
36	35 2001 2 20001	36	32 20 20 200 200 200 20 20 2
37	36 2001 2 20001	37	33 20 20 200 200 200 20 20 2
38	37 2001 2 20001	38	34 20 20 200 200 200 20 20 2
39	38 2001 2 20001	39	35 20 20 200 200 200 20 20 2
40	39 2001 2 20001	40	36 20 20 200 200 200 20 20 2
41	40 2001 2 20001	41	37 20 20 200 200 200 20 20 2
42	41 2001 2 20001	42	38 20 20 200 200 200 20 20 2
43	42 2001 2 20001	43	39 20 20 200 200 200 20 20 2
44	43 2001 2 20001	44	40 20 20 200 200 200 20 20 2
45	44 2001 2 20001	45	41 20 20 200 200 200 20 20 2
46	45 2001 2 20001	46	42 20 20 200 200 200 20 20 2
47	46 2001 2 20001	47	43 20 20 200 200 200 20 20 2
48	47 2001 2 20001	48	44 20 20 200 200 200 20 20 2
49	48 2001 2 20001	49	45 20 20 200 200 200 20 20 2
50	49 2001 2 20001	50	46 20 20 200 200 200 20 20 2

30	3000	20000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000
31	3000	20000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000
32	3000	20000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000
33	3000	20000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000
34	3000	20000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000
35	3000	20000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000
36	3000	20000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000
37	3000	20000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000
38	3000	20000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000
39	3000	20000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000
40	3000	20000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000
41	3000	20000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000
42	3000	20000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000
43	3000	20000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000
44	3000	20000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000
45	3000	20000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000
46	3000	20000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000
47	3000	20000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000
48	3000	20000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000
49	3000	20000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000
50	3000	20000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000	1,140,000

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By Ian Poole

A Popper the popping pea you must explore the anti-fest rooms of each of the Green Giant's castles in search of the Popper juniors that he has kidnapped.

Each castle has eight floors, each eight rooms wide and on each floor you will find a junior Popper. When you have found all eight Poppers in each castle you must put them back into their pod.

However life is not all that easy because the Green Giant has set many hurdles to hinder your progress.

To get from one floor of the castle to another you must pop through a hole in the floor, but make sure that you have found the Popper junior on that floor because there is no way back up again. Because of multiple holes positioned beneath each other because you will be unable to find all the Popper juniors and put them in their pod.

When you get all the Poppers in the pod you go on to the next castle to rescue even more Poppers from the clutches of the Green Giant.

Controls for Play

To move Popper about the castle use a joystick in port 2. Press fire to start a game and push left and right to guide Popper.

In load Popper, press Shift and Run/Stop and press PLAY on the tape deck. The game will load and run automatically.

Note

To type in the game, please use the Easy Commodore Hex Data Entry Program. Check the Contents page to find out exactly where it is in this issue.

PROGRAM: POPPER

USE HEX DATA ENTRY TO TYPE THIS IN.

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Contributions

So you own a Commodore? So you've written some programs? So why haven't you sent them to us?

Your Commodore is always on the hunt out for new programs, hints and tips, articles and even regular series. In fact if you have something that you think could be of use to other Commodore owners we want to hear about it.

So if you have got something which you think we may be interested in. How do you go about submitting it to us?

Below you will find a list of guidelines that will help us to deal with any item that you send in to us. We don't expect everybody to be the next William Shakespeare but if you do follow these simple rules then it will make our job a lot easier.

1) If possible all material sent to the magazine should be typed or printed out on a computer printer.

2) All text should be double spaced i.e. there should be a blank line between each line of text. You should also leave a margin of about 10 characters around the text.

3) On the very first page you should put the following:

Name of the article
Machine that it is for
Any extras required - disk, printer etc.
Your name
Your address
Your telephone number

4) The top of every page should have the following information on it:

Abbreviation of the article title
Your name
The page number

For example, suppose you had submitted an article on C64 interrupts. You should put something like the following at the head of the page:

Interrupts/J.Smith/1

5) Please make sure that you do not make any additional marks on your text especially underlining.

6) Try and write in clear concise English, it does not have to be a work of literature but it must be comprehensible.

7) On the bottom of each page you should put the word MORE if there are more pages to the article or ENDS if it is the last page.

8) If possible, enclose a listing of all programs.

9) Under no circumstances use a staple to hold the pages together. Use a paperclip instead.

10) Programs should be included on either disk or tape. Make sure that you SAVE two copies of every program so that we have a better chance of loading them if problems occur.

11) Programs under 10 lines can be included in the text. If your program is longer than this you must enclose a disk or cassette.

12) If your article needs any artwork then supply clear examples of what is needed. We don't expect you to be an artist but we do need to see what is required.

13) Photographs, if necessary, must be either black and white prints or colour slides. We can take them ourselves so don't worry about this too much.

14) Submissions of any length are welcome. If you have a finite time routine that you think may be of use to someone else we welcome it just as much as a full blown six part series.

15) Payment varies quite a lot and depends on quite a number of factors, such as complexity of program, presentation of program, number of magazine pages it takes up etc. Payment is generally between £10.00 and £200.00.

16) All payments are made in the month that the magazine containing your article has appeared in print.

17) If we do find your submission suitable for inclusion in the magazine we will write to you giving the terms of publication, the rate of payment and an agreement form. Prompt return of this form will allow us to use your program as soon as possible.

18) If you want the program returning to you, should we find it unsuitable for publication, then you should enclose a stamped self addressed envelope.

19) The last and most important point to make is 'get writing', we are waiting for your articles.

Pirate Power

If you're a Basic programmer looking for new tools then this Basic Extension from Pirate Software may be just what you're after.

By Evelyn Mills

Extension 64 is a program which will extend your Basic into a form which is both compact and efficient. Naturally you will require to restructure your ideas on programming, but commands have been streamlined to an extent which is quite remarkable. To select a random number from the 120 or so data commands available, "STIX 2," will give a joystick response on both the x and y axes.

On loading you will find that you have 36 plus K available for programming, the whole being entirely compatible with standard Basic if you wish. Effectively, Extension 64 is primarily intended to enable you to manipulate sprites and music with greater ease and this is most certainly done. There are, of course, many other useful features but these are the two which should impress you most.

You may be daunted by the Manual, however demos are available on both cassette and disk and, if you follow the MAZE Demonstrating through in the supplementary listing provided, you should get to grips with this incredibly simple program structure. Plenty of examples are provided in the Manual and the cross-references are good.

Sprites

So what does all this do? SPRITES may be animated with a one line command, while boundary limits can be set to bounce your sprites around in a variable fashion. Up to 64 sprites

may be displayed on the screen at any one time, working on a basis of seven sets and eight sprites. I would recommend that one set is sufficient for starters. Sprites may be rotated, flipped around, made to 'chase' each other (FLEE command) or halted (HALTON).

In the event that you do not have a sprite generator, there is an excellent one provided which operates via keyboard or joystick. The SPRIGEN (generator) has a very good screen display, allows for flipping, multi-colour display and saves the data to tape or disk for recall if required. Data files may be created in this way. All of the functions and displays are well documented in the Manual; please take note of how to reload your sprite data!

Music

Now to MUSIC. In the demo section you will find a program called ROUND. The tone and quality of the music is excellent; let this demo run on until the music has finished and you will find a 'keyboard' with three Beagle Rhythms incorporated which can give you a lot of fun - full screen directions here.

To program music however, back to the manual: the main references to head for here are VOICE and PLAY; these sections contain full data on how to control waveform, modulation, frequency, synchronisation etc. To find out how to program such data and to output a one or three voice melody, again refer to the demo programs. You

will be surprised at the simplicity of operation.

Other Features

Now to the CHRGEN or character generator. This is a fairly standard procedure for redefinition of characters (size and composition) and a full set of redefined characters may be saved and reloaded for further programming.

Hires graphics are not forgotten; line drawing, circling and boxing are all present, with a choice of modes, colours, and pens. There are full instructions for a SPLIT SCREEN mode allowing multicolour bit map graphics and text to be used together.

I did say that there are over 120 commands - look up the Quick Reference Index and you will find them there - Print at, Color at, Shrink, Scroll, Restore to a line number (very useful), Screen blanking, Auto-numbering, Block deletion etc. Some things old and a lot new.

The most impressive feature of EXT-64 is its compactness of commands: use it in conjunction with Basic and you have here a very powerful programming tool indeed to give you maximum effect with minimal effort. Remember that this a programmer's program. TE

Available

Programs Extension 64 Company:
Pirate Software, 24 Badger Lane,
Ingley, Barnold, Skipton-On-Tyne,
Cleveland. Tel: 0642 762540. Price:
£2.95 tape, £9.45 disk, £25.95 cartridge.

Bare Facts

Inside the Commodore range of computers there are a variety of machine code routines that are available to the user. We look at what they are and how to use them.

Whenever any action is taken on a Commodore computer an internal machine-code routine actually handles the action. For example there is a routine in the computer that prints out the character in the A register to the current output device.

All of these routines sit in a Read-Only Memory (ROM) inside the computer called the Kernel. These routines are therefore referred to as Kernel Routines.

Commodore, in infinite wisdom, has placed the routines on each of their computers in the same area of memory, obviously not all machines have the same routines, but where they are the same they sit at the same place. Knowing what these routines do and where they sit in the computer's memory is extremely important when writing machine-code programs or transferring a program from one machine to another.

Below you will find a complete list of all the major Kernel routines. This should aid you in writing your own machine-code programs and converting from one machine to another.

ACTPR

Purpose: Get a byte from the serial bus.
Call address: \$FFA3
Output parameter: A
Machines: All

Whenever you wish to get data from the serial bus this is the routine to use. This routine gets a byte of data and places it in the A register. Before using this routine the TALK routine must be used to tell the device on the serial bus to send data. If the input device requires a secondary command you must send this with the TALK routine before using this one.

BOOTCALL

Purpose: Boot the disk.
Call address: \$FF23
Input parameter: X
Machines: C128

When called this routine will boot any auto-start disk that is in the drive. The X register should contain the device number of the drive.

C64 MODE

Purpose: Enable the C64 mode

Call address: \$FF4D
Machines: C128

A call to this routine causes a C128 in C128 mode to switch into C64 mode.

CHKIN

Purpose: Open a channel for input.
Call address: \$FFC8
Input parameter: X
Machines: All

This defines a logical file for input. The file must have already been opened by using the OPEN Kernel routine. If you are wanting to receive data from somewhere other than the keyboard this routine must be called before using CHRIN or the GETIN routines. Should you be using the keyboard then the calls to this and the OPEN routine are not required.

CHROUT

Purpose: Open a channel for output.
Call address: \$FFC8
Input parameter: X

Similar to the above routine, however, this time the OPEN file is set up for output. This routine is used before outputting data to any device, unless it is the screen.

CHRIN

Purpose: Get a character from the input channel.
Call address: \$FFCF
Output parameter: A
Machines: All

This routine gets a byte of data from a channel already set up as the input routine by using the routine CHRIN. If CHRIN has not been used then all input is expected from the keyboard. The data is returned in the accumulator.

CHROUT

Purpose: Output a character.
Call address: \$FFD2
Input parameter: A
Machines: C16, Plus/4, C64, C128

This routine sends the character in the A register to the current output device. The output device must have been set up using the OPEN and CHKOUT routines. If these have not been used the data is sent top the screen.

CHKOUT

Purpose: Send byte over serial bus
Call address: \$FFA8
Input parameter: A
Machine: All

This is the routine used to send data over the serial bus. Before you use this routine the LISTEN routine must be used to tell a device to get ready to receive data. Should the device use a secondary address then you should use the SECOND routine to send this.

CINT

Purpose: Initialize video controller and screen editor
Call program: \$FF91
Machine: All

This routine initializes the video chips and the Screen editor. On the C128 the function keys are set to their default values and the 40/80 key is checked to see which mode the video chip should be in.

CLALL

Purpose: Close all files
Call address: \$FFE7
Machine: All

A call to this routine will close all open files. A CLRCHN routine is also executed to reset all I/O channels.

CLOSE

Purpose: Close a specified file
Call address: \$FFC3
Input parameter: A
Machine: All

This routine is used to close a file after it is finished with. The accumulator should be loaded with the number of the channel to be closed before calling this routine.

CLRCHN

Purpose: Clear I/O channels
Call address: \$FFCC
Machine: All

Call this routine to clear all open channels and restore the Input/Output channels to their original default values. If any open channels are set up as serial then an UNTALE is set first to clear the input channel or an UNLISTEN is set to clear the output channel.

GETCONF

Purpose: Get the configuration byte.
Call address: \$FF6B

Input parameter: X
Output parameter: A

A table at memory location \$FF6B is required for normal operation of the C128. The configuration index should be passed in the X register. The configuration is returned in the A register.

DLCHR

Purpose: Copy the character ROM
Call address: \$FF62
Machine: C128

A call to this routine causes the character set to be copied into the video display chips internal memory.

DMACALL

Purpose: Initialize external RAM components
Call address: \$FF56
Input parameter: X
Machine: C128

When you require direct memory access to external memory it must first be initialized with this routine. The X register should contain the new configuration.

GETIN

Purpose: Get a character
Call address: \$FFE4
Output: A
Machine: All

If the input channel is the keyboard then one character is read from the keyboard queue and its ASCII value placed in the A register. No characters in the buffer places a zero in the A reg. If the input channel is serial, cassette or screen then use the CHRIN routine.

INDCMP

Purpose: Compare the accumulator with memory in any bank
Call address: \$FF7A
Input parameters: A, X, Y \$02C
Output parameter: \$02

To compare the contents of the accumulator with the contents of a memory location in any bank you should put the configuration index in the X register and the offset in the Y register. Location \$02C3 should hold the address of the zero page memory location that holds a pointer to the memory location that you wish to compare with.

INDFET

Purpose: Get a byte from any bank
Call address: \$FF74
Input parameters: A, X, Y
Output parameter: A

This allows you to read the contents of an address in any configuration without having to change the actual memory configuration. A pointer must be defined in a zero page

location that points to the address to be read. The A register should contain this address. The configuration index is passed in the X register and the offset to the zero page pointer in the Y register. The result is returned in the A reg.

INDSTA

Purpose: Store accumulator in any bank
Call address: \$FFF7
Input parameters: A, X, Y, \$0189
Machine: C128

This routine will store the contents of the A register in any memory configuration. The A register should contain the character to be stored. The zero page address where a pointer to the memory address is stored must be placed in number and the Y register the offset from the location that is in zero page.

IOBASE

Purpose: Define I/O memory page
Call address: \$FFF3
Output parameters: X, Y
Machine: All

This routine sets the X and Y registers to the address of the memory section where the memory mapped I/O devices reside. You can then use this address with relative addressing to access the different ports in the necessary devices. The X register contains the low byte of the address and the Y register the high byte.

This routine provides a certain amount of compatibility between Commodore machines. If you call this routine and use relative addressing to address the registers in the I/O chips.

IOINIT

Purpose: Initialize I/O devices
Call address: \$FFB4
Machine: All

This routine initializes all input/output devices and routines.

JMPFAR

Purpose: Jump to any bank
Call address: \$FF71
Input parameters: zero page 2 to 9
Machine: C128

This routine enables a jump to another routine in any bank. Parameters are passed through memory locations 2 to 9.

JSRFAR

Purpose: Jump to a subroutine in any bank
Call address: \$FF6E
Input parameters: Zero page 2 to 9
Output parameters: Zero page 2 to 9

This routine is used to jump to a subroutine in any bank. The parameters are passed in memory locations 2 to 9.

LISTEN

Purpose: Tell a device on the serial bus to listen
Call address: \$FFB1
Input: A
Machine: All

This routine commands a device on the serial bus to get ready to receive data. The A register should be loaded with the device number before using this routine.

LKLUPL

Purpose: Search in table for logical file number
Call address: \$FF59
Input parameter: A
Machine: C128

This routine searches in the table for the device and secondary address of the logical file specified in the A register. If the file is found then carry is cleared, A register contains the file number, X holds the device number and Y holds the secondary address.

LKUPSA

Purpose: Search for secondary address
Call Address: \$FF5C
Input parameters: Y
Machine: C128

The specified secondary address (in the A reg) is searched for in the table of OPEN files. If the search succeeds the carry is cleared and the A register will contain the File Number and the X register the device number.

LOAD

Purpose: Load from device
Call address: \$FFD5
Input: A, X, Y
Machine: All

This routine LOADs data from the specified device. The Accumulator should be set to a zero if a LOAD is to take place or a one should you require a verify. If you OPEN the file with a secondary address of 0 the X and Y registers should contain the start address for the LOAD. If the secondary address is 1 then the data is LOADed into the zero memory that it was SAVEd from.

Before you use this routine you must have called the SETLFS and SETNAM routines.

MEMBOT

Purpose: Set bottom of memory
Call address: \$FF9C
Input parameters: X, Y
Output parameters: X, Y
Machine: All

This is used to set the bottom of memory. The lower boundary of the available memory is set with the two registers X and Y. X is the low byte of the address and Y the high. If the carry flag is set when a call is made to this routine the memory bottom is read and returned in the X and Y registers.

MENTOP

Purpose: Set the TOP of RAM
Call address: \$F199
Input parameters: X, Y (carry clear)
Output parameters: X, Y (carry set)
Machines: All

When the carry is set the top of memory address is returned in the X and Y registers. If carry is clear the top of memory is set to the address in the X and Y registers, X is the low byte and Y the high.

OPEN

Purpose: Open a logical file
Call address: \$FFCD
Machines: All

This is the routine used to OPEN a logical file. Once the file is set up you can then use it for either input or output. The SETLFS and SETNAM routines must be called before using OPEN.

PFKEY

Purpose: Define a function key
Call address: \$FFB5
Input parameters: A, X, Y
Machine: C128

This is the routine to use if you are wanting to define a function key. The zero-page address that points to the text for the key should be placed in the A register. The X programmed and the Y register should contain the length of the string.

PLOT

Purpose: Set cursor location
Call address: \$FFFD
Input parameters: X, Y (carry clear)
Output parameters: X, Y (carry set)
Machines: All

A call to this routine with the carry set will return the position of the cursor on the screen in the X and Y registers. X holds the row number and Y holds the column. Calling this routine with the carry clear will move the cursor to the screen position specified in the X and Y registers.

PRIMM

Purpose: Print out a message
Call address: \$FF7D
Machine: C128

All characters following this call are sent to the current output device until a zero-byte is reached. The program then continues normally.

RAMTAS

Purpose: Perform RAM test
Call address: \$FF87
Machines: All

This is the initialization routine that sets up the zero-page etc. of the machine. This is sometimes called a warm start.

RDTIM

Purpose: Read system clock
Call address: \$FFDE
Output parameters: A, X, Y
Machines: All

This is used to read the system clock. Three bytes are returned by the routine. The A register contains the most significant byte, the X register contains the next most significant and the Y register the least significant.

READST

Purpose: Read Status word
Call address: \$FFB7
Output parameter: A
Machines: All

This routine returns the status of the I/O devices in the A register. This routine should be called and the status checked after the I/O operation.

RESTOR

Purpose: Initialize the system vectors
Call address: \$FFFA
Machines: All

This routine sets up the default values for all of the computer's system and interrupt vectors.

SAVE

Purpose: SAVE memory to a device
Call address: \$FFD8
Input registers: A, X, Y
Machines: All

This is the routine to use if you wish to SAVE a section of memory. The device address, file name etc. must be set with the SETLFS and SETNAM routines. 128 owners must also set the bank with a call to SETBANK.

The zero-page address at which the start address of the area to be SAVEd is stored must be placed in the A register. The end address of the area is placed in the X (low) and Y (high) registers.

SCANKEY

Purpose: Scan the keyboard

Call address: BFF7F
Machines: All

This routine scans the keyboard and checks for a keypress. This routine is called by the interrupt handler. If a key is pressed its ASCII value is placed in the keyboard queue.

SCREEN

Purpose: Return screen format.
Call address: BFFED
Machines: All (but see I28)
Output parameters: X, Y

This routine returns the format of the screen. On a CG4 this would be 40 columns in the X register and 25 lines in the Y register. This routine can be used to determine what machine your program is working on.

I28 owners should note that this routine will get the size of the current screen window. After the call the A register contains the maximum column number. The number of lines in the Y register and the X register contains the number of columns.

SECOND

Purpose: Send secondary address for LISTEN
Call address: BFF93
Input parameters: A
Machines: All

Use this routine when you wish to send a secondary address to an I/O device after issuing a LISTEN command. When sending a secondary address down the serial bus the address must first be ORed with \$04.

SETRNK

Purpose: Define memory bank for disk operation.
Call address: BFF68
Input parameters: A, Y
Machines: C128

You should call this routine before performing a LOAD, SAVE, VERIFY and OPEN command. The configuration index of the filename should be placed in the Y register and the configuration index of the memory area to be processed should be in the accumulator.

SETLFS

Purpose: Set up a logical file
Call address: BFFBA
Input parameters: A, X, Y
Machines: All

Use this routine to set the logical file number, device address and secondary address. The file number is passed in the A register. The X register should contain the device number and the Y register the secondary address.

SETMSG

Purpose: Enable/Disable system messages
Call address: BFF90
Input parameter: A
Machines: All

This routine controls the printing of error and system messages. If bit 7 of the A register is set then error messages will be printed. If bit 6 of the A register is set then system messages will be printed.

SETNAM

Purpose: Set up file name
Call address: BFFED
Input parameters: A, X, Y
Machines: All

This is the routine to use when you are setting up a file name for the OPEN, SAVE or LOAD kernel routines. The A register should contain the length of the file name. The X and Y registers should contain the address in memory where the name is stored. X is the low byte and Y the high. I28 owners must also use the SETRNK routine to specify the bank to be used.

SETTIM

Purpose: Set the system clock
Call address: BFFD8
Input parameters: A, X, Y
Machines: All

The internal 'JIT' clock can be set by this routine. Before calling this routine the A register should contain the most significant byte, the X register should contain the next most significant and the Y the least.

SETMO

Purpose: Set the time out flag for the IEEE
Call address: BFFA2
Input parameter: A
Machines: All

This routine saves the value passed in the accumulator to the timeout flag for the IEEE routines. Bit 7 of the accumulator should be set to 1 for timeouts to be effective.

STOP

Purpose: Check if the STOP key is pressed
Call address: BFFE1
Output parameter: Zero flag
Machines: All

This routine checks to see if the STOP key has been pressed since the last IRQ call. If it has then the zero flag will be set. In addition the CLEAR routine will be called.

SWAPPER

Purpose: Switch between 40 and 80 columns.
Call address: \$FF2F
Machines: C128

A call to this routine will cause a toggle between 40 and 80 column modes of operation.

TALK

Purpose: Tell a device on the serial bus to talk.
Call address: \$FFB4
Input parameter: A
Machines: All

When you want a device on the serial bus to TALK you must call this routine with the device number in the A register.

TASKA

Purpose: Send a secondary to a device that is commanded to TALK.
Call address: \$FF96
Input parameter: A
Machines: All

This routine will transmit the secondary address contained in the A register to a TALK device.

UDTIM

Purpose: Update the system clock.
Call address: \$FFEA
Machines: All

This routine causes the system clock to be updated. It is normally updated by the interrupt every 1/60th of a second.

UNLSN

Purpose: Send an UNLISTEN command.
Call address: \$FFA8
Machines: All

A call to this routine will tell all devices on the serial bus that are listening to stop receiving data.

UNTLK

Purpose: Send an UNTALK command.
Call address: \$FFA0
Machines: All

A call to this routine will tell any devices that are set to TALK to stop transmitting data.

VECTOR

Purpose: Copy or reset the system vectors.
Call address: \$FF8D
Input parameters: X, Y (carry clear)
Output parameters: X, Y (carry set)

Machines: All

Calling this routine with the carry bit set stores the current contents of the RAM vectors in a list pointed to by the X and Y registers. Calling this routine with the carry bit clear causes the RAM vectors to be copied from the area pointed to by the X and Y registers.

In Bare Facts we are attempting to provide you with the necessary information to make writing machine code programs and transferring machine code programs from one machine to another. If there are any specific areas that you would like us to consider for inclusion in this section of the magazine then please write to us at:

Bare Facts
 Your Commodore
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However we must stress that all we are asking for is particular subjects that you require information on. We can not endeavour to convert or write your programs for you.

75

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B A E A H

Printer Winner

The winner of our December competition was Gwynne Gibson, from Pity Me in Durham. He has won a Citizen 1200 *Sis* Matrix Printer worth £187 excluding VAT. A Commodore printer interface is also being included so that the printer is ready for immediate use. Congratulations Gwynne!

Congratulations!

The first prize winner of the CCL Hi-Wave competition was Brian Osborn of Kirkcubrick who received a superb package of a signed Tubular Bells album, a copy of the video and the computer program. The 29 runners up prizes of the program go to: D.J. Arnett, Swindon; Henry Topham, Sinden Kighley; W.H. Cox, West Lynn; Stephen Smith, Barnham; Mr P.G. Bullimore, Falmace; Ann Palmer, Statham; C.M. England, Chesille House; Tracy Rodin, Poole; Mr R. Lucia, Harlow; Mark Winfield, Norrall Hill; Julian Faganidi, Dulwich; J. Harper, Bofford; Mr R. Gillings, Portsmouth; Andrew Fairbrother, Princes-on-Sea; Ian Hallow, Hants; Peter Goodwin, Somerset; H.J. Brumby, The Netherlands; D. Davrick, Cheddar; Ian Horn, Colchester; Mr J. Gubbins, Aldershot; Mr D. Taylor, Isle Of Wight; Maroon James, Durham; Michael Treacy, Co. Limerick; P.A. Hardy, Farnborough; Stephen Holliday, Chorley; Anthony Givis, Hove; Steve Skinner, Nottingham; Simon Thurman, Birmingham.



Cups!

In our February issue, there were some confusing line numbers in the *Word Pro 4.0* article for the *Plus/4*. There was an assembly listing omitted from the article and although this is not necessary, when you want to type in and run the program, it may be quite useful to those of you who are interested in exactly how the program works. Therefore, if you want a copy of the listing, please send us a.s. to *Word Pro Listing, Four Commodore, 1 Golden Square, London W1R 3AB*.

Also in the February issue there is a stray character in two lines of *Adventure Aid Graphics* (p.96). The line should actually read:

```

100 IF (X=1) THEN GOTO C3-C3-1. END BR
    "C3, C3, C3, C3, C3"
100 PRINT "C3, C3, C3, C3, C3"
    : GOTO C3, C3, C3, C3, C3
  
```

We apologise for any inconvenience which these slight errors may have caused to our readers.

Hex Data Entry

We have had a number of calls from people who are having problems getting the [REV H] and [REV SN] in line 50. These should appear in the listing as a reverse H character and a reverse shifted N. In the LISTING article we explain how to get a [REV] character, follow the same procedure for these. It appears that a dot has disappeared in some copies of the magazine. Line 540 should have [LEFT], [LEFT] within the quote.

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 Assistant Editor: Marie Curry
 Editorial Assistant: Stuart Kirkham
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