

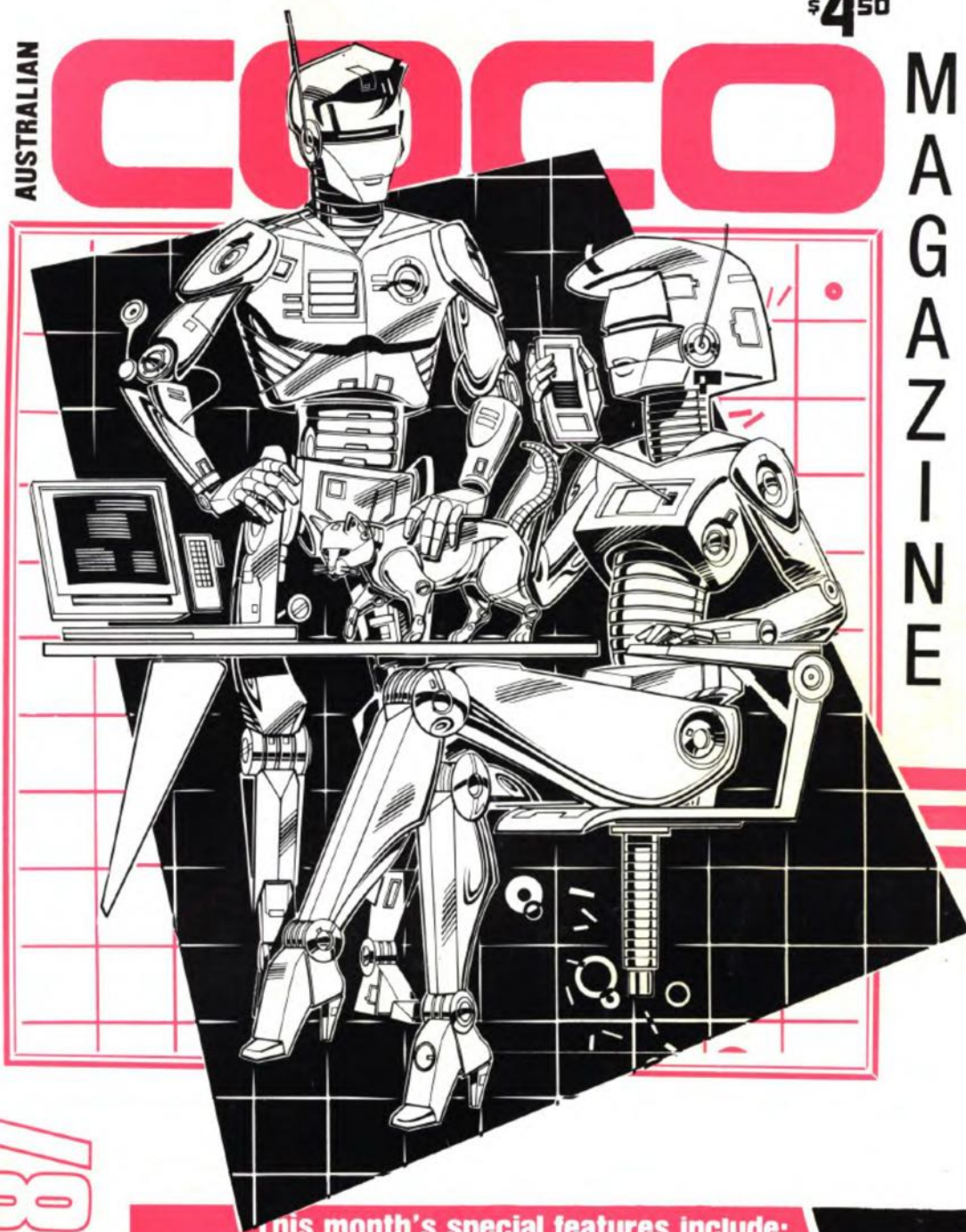
THE Magazine for experienced TANDY Colour Computer Users!

\$4⁵⁰

AUSTRALIAN

COCO

MAGAZINE



VOL3NO11
JULY87

This month's special features include:

WORD-PROII — CHATWIN MANOR — AUTO30K

COCO3 EXPERIMENTS — CZAP3 — LINE

LISSABOX — ONOV3.1 — INFILTRATOR

plus

CRYSTAL (COCO3) — COCO3 REVEALED

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WHAT'S ON THE BEST OF CoCoOz

Best of CoCoOz #1. EDUCATION

ROADQUIZ ROB WEBB
SHARE MARKET ALEPH DELTA
HANGMAN ALEPH DELTA
AUSTQUIZ P. THOMAS
ALPHABET RON WEBB
SPELLING TUTOR IAN LOBLEY
TANK ADDITION DEAN HODGSON
FRACTION TUTOR ROBBIE DALZELL
TABLES BARRIE GERRAND
ICOSA BOB WALTERS
KIDSTUFF JOHANNA VAGG
TAXMAN TONY PARFITT
FLAGQUIZ ROB WEBB

Best of CoCoOz #2 part 1 16K GAMES

PYTHON V. ARMSTRONG
COCONIND STEVE COLEMAN
POKERMCH GRAHAM & MATTHEWS
OILSLICK JEREMY GANS
SPEEDMATHS DEAN HODGSON
COMETOR BOB THOMSON
BATTACK JEREMY GANS
SKIING JOSHUA GANS
PROBDICE BOB DELBOURGO
RALLY TONY PARFITT
CHECKERS J & J GANS
FOURDRAW JOHANNA VAGG

Best of CoCoOz #2 part 2 32K GAMES

TREASURE DAVIDSON & GANS
SHOOTING GALLERY TOM DYKEMA
MASTERMIND GRAHAM JORDAN
GARDEN OF EDEN DAVE BLUHDORN
ANESTHESIA MIKE MARTYN
YAHTZEE KEVIN GOVAN
ORGOON TRAIL DEAN HODGSON
BATTLESHIP CHRIS SIMPSON
ADVENTURE + STUART RAYNER
ANDROMEDIA MAX BETTRIDGE
LANDATTACK ALDO DEBERNADIS

Best of CoCoOz #3 UTILITIES

SCREEN PRINT TOM DYKEMA
RANTEST TOM DYKEMA
PRINT SORT PAUL HUMPHREYS
BEAUTY BOB THOMPSON
DATAGEN ROBIN BROWN
PCOPY BRIAN DOUGAN
FASTEXT OZ-VIZ
MONITOR + BRIAN FERGUSON
COPYDIR THOMAS SZULCHA
LABELLER FRED BISSELING
SPEED CONTROL PAUL HUMPHREYS
2BC WARREN WARNE
CREAT-A-TITLE BRIAN FERGUSON
DISKFILE BRIAN DOUGAN
BIG REMARKS BOB THOMSON
LABELLER GORDON BENTZEN
DIR MORRIS SINGER
HI ALEX. HARTMANN

Best of CoCoOz #4 Business

HI ALEX. HARTMANN
(disk; Disk Directory Manager)
PERSMAN PAUL HUMPHREYS
(Personal Finance Management)
BANKSTAT BARRY HATTAN
(Annual & Store Statement)
CC5 GRAHAM MORPHETT
(tape; Sales invoicing)
INSURE ROY VANDERSTERN
(Analyse Home Contents)
COCOFIL BRIAN DOUGAN
(tape; database)
DPMS PAUL HUMPHREYS
(disk; Disk Program Management Sys)
DATABASE PAUL HUMPHREYS
(tape; THE tape database)
RESTACC DUNG LY
(tape; Restaurant Accounts)
SPDSHEET GRAHAM MORPHETT
(disk; 22 column spreadsheet)
PRSPDSMT GRAHAM MORPHETT
(disk; prints out "SPDSHEET")
ACS3 GREG WILSON
(disk; Multi disk database)

Best of CoCoOz #5 ADVENTURES

ADV 32K S. RAYNER
QUEST TONY PARFITT
LABYRINTH JAMES REDMOND
ADV + SEAN LOVE
CRYSTAL C & K SPRINGETT
PRISON TIM ALTON
OPALTON IAN CLARKE
WIZARD DARRELL BERRY
TREASURE C. DAVIDSON
LOST ALEX. HARTMANN

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HATDANCE JOHANNA VAGG
AUSTSONG McDERMOTT FAMILY
ADVANCE McDERMOTT FAMILY
WALTZING McDERMOTT FAMILY
TIMEKANG McDERMOTT FAMILY
BAND McDERMOTT FAMILY
KIDSTUFF JOHANNA VAGG
MATCHER ?
LETTERS JACK FINNEN
BABYSIT JOHANNA VAGG
SPELLING JOHANNA VAGG
SPEEDTAB DEAN HODGSON
10 FACES JOHANNA VAGG

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THE ROOM HERMANN FREDRIKSON
BACK STREET JOY WALLACE
LOCO MIKE D'ESTERRE
COCO ART SANDY McGREGOR
KANGA JOHANNA VAGG
THE BOAT SANDY McGREGOR
SAD COCO P. BOLLE
TOWER C.A. SYMS
VINDY DAY SARAH LAW
SAILING STEVE YOUNGBERRY
OUTHOUSE STEVE YOUNGBERRY
SMURF JOHANNA VAGG
SUNSTATE STEVE YOUNGBERRY
HELICOPTER ANDREW WHITE
MARTHA ANDREW WHITE
BAD MOON STEVE YOUNGBERRY
MCC JOY WALLACE
EAGLE ?
BLASTER PAUL YEOULD
FOGHORN PAUL YEOULD

Best of CoCoOz #8 16K GAMES

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QWERL DARRELL BERRY
SHOOTOUT CRAIG STEWART
SHUTTLE CRAIG STEWART
FROG DARREN OTIERY
FROGRACE TOM LEHANE
KIMMAT TOM LEHANE
GRANDPRI DOUG GREY
VATER VARS JUSTIN LIPTON
CATERPILLER JUSTIN LIPTON
DETECTIVE VAL STEPHEN
BREAKOUT WHY/BILT

Best of CoCoOz #9 32K GAMES

TRIONING BOB DELBOURGO
MATCHEM CHARLES BARTLETT
GO BOB DELBOURGO
WARZOD MAX BETTRIDGE
CHOMPER MAX BETTRIDGE
POPBALL MAX BETTRIDGE
LUDO WHY/BILT
SABRE ANDREW SIMPSON
MOVEABOUT KEVIN GOVAN
JIGSAV JAMES REDMOND
LABYRINTH JAMES REDMOND
TANK CRAIG STEWART

Best of CoCoOz #10 Education II

METEOR DEAN HODGSON
DRIVERS TEST ANDREW SIMPSON
SALE JUSTIN LIPTON
TABLES PAT KERMODE
OPALTON IAN CLARKE
CAPITAL LETTERS BOB HORNE
TEST MATCH JEFF SHERR
SENTENCE ENDINGS BOB HORNE
ESCAPE DEAN HODGSON
RAILMATH BOB HORNE
COUNTDOWN DEAN HODGSON
WHATZIT BOB HORNE
HOMOPHONES BOB HORNE
COMPOUND WORDS BOB HORNE

Best of CoCoOz #11 Education III This is a DISK only issue!!

CHATWIN MANOR BOB HORNE

Please Note: Some of the programs on Best of CoCoOz #3 and #4 will not work on the Coco 3.

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'What's new

Well ... here I am, again! Do you realise that it's been exactly one year - one whole, complete year - since I took over the job of being editor for Rainbow ... erm, CoCo Magazine? I didn't!

Since then, we've moved, dropped the American content out of Rainbow (actually, we dropped Rainbow as well ...), got ourselves a new magazine (known as "Softgold"), both magazines with nothing BUT Australian content, a complete name change ("CoCo" became "Softgold" and "Rainbow" became "CoCo"), new personnel (Karen & Paul), and to top it all off, a new place to work!

Things change in a year, don't they? THIS particular magazine a year ago was featuring the best stuff the American Rainbow could put out - and now it's better, 'cause we're putting nothing but Australian material in!

That says a lot for Australian programmers, eh?

It says that we're good at what we do! So there! It shows to everyone else how competent we can be, if we put our heads down and really work on it.

Congratulations for making the magazines the kind of magazines YOU want them to be.

Competitions

All the competitions entries I must say have been great! Because I'm the first to see all the programs as they come through the door, I get to see what great efforts people have put into their work.

Remember, all entries have to be in BEFORE the 31st of July to be eligible for this year's prizes.

The prize winners will be announced at Conf'87 and the winners can look forward to some great prizes

If you're interested, we're holding the ...

* Graphics competition: give us your best picture, in any form you want ... your picture can be created through the following means:

- * CoCoMax,
- * Basic,

* Machine Language,
* Graphicom,
* Digitized pictures,
... as long as it's a graphics picture.

* Utilities competition: any utility, software or hardware will be accepted, as long as the item is a utility, not an application ... yes, there is a difference!

A utility is something you can directly use with your computer (eg, a disk zap program), while an application is something where you use your computer to apply to a situation (eg, a program to figure out the fuel economy of your car).

* Games Competition: In this category there will be two first prize winners. One for the best CoCo 3 game and one for the best CoCo 2 program.

The winners game in each category will have their game purchased by Tandy for distribution.

Please state whether your game is an entry to the games competition - those people who have already submitted one will be eligible for the draw.

Viatel

A new feature for Goldlink from now on is that Tuesday night has been nominated as Computer User's night.

Although you can ask for help or leave some advice for other users any time on Goldlink, Tuesdays nights we'll be on specifically to talk about computers.

What's more, a lot of other people who don't normally log on often will be on to talk computers to ...

So Tuesday night is computer night on Goldlink - log on and join in!

Conf'87

Preparations for Conf'87 are really zooming! We've received lots of registrations for this event, and places are limited, so hurry - get your registration in!

IN A NUT SHELL



?

Warwick User Group

About the beginning of June, Graham and I went up to the Warwick User Group (hands up where is Warwick?).

(For those who haven't been privileged, Warwick is about 200km west of Ashmore ... now, who knows where Ashmore is?)

About 15 people turned up at the meeting held in the Warwick primary school, and our topics covered everything from Telememo (what the Tandy blokes use to talk to each other - a service on Austpac) to Viatel (what some other people use to talk to each other); basically a communications night!

All in all, Graham and I got so wrapped up in this meeting that we finally got home to the Coast at about 2.00am.

It was great to meet the people there. They're a keen group with a number of capable members.

New Premises

As everyone should know (by now), we have moved! For the underprivileged (or those who don't read 'Nutshell' or 'Clubroom') our new address is 26/207 Currumburra Rd, Ashmore, 4215.

Our postal address is still the same (which, in case someone doesn't know) is PO Box 1742, Southport, Qld, 4215.

Now, our NEW telephone number is (075) 39-6177. For those of you who have been trying to ring this number, don't give up yet! - we're working on another telephone number!

If anyone wants to drop in on us, this is how it works:

From Southport, go west along Nerang St until you see an Ampol Station on the right and a shooting center on the left.

Here turn left. Immediately on your left (after you have turned the corner) is a shopping type complex. Stick to the left. You'll see a Pizza place and a Hairdressing store. Next to it, you'll see an Arcade. Go into the arcade and we're the first door on the left.

Dear Graham,

Some time ago I ordered the December 1986 edition of Rainbow on Disk from you but unfortunately the OS-9 files were missing. The disk was not a floppy. I have checked both sides of the disk many times and have found nothing!

The normal RSDOS files are correct. Would you please help me?

L.W. Brown
Burwood, Vic

We were selling Rainbow on disk quite a few months before Falsoft themselves in the US began to sell such a product.

The product we sold was always based on the Rainbow on tape we received on a monthly basis from the US and this did not change when Rainbow began selling a disk version themselves basically because at the time there was no demand for the OS-9 material.

We have now concluded our arrangement with Falsoft and no longer supply any Falsoft material - even back issues, so we cannot help you with the OS-9 material you need.

Graham

*

Dear Graham,

I know you are probably sick and tired of people complaining. However I have a couple of complaints regarding programs in the first editions of Softgold and Australian CoCo.

I am quite new to the field of computing (12 months) and I enjoy both magazines. I look forward to each month's edition.

I was reading the letter in the first edition of the new Softgold where a reader complained about numerous mistakes in the listings. Your letter of defense stating that the number of mistakes is decreasing seems unbelievable, as in Australian CoCo the utility, "Drawing Machine", by Andrew McLintock, has a major typing error, in that Line 40 has commands that do not make sense.

After spending five hours typing it, a few desperate phone calls were made after which I discovered that you had somehow got OS-9 mixed up in the listing. With no way of fixing

this, the program is useless until you publish the corrections.

Secondly, I have noticed that in the programs designed for use without disk drive you still don't persist in leaving the 'CSAVE' command without the 'C'. It doesn't cause me any problems, but to a beginner it may. Please could you refrain from doing this.

I would be pleased if you could rectify these problems.

Neil Evans
Cheltenham, VIC

Neil,

Okay, you got us!

In the March magazine we got trapped because we were using the 1.4 Rainbow Bits DOS (Disk Operating System) when we needed to use the Tandy DOS in the CoCo 3. The programs effected were re-printed in the April issue.

You've no doubt heard of Murphy's Law. I guess it was tempting fate - if not fate, then certainly Murphy - to make a statement of that nature, especially in the first issue of the new magazine. But I still contend that basically speaking the error rate in the magazines is improving considerably.

As for your request regarding line 3 of our programs, we've previously suggested that everyone consider using this system.

The beauty of using line 3 as your save line is that you don't have to remember the name you are using for that program.

Cassette users should be aware that the word CSAVE is the word that needs to be used in place of the word SAVE in that line.

I accept that it may create a minor problem for new users, however if the jump in line 2 is correctly in place, they won't even notice it!

If this sounds a little callous, I'm sorry but the way people learn about their computers is from the errors either they or we make. We're trying very hard not to make many errors, but if you have a problem you can always phone your local user group contact, or Tandy or ourselves to get help.

Graham.

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SOME EXPERIMENTS with COLOURS and GRAPHICS on the COCO3

UTILITY

by George McLintock

I HAVE HAD A CoCo 3 for some months now and have been experimenting with some of the effects that can be obtained with its new graphic capabilities.

The program submitted, called 3EXPERMT, contains a number of routines that I developed.

The main line of interest was with different shades of the same basic colour, and how they merge from one to the other.

With 64 colours, the CoCo 3 provides a range of different colours, each only slightly darker or lighter than the one next to it.

The first routine provides a means of generating these effects on the HSCREEN 2 screen, from an existing PMODE 4 picture

Other routines were then developed to:

- pre-define up to 100 different palette combinations, and switch between them to see the effects with any HSCREEN picture,
- perform a specialised paint operation on the HSCREEN,
- save and restore palette groups and HSCREEN pictures'
- combine the various routines through a single menu arrangement.

These associated routines can be used for any HSCREEN picture on the CoCo 3. If the picture is put in the HSCREEN memory before running the program, it can be displayed and operated on by the program.

Merging Colours

The basis for producing these effects has been to generate a picture on HSCREEN 2 from the PMODE 4 picture which uses a two colour shading effect. There are a number of PMODE 4 pictures around which use the two colour shading effect quite well.

For example, some of the sample pictures with CoCo Max and other screen draw programs. CoCo Max also provides a

convenient way to obtain this effect yourself, using the spray can selection.

Different shades on the two color screen are obtained by varying the frequency and pattern of dots on and off within a given grid size.

Simplistically, a one on two off pattern will appear lighter than a two on one off pattern.

The conversion procedure applied to the transfer from PMODE 4 to HSCREEN 2 is based on this approach. A grid is specified around each pixel on the PMODE 4 screen, and the value transferred to the corresponding pixel position in HSCREEN 2 is the sum of the value of all the pixels in the grid.

For example, if the grid is 3 X 3, with the pixel at the centre, eg

```

XXX 100 110
XPX AS 010 and 011
XXX (1) 001 (2) 110
... then the corresponding

```

pixel in HSCREEN 2 will be 3 with pattern 1, and 6 for pattern 2. The actual value can be anywhere between 0 and 9.

Once the picture has been transferred in this way, it is then necessary to change the palette selection so that the palette slots from 0 to 9 are increasing (or decreasing) shades of the same basic color.

You then get a merging of different shades of that color, combined with the two color shading effect from the PMODE 4 screen. Palette slots zero and 9 can also be altered to contrasting &/or similar shades for different effects.

You don't really require a complex PMODE 4 picture to see the general effect. For example, you can convert a solid 2 color picture and produce a merging of colours at the edges. ie if you convert with a 15 X 1 grid, then what appears as a solid edge on PMODE 4 will become a series of pixels from 0 to 15 before becoming a solid area of color slot 15.

With the reverse sequence, 15 to 0 on the other side.

You can then vary this one by running say slots 6 and 7 as a contrasting color to produce a different effect.

Conversion Options

The basis of conversion from PMODE 4 to HSCREEN 2 is trial and error. You try different options until you get the effect you like.

There are two aspects to be specified for each conversion

- the size of the grid around each pixel in the PMODE screen
- and the position of the pixel within the grid (Pixel position starting from 1)

This allows for the full range of variations possible within the criteria for conversion. The maximum grid size is length X depth (<= 15, which is the maximum number of colours on HSCREEN 2.

Pre-Defined Palettes

Once you have the picture on HSCREEN 2, you then have the problem of how to see the effects of different color combinations. There are a large number of different possible combinations that you can look at.

For example, increasing / decreasing shades of from 2 to 15 slots, similar and contrasting foreground / background combinations etc, with each combination duplicated for each basic color.

The program provides this capability by allowing up to 100 different palette combinations to be pre-defined, and applied to the screen whenever required.

Each palette combination can be defined and modified while using the program to view the screen.

All changes can be retained as part of the program, (by (C)SAVE'ing it) and they remain as altered each time the program is loaded.

Palette combinations are referred to by a two character grid reference, from A0 to J9, to provide a 10 X 10 grid. A palette combination can be recalled by the grid reference, or in the display mode you can step through them with the arrow keys.

If using the arrow keys, the left and right arrows move along the 0 to 9 grid, while the up and down arrows move along the A to J grid.

If you arrange the palette combinations to suit, you can use this procedure to see a range of effects quite rapidly.

Painting Areas of the HSCREEN

Most two color pictures have distinct areas of background and foreground colours which are separated by shaded areas to produce the overall effect. The paint option included here is designed to allow each distinct area to be painted in its own color.

So that if you do a conversion on, say a 2 X 2 grid, you still have a lot of different colours free to be used for adding to the picture.

The normal paint instruction is not really suitable for this purpose. It is specified to paint all areas of the screen, irrespective of what color it is now, and it only stops painting when it reaches a specified border color.

The basic criteria for the paint option used here is to change the specified existing color on the screen to some other selected color, and to stop painting whenever it reaches any other color at all.

This basic criteria is logically difficult to implement, and other criteria are also applied.

The paint option effectively consists of two components. The first component defines the border of the area to be painted, and the second component paints within that border only.

The actual paint will then change the specified existing color to the new selected color, but leave all other colours within the border unaltered.

The routine to define the border uses a single parameter to specify the maximum number of pixels that it will search for in an 'outward' direction for a continuation of the border. If it is not found within this

range, then the border continues straight down (or up) the screen.

This parameter provides a means of stopping any 'leaks' of the paint from the selected area. It is set to 12 initially, but can be altered from the menu.

The basic logic of the paint as applied here is similar to the paint option as applied in my screen dump (LINEDUMP).

The paint option may sometimes provide an unexpected result. Changing the starting position within the area to be painted will sometimes correct this. By changing whether the paint is moving up or down the screen when it paints the area concerned.

Selection of Area to Paint

When you select the paint option, the cursor is in the centre of the picture. You move the cursor with the arrow keys. The normal arrow keys move the cursor 8 dots at a time, upper case arrow keys by one dot at a time.

The <>, . keys will move the cursor 48 dots at a time.

The cursor is a square of 4 X 4 pixels where each pixel is a different colour slot. The actual point of the cursor is the top left corner.

To assist in seeing the cursor, it is set to blink in association with the background colour (Slot zero).

When the cursor is 'in' the area to be painted, press the Y key and you will be asked for the palette slot to be used for the paint. When this is selected, the paint starts. Use the Q key instead of Y to exit the paint routine.

When the paint is finished, the cursor re-appears where Y was pressed, and you can then move it to paint another area, or use Q to exit.

Save and Restore Palettes and Pictures

The routine to save and restore the HSCREEN 2 is based on the procedure used in an earlier submission. (3SAVESCN, CoCo, Jan 87).

Pictures which have been saved using that procedure can be reloaded with this program, and it will load pictures saved from this one.

The option to save and restore palettes is provided to allow different palette combinations

to be associated with different pictures. Any selection of pre-defined palettes can be saved to an external file and re-loaded as required. Palettes can also be listed to a printer.

When saving palettes an * can be used to specify all palettes in that position. eg A* is all A's, *2 is all 2's, and ** is all palettes.

The restore option also allows palette combinations to be set up using another program to produce a data file of the appropriate structure.

Program listing 2, is a small Basic program which produces a palette data file from DATA statements that can then be loaded directly into 3EXPERT.

Each data statement consists of 17 elements, where the first is the grid reference, and the next 16 are the colours for each palette slot from 0 to 15. The following example puts the default colours to palette A1:

```
DATA A1,18,54,9,36,63,27,45,
38,0,18,0,63,0,18,0,38
```

The data statements in listing 2 produce a sample of different palette groups. Palette slots not used are set to the default values.

The last data statement in this program must start with a * to show the end of data.

Menu

The menu arrangement is a little rough and ready, but provides access to all functions, and includes a brief description where appropriate.

While viewing the HSCREEN (Option 3 of the main menu), pressing "K" will allow you to change the palette displayed by using the arrow keys, while "C" allows you to select a new palette by grid reference.

The current palette is shown in the lower left of the screen to indicate that you are in this mode.

"Q" will always return you to the next higher menu. The main menu provides an option to exit. This should be used to exit the program.

This program modifies the Basic ROM for its internal operations, and this option is required to restore the ROM to normal. Alternatively you can press reset to restore the ROM.

Using the Program

The program contains a number of machine language (ML) routines. The program submitted is set up to include the ML routines at the end of the Basic program following the procedure described in 'Charlie's Machine', Aust Rainbow, Jan 83, and as used in a number of my previous submissions.

When you run the program the first time, the ML code will be incorporated within the Basic program.

You should (C)SAVE this version and retain it for future use, although this is not essential, you can run it again to use it.

Programs in this format can be edited and used normally.

The pre-defined palettes are also stored in this part of the program, so that they remain part of the Basic program.

When you alter the definition of palettes, you have to (C)SAVE that version of the program if you wish to retain the new palette definitions. The alternative procedure for retaining new palette definitions is to save them to an external file, and restore them as required.

HSCREEN 2 Margins

The PMODE 4 picture is 256 pixils wide, while the HSCREEN 2 one is 320 pixils wide. When the Pmode 4 picture is moved to the HSCREEN, it is centered on the screen and the margins set to colour slot zero.

The colour slot used for the margins can be altered by poking a different value into M+146 and M+312.

Some General Programming Notes

This program uses features of the CoCo 3 to access the high resolution graphic screen which were outlined in Aust. CoCo, Jan 87.

To summarise these:

POKE &H13E,0:POKE &H143,0,
... allows BDOS to work with the CoCo 3. It should also work with other DOS's that follow the conventional procedure for adding new reserved words to Basic.

POKE &HE6C6,18:POKE &HE6C7,18
... changes the HSCREEN command so that it will display the high res screen without clearing it.

POKE &HE6E1,&H7E
... changes an LDX instruction

within the HCLS command to a JMP instruction. The two bytes poked into &HE6E2 and &HE6E3 is the entry address to the ML routine to be executed.

The ML routine is then entered by executing a HCLS command in BASIC.

When the ML routine is finished, it returns to BASIC with a JMP Hex E6EB.

Within the ML routine, the high res graphic screen is available in normal address space from Hex 2000 to Hex 9FFF.

All interrupts are masked and must be left that way. The ML routine must establish its own stack at an address below Hex 2000. These routines use the cassette buffer for the purpose.

Using this procedure imposes a number of restrictions on the ML routines to access the high res graphic screen. A major one being that it could be very dependent on the ROM version of the CoCo 3.

It is used here because I have not yet been able to find out how to access this memory with normal assembler instructions.

However, given the ROM version, the main practical limitation of the procedure is that the ML code and all other data required during the access to the high res screen must be held in memory below address Hex 2000, which for a disk system is effectively between Hex E00 and Hex 7FFF.

It would certainly be a lot more convenient if the high res screen could be accessed in the normal ROM space instead.

It is this constraint which causes the uneven delays during the conversion of the PMODE screen to the HSCREEN. The PMODE screen can only be transferred in groups of 16 lines at a time.

Also the PMODE screen has to be located above Hex 2000 to provide space below this address. It's in pages 4 to 7.

The ML code is held in memory at the end of the normal Basic program. The ML code used to access the high res screen is moved, during initialisation, from there to Hex E00 for execution.

If another picture is loaded into the PMODE screen while using the program, then that copy of the ML code is destroyed.

Hence, this code has to be restored following the move of the picture from pages 1-4 to 4-7.

ML Program Operation

The ML routines to save and restore the high res graphic screen have been described in Australian CoCo, Jan 87.

The operation of the conversion of the PMODE screen to the HSCREEN one is along the following lines.

Conceptually, each line of pixils in the PMODE 4 screen is transferred to the HSCREEN 2 in a single sequence of operations.

The first operation is to extract all the pixils from the PMODE screen that are required for the grid around each pixil.

These are moved to the 'extract' screen (Cleared memory above Hex 7100), where each pixil is stored in a separate byte (ie a zero or one), so that if the grid is 3x4 then four lines of pixils are extracted from the PMODE screen and stored in the extract screen.

As 256 bytes for each line, and four lines deep. Sufficient memory is provided in cleared space for a 1x15 grid (ie 15 lines deep).

The second operation is to generate a single line of pixils for the HSCREEN in the 'transfer' screen (memory locations Hex 1000 to Hex 1FFF), by operating on the data in the extract screen.

This operation is performed from the left and moving across the extract screen. All bytes in the grid around each pixil are added together to obtain the value of the pixil to be inserted in the equivalent pixil location in the HSCREEN.

In this way a single line of up to 256 bytes is built up in the transfer screen to correspond to the line as extracted from the PMODE screen, where each byte (representing a pixil) in the transfer screen is the sum of the pixils within the grid around each pixil in the PMODE screen.

The third and final operation in the conversion is to combine the bytes in the transfer screen into the structure required for HSCREEN 2 (two pixils per byte) and move them to the actual high res graphic screen memory.

Conceptually this basic sequence of operations is reasonably straight forward.

The problems arise when you want to allow for different sizes of the grid and for different relative positions in the selected pixils within the grid.

These two factors combine to reduce the number of pixels that are generated in the HSCREEN. ie the number of pixels in the HSCREEN are reduced to the number of pixels in the PMODE screen that have a full grid around them, eg for a centre pixel in a 3x3 grid, only the pixels between 1,1 and 254,190 can be transferred.

No pixel on the edge of the screen can have a full grid round it.

This particular problem is overcome by using special counters for the movement from the extract screen to the transfer screen, and by starting each line in the transfer screen at an offset from the normal edge of screen.

These special counters and offsets are set from the Basic program by pokes to specified memory locations before the ML routines are entered. The logic required to calculate these values is much easier to code in Basic, and the ML routines are coded to expect these values to be set before entry.

The approach used also restricts these complications to the setup of the transfer screen only, and is part of the reason for selecting the three stage sequence for the conversion.

The first and third stages of conversion can then be based on fixed parameters for all operations.

In practice, the three stages of the conversion are not performed in a strict sequence.

It would slow things down if you did because of the way the high res screen is accessed. The actual implementation is to move 16 lines at a time.

Stages 1 and 2 are performed 16 times to build up 16 lines in the transfer screen, and these are then moved as a group to the HSCREEN.

This is then repeated 12 times, with different parameters for the first and 12th time.

Appropriate pointers are maintained to keep track of the next line in both the PMODE and HSCREEN screens.

The various memory locations set from the Basic program are:

"SA": No of pixels to extract across screen
 "SD": No of lines of pixels to extract this time
 "SB": first pixel moving across screen.
 "SC": first pixel moving down screen.

"VA": width of grid around each pixel.

"VD": depth of grid around each pixel.

These parameters have the same name in both the Basic and assembler source code.

Modification Options

The starting address of the extract screen is held at a single location in the ML code (at M+28, where M=SA in the basic program). This is set at Hex 7100 to provide sufficient space to extract 15 lines of pixels.

If you exclude the 1x15 and 2x7 grids, then there is sufficient memory available in graphic page 4 to use as the extract screen.

There is sufficient memory here for 6 lines of pixels with a disk system, by moving the PMODE 4 screen to pages 5 to 8 instead of 4 to 7.

This would free normal cleared space for other purposes, and provide an extra 2.25K of memory for additions to the basic program if required.

It eliminates the need for protecting any cleared space

If you make this change then the following pokes are also required to alter addresses used in the ML code.

```
POKE M+24,&H26
POKE M+28,&H20
POKE M+52,&H32
POKE M+57,&H26
POKE M+62,&H3E
```

Other changes are required to the PCLEAR in Line 2290, the PCOPY in Line 760 and PMODE in Line 920.

To be safe also add at line 2510 a test to ensure that D does not exceed 6. It will wipe out the top of the PMODE screen if it does (ie the extract screen will extend over the PMODE one).

The Listing:

```
1 '** 3EXPERMT
  BY GEORGE MCLINTOCK
  APRIL 87
2 GOTO 10
3 SAVE"230C:3":END'8
4 'SOME ROUTINES TO EXPERIMENT V
  ITH GRAPHIC CAPABILITIES OF COCO
  3
```

```
10 GOTO 2700
20 A$=INKEY$:IF A$="" THEN 20 ELSE RETURN 'GET CHAR
30 HSCREEN 0:FOR H=0 TO 15:PALETTE H,H(H):NEXT H:RETURN 'NORMAL
40 HSCREEN 2:FOR H=0 TO 15:PALETTE H,P(H):NEXT H:RETURN 'CURRENT
50 'PAINT AREA OF SCREEN
60 IF Y+X1>ND THEN Y2=ABS(ND-Y-X) ELSE IF Y+X1<0 THEN Y2=Y+X1
70 IF HPOINT(P1,Y+X1-Y2)=F THEN H1=P1:GOTO 90
80 IF P1>H1 THEN H1=P1 ELSE P1=H1
90 IF HPOINT(P2,Y+X1-Y2)=F THEN H2=P2:GOTO 110
100 IF P2<H2 THEN H2=P2 ELSE P2=H2
110 FOR X=P1 TO P2:IF HPOINT(X,Y)=F THEN HSET(X,Y,C)
120 NEXT X
130 GOSUB 170:GOSUB 250
140 IF SK=0 THEN 60
150 RETURN
160 'FIND LEFT BOUNDARY
170 SK=0:Y=Y+Y1:IF Y>ND OR Y<0 THEN 200
180 IF HPOINT(P1,Y)=F THEN PS=P1:GOTO 210
190 P1=P1+1:IF P1<=P2 THEN IF HPOINT(P1,Y)=F THEN RETURN ELSE 190
200 SK=1:RETURN
210 P1=P1-1:IF P1>0 THEN IF HPOINT(P1,Y)=F THEN 210
220 P1=P1+1:IF ABS(PS-P1)>>XP THEN P1=PS
230 RETURN
240 'FIND RIGHT BOUNDARY
250 IF Y>ND OR Y<0 THEN 280
260 IF HPOINT(P2,Y)=F THEN PS=P2:GOTO 290
270 P2=P2-1:IF P2>=P1 THEN IF HPOINT(P2,Y)=F THEN RETURN ELSE 270
280 SK=1:RETURN
290 P2=P2+1:IF P2<=NA THEN IF HPOINT(P2,Y)=F THEN 290
300 P2=P2-1:IF ABS(PS-P2)>>XP THEN P2=PS
310 RETURN
320 'MOVE CURSOR
330 GOSUB 40:X=160:Y=96
340 X1=0:Y1=1:HGET(X,Y)-(X+3,Y+3),2:HPUT(X,Y)-(X+3,Y+3),1
350 A$=INKEY$:IF A$<>"" THEN 370 ELSE X1=X1+1:IF X1>9 THEN X1=0:HPUT(X,Y)-(X+3,Y+3),Y1:IF Y1=1 THEN Y1=4 ELSE Y1=1
360 GOTO 350
370 E=INSTR(A1$,A$):IF E=0 THEN 350
380 HPUT(X,Y)-(X+3,Y+3),2:IF E=1 THEN 450
390 IF E=2 THEN X=X-8 ELSE IF E=3 THEN X=X+8 ELSE IF E=4 THEN Y=Y-8 ELSE IF E=5 THEN Y=Y+8 ELSE IF E=6 THEN X=X-1 ELSE IF E=7 THEN X=X+1 ELSE IF E=8 THEN Y=Y-1 ELSE IF E=9 THEN Y=Y+1 ELSE IF E=10 THEN X=X-48 ELSE IF E=11 THEN X=X+48
```

```

400 IF E=12 THEN Y=Y-48 ELSE IF
E=13 THEN Y=Y+48 ELSE IF E=14 TH
EN RETURN
410 IF X<0 THEN X=0 ELSE IF X>31
6 THEN X=316
420 IF Y<0 THEN Y=0 ELSE IF Y>18
8 THEN Y=188
430 GOTO 340
440 'GET COLOR
450 HGET(0,156)-(320,191),3:HLIN
E(0,156)-(320,191),PRESET,BF
460 HPRINT(1,20),"CURRENT COLOR
IS ":HPRINT(19,20),C:HPRINT(1,21
),"PRESS ENTER TO USE THIS COLOR
AGAIN":HPRINT(7,22),"OR ENTER N
EW COLOR"
470 P=2:GOSUB 1460:HPUT(0,156)-(
320,191),3:IF N$=Q$ THEN RETURN
ELSE IF N$<>CHR$(13) THEN C=VAL(
N$)
480 ' FIND BOUNDARY
490 P=X:Q=Y:F=HPOINT(P,Q):N=1:Y1
=1
500 IF HPOINT(X,Y)=F THEN IF X<=
NA THEN X=X+1:GOTO 500 ELSE X=X+
1
510 P2=X-1:X=P
520 IF HPOINT(X,Y)=F THEN IF X>0
THEN X=X-1:GOTO 520 ELSE X=X-1
530 P1=X+1:X=P1:P3=P1:P4=P2
540 'PAINT DOWN SCREEN
550 H1=P1:H2=P2:Y2=0:GOSUB 60
560 'PAINT UP SCREEN
570 Y1=-1:X1=-X1:P1=P3:P2=P4:H1=
P3:H2=P4:Y=Q
580 GOSUB 170:GOSUB 250:Y2=0:GOS
UB 60
590 X=P:Y=Q:GOTO 340
600 'SETUP PAINT
610 CLS:PRINT"USE X TO CHANGE GA
P":PRINT"OR PRESS ENTER TO CONTI
NUE":PRINT:PRINT"WHEN HSCREEN DI
SPLAYED - USE":PRINT:PRINT"Y TO
PAINT THIS AREA":PRINT"Q TO QUIT
"
620 GOSUB 20:IF A$="Q" THEN RETU
RN ELSE IF A$<>"X" THEN 330
630 PRINT:PRINT"CURRENT GAP IS";
XP:INPUT"ENTER NEW VALUE";XP:GOT
O 330
640 'MAIN MENU
650 CLS:PRINT"EXPERIMENT WITH GR
APHICS":PRINT
660 PRINT"1 OPERATE ON PMODE SCR
EEN":PRINT"2 RESTORE HSCREEN FRO
M PMODE":PRINT"3 VIEW HSCREEN &
PALETTES":PRINT"4 CONVERT PMODE
TO HSCREEN":PRINT"5 PAINT":PRINT
"6 OPERATE ON PALETTES"
670 PRINT"7 SAVE/LOAD HSCREEN":P
RINT"8 SAVE/LOAD PALETTES":PRINT
"9 EXIT"
680 PRINT:PRINT"Q WILL RETURN TH
IS MENU":GOSUB 20:H=VAL(A$)
690 ON H GOSUB 1970,790,900,2470
,610,960,2030,2120,870
700 CLS:GOSUB 30:GOTO 650
710 'INVERT PMODE
720 EXEC IV:RETURN
730 'LOAD PMODE SCREEN
740 CLS:INPUT"ENTER FILE NAME";N
$
750 LOADM N$
760 FOR X=4 TO 1 STEP -1:PCOPY X
TO X+3:NEXT X
770 GOSUB 940
780 'MOVE TO HSCREEN
790 GOSUB 40
800 POKE M,12
810 POKE SW,0:EXEC F1
820 HCLS
830 POKE SW,1:EXEC F2
840 HCLS
850 RETURN
860 '
870 POKE M,0:POKE M-1,&H20:POKE
M-2,&H8:GOSUB 30
880 STOP
890 'SHOW HSCREEN & CHANGE PALET
TE
900 GOSUB 40
910 GOSUB 20:IF A$="Q" THEN RETU
RN ELSE IF A$="C" THEN GOSUB 130
0:GOSUB 1150:RETURN ELSE IF A$="
K" THEN GOSUB 1300:GOSUB 1210:RE
TURN ELSE 910
920 PMODE 4,4:SCREEN 1,1 'DISPLA
Y PMODE
930 GOSUB 20:IF A$="Q" THEN RETU
RN ELSE 930
940 H=&HE00:FOR X=U1 TO U1+224:P
OKE H,PEEK(X):H=H+1:NEXT X:RETUR
N 'RESTORE ML
950 'PALETTE MAINTENANCE
960 CLS:PRINT"PALETTE OPTIONS":P
RINT"(THIS PALETTE ";G$;"")
970 PRINT"1 ALTER HPRINT COLORS"
:PRINT"2 ALTER THIS PALETTE":PRI
NT"DISPLAY PALETTES":PRINT"3 BY
REFERENCE":PRINT"4 BY ARROW KEYS
":PRINT"CHANGE PALETTES":PRINT"5
SAVING THIS ONE":PRINT"6 NOT SA
VING THIS ONE"
980 PRINT"SAVE THIS PALETTE":PRI
NT"7 AS ";G$:PRINT"8 WITH DIFFER
ENT REFERENCE":PRINT"Q TO RETURN
TO MENU"
990 PRINT"ENTER OPTION";:GOSUB 2
0:IF A$="Q" THEN RETURN
1000 ON VAL(A$) GOSUB 1030,1070,
1140,1200,1320,1330,1370,1380
1010 GOSUB 30:GOTO 960
1020 'CHANGE HCOLOR
1030 PRINT:PRINT"ENTER PARAMETER
S FOR HCOLOR"
1040 INPUT "COMMAND AS FG,BG";FG
,BG
1050 HCOLOR FG,BG:RETURN
1060 'ALTER THIS PALETTE
1070 GOSUB 1410:HPRINT(1,19),"AL
TER":HPRINT(1,20),G$:HPRINT(1,21
),"PR,CC"
1080 P=5:GOSUB 1460:IF N$=Q$ THE
N 1120
1090 H1=VAL(N$):H2=VAL(B$):P(H1)
=H2:PALETTE H1,H2:HLINE(40,H1*8)
-(56,H1*8+7),PRESET,BF:HPRINT(5,
H1),MID$(STR$(P(H1)),2):GOSUB 15
70
1100 GOTO 1080
1110 GOSUB 1820
1120 HPUT(0,0)-(60,191),3:RETURN
1130 'DISPLAY PALETTE BY REFEREN
CE
1140 GOSUB 1410
1150 HPRINT(1,19),"SHOW":HPRINT(
1,20),G$:HPRINT(1,21),"NEXT"
1160 P=2:GOSUB 1460:IF N$=Q$ THE
N 1120
1170 G$=N$:GOSUB 1590:GOSUB 1690
:GOSUB 1760:GOSUB 1550:HPRINT(1,
20),G$:GOSUB 1560
1180 GOTO 1160
1190 'DISPLAY BY ARROW KEYS
1200 GOSUB 1410
1210 HPRINT(1,19),"SHOW":HPRINT(
1,20),G$:HPRINT(1,22),"ARROW":HP
RINT(1,23),"KEYS"
1220 GOSUB 20:IF A$="Q" THEN 112
0
1230 P=INSTR(A1$,A$):IF P<2 OR P
>5 THEN 1220
1240 IF P=2 THEN P2=P2-1:IF P2<0
THEN P2=9
1250 IF P=3 THEN P2=P2+1:IF P2>9
THEN P2=0
1260 IF P=4 THEN P1=P1-1:IF P1<0
THEN P1=9
1270 IF P=5 THEN P1=P1+1:IF P1>9
THEN P1=0
1280 G=P1+10+P2:GOSUB 1660:GOSUB
1690:GOSUB 1760:GOSUB 1550:HPRI
NT(1,20),G$
1290 GOTO 1220
1300 HGET(0,0)-(60,191),3:HCOLOR
FG,BG:HLINE(0,160)-(60,191),PRE
SET,BF:HPRINT(1,20),G$:GOSUB 178
0:RETURN
1310 'CHANGE PALETTE
1320 GOSUB 1720
1330 LP=G:PRINT:INPUT"ENTER NEW
PALETTE REF";G$
1340 GOSUB 1590:GOSUB 1690:GOSUB
1760
1350 RETURN
1360 'SAVE PALETTE
1370 GOSUB 1720:RETURN
1380 PRINT:PRINT"ENTER REFERENCE
NUMBER TO SAVE AS";:INPUT G$
1390 GOSUB 1590:GOSUB 1720:RETUR
N
1400 'SET HSCREEN TO DISPLAY PAL
ETTE
1410 GOSUB 40:HGET(0,0)-(60,191)
,3:HCOLOR FG,BG:HLINE(0,0)-(60,1
91),PRESET,BF
1420 FOR X=0 TO 15:HPRINT(5,X),M
ID$(STR$(P(X)),2):NEXT X:FOR X=0
TO 9:HPRINT(0,X),X:NEXT X:FOR X
=10 TO 15:HPRINT(0,X),MID$(STR$(
X),2):NEXT X
1430 FOR X=0 TO 15:HCOLOR X,0:HL
INE(18,X*8)-(38,X*8+8),PSET,BF:N
EXT X
1440 HCOLOR FG,BG:RETURN
1450 'GET CHARS FROM KEYBOARD
1460 P1=0:N$="":B$=""
1470 GOSUB 20:IF A$=CHR$(8) THEN
IF P1=0 THEN 1470 ELSE P1=P1-1:
GOSUB 1570:N$=LEFT$(N$,P1):HPRIN
T(0,23),N$:GOTO 1470
1480 HPRINT(P1,23),A$:P1=P1+1:N$
=N$+A$:IF A$=CHR$(13) OR P1>P T
HEN 1490 ELSE 1470
1490 P2=INSTR(N$,""):IF P2=0 TH
EN RETURN

```

```

1500 X$=N$
1510 IF P2<P1 THEN B$=RIGHT$(N$,
P1-P2)
1520 IF P2>1 THEN N$=LEFT$(N$,P2
-1)
1530 RETURN
1540 'CLEAR PARTS SCREEN
1550 HLINE(0,160)-(23,167),PRESE
T,BF:RETURN '0,20/2
1560 HLINE(0,184)-(23,191),PRESE
T,BF:RETURN '0,23/2
1570 HLINE(0,184)-(47,191),PRESE
T,BF:RETURN '0,23/5
1580 'UNPACK G$ TO G
1590 IF G$="LL" THEN G=LP:GOSUB
1650:RETURN
1600 IF G$="SS" THEN G=100:GOSUB
1650:RETURN
1610 P1=INSTR(A2$,LEFT$(G$,1))-1
:P2=VAL(RIGHT$(G$,1))
1620 G=P1*10+P2:IF G<0 THEN G=0
ELSE IF G>100 THEN G=100
1630 RETURN
1640 'PACK G TO G$
1650 P1=INT(G/10):P2=G-P1*10
1660 G$=MID$(A2$,P1+1,1)+CHR$(48
+P2)
1670 RETURN
1680 'EXTRACT PAL
1690 H1=U+G*16:FOR H2=0 TO 15:P(
H2)=PEEK(H1+H2)
1700 NEXT H2:RETURN
1710 'RESTORE PAL
1720 H1=U+G*16:FOR H2=0 TO 15:PO
KE (H1+H2),P(H2)
1730 NEXT H2:RETURN
1740 HLINE(40,0)-(56,16*8),PRESE
T,BF:FOR H=0 TO 15:HPRINT(5,H),M
ID$(STR$(P(H)),2):NEXT H
1750 'SET NEW PAL
1760 FOR H1=0 TO 15:PALETTE H1,P
(H1):NEXT H1:RETURN
1770 'G TO TEMP
1780 FOR H1=0 TO 15:T(H1)=P(H1):
NEXT H1
1790 T$=G$:T=G
1800 RETURN
1810 'TEMP TO G
1820 FOR H1=0 TO 15:P(H1)=T(H1):
NEXT H1
1830 G$=T$:G=T
1840 RETURN
1850 'COMMON SETUP
1860 PRINT:PRINT"S TO SAVE":PRIN
T"L TO LOAD":PRINT"Q TO RETURN T
O MENU":GOSUB 20:PRINT A$:X$=A$:
IF A$="Q" THEN RETURN
1870 PRINT:PRINT"D FOR DISK":PRI
NT"T FOR TAPE":IF X1=1 AND X$="S
" THEN PRINT"P TO PRINT"
1880 GOSUB 20:PRINT A$:IF A$="P"
THEN PRINT "ENTER HEADING" ELSE
PRINT "ENTER FILE NAME"
1890 INPUT N$
1900 RETURN
1910 'SET DEVICE
1920 IF A$="P" THEN X1=-2:RETURN
ELSE IF A$="D" THEN X1=1:RETURN
1930 X1=-1:PRINT:PRINT"SET TAPE
RECORDER TO ";:IF X$="S" THEN PR
INT "RECORD" ELSE PRINT "PLAY"
1940 INPUT "AND PRESS ENTER";E
1950 RETURN
1960 'PMODE
1970 CLS:PRINT"OPERATIONS ON PMO
DE SCREEN":PRINT
1980 PRINT"1 LOAD PMODE SCREEN":
PRINT"2 VIEW PMODE":PRINT"3 INVE
RT PMODE"
1990 GOSUB 20:H=VAL(A$):IF H<1 O
R H>3 THEN 1980
2000 ON H GOSUB 740,920,720
2010 RETURN
2020 'HSCREEN
2030 CLS:PRINT"SAVE/LOAD HSCREEN
":X1=0:GOSUB 1860:IF A$="Q" THEN
RETURN ELSE GOSUB 1920:GOSUB 40
2040 POKE SU,32:POKE M,170:IF X$
="S" THEN POKE SU+2,0:Y=0:A$="O"
ELSE POKE SU+2,1:A$="I":Y=1
2050 FOR X=1 TO 8:X$=N$+MID$(STR
$(X),2)
2060 IF Y=1 THEN IF X1=1 THEN LO
ADM X$:HCLS:GOTO 2090 ELSE CLOAD
M X$:HCLS:GOTO 2090
2070 HCLS:IF X1=1 THEN SAVEM X$,
&H1000,&H1FFF,0:GOTO 2090
2080 CSAVEM X$,&H1000,&H1FFF,0
2090 NEXT X
2100 RETURN
2110 'SAVE/LOAD PALETTES
2120 CLS:PRINT"SAVE/LOAD PALETTE
S":X1=1:GOSUB 1860:IF A$="Q" THE
N RETURN ELSE GOSUB 1920:GOSUB 1
780
2130 IF X$="S" THEN A$="O" ELSE
A$="I"
2140 OPEN A$,X1,N$:IF A$="O" THE
N IF X1=-2 THEN PRINT #X1,N$:GOT
O 2170 ELSE 2170
2150 IF EOF(X1) THEN CLOSE:GOSUB
1820:RETURN
2160 INPUT #X1,G$:FOR X=0 TO 15:
INPUT #X1,P(X):NEXT X:GOSUB 1590
:GOSUB 1720:GOTO 2150
2170 PRINT:PRINT"ENTER PALETTES
TO SAVE":PRINT"WITH A COMMA BETW
EEN EACH ONE":PRINT"PRINT"USE *
TO SHOW ALL - EG":PRINT"A* IS AL
L A'S":PRINT"*1 IS ALL 1'S":PRIN
T"** IS ALL PALETTES"
2180 LINE INPUT A$
2190 FOR X=1 TO LEN(A$) STEP 3:G
$=MID$(A$,X,2)
2200 IF G$="**" THEN FOR P=1 TO
10:MID$(G$,1)=MID$(A2$,P,1):GOSU
B 2250:NEXT P:GOTO 2240
2210 IF LEFT$(G$,1)="*" THEN FOR
H=1 TO 10:MID$(G$,1)=MID$(A2$,H
,1):GOSUB 2260:NEXT H:GOTO 2240
2220 IF RIGHT$(G$,1)="*" THEN GO
SUB 2250:GOTO 2240
2230 GOSUB 2260
2240 NEXT X:CLOSE:GOSUB 1820:RET
URN
2250 FOR H=0 TO 9:MID$(G$,2)=RIG
HT$(STR$(H),1):GOSUB 2260:NEXT H
:RETURN
2260 PRINT #X1,G$,"";:FOR Y=0 T
O 15:PRINT#X1,USING "###";P(Y);:
NEXT Y:IF X1=-2 THEN PRINT #X1
2270 RETURN
2280 'SET UP ROUTINES
2290 CLEAR 500,&H7100:PCLEAR 7:P
OKE &H13E,0:POKE &H143,0
2300 CLS:PRINT "SETTING UP"
2310 DIM P(15),T(15),H(15)
2320 DIM X,Y,X1,NA,ND,P,P1,P2,H,
H1,H2,E,G,A$,G$
2330 A1$="Y"+CHR$(8)+CHR$(9)+CHR
$(94)+CHR$(10)+CHR$(21)+CHR$(93)
+CHR$(95)+CHR$(91)+"<",>,"Q"
2340 A2$="ABCDEFGHJIJ":Q$="Q"+CHR
$(13)
2350 Y=&HFFB0:FOR X=0 TO 15:P(X)
=PEEK(X+Y)-64:H(X)=P(X):NEXT X '
SET EXISTING PALETTE
2360 HBUFF 1,20:HBUFF 2,20:HBUFF
3,6000:HBUFF 4,20:NA=319:ND=191
2370 SA=PEEK(27)*256+PEEK(28)-20
63:SD=SA+1:SB=SA+2:SC=SA+3:WD=SA
+5:VA=SA+6:E1=SA+&H6C:E2=SA+&H81
:F1=SA+&H1E:F2=SA+&H2E:IV=SA+&H3
8:U1=SA+219:U=SA+443:FG=1:BG=0:G
$="ST":G=100:GOSUB 1720
2380 XP=12
2390 POKE &HE6C6,18:POKE &HE6C7,
18:HSCREEN 2:HGET(0,0)-(3,3),2
2400 FOR X=0 TO 3:FOR Y=0 TO 3 '
SET CURSOR
2410 HSET(X,Y,X*4+Y)
2420 NEXT Y,X
2430 HGET(0,0)-(3,3),1:HLINE(0,0
)-(3,3),PRESET,BF:HGET(0,0)-(3,3
),4:HPUT(0,0)-(3,3),2
2440 POKE &HE6E1,&H7E:POKE &HE6E
2,&H0E:M=&HE6E3:SV=&HE00:SU=SV+1
57
2450 HSCREEN 0:GOSUB 940:GOTO 65
0
2460 'CONVERT
2470 CLS:PRINT"CONVERTS THE PMOD
E 4 SCREEN DURING TRANSFER - TO
GIVE SHADING EFFECT"
2480 PRINT"ENTER SIZE OF GRID AS
":INPUT"WIDTH , DEPTH";W,D
2490 IF W<1 OR D<1 THEN PRINT"MU
ST BE POSITIVE VALUES":GOTO 2480
2500 IF W*D>15 THEN PRINT"W*D MU
ST BE LESS THAN 15":GOTO 2480
2510 '
2520 PRINT"ENTER GRID POSITION O
F PIXEL":INPUT W1,D1
2530 IF W1<1 OR W1>W OR D1<1 OR
D1>D THEN PRINT"PIXIL MUST BE WI
THIN GRID":GOTO 2520
2540 POKE M,&H64:GOSUB 40
2550 POKE SB,W1:POKE VA,W:POKE V
D,D
2560 ST=256-W:IF ST>256 THEN ST
=0
2570 POKE SA,ST
2580 POKE SC,D1-1:ST=192-D+1
2590 POKE SD,16-D1+1
2600 EXEC E1:POKE SW,0
2610 HCLS
2620 ST=ST-16:POKE SW,1
2630 FOR X=1 TO 10
2640 POKE SD,16:ST=ST-16:EXEC E2
2650 HCLS
2660 NEXT X
2670 POKE SD,ST:EXEC E2
2680 HCLS
2690 RETURN
2700 'SET ML
3320.GOTO 2290

```


The Listing:

```

00100 * CALLED SCNSAVE - SAVES AND RESTORES HIGH
RES SCREEN COCO 3
7E00
    0000
    0002
    0003
    0005
    0007
    0009
    000B
7E00 2000
7E02 00
7E03 1000
7E05 2000
7E07 0000
7E09 0000
7E0B 0000
7E0D 30 8C FO
7E10 EF 07
7E12 10AF 09
7E15 ED 0B
7E17 1F 13
7E19 10AE 40
7E1C AE 43
7E1E 6D 42
7E20 26 17
7E22 A6 A0
7E24 A7 80
7E26 AC 45
7E28 26 F8
7E2A 10AF 40
7E2D 1F 31
7E2F EE 07
7E31 10AE 09
7E34 EC 0B
7E36 7E E6EB
    00450 *
7E39 A6 80
7E3B A7 A0
7E3D AC 45
7E3F 26 F8
7E41 20 E7
    7E43
    7E0D
00000 TOTAL ERRORS
    
```

00010 * CALLED MOVE - MOVES FROM COCO2 SPACE TO

COCO 3 HIGH RES SCREEN

00020 * CONVERTING FROM PMODE 4 TO HSCREEN 2

00030 *

```

0000 00040 SW1 EQU 0
0001 00050 SW2 EQU 1
0002 00060 CNT1 EQU 2
0003 00070 CNT2 EQU 3
0004 00080 CNT3 EQU 4
    
```

	0005		00090 CNT4	EQU	5	
	0006		00100 D1	EQU	6	
	0008		00110 D2	EQU	8	
	000A		00120 E1	EQU	10	
			00130 *			
0000	0000		00140 TABLE	FDB	0	SW1 SW2
0002	0000		00150	FDB	0	CNT1 CNT2
0004	0000		00160	FDB	0	CNT3 CNT4
0006	0000		00170	FDB	0	D1
0008	0000		00180	FDB	0	D2
000A	2000		00190	FDB	\$2000	E1 START HSCREEN
			00200 *			
	02C0		00210 T1	EQU	\$02C0	
	02B0		00220 T2	EQU	\$02B0	
			00222 *			
			00224 *	STRAIGHT TRANSFER NO CONVERSION		
			00230 *			
000C	10FF	02C0	00240 START	STS	T1	SAVE STACK
0010	10CE	02B0	00250	LDS	#T2	
0014	34	66	00260	PSHS	A, B, Y, U	
0016	33	8C E7	00270	LEAU	TABLE, PCR	
0019	6D	40	00280	TST	SW1, U	
001B	26	04	00290	BNE	SM1	
001D	AE	4A	00300	LDX	E1, U	FIRST TIME
001F	AF	46	00310	STX	D1, U	
0021	108E	1400	00320 SM1	LDY	#\$1400	START TRANSFER SCN
0025	AE	46	00330	LDX	D1, U	
			00340 *			
0027	86	60	00350	LDA	#96	
0029	A7	44	00360	STA	CNT3, U	
002B	86	20	00370 S1	LDA	#32	
002D	A7	43	00380	STA	CNT2, U	
002F	8D	29	00390	BSR	MARGIN	
0031	86	04	00400 S2	LDA	#4	
0033	A7	42	00410	STA	CNT1, U	
0035	E6	A0	00420	LDB	, Y+	
0037	4F		00430 S3	CLRA		CONVERT 8 PIXILS
0038	59		00440	ROLB		PER BYTE IN PMODE
0039	49		00450	ROLA		TO 2 PIXILS PER
003A	49		00460	ROLA		BYTE IN HSCREEN
003B	49		00470	ROLA		
003C	49		00480	ROLA		
003D	59		00490	ROLB		
003E	49		00500	ROLA		
003F	A7	80	00510	STA	, X+	
0041	6A	42	00520	DEC	CNT1, U	
0043	26	F2	00530	BNE	S3	
0045	6A	43	00540	DEC	CNT2, U	
0047	26	E8	00550	BNE	S2	
0049	8D	0F	00560	BSR	MARGIN	
004B	6A	44	00570	DEC	CNT3, U	
004D	26	DC	00580	BNE	S1	
004F	AF	46	00590 EXM1	STX	D1, U	
			00600 *			
0051	35	66	00610 EXIT	PULS	A, B, Y, U	
0053	10FE	02C0	00620	LDS	T1	RETURN

```

0057 7E E6EB 00630 JMP $E6EB TO BASIC
00640 *
005A C6 10 00650 MARGIN LDB #16
005C 86 00 00660 LDA #0 COLOR SLOT
005E A7 80 00670 M1 STA ,X+
0060 5A 00680 DECB
0061 26 FB 00690 BNE M1
0063 39 00700 RTS
00710 *
00720 * MOVE AFTER CONVERSION
00730 *
0064 10FF 02C0 00740 STRX STS T1 SAVE STACK
0068 10CE 02B0 00750 LDS #T2
006C 34 66 00760 PSHS A,B,Y,U
006E 33 8C 8F 00770 LEAU TABLE,PCR
0071 6D 40 00780 TST SW1,U
0073 26 04 00790 BNE XM1
0075 AE 4A 00800 LDX E1,U FIRST TIME
0077 AF 46 00810 STX D1,U
0079 108E 1000 00820 XM1 LDY #$1000 START TRANSFER SCN
007D AE 46 00830 LDX D1,U
007F 86 10 00840 LDA #16
0081 A7 44 00850 STA CNT3,U
0083 8D D5 00860 X1 BSR MARGIN
0085 C6 80 00870 LDB #128
0087 4F 00880 X2 CLRA COMBINE 2 BYTES WITH
0088 AA A0 00890 ORA ,Y+ PIXIL IN EACH INTO
008A 49 00900 ROLA SINGLE BYTE
008B 49 00910 ROLA
008C 49 00920 ROLA
008D 49 00930 ROLA
008E AA A0 00940 ORA ,Y+
0090 A7 80 00950 STA ,X+ TO HSCREEN
0092 5A 00960 DECB
0093 26 F2 00970 BNE X2
0095 8D C3 00980 BSR MARGIN
0097 6A 44 00990 DEC CNT3,U
0099 26 E8 01000 BNE X1
009B 20 B2 01010 BRA EXM1
01020 *
009D 01030 ZZEND EQU *
000C 01040 END START
00000 TOTAL ERRORS

```

00010 * CALLED MOVE 1 - EXTRACTS FROM PMODE 4,
CONVERTS, AND MOVES TO HSCREEN

```

00020 *
7D00 00030 ORG 32000
      FFF0 00040 SA EQU -16
      FFF1 00050 SD EQU -15
      FFF2 00060 SB EQU -14
      FFF3 00070 SC EQU -13

```


	FFF4	00080	SDT	EQU	-12		
	FFF5	00090	WD	EQU	-11		
	FFF6	00100	WA	EQU	-10		
	FFF7	00110	CNT1	EQU	-9		
	FFF8	00120	CNT2	EQU	-8		
	FFF9	00130	CNT3	EQU	-7		
	FFFA	00140	FP	EQU	-6		
	FFFC	00150	FT	EQU	-4		
	FFFE	00160	FE	EQU	-2		
	0000	00170	ET1	EQU	0		
	0002	00180	ET2	EQU	2		
	0004	00190	ET	EQU	4		
	0006	00200	TFR	EQU	6		
	0008	00210	EX	EQU	8		
	000A	00220	TFR1	EQU	10		
	000C	00230	ES	EQU	12		
		00240	*				
7D00	0000	00250		FDB	0	-16 -15	SA SD
7D02	0000	00260		FDB	0	-14 -13	SB SC
7D04	0000	00270		FDB	0	-12 -11	SDI WD
7D06	0000	00280		FDB	0	-10 9	WA CNT1
7D08	0000	00290		FDB	0	-8 -7	CNT2 CNT3
7D0A	0000	00300		FDB	0	-6 -5	FP
7D0C	0000	00310		FDB	0	-4 -3	FT
7D0E	0000	00320		FDB	0	-2 -1	FE
7D10	0000	00330	TABLE	FDB	0	0 1	ET1
7D12	0000	00340		FDB	0	2 3	ET2
7D14	2000	00350		FDB	\$2000	4 5	ET END TRANSFER
SCN							
7D16	1000	00360		FDB	\$1000	6 7	TFR START CONV
TRANSFER							
7D18	2000	00370		FDB	\$2000	8 9	EX START PMODE
7D1A	1400	00380		FDB	\$1400	10 11	TFR1 START ST
TRANSFER							
7D1C	2000	00390		FDB	\$2000	12 13	ES START
EXTRACT SCREEN							
		00400	*				
7D1E	8D	48	00410	START	BSR	SETU	
7D20	AE	4A	00420		LDX	TFR1,U	MOVE PMODE 4
7D22	10AE	48	00430		LDY	EX,U	TO TRANSFER
7D25	A6	A0	00440	S1	LDA	,Y+	AREA
7D27	A7	80	00450		STA	,X+	
7D29	AC	44	00460		CMPX	ET,U	
7D2B	26	F8	00470		BNE	S1	
7D2D	39		00480		RTS		
		00490	*				
7D2E	8D	38	00500	S2	BSR	SETU	SECOND HALF
7D30	AE	4A	00510		LDX	TFR1,U	
7D32	108E	2C00	00520		LDY	#\$2C00	HALF PMODE
7D36	20	ED	00530		BRA	S1	
		00540	*				
7D38	8E	2000	00550	INVERT	LDX	#\$2000	START PMODE
7D3B	63	80	00560	INV1	COM	,X+	
7D3D	8C	3800	00570		CMPX	#\$3800	END PMODE
7D40	26	F9	00580		BNE	INV1	
7D42	39		00590		RTS		

```

00600 *
00610 * EXTRACT NEXT SET OF LINES FROM PMODE 4

SCREEN
00620 *
7D43 10AE 4C 00630 FRED LDY ES,U START EXTRACT SCREEN
7D46 AE 5A 00640 LDX FP,U IN PMODE
7D48 A6 55 00650 LDA WD,U
7D4A A7 59 00660 STA CNT3,U
7D4C 86 20 00670 FRED1 LDA #32 ACCROSS LINE
7D4E A7 58 00680 STA CNT2,U
7D50 86 08 00690 FRED2 LDA #8
7D52 A7 57 00700 STA CNT1,U
00710 *
7D54 E6 80 00720 LDB ,X+
7D56 4F 00730 FRED3 CLRA CONVERT 8 PIXILS PER
7D57 59 00740 ROLB BYTE IN PMODE TO
7D58 49 00750 ROLA 1 PIXIL PER BYTE IN
7D59 A7 A0 00760 STA ,Y+ EXTRACT SCREEN
7D5B 6A 57 00770 DEC CNT1,U
7D5D 26 F7 00780 BNE FRED3
7D5F 6A 58 00790 DEC CNT2,U
7D61 26 ED 00800 BNE FRED2
7D63 6A 59 00810 DEC CNT3,U
7D65 26 E5 00820 BNE FRED1
7D67 39 00830 RTS
00840 *
7D68 33 8C A5 00850 SETU LEAU TABLE,PCR
7D6B 39 00860 RTS
00870 *
00880 * INITIALISE PARAMS AND SET FOR EACH

TRANSFER
00890 *
7D6C 8D FA 00900 ZINIT1 BSR SETU
7D6E AE 48 00910 LDX EX,U START PMODE
7D70 AF 5A 00920 STX FP,U
7D72 A6 46 00930 LDA TFR,U
7D74 E6 53 00940 LDB SC,U
7D76 27 09 00950 BEQ ZINIT2
7D78 4C 00960 INIT1A INCA BLANK THESE LINES
7D79 5A 00970 DECB
7D7A 26 FC 00980 BNE INIT1A
7D7C 5F 00990 CLRB
7D7D 1F 01 01000 TFR D,X
7D7F 20 04 01010 BRA INIT2A
01020 * ENTER HERE FOR SUBSEQUENT
7D81 8D E5 01030 ZINIT2 BSR SETU
7D83 AE 46 01040 LDX TFR,U
7D85 A6 52 01050 INIT2A LDA SB,U OFFSET THE BITS
7D87 30 86 01060 LEAX A,X
7D89 AF 5C 01070 STX FT,U START FROM
7D8B A6 51 01080 LDA SD,U DOWN THIS TIME
7D8D A7 54 01090 STA SDT,U
01100 *
01110 * CLEAR TRANSFER SCREEN AREA
01120 *

```

7D8F	AE	46	01130	CLEAR	LDX	TFR, U	
7D91	86	00	01135		LDA	#0	MARGIN COLOR SLOT
7D93	A7	80	01140	CL1	STA	, X+	
7D95	AC	44	01150		CMPX	ET, U	
7D97	26	FA	01160		BNE	CL1	
			01170	*			
			01180	*	CONTROL LOOP FOR EACH LINE EXTRACTED		
			01190	*			
7D99	8D	A8	01200	DA1	BSR	FRED	
7D9B	8D	0E	01210		BSR	MOVE	
7D9D	6C	5C	01220		INC	FT, U	
7D9F	AE	5A	01230		LDX	FP, U	
7DA1	30	88 20	01240		LEAX	32, X	
7DA4	AF	5A	01250		STX	FP, U	
7DA6	6A	54	01260		DEC	SDT, U	
7DA8	26	EF	01270		BNE	DA1	
7DAA	39		01280		RTS		
			01290	*			
			01300	*	MOVES THE LINES JUST EXTRACTED TO TRANSFER		
SCREEN							
			01310	*			
7DAB	10AE	5C	01320	MOVE	LDY	FT, U	
7DAE	A6	50	01330		LDA	SA, U	NO ACCROSS LINE
7DB0	A7	59	01340		STA	CNT3, U	
7DB2	AE	4C	01350		LDX	ES, U	
7DB4	AF	40	01360	M1	STX	ET1, U	
7DB6	AF	42	01370		STX	ET2, U	
7DB8	A6	55	01380		LDA	WD, U	GRID DOWN
7DBA	A7	58	01390		STA	CNT2, U	
7DBC	4F		01400		CLRA		
7DBD	E6	56	01410	M2	LDB	WA, U	GRID ACCROSS
7DBF	AB	80	01420	M3	ADDA	, X+	ADD GRID AROUND
PIXIL							
7DC1	5A		01430		DECB		
7DC2	26	FB	01440		BNE	M3	
7DC4	AE	42	01450		LDX	ET2, U	
7DC6	30	89 0100	01460		LEAX	256, X	
7DCA	AF	42	01470		STX	ET2, U	
7DCC	6A	58	01480		DEC	CNT2, U	
7DCE	26	ED	01490		BNE	M2	
			01500	*			
7DD0	A7	A0	01510		STA	, Y+	INTO TRANSFER SCREEN
7DD2	AE	40	01520		LDX	ET1, U	
7DD4	30	01	01530		LEAX	1, X	
7DD6	6A	59	01540		DEC	CNT3, U	
7DD8	26	DA	01550		BNE	M1	
7DDA	39		01560		RTS		
			01570	*			
	7DDB		01580	ZZEND	EQU	*	
	7D1E		01590		END	START	
00000 TOTAL ERRORS							

It's an oldie, but a goodie.

AUTO30K

CoCo 32K
UTILITY

by George McLintock

I DECIDED TO SUBMIT this utility more for old times sake than anything else. I completed it a few years ago now, and use it myself quite regularly.

Despite its faults, I still regard it as one of my more notable achievements.

I have an earlier version of it without the screen edit functions, that incorporates the upload/download procedures that I developed to use the disk drives on a system 80 for storage of programs for the CoCo.

That download uses the same basic procedure as the single key entry. The characters go into the machine in the same way as if you had typed them in from the keyboard.

The download was in fact developed first, the other bits came later by using the same procedure.

At one stage I had the idea of submitting the earlier version to 80 MICRO, but at about that time they published an article which did much the same with a Model 1 and using the download command of the CoCo. ('CC DOWNLOAD' by Frank Bogardus, 80 Micro, March 83).

It also did the Model 1 side a lot neater than my efforts on the System 80, so I didn't bother. Nor did I ever get round to modifying the Model 1 programs to try it.

It requires some modification because the only real difference between the Model 1 and the System 80 is the way they handle the RS-232 interface.

In fact, the idea of using the disks on the System 80 didn't work out that well in practice.

I found it more convenient to use the normal cassette on the CoCo. In retrospect, I think my main reason for doing that one was to 'make it work'.

Once I had done so, and found it less convenient to use than the cassette, I never actually used it on a regular basis.

I've worked out a number of

ways to make it more convenient to use, but have not had the interest required to undertake the work involved.

I still use the earlier version occasionally. Its useful for the direct transfer of Model 1 BASIC programs to the CoCo without typing, and then start modifying it.

I did one for my son recently, but he hasn't got round to the conversion yet.

The use of the utility is set out in the attached instructions. These are in all upper case, because at the time I wrote them I didn't have a word processor and they were produced by a BASIC program using strings.

The only printer I had at the time was the GP-80 which is a 7 pin dot matrix and has no lower case decoders, so it wasn't worth the effort to use lower case. The BASIC program used to print (or display) is also included.

It includes its own instructions for producing a hard copy and consists mainly of character strings.

These instructions were put together when I first gave copies to some friends, and I've not felt the need since then to revise them.

I thought I might do separate notes on the basic principles of how the thing inter reacts with the Basic ROM.

These routines were developed early in the life of the CoCo and before I had any knowledge of the CoCo ROM itself.

Ron Wright's disassembly and Jake Commander's ROM series in the Colour Computer Magazine came along after this lot was completed.

This utility is completely independent of the ROM. It performs all its functions through the RAM hooks at Hex 167 and 16A. It makes no direct calls to the ROM except for the standard get character from keyboard and send character to a device.

It's mainly for this reason that the 'how it works' might be of some more particular interest.

RAM hooks are common to all ROM based Basic interpreters. As far as I am aware they exist with all BASIC interpreters, and they all have one associated with the functions 'get a character from the keyboard' and 'put a character on the screen'.

Once you know the essential requirements for these two functions, you can develop utilities to do practically anything you can do yourself from the keyboard, simply because you can achieve the same effect as if you were sitting there, seeing what comes up on the screen, and then entering data through the keyboard.

The only limit is what you can simulate with program logic.

There might be better and neater ways of doing the same thing, but this way you can work independently of the rest of the system.

I have also thought that it should be possible to use a similar procedure to set up a form of batch file for the CoCo, but again it's one of those things that I haven't yet had the interest to try and do.

With respect to the utility itself, I find I use the single key entry and auto line number a lot more than the screen edits.

I've become used to the Microsoft single line edit, and the control keys for the screen edits could be better organised.

I feel I would be more inclined to use it if I improved the control key functions. There is also still a bug in there somewhere which I haven't yet been able to isolate.

I intend to redo these parts someday, and also to alter the rest of it so that the cursor will show on the 40-80 column screen of the CoCo 3. Apart from the screen edits and the cursor, the rest of it works on the new CoCo 3 screens.

Because these bits use the standard CHROUT instead of STA's to the 32 column screen.

I expect it should be fairly easy to make the cursor appear on the CoCo 3 screens, so this may get done earlier than the rest of it.

The other interesting feature with it, is the ability to select your own cursor and prompt message. A personalised prompt can be fun at times.

These functions were derived from an article in 80 MICRO, Jan 83, by Ed Deming, called 'When OK Isn't'

Instructions

Auto30K is a machine language utility that provides

- automatic line numbering
- single key entry of predefined strings
- on screen editing
- choice of cursors
- choice of prompt

To use, type

```
CLEAR200,30000:(C)LOADM:EXEC
```

The code is relocatable, but if loaded with offset the entry addresses need altering.

This refers to a (C)LOADM file on tape. The program submitted is in basic with data statements containing the ML code (including checksums).

If you run the BASIC program you can then type:

```
(C)SAVEM"AUTO30K",30000,32767,30732
```

- Some keys are already defined; eg the down arrow key is used to specify a function key follows

:eg down arrow key and then 'A' will start auto line numbering.

Auto Line Numbering

- When first used displays

```
AUTO 100,10?
```

.. press ENTER and line numbering starts with 100 and an increment of 10.

Options:

120 & <ENTER>: starts at line 120 and increments in lots of 10.

130,5 & <ENTER>: starts at line 130 and increments in lots of 5.

,5 & <ENTER>: starts at line 100 and increments in lots of 5.

. after the first use the starting line number will always be the next number in sequence

. pressing break stops auto line numbering

. a line of "*" against a new line number indicates that the line already exists, and will be replaced.

- Prevented by a break before an enter single key entry of predefined strings

. the down arrow key, followed by another key will enter a defined string as if it had been typed through the keyboard.

- Applies to any mode, normal entry to BASIC, edit, input etc

. keys are defined by a call to the utility for extended (disk) basic a key is defined by -

- set DEFUSR0 = 31015

- set A\$="key" + "string":

```
A$=USR(a$) <ENTER>
```

: where key = key to be used

: and string = the string to be entered by that key

eg.

```
A$="QPRINT#-2,"+CHR$(34)+"FRED"+CHR$(34)
```

... will cause PRINT#- 2,"FRED" to be entered when down arrow key, and "Q" are pressed

- any number of keys can be defined once DEFUSR0 has been set.

. for non-extended basic (which will also work for the other basics), define A\$ in direct mode and then execute the code on function key 'D', which will define the key.

eg. A\$="fred" <ENTER>, down arrow key, 'D', <ENTER> will define the key.

The code on key 'D' is

```
E=LEN(A$):B=479:POKE474,E:POKE476,1:POKE477,224:FOR X=1TO E:POKE B+X,ASC(MID$(A$,X,1)):NEXT X:EXEC31012
```

This code sets some pointers and moves the string to the cassette buffer area, and executes the address 3 below the normal entry which then loads the x register with the required address for the string in the buffer area.

A similar procedure works to delete a key. Use the same code as on 'D', but EXEC31226 instead.

To avoid re-typing you can use the same code from d, and then backspace to change the exec address.

On Screen Editing

. Provides a form of on screen editing which is similar to that with the IBM PC and some mainframe terminals.

- The substance of the editing is based on a stx (start of text) and etx (end of text) concept.

: stx and etx are graphic characters that appear on the screen.

- When ENTER is pressed, with the cursor between an stx & etx, all characters between the stx and etx are sent to the BASIC interpreter.

: ... and treated as if typed in, ie, either direct mode or with line numbers.

. On screen editing is entered by pressing the clear key (either normal or upper case)

- note the clear key loses its normal function, to clear the screen - use CLS

. When in this mode the cursor changes control keys are

- arrow keys in normal case, move the cursor around the screen, with wrap around at ends.

- ENTER; sends all characters between stx and etx.

- Shift arrow keys:
: u/c left arrow - inserts a stx at start of this line.

: u/c right arrow - inserts an etx at end of this line.

: u/c down arrow - deletes this line.

: u/c up arrow - inserts a blank line

. Other control keys are activated by pressing the clear key first ...

- which gives a solid black cursor while it waits for the control key.

Control keys in this mode are

"A" - starts auto line numbering, which works as before : with a stx/etx around each line.

"K" - acts as down arrow key in normal mode.

: eg. clear,k,q will enter print#-2, etc as if from keyboard.

Note - if use clear,k,a have to do an extra enter to start auto line numbering, and is not recommended.

"I" - inserts characters into the line from this position
: cursor changes.
: rest of line moves along as required.
: exit with any arrow key or enter.

"D" - deletes a character when any key is pressed.
: cursor changes.
: rest of line is closed up.
: exit with any arrow key, or enter,

"<left arrow key>" - moves cursor to left of this line.

"<right arrow key>" - displays the BASIC line number between a stx and cursor
: eg stx 100 clear,rt arrow displays line no 100

"<down arrow key>" - displays the next BASIC line

"<up arrow key>" - displays previous BASIC line.

. These control keys use the same routines as auto line numbering
- the current line number is the next line number for auto.
- this can be set by the right arrow function, or by executing auto, and setting the required line number there.
- using these functions alter the auto start and increment values.

. break exits from screen edit to normal.
- break will normally cancel an operation.

Choice of Cursors

. The cursor characters are all set at a single memory location in the utility, and can be changed by pokes to those addresses

. the normal cursor and screen edit cursors are set to blink
- which is done by alternating between two different cursors
- the normal cursor can be made non-blinking by putting the same character in the other cursor location

- the screen edit cursor will always blink with the character in that position

. cursor positions are -
30361 - normal cursor blank (actually 96 decimal).
30362 - normal cursor as seen
30363 - screen edit, cursor blank, or character in that position.
30364 - screen edit cursor as seen.
30405 - cursor shown during delete.
30406 - cursor shown during insert.
30674 - cursor shown while waiting for function key.
32142 - cursor after clear as control key.

. These cursors can be replaced by any printable characters, by poking desired values into these locations.
- note some cursors are stored directly onto screen and show as screen characters, not ASCII

. These values can be poked while the utility is in control
- if it stuffs up, return to normal BASIC, and POKE desired values, and then restart the utility.

. The stx and etx characters may also be altered
- these values are stored at locations -
30410 - stx
30411 - etx
- These two values must be graphic characters, ie ASCII values greater than 128

Choice of Prompt

. The prompt message, ready, is stored from 32728 onwards (max of 40 bytes), and must end with a CHR\$(13);CHR\$(0)
- it can be altered by poking any desired string, including a carriage return, into these locations
- eg.

```
Z=32728:A$="the dog has struck again"+chr$(13)+"watch out!!"+CHR$(13);CHR$(0):FOR X=1 TO LEN(A$):POKE Z,ASC(MID$(A$,X,1)):Z=Z+1:NEXT X
```

This will make A\$ the prompt
- or more simple

```
A$=">" + chr$(13) + chr$(0)
```

Utility Entry Addresses

. The utility has a number of sub-routines as follows
- called by exec address, or by user call with a string parameter

31015 - entry to define a key, called by USR.

31229 - entry to delete a key definition, called by USR, where the first character in the string specifies the key code to be deleted.

31351 - starts auto line numbering, exec address.

30808 - prints the lowest memory location used for storage of key definitions.

30722 - initialises the utility, with no keys defined.

30732 - initialises the utility, with all existing key definitions retained.

30789 - resets control to normal BASIC.

- restart again by EXEC30732

31296 - prints all keys defined to the printer

31300 - displays all keys defined to the screen messages

. A number of messages appear from time to time:

- respond logically.
- if you attempt to define a key which already has a definition, you get a choice of 'R' or 'C'
: 'R' replaces the old definition with the new one
: 'C' cancels the new definition

. key definitions are stored from 30340 downwards in memory
- there is no limit to the number of keys that can be defined.

: except the number of keys on the keyboard.

: upper case keys are different to lowercase.

- if more than 340 bytes are used, you get the 'no room for' message and have to protect more memory.

: eg clear 200,29000 will give 1340 bytes of storage for key definitions.

- the maximum length of a string that can be associated with a single key is 127 bytes

. The 'ha ha' message comes when you try to do something that won't work

General

The screen edit mode still has a few bugs in it, which are either insignificant or not re-occur from a cold start.

- if you find some that you can recreate from a cold start, let me know.

: I may fix them

. Some that occur are -

- Syntax error when entering a line the first time from screen edit ...

: ENTER it again and it normally works.

-CXcharacter from alternate cursor in screen edit is printed at end of line ...

: ignore it

- If etx is the only character on the last line when press enter, it may be overwritten ...

: replace it

- System hangs in screen edit ...

: press break &/or ENTER

: if not fix, reset normally will, if not need to do a cold start.

- If used with a auto key repeat routine the screen edit function is more likely to hang

Other notes

. BASIC programs which have been CSAVED to tape using normal BASIC may not reload correctly.

- there is a very small increase in the time between blocks for tape operations.

- can be fixed by returning to normal BASIC by typing EXEC30789, CLOADING the program, then type EXEC30732

- programs csaved while using this utility will load correctly with normal BASIC

: and it does not happen with all tape recorders

. This utility alters ram vectors at hex 167 and 16a, and may not work correctly if used in conjunction with any other program that also alters those vectors

Other utilities that I have submitted (like pskip) that alter one of these ram hooks will work correctly in association with AUTO30k.

The only thing to watch is that you restore them to normal in the reverse sequence to which you initialise them.

The 'H' key has been defined to show the main entry points to the routine. Use down arrow, 'H' to be reminded of what they are.

Other keys defined are a fairly basic set.

If you want to retain the keys as you have re-defined them, you have to (C)SAVEM the program again.

The necessary start address is obtained from EXEC30808, the end address is 32767, and exec address is 30732.

I normally use 30000 as the start address. It doesn't really matter providing it is below the start of the key definitions.

40 bytes is really a bit excessive for the prompt. When I selected these locations I was into changing the prompts regularly.

I've now settled on ready for myself. It would be fairly simple to move the utility up 30 odd bytes to give a bit more space above 30000 for key definitions, but I've not bothered.

It would require changes to these instructions.

If you want a string command to execute when you use the function key, you require a CHR\$(13) on the end of it.

eg the string to start auto line numbering is "a" + "EXEC32351" + CHR\$(13).

The CHR\$(13) acts as if you had pressed the enter key.

If you want to display a message without executing it (like on h), put a CHR\$(3) (break) on the end instead.

If you use 'enter' in this context, you will get a syntax error message after it is displayed.

The utility also contains a switch (at 30344) to allow you to suppress the display of a command entered from a key definition.

eg the down arrow key, 'A' displays the EXEC31351 on the screen. If you change the string on 'A' to ...

```
POKE30344,1: + CHR$(13) +
CLS:EXEC31351 + CHR$(13)
```

... then the command will not print on the screen, but the screen will be cleared. The CLS is required because the way it is set up now - you can't suppress the display of the POKE

30344,1 before the first cr.

This switch was in fact put there for the screen edit function, which came later.

The Listing:

```
1 '** AUTO30K
   BY GEORGE MCCLINTOCK
   SOME YEARS AGO
2 GOTO 10
3 SAVE"230B:3":END'8
4 'THIS PROGRAM SETS UP THE MULT
  I-PURPOSE ML UTILITY CALLED AUTO
  30K THAT PROVIDES
5 'AUTO LINE NUMBERING, SINGLE K
  EY ENTRY OF STRINGS, AND ON SCRE
  EN EDITING
6 'EXEC ADDRESS IS 30732
7 'FOR A 16K MACHINE CHANGE M TO
  13525 AND CLEAR 200,13500
8 'ALL ENTRY POINTS HAVE TO BE A
  LTERED TO SUIT
9 'EACH DATA LINE HAS ITS OWN CH
  ECKSUM
10 CLEAR 200,30000
120 M=30025:M1=M-25
30 LN=150:FOR X=0 TO 2710 STEP 2
5: IF X<2699 THEN N=25 ELSE N=10
40 GOSUB 100:NEXT X
50 CLS:PRINT "AUTO30K MACHINE LA
  NGUAGE NOW INMEMORY FROM";M1;" T
  O";M1+2710+25
60 PRINT "IT CAN BE (C)SAVEM'ED
  FROM THEREFOR LATER USE":PRINT
70 PRINT "OR USED NOW AFTER INIT
  IALISING BY EXEC";M1+732
80 STOP
90 '
100 PRINT LN;;A=0:FOR Y=0 TO N-1
110 READ C$:B=VAL("&H"+C$):A=A+B
   :POKE M,B:M=M+1
120 NEXT Y:READ C$:IF A<> VAL("&
  H"+C$) THEN PRINT "ERROR IN LINE
  NO";LN:STOP
130 LN=LN+10:RETURN
140 '
150 DATA 0,0,0,0,4F,50,45,4E,22,
44,22,2C,23,31,2C,22,55,54,49,4C
,49,54,59,53,22,531
160 DATA 3A,47,45,54,23,31,2C,31
,3A,45,58,45,43,20,26,48,39,38,3
9,D,5A,29,45,3D,4C,5C0
170 DATA 45,4E,28,41,24,29,3A,42
,3D,34,37,39,3A,50,4F,4B,45,34,3
7,34,2C,45,3A,50,4F,5F8
180 DATA 4B,45,34,37,36,2C,31,3A
,50,4F,4B,45,34,37,37,2C,32,32,3
4,3A,46,4F,52,58,3D,613
190 DATA 31,54,4F,45,3A,50,4F,4B
,45,42,2B,58,2C,41,53,43,28,4D,4
9,44,24,28,41,24,2C,629
200 DATA 58,2C,31,29,29,3A,4E,45
,58,54,58,3A,45,58,45,43,33,31,3
0,31,32,20,44,64,44,63A
210 DATA 45,46,4B,45,59,3D,33,31
,30,31,35,20,41,55,54,4F,3D,33,3
1,33,35,31,20,4C,4F,5F9
220 DATA 57,4D,45,4D,3D,20,33,30
```

,38,30,38,20,4E,4F,52,4D,41,4C,3
D,33,30,37,38,39,20,5E7
230 DATA 52,45,53,54,41,52,54,3D
,33,30,37,33,32,20,44,45,4C,4B,4
5,59,3D,33,31,32,32,644
240 DATA 39,20,44,49,53,4B,45,59
,3D,33,31,33,30,30,3,48,5B,45,44
,49,54,45,4,50,52,60D
250 DATA 49,4E,54,23,2D,32,2C,43
,48,52,24,28,31,33,29,3B,43,48,5
2,24,28,32,35,35,29,578
260 DATA 51,1B,50,52,49,4E,54,23
,2D,32,2C,4C,9,50,52,49,4E,54,20
,32,33,34,30,2B,26,5C3
270 DATA 48,54,D,45,58,45,43,20,
33,31,33,35,31,D,41,B,0,0,0,0,0,
0,64,0,A,3E2
280 DATA 0,22,0,0,76,39,0,75,4D,
5A,0,60,C6,20,8C,33,30,30,32,35,
0,0,0,D,52,518
290 DATA 45,44,4F,20,41,55,54,4F
,20,73,D9,30,20,31,30,3F,0,D,FF,
FF,FF,0,0,0,0,797
300 DATA FF,FF,FF,FF,0,5F,7E,0,7
5,49,84,88,0,0,0,0,A,D,4B,45,59,
20,5A,20,49,886
310 DATA 53,D,27,10,3,E8,0,64,0,
A,0,1,9,D,49,53,20,41,4C,53,4F,D
,E,D,45,45F
320 DATA 4E,54,45,52,20,52,20,4F
,52,20,43,0,9,D,49,53,20,4E,4F,5
7,D,D,D,4E,4F,559
330 DATA 20,52,4F,4F,4D,20,46,4F
,52,D,7,D,48,41,20,48,41,D,A,D,4
5,4E,54,20,46,528
340 DATA 41,49,4C,D,9,D,44,45,4C
,45,54,45,44,D,6A,5C,AE,5D,A6,80
,AF,5D,6D,59,27,7ED
350 DATA 7C,6D,5C,26,4A,6F,59,20
,46,6F,5B,6D,52,27,5C,86,20,20,5
8,D,6F,27,3,7E,C5,7F6
360 DATA 8F,F,70,32,62,34,14,34,
74,17,0,9B,6D,5C,26,CC,6D,51,27,
5,6F,51,16,4,27,6EA
370 DATA 6D,50,10,26,5,C8,6D,4F,
27,10,9E,88,CC,2A,19,AD,9F,A0,2,
5A,26,F9,9F,88,6F,9E5
380 DATA 4F,17,0,E3,6D,5B,27,18,
81,3,27,B2,81,D,26,10,6D,52,10,2
7,3,F8,6C,51,E6,805
390 DATA C8,36,E7,44,16,7,8D,6D,
52,10,26,4,C9,81,A,27,1B,81,C,27
,9,81,5C,27,5,728
400 DATA 35,74,7E,A1,B9,6C,52,AE
,44,86,60,E6,47,AF,46,ED,44,20,B
C,9E,88,E6,84,86,B,C67
410 DATA A7,84,AD,9F,A0,0,27,FA,
E7,84,8D,2,20,81,30,50,B6,82,A1,
82,27,C,1,0,27,AF9
420 DATA 5,50,30,85,20,F1,6F,5C,
39,E7,5C,50,30,85,AF,5D,39,33,8D
,FE,94,39,8D,F9,30,AED
430 DATA 50,AF,C4,6F,82,6F,82,8E
,1,67,31,8D,0,D0,8C,21,10,B3,1,6
8,12,12,8D,1E,31,962
440 DATA 8D,FF,33,8D,18,8E,1,67,
86,7E,A7,80,31,8D,0,88,10,AF,81,
A7,80,31,8D,FF,19,B08
450 DATA 10,AF,81,39,C6,3,A6,80,
A7,A0,5A,26,F9,39,10,8E,1,67,30,
8D,0,96,8D,EC,12,A45
460 DATA 12,30,8D,FE,FF,8D,E4,39
,8D,A3,BC,C4,83,0,4,ED,C8,33,30,
C8,33,17,2,B8,C6,C87
470 DATA 5,30,48,16,1,26,CC,1,0,
34,6,A6,45,A7,9F,0,88,6D,5A,20,1
4,8E,8,0,30,63B
480 DATA 1F,26,FC,CC,FF,8,8E,1,5
2,A7,80,5A,26,FB,6F,5A,AD,9F,A0,
0,26,13,6A,E4,26,AF9
490 DATA F6,63,61,27,3,A6,45,8C,
A6,44,A7,9F,0,88,20,E7,A7,E4,A6,
44,A7,9F,0,88,35,B92
500 DATA 6,39,D,6F,26,29,6D,8D,F
D,CA,27,B,32,62,81,D,26,4,6F,8D,
FD,BE,39,8C,AB,970
510 DATA EF,26,13,6D,8D,FD,B3,27
,4,6C,8D,FD,AE,30,8D,6,F9,32,66,
7E,AC,79,7E,CB,4A,C2B
520 DATA 0,0,FF,FF,FF,FF,0,0,0,0,
,FF,FF,FF,FF,0,0,0,0,FF,FF,FF,FF
,0,0,0,BF4
530 DATA 0,FF,FF,FF,FF,0,0,0,0,F
F,FF,FF,FF,0,0,0,0,FF,FF,FF,FF,0
,0,0,0,BF4
540 DATA FF,FF,FF,FF,0,0,0,0,FF,
FF,FF,FF,8E,1,DA,17,FE,D3,10,AE,
2,A6,A0,E6,84,EB9
550 DATA 2F,49,5A,2F,46,ED,42,10
,AF,C8,1B,AE,C4,AF,48,50,30,85,3
0,1C,9C,27,2F,39,6F,96C
560 DATA 80,6F,80,AF,C4,E6,43,A6
,A0,A7,80,5A,26,F9,EC,42,ED,84,A
7,C8,41,30,C8,3B,8D,E00
570 DATA 2F,E6,43,AE,C4,8D,2B,A6
,42,17,FE,72,6D,5C,27,1C,AE,C4,A
C,5D,26,28,6F,5C,39,ACA
580 DATA 30,8D,FD,95,20,11,30,8D
,FD,81,8D,B,E6,43,AE,C8,1B,20,6,
30,8D,FD,8A,E6,80,BDD
590 DATA F,6F,A6,80,AD,9F,A0,2,5
A,26,F7,39,30,8D,FD,40,8D,EC,E6,
5C,AE,5D,8D,E8,30,CA7
600 DATA 8D,FD,3E,8D,E0,17,FE,B9
,AD,9F,A0,2,81,52,27,16,AE,48,AF
,C4,6F,82,6F,82,30,C7C
610 DATA 8D,FD,34,8D,C7,E6,5C,AE
,5D,8D,C3,20,A5,8D,2,20,EE,10,AE
,5D,E6,5C,30,A5,30,C73
620 DATA 2,E6,3F,27,F,E7,5C,CB,2
,A6,A2,A7,82,5A,26,F9,AF,5D,20,E
D,4F,AF,C4,ED,83,CA2
630 DATA 39,8E,1,DA,17,FD,FD,10,
AE,2,A6,A4,A7,C8,41,E6,84,10,27,
FF,6E,17,FD,DO,6D,CCC
640 DATA 5C,27,19,30,C8,3B,17,FF
,78,E6,5C,AE,5D,17,FF,73,30,8D,F
D,2,17,FF,6A,8D,AD,BA9
650 DATA 6F,5C,39,A6,C8,41,AD,9F
,A0,2,86,75,AD,9F,A0,2,17,FF,3E,
20,EB,86,FE,20,1,B8E
660 DATA AF,97,6F,31,8D,FC,4A,31
,30,EC,A3,C1,0,27,20,30,8D,0,1D,
A7,1,C6,3,17,FF,9B2
670 DATA 39,E6,21,1F,98,40,31,A6
,1F,21,17,FF,2D,8E,FF,FF,30,1F,2
6,FC,20,DA,39,D,5A,A28
680 DATA 20,17,FD,83,30,55,17,0,
A1,6F,42,31,C8,1B,17,0,E3,86,2C,
A7,A0,34,20,30,57,887
690 DATA 17,0,8E,35,20,17,0,D3,8
6,3F,A7,A0,6F,A4,30,C8,16,17,0,E
4,A6,42,81,15,2E,8B8
700 DATA 60,17,FD,C3,81,8,27,16,
A7,80,6C,42,AD,9F,A0,2,81,D,26,E
7,30,1F,E6,42,C1,A93
710 DATA 1,26,10,20,4E,6D,42,27,
D9,30,1F,6A,42,AD,9F,A0,2,20,CF,
31,49,86,5,A7,43,81B
720 DATA 6F,A0,4A,26,FB,E6,42,A6
,82,81,0,27,29,81,39,2E,1E,81,2C
,27,D,81,30,2D,16,876
730 DATA 80,30,A7,A2,5A,27,F,20,
E5,34,30,5A,E7,42,31,57,8D,42,35
,30,20,B5,6F,42,30,8E7
740 DATA C8,10,20,90,31,55,8D,33
,17,0,8A,6C,5B,6D,52,10,26,FC,89
,39,C6,5,E7,43,31,90F
750 DATA 48,86,30,A7,A0,5A,26,FB
,31,48,EC,84,30,C8,46,A3,84,2D,4
,6C,A4,20,F8,E3,84,BCE
760 DATA 31,21,30,2,6A,43,26,EE,
39,30,49,4F,5F,A7,48,ED,C8,33,E3
,C8,33,ED,A4,E3,A4,B72
770 DATA ED,C8,33,E3,C8,33,E3,A4
,E3,1F,6F,80,6A,43,26,E6,ED,A4,3
9,C6,6,30,48,5A,27,C86
780 DATA 12,A6,80,81,30,27,F7,A7
,A0,6C,5C,5A,27,4,A6,80,20,F5,39
,C6,1,20,F0,F,6F,A64
790 DATA A6,80,81,0,27,6,AD,9F,A
0,2,20,F4,39,EC,55,E3,57,ED,55,8
D,3,16,FC,7,30,AA5
800 DATA 55,17,FF,7A,6F,5C,31,C8
,1B,10,AF,5D,6D,52,27,E,6C,59,A6
,C8,35,A7,A0,6C,5C,A4B
810 DATA 6C,59,6C,C8,32,17,FF,A7
,86,20,A7,A4,6C,5C,8D,3,86,D,39,
EC,55,9E,19,10,AE,AB3
820 DATA 84,27,D,10,A3,2,27,6,23
,6,AE,84,20,F0,6C,4F,39,FF,FF,FF
,0,0,0,0,FF,8F5
830 DATA FF,FF,FF,0,0,0,0,FF,FF,
FF,FF,0,0,0,0,FF,FF,FF,FF,0,0,0,
0,FF,FF,CF3
840 DATA FF,FF,0,0,0,0,FF,FF,FF,
FF,0,0,0,0,FF,FF,FF,FF,0,0,0,0,F
F,FF,FF,CF3
850 DATA FF,0,0,0,0,CC,0,1,20,D,
CC,FF,FF,20,8,CC,FF,E0,20,3,CC,0
,20,D3,88,A00
860 DATA DD,88,10,83,4,0,24,A,C3
,2,0,DD,88,6C,5A,16,0,8A,10,83,5
,FF,23,F5,83,8EC
870 DATA 2,0,20,EE,6F,50,6F,52,A
E,44,10,AE,46,AF,46,10,AF,44,CC,
5,E0,DD,88,16,FA,AA4
880 DATA F7,6D,C8,32,10,27,2,C3,
6F,C8,32,20,F1,6D,54,27,1D,81,D,
2F,13,81,5E,27,F,8BE
890 DATA A7,42,6D,54,2D,5C,81,5C
,26,50,6C,59,16,FB,3B,E6,43,E7,4
5,6F,54,81,9,27,88,9E8
900 DATA 81,8,27,89,81,5E,27,8A,
81,A,27,8B,81,D,27,BF,81,5D,27,4
8,81,15,27,3B,81,840
910 DATA 5F,10,27,1,34,81,5B,10,
27,1,1E,81,3,27,91,81,C,10,27,0,
C3,81,5C,10,27,5DA
920 DATA 0,BD,AD,9F,A0,2,A6,9F,0
,88,A7,44,16,FA,85,8D,20,8D,2D,A
6,42,20,EB,8D,18,AF7
930 DATA 8D,2E,86,60,A7,84,20,E5
,8D,E,8D,1B,A6,C8,35,20,D8,8D,2C
,A6,C8,36,20,EC,9E,BB6
continued on page 37

SEE YOU AT

CONF

BUNDEENA NSW

AUGUST 8 & 9

Conf '87 this year is to be held at the Uniting Church's campsite in Bundeena NSW.

This is a particularly pretty area of Sydney, situated on the northern tip of the Royal National Park, in Port Hacking.

The water views are fabulous, and the bushwalks are amongst the best in Australia.

Getting there is not a problem.

Bundeena is reached through the Royal National Park by road or by train to Cronulla and ferry from the nearby wharf to Bundeena.

The conference will be jam packed with all sorts of things to see and do!

The big news this year will obviously be the growing use of OS-9 Level 2 on the CoCo 3's; and Conf '87 will be the definitive place to see this excellent system.

By that time initial users will have had time to sort the system out and create some really interesting stuff.

But it is not just OS-9 that is of interest this year.

Blaxland Computer Services have imported a wide range of new products for the Tandy CoCo 3 and all of this will be on show and in use.

Some of these products are very exciting. For example Colour Max 3 should be available at the show - a colour version of CoCoMax.

And Blaxland will also have the MIDI interface which allows you to connect your CoCo to any synthesiser.

Paris Radio will be bringing their Sculptor based accounting package, all the new OS-9 packages for the CoCo 3, an Atari running OS-9, they'll have a big modem sale, featuring the HAYES compatible Avtek Megamodem, the latest version.

They will also be connected to "Infocenter", Paris Radio's on-line information service.

Infocenter was one of the first on-line services in Australia and continues to be a source of programs and information for Tandy computer owners.

Paris will also have an enormous bookshelf, including "CoCo 3 Peeks and Pokes". There will be memory upgrades for the CoCo 3, Macintosh software running on the Atari, and possibly an Oki Laser Line 6 printer working with the CAD 3-D software package for the Atari 1020.

With the release of the new T1000 EX and SX, interest in these machines has never been higher. We'll have a number of these computers at the conference, as well as their big brothers, the T3000 series, which we'll be putting through their paces.

We've had continuing interest in some of the more diverse subjects covered in the magazine at past conferences, so again this year we'll have tutorials on hardware mods and on Forth.

There'll be Basic Basic and Advanced Basic courses, and an Assembly Language tutorial as well.

Some of the people attending as lecturers this year include Johanna Vagg, Ron Wright, Jack Fricker, John Redmond, Mike Turk and John Witstyn.

John Witstyn is an expert on MS DOS and especially the IBM PC and he will bring us a broad range of information for Tandy 1000 users.

Other computers will be discussed, principally the 68000 series of computers, and of course, we'll be showing Goldlink 642 on Viatel - and computer communications in general.

'87

Conference is a place to meet old friends, to meet the people behind the names in the magazine, to learn a lot of new information, to see the latest Tandy equipment.

We hope you'll come. We're sure you'll be glad you did. But please hurry your booking, because accommodation (which is not obligatory) and places at the conference, are both limited by the size of the centre.

The cost is increased over previous years due entirely to the fact that we are doing it in Sydney which is a good deal more expensive than the Gold Coast!

On the other hand, many of you will save by not having the additional travelling expenses associated with getting to the Gold Coast.

We aim to make the conference a family affair, and the location is a good one for people with families who are less interested in computers, but who would still like to be with dad or mum for the weekend.

The family can take a ferry trip, go for bush walks, or just laze on the beach, whilst you do your thing at the conference.

P.O. BOX 1742, SOUTHPORT.
QLD. 4215 Phone (075) 39-6177

Rates

Accommodated (1) \$87.00
Family of 2, + \$68.00 = \$155.00
Additional family members \$52.00 ea
Includes supper Friday evening, breakfast
lunch and dinner on Saturday and breakfast
and lunch on Sunday plus all accommodation.

Non Accommodated Rates

	One day	Two Days
One person	\$40.00	\$58.00
Sat Evening Meal	\$12.00	\$12.00
	=====	=====
	\$52.00	\$70.00

Additional family \$31.50 \$45.50 /person
Includes morning / afternoon tea and lunch.

\$20.00 deposit required with booking;
Full payment to be made by 15th July 1987.

LOCATION:-

Uniting Church's campsite
Maddena NSW

DATE:- 8th & 9th August, 1987

REGISTER NOW!!

We can only accept a limited number of people this year. **DON'T MISS OUT!** on a top weekend of **FUN, FRIENDSHIP and LEARNING.**

Name:

Address:

Phone:

No. People attending:

SPEAK UP!:- Now is your chance to suggest your ideas for any tutorials we may not have mentioned. (participants only).

Tutorials likely to attend:

Please find enclosed:

chq/money order/bankcard/visa/mastercard

Card No.

Signature:



CZAP3

Two people from the Hills
District CoCo Club

UTILITY

CZAP3 WAS originally written for the CoCo 2, as a BASIC utility for those people who had accidentally killed the wrong file from the directory.

Myself and another, who wishes to remain anon, decided that after looking through our archive of programs we would modify this one for the CoCo 3.

It didn't take too long at all - we decided to add a modification, especially for those who cannot remember the ASCII code in either HEX or DEC.

I hope you enjoy this program, it is self explanatory, using a 40 column screen.

This and many other programs you will eventually get to see are the results of TWO People who are proud to belong to the Hills District Colour Computer Club.

Happy Computing.

The Listing:

```

0 ON BRK GOTO 1100
1 GOTO5
2 '***** 3 ZAP *****
3 SAVE"235:3":END'8
5 WIDTH40:PALETTE 0,0:ATTR3,0:CLS
10 LOCATE10,2:PRINT"Coco-3 disk
utility":LOCATE15,5:PRINT"Color
Zap"
20 LOCATE5,8:PRINT"Modified by H
ills Dist C.C.C":LOCATE12,20:ATT
R4,5,B:PRINT"Now LOADING..":ATT
R2,0
30 FORX=1TO2500:NEXTX
40 POKE65497,0
50 CLEAR500:DIM M$(1),A$(16),K(2
2):BL$=CHR$(128):BL=159
60 FORX=1 TO 16:READ A$(X):NEXT
70 DATA D,#,0," ",T,#,,," ",S,#,
,,," ",," "
80 FORX=1TO22:READK(X):NEXT
90 DATA 8,9,10,12,13,48,49,50,51

```

```

,52,53,54,55,56,57,65,66,67,68,6
9,70,94
100 CLS:LOCATE11,0:PRINT"----= CO
LOR.ZAP ----=:LOCATE6,2:PRINT"TH
E FOLLOWING KEYS ARE USED":LOCAT
E6,4:PRINT"----= MODIFICATION MOD
E ----=:ATTR3,2:PRINTSTRING$(39,
"*"):ATTR4,1
101 LOCATE0,6:PRINT"To modify --
-----<M>":LOC
ATE0,7:PRINT"To cancel -----
-----<C>":LOCATE0,8:
PRINT"To exit program -----
-----<X>":LOCATE0,9:PRINT"B
asic character codes -----
--<H>":ATTR2,4
102 LOCATE0,10:PRINT"To make mod
ification -----<ENTER>"
103 LOCATE0,11:PRINT"To move cur
sor ----- arrow keys":AT
TR3,0
104 ATTR3,3:LOCATE0,12:PRINT"Pre
vious sector ----- left ar
row":LOCATE0,13:PRINT"Next secto
r ----- right arrow":A
TTR3,2:PRINTSTRING$(39,"*"):ATTR
3,0
105 LOCATE0,15:INPUT"How many dr
ives 1 or 2 ";MD:MD=INT(MD-1):IF
MD<0ORMD>3 THEN GOTO100
120 IFMD=0 THEN DN=0:GOTO15
0
130 PRINT"DRIVE #:<0,1,2,3
> ---- ";:INPUTDN:DN=INT(DN):IFD
N<0ORDN>3 THEN GOTO130
140 A$(3)=STR$(DN):A$(3)=RIGHT$(
A$(3),1)
150 PRINT"TRACK #:<0 - 39>
---- ";:INPUTTN:TN=INT(TN):IF
TN<0 OR TN>39 THEN GOTO150
160 PRINT"SECTOR#:<1 - 18>
---- ";:INPUTSN:SN=INT(SN):IF
SN<1 OR SN >18 THENGOTO160
170 MN=0
180 ' MAIN ROUTINE
185 POKE359,57:POKE65314,64
190 CLS:POKE65496,0:DSKIS DN,TN,
SN,M$(0),M$(1)
195 POKE65497,0
200 A$(7)=STR$(INT(TN/10)):A$(8)
=STR$(TN-10*INT(TN/10))
210 A$(7)=RIGHT$(A$(7),1):A$(8)=
RIGHT$(A$(8),1)
220 A$(12)=STR$(INT(SN/10)):A$(1
3)=STR$(SN-10*(INT(SN/10)))
230 A$(12)=RIGHT$(A$(12),1):A$(1
3)=RIGHT$(A$(13),1)
240 GOSUB410

```

```

250 IN$=""
260 IN$=INKEY$:IFIN$=""THEN260
265 IFIN$="H"THEN GOTO 1200
270 IFIN$="N"THEN GOSUB 610:GOTO
190
275 IFIN$="X"THEN RUN5
280 IN=ASC(IN$)
290 IFIN=9 THEN 360
300 IFIN=12 THEN GOTO 120
310 IFIN<>8 THEN GOTO260
320 IF MN=1 THENMN=0:CLS:GOTO240
330 SN=SN-1:IFSN<1 THENSN=18:TN=
TN-1
340 IFTN<0THENTN=0:SN=1:MN=0:GOT
O250
350 MN=1:GOTO190
360 IF MN=0 THENMN=1:CLS:GOTO240
370 SN=SN+1:IFSN>18 THEN SN=1:TN
=TN+1
380 IFTN>39 THEN TN=39:SN=18:MN=
1:GOTO250
390 MN=0:GOTO190
400 ' PRINT FORMAT
410 WIDTH32:FORZ=1TO 128 STEP 8
420 L$=HEX$(Z+MN*128-1):IFLEN(L$
)<2THEN L$="0"+L$
430 PRINT@32*(Z-1)/8,A$(1+(Z-1)/
8);L$;BL$;
440 FORQ=0TO7 STEP2
450 H1$=HEX$(ASC(MID$(M$(MN),Z+Q
,1)):H2$=HEX$(ASC(MID$(M$(MN),Z
+Q+1)))
460 IFLEN(H1$)<2 THENH1$="0"+H1$
470 IFLEN(H2$)<2 THENH2$="0"+H2$
480 PRINTH1$;H2$;
490 IFQ=6 THENPRINTBL$; ELSEPRIN
T" ";
500 NEXTQ
510 J=(Z-1)/8
520 FORQ=0TO7
530 PK=ASC(MID$(M$(MN),Z+Q,1))
540 IF PK<32 THENPK=96:GOTO570
550 IF PK=>32 AND PK<=63 THENPK=
PK+64:GOTO570
560 IF PK=>96 AND PK<=127 THENPK
=PK-96
570 POKE1048+J*32+Q,PK
580 NEXTQ
590 NEXT:RETURN
600 ' MODIFY MODE
610 SP=1:CU=1028:CM=0:MM$=""
620 CU=1028+32*INT((SP-1)/8) +
CM +INT(CM/4)
630 PE=PEEK(CU)
650 POKECU,BL:MM$=INKEY$:POKECU,
PB:IFMM$=""THEN650 ELSEMM=ASC(MM
$)

```



For our 3D freaks.

LISSABOX

GRAPHICS DEMO

by Peter Harry

```

660 FL=0:FORZ=1TO22:IFM=K(Z)THE
NFL=Z
670 NEXTZ:IFFL=0THEN650
680 ON FL GOTO 700,730,760,780,8
00,870,870,870,870,870,870,8
70,870,870,870,870,870,870,8
70,1090
690 ' BACK ARROW
700 CM=CM-1:IFCM=0 THEN SP=SP+(
INT(CM/2)<>CM/2):GOTO620
710 CM=0:IFSP>8THEN SP=SP-1:CM=1
5:GOTO620 ELSE GOTO650
720 ' FORWARD ARROW
730 CM=CM+1:IFCM<=15 THEN SP=SP-
(INT(CM/2)=CM/2):GOTO620
740 CM=15:IF SP<121 THEN SP=SP+1
:CM=0:GOTO 620 ELSE GOTO650
750 ' DOWN ARROW
760 IF SP<121 THEN SP=SP+8:GOTO62
0 ELSE GOTO650
770 ' CLEAR
780 GOTO190
790 ' MODIFY DISK MEMORY
800 WIDTH40:CLS6:LOCATE11,0:PRIN
T"--> MODIFY DISK <--":LOCATE0,1
0:PRINT"To cancel press -----
----- <C>"
802 LOCATE0,12:PRINT"To modify d
isk contents press - <ENTER>"
810 VM$=INKEY$:IFVM$=""THEN 810
815 'IFVM$="H"THENGOTO1200
820 IFVM$="C" THEN GOTO190
825 IFVM$="X"THENGOTO1100
830 IFASC(VM$)<>13 THEN GOTO810
840 POKE65496,0:DSKO$ DN,TN,SN,M
$(0),M$(1)
845 POKE65497,0
850 GOTO190
860 ' MODIFYING HEX VALUE
870 PZ=K(FL):IFPZ<65 THEN PZ=PZ+
64
880 POKECU,PZ
890 V(0)=0:V(1)=0:VL=0
900 IFINT(CM/2)=CM/2 THENGOTO970
910 V(1)=FL-6
920 PN=PEEK(CU-1)
930 IFPN>=112THENPN=PN-112:GOTO9
60
940 IFPN>=65THENPN=PN-55:GOTO960
950 IFPN>=48THENPN=PN-48
960 VL=PN*16+V(1):GOTO1020
970 V(0)=FL-6:PN=PEEK(CU+1)
980 IFPN>=112THENPN=PN-112:GOTO1
010
990 IFPN>=65THENPN=PN-55:GOTO101
0
1000 IFPN>=48THENPN=PN-48
1010 VL=V(0)*16+PN
1020 MID$(M$(MN),SP,1)=CHR$(VL)
1030 IFL<32THENVL=96:GOTO1060
1040 IFVL>=32AND VL<=63 THEN VL=
VL+64:GOTO1060
1050 IFVL>=96 ANDVL<=127 THEN VL
=VL-96
1060 SV=INT((SP-1)/8):POKE1047+3
2*SV+SP-8*SV,VL
1070 GOTO730
1080 ' UP ARROW
1090 IF SP>8 THEN SP=SPP-8:GOTO6
20 ELSE GOTO650

```

continued on page 63

LISSABOX IS A demonstration of the CoCo 3's high resolution and speed. It draws boxes in lissajous patterns which produces a 3-D effect. The boxes are drawn in 14 different colors which are rotated by changing the palettes.

The background is stepped through each of the 64 colours. The boxes are drawn with a random black border which further enhances the 3-D effect.

Variables & Line Numbers

There are several variables which may be changed to give different effects.

"ST" is the step between the boxes if this is reduced the boxes are drawn closer together.

"NM" is the number of lissajous patterns drawn before the screen is cleared and a new pattern is drawn.

Line 220 may be changed for different box sizes.

Line 270 selects BD which determines if the box border is drawn.

Line 310 rotates the palettes. This was done using pokes because it is much faster than using the palette command.

Line 320 calculates the position of the next box and Line 340 draws it.

Line 350 draws the border if BD=1.

Line 370 contains the colours for the boxes the first 2 zeros are the background start colour and the box border colour.

The remainder being the 14 box colours in order.

Line 150 sets the Coco in high speed and increases the screen height removing the border.

Line 380 returns the Coco to normal when the break key is pressed.

I hope you enjoy the patterns produced.

```

0 GOTO10
3 SAVE"241:3":END'6
10 '*****
20 '**** LISSABOX ****
30 '** WRITTEN BY **
40 '** PETER HARRY **
50 '**** V3.02 ****
60 '* DATED 04MAR87 *
70 '*****
80 '* A DEMONSTRATION *
90 '* PROGRAM FOR THE *
100 '***** COCO 3 *****
110 '*****
120 '
130 FG=1:ST=200:NM=7'** ST=STEP,
NM= NUMBER OF PATTERNS
140 ONBRK GOTO380
150 POKE&HFFD9,0:POKE&HE071,&H80
160 FORX=2TO15:HBUFF X,240:NEXT'
** SET UP BUFFERS FOR EACH BOX
170 HSCREEN2
180 HCLS0:FORP=0TO15:READC:PALET
TEP,C:NEXT:' ** SET UP PALETTE C
OLOURS
190 '
200 '*** DRAW COLOURED BOXES AND
SAVE IN BUFFERS ***
210 FORX=2TO15:HCOLORX,0
220 HLINE(160,92)-(180,112),PSET
,BF:HGET(160,92)-(180,112),X:NEX
T
230 '*** CHOOSE ANOTHER NX,NY **
*
240 NX=INT(RND(8)+1):NY=INT(RND(
10)+1)
250 IFNX=1THENNX=3
260 IFNY=1THENNY=3
270 BD=RND(2)-1:HCLS1
280 '
290 '*** DRAW BOXES ON THE SCREE
N ***
300 FORI=0TOST*NM
310 PP=PEEK(&HFFB2):FORX=&HFFB2
TO &HFFBE:POKEY,PEEK(X+1):NEXT:P
OKE&HFFB,PP'**ROTATE PALETTE CO
LOURS
320 X=INT(SIN(NX*1/ST)*149)+150:
Y=INT(COS(NY*1/ST)*85)+86'** CAL
CULATE POSITION
330 FG=FG+1:IFFG=16THENFG=2:B=B+
1:PALETTE1,B:IFB=63THENB=0'** IN
CREMENT BOX COLOUR AND BACKGROUN
D COLOUR
340 HPUT(X,Y)-(X+20,Y+20),FG,PSE
T

```

continued on page 63

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Item #	Description	Price
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G 1004	# 3	\$16.00

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Item #	Description	Price
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G 1007	# 2 Part 2 32K Games	\$16.00
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Q 1006	Crosstalk	\$306.00
Q 1007	Lotus 123	\$1054.00
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Z 2002	Webster's Spelling Checker	\$89.95
Z 2003	Webster's Thesaurus	\$89.95
Z 2004	Windowword	\$269.00
Z 2005	Ready	\$99.00
Z 2006	Thinktank	\$385.00

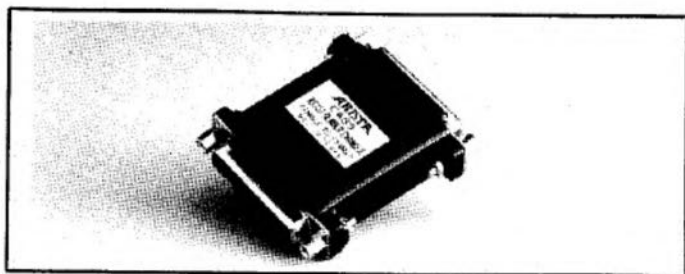
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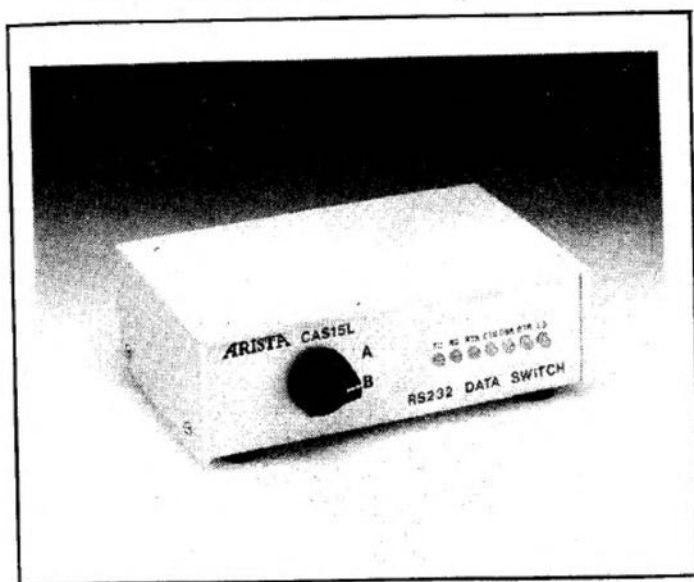
Item #	Description	Price
G 1017	CoCoTex - Videotex pac (Viatal) for all CoCos On Tape	\$79.95
G 1018	CoCoTex as above on disk	\$79.95
G 1019	Vtex 2 - Videotex pac for IBM Compatibles	\$225.00
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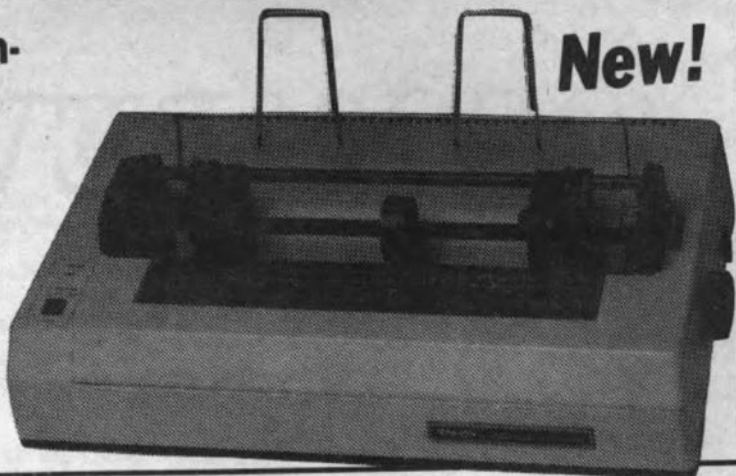
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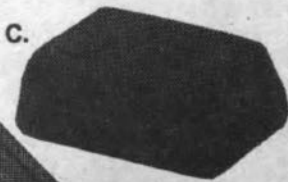
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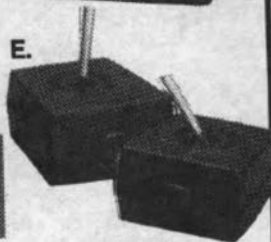
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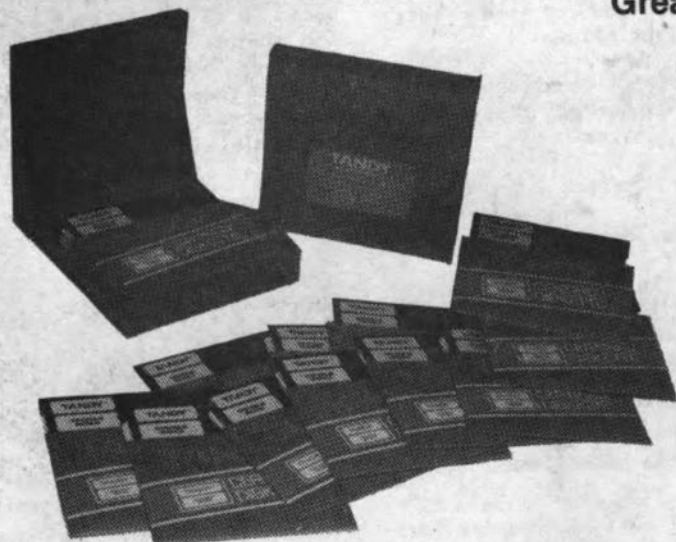


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For those users who don't own a CoCo3, here's...

COCO3 REVEALED

UTILITY

by Darren Reed

THE FOLLOWING information is classified as TOP SECRET - strictly for the CoCo 3 only; it may make others jealous or envious.

On the purchasing of my CoCo 3, I immediately went to try out these new hi-res graphics screens. They disappointed me somewhat - there was still only 192 vertical lines down.

With this in mind and a disassembler in memory I set to work to find a way to get the full 200 lines, as advertised.

The information below is a result of my looking through the new ROM, with the aid of a CoCo 3 service manual which does exist, incidently with the same catalog number as the CoCo 3: 26-3334.

First 200 lines in hi-res
modes.

POKE &HFF99,XX:POKE &HE7BA,200:
POKE &HE7BF,199:POKE &HEF8F,24:
POKE &HEB75,200:POKE &HF521,
200:POKE &HF526,199

XX = 53, 62, 53, 61
(for HSCREEN 1, 2, 3, or 4)

These pokes will enable the use of all hi-res commands to access the full 200 lines, including an extra line of text at the bottom of the screen.

The first poke must be executed each time a HSCREEN command is done - after it of course.

The others need only be executed once after each reset or power on.

N.B. The CoCo 3 is always in 'RAM' mode, so alterations to ROM can be made with ease, but the ROM is returned to normal when the RESET or the on/off button is pushed.

In addition to this it is possible to extend the text screens from 24 lines (0-23) to 28 lines (0-27).

In 40 column mode this is accomplished with the following pokes:

POKE &HE03D,&H65:POKE &HF666,
&H1C:POKE &HF66B,&H28:POKE
&HF66C,&HC0:POKE &HF866,&H28
:POKE &HF867,&H70:POKE &HF87F
,&H1B:POKE &HF87F,&H1C

WARNING: Type these in from 32 column mode or else it may not work!

Below the 28th line there is an extra 'mini' line, only noticeable in 40 columns if the 80 column screen has a different background colour.

This line is there because the 225 line screen is not a multiple of 8.

The parameters for 40 & 80 column mode are stored high up in memory, from location \$FE00 - \$FE08.

An explanation of what they hold is given below.

\$FE00-\$FE01: Location of the beginning of current line.

\$FE02: Current X cursor location.

\$FE03: Current Y cursor location.

\$FE04: No. of columns across screen.

\$FE05: No. of rows down screen.

\$FE06-\$FE07: Location of the bottom left corner of screen plus either 80 or 160 for 40/80 column mode.

\$FE08: CURRENT ATTR SETTING (Refer to the manual under HSTAT to see how this byte is organized.)

For those who wish to write Machine Code routines to access the 40/80 column screen, use a JSR \$E0B5 at the beginning of the routine and a JSR \$E097 at the end, before the RTS.

The CoCo 3 has one character set defined for use on the hi-res screens. This character set has 139 different characters able to be used out of 192.

However it is only possible to access 96 of these 139 using CHR\$ or similar means.

The other 43 are elsewhere and several pokes need be typed in first to access them.

To get the second set type:

POKE &HEFC9,&HFA:POKE &HEFCA,
&H10

To restore to normal type:

POKE &HEFC9,&HF0:POKE
&HEFCA,&H9D

Since the CoCo 3 is always in RAM mode, it possible to alter these character sets to suit your own needs. The data for the two sets resides between \$F09D and \$F39D, for the first and \$FA10 and \$FE10 for the second.

Each character on the hi-res screen is an 8x8 matrix. This is made up of 8 bits by 8 bytes in the memory. To explain how it comes up, use this diagram.

* For those with disk systems, the second set may not be available.

BYTE	BIT	VALUE
	0 1 2 3 4 5 6 7	0-255
0	. . . X	8
1	. . X . X	20
2	. X . . . X . . .	34
3	. X . . . X . . .	34
4	. X X X X X . . .	62
5	. X . . . X . . .	34
6	. X . . . X . . .	34
7	34

"X" - SET, "." - UNSET

This could be a typical 'A', which resides at locations \$F1A5 - \$F1AC, CHR\$(65). For those who wish to use fonts that already exist, I have written a program that converts the many GRAPHICOM II font files to CoCo 3 usable.

By using the converter, it is possible to create fonts under GRAPHICOM II's font editor and then use them on your CoCo 3.

Also there is a font editor written for the CoCo 3 at the end of this article.

The CoCo 3 hi-res graphics screens are very limiting when compared with the old PMODEs. There is no paging or extra graphic storage other than the buffer for HGET/HPUT in the 128K CoCo 3.

Another bad feature of the HSCREENs is that the HSCREEN command automatically executes a HCLS. This can be annoying but there are several ways to stop it. The most common is:

```
POKE &HE6C6,18:POKE &HE6C7,18
(overwriting a JSR with 2
NOPs)
```

It is also possible to control the area which the HCLS clears. The hi-res graphics screens are referred to at locations \$2000 - \$9FFF, an 8K block.

By poking any value between \$2000 and \$9FFF into locations \$E6E7 - \$E6E8 and \$E6E2 - \$E6E3 for the end and start of the HCLS area, it is possible to define the area which HCLS clears.

Thus by poking \$5F into \$E6E7 and \$FF into \$E6E8, only the top half of HSCREEN 2 & 4 would end up cleared to the desired colour.

Paging in the hi-res modes is possible through some small machine code routines but only for HSCREEN 1 & 3. These two screens are only half the size of the other two and hence the other half can be used for paging.

The two screens for HSCREENs 1 & 3 are at \$60000 - \$63FFF and \$64000 - \$67FFF, which is at \$72000 - \$5FFF and \$76000 - \$9FFF for BASIC.

ONLY LPOKE and LPEEK or machine language routines between \$70600 and \$71FFF (\$70E00 and \$71FFF for disk systems) can access the hi-res graphics screens so do not poke locations \$72000-\$79FFF expecting your hi-res screens to change - your basic program or BASIC ROM is being changed!

To flip between the two screens use the following pokes:

```
POKE &HFF9D,8 to see the
second
POKE &HFF9D,128 to see the
original.
```

Locations \$FF9D - \$FF9E are both vertical offset registers. They offset the area of memory being used as video ram.

With careful use of the two registers, a scrolling effect

can be produced. Bit 0 of \$FF9E is the lowest value and bit 8 of \$FF9D is the highest.

By raising 2 to the offset value, the number of bytes offsetted can be calculated.

For example:

- if bit 4 of \$FF9D were set and the others unset, the offset would be 32768 bytes, 2 @15 (the offset value).

\$FF9E bit	0	off	3\$
"	1	"	4
"	2	"	5
"	3	"	6
"	4	"	7
"	5	"	8
"	6	"	9
"	7	"	10
\$FF9D bit	0	off	11
"	1	"	12
"	2	"	13
"	3	"	14
"	4	"	15
"	5	"	16
"	6	"	17
"	7	"	18

To transfer the first screen to the second use this program.

```
10 DATA BD,E1,19,8E,20,00,10,
8E,60,00,EC,81,ED,A1,8C,60,
00,26,F7,BD,E0,FF,39
20 FOR I = 0 TO 23
30 READ A$
40 POKE &HE00+I,VAL("&H"+A$)
'FOR TAPE CHANGE &HE00 TO
&H600
50 NEXT
60 DEFUSR0=&HE00
'FOR TAPE CHANGE &HE00 TO
&H600
70 A=USR0(0)
80 END
```

WARNING: DO NOT USE A PCLEAR 0 EQUIVALENT WITH THIS ROUTINE UNLESS YOU RELOCATE IT IN LINE 40 !!

Once this machine code routine is loaded into memory and provided that no PMODE graphics are used, it can be used by a USR call.

To reverse this process only two values in line 10 need be changed: 81 to A1 and A1 to 81.

Drawing on the second screen is also possible for the same HSCREENs. To change the drawing use the following pokes:

```
HSCREEN NO. : First Screen
1 : &HE828,&H20
3 : &HE807,&H20
HSCREEN NO. : Second Screen
1 : &HE828,&H60
3 : &HE807,&H60
```

Be extra careful NOT to use these in HSCREENs 2 & 4

For those who wish to write their own machine code programs that access the hi-res graphics memory, use a JSR \$E119 at the beginning of the routine, and a JSR \$E0FF at the end of the routine, before the RTS.

A final note for those who have changed the palette registers using pokes or machine code; the static is caused by the 6809B not being synchronized with the ACVC (Game chip).

To synchronize the two chips, a SYNC instruction must be executed by the 6809B, before the register is changed; SYNC is a machine code instruction only, so please don't try it in basic, it only results in an SN error.

The SYNC will not work all the time, however. A program in the Rainbow that showed all 64 colours at once used SYNC but look at your screen. I have included a program called 'POKESYNC' which patches the poke command, so that it does a SYNC.

However, if used with the VORTEX program, which uses pokes to change the palette, there is still static.

For those who don't know where the palette registers are, they are at locations \$7FFB0 - \$7FFBF.

The values at these locations have 64 added to the colour for some reason. A break down of a palette register is as follows:

```
Bit no. 0 1 2 3 4 5
RGB output B0 G0 R0 B1 G1 R1
```

Thus a typical green might be 010010, both green bits set.

The Listing:

```
0 GOTO10
1 '* GRAPHICOM - CC3 FONT CONV *
***** DARREN REED *****
3 SAVE"250A:3":END'9
10 DATA 8E,7C,00,10,8E,F0,9D,EC,
81,ED,A1,8C,7F,00,26,F7,39
20 FOR I=0TO16:READA$:POKE&HF00+I
,VAL("&H"+A$):NEXT
30 CLS:PRINT"GRAPHICOM II - COCO
-3 FONT CONVERTER":INPUT"GRAPHIC
OM II FONT FILE NAME";NMS:PRINT
LOADING...":LOADNMS+".SET"
40 PRINT"UPLOADING...":DEFUSR0=&H
F00:A=USR0(0):PRINT"SAVING AS ";
NMS+".CC3":SAVENMS+".CC3",&HF09
D,&HF39D,41175:PRINT"DONE..."
50 INPUT"DO ANOTHER?";YNS:IFYNS=""
N"THENENDELSE30
```


The Listing:

```
0 GOTO10
1 '***** FONT CHANGER *****
  **** DARREN REED *****
3 SAVE"250B:3":END'9
10 PCLEAR4
20 HCOLOR8,4:HSCREEN2
30 HLINE(95,80)-(00,80),PSET:HLI
  NE(0,72)-(87,72),PSET:HLINE-(95,
  40),PSET:HLINE-(115,40),PSET:HLI
  NE-(113,48),PSET:HLINE-(103,48),
  PSET:HLINE-(101,56),PSET:HLINE-(
  111,56),PSET:HLINE-(109,64),PSET
  :HLINE-(99,64),PSET:HLINE-(95,80
  ),PSET
40 HLINE(125,80)-(135,40),PSET:H
  LINE-(155,40),PSET:HLINE-(145,80
  ),PSET:HLINE-(125,80),PSET:HLINE
  (133,72)-(139,48),PSET:HLINE-(14
  6,48),PSET:HLINE-(140,72),PSET:H
  LINE-(133,72),PSET
50 HLINE(165,80)-(175,40),PSET:H
  LINE-(180,40),PSET:HLINE-(182,70
  ),PSET:HLINE-(190,40),PSET:HLINE
  -(195,40),PSET:HLINE-(185,80),PS
  ET:HLINE-(180,80),PSET:HLINE-(17
  8,50),PSET:HLINE-(170,80),PSET:H
  LINE-(165,80),PSET
60 HLINE(215,40)-(320,40),PSET:H
  LINE(320,48)-(228,48),PSET:HLINE
  -(220,80),PSET:HLINE-(210,80),PS
  ET:HLINE-(218,48),PSET:HLINE-(21
  3,48),PSET:HLINE-(215,40),PSET
70 HLINE(25,152)-(33,120),PSET:H
  LINE-(0,120),PSET:HLINE(0,112)-(
  55,112),PSET:HLINE-(53,120),PSET
  :HLINE-(41,120),PSET:HLINE-(35,1
  44),PSET:HLINE-(47,144),PSET:HLI
  NE-(45,152),PSET:HLINE-(25,152),
  PSET
80 HLINE(65,152)-(75,112),PSET:H
  LINE-(81,112),PSET:HLINE-(77,128
  ),PSET:HLINE-(85,128),PSET:HLINE
  -(89,112),PSET:HLINE-(95,112),PS
  ET:HLINE-(85,152),PSET:HLINE-(79
  ,152),PSET:HLINE-(83,136),PSET:H
  LINE-(75,136),PSET:HLINE-(71,152
  ),PSET:HLINE-(65,152),PSET
90 HLINE(105,152)-(115,112),PSET
  :HLINE-(135,112),PSET:HLINE-(125
  ,152),PSET:HLINE-(119,152),PSET:
  HLINE-(123,136),PSET:HLINE-(115,
  136),PSET:HLINE-(111,152),PSET:H
  LINE-(105,152),PSET:HLINE(116,13
  2)-(124,132),PSET:HLINE-(128,116
  ),PSET:HLINE-(120,116),PSET
100 HLINE-(116,132),PSET
110 HLINE(145,152)-(155,112),PSE
  T:HLINE-(160,112),PSET:HLINE-(16
  2,142),PSET:HLINE-(170,112),PSET
  :HLINE-(175,112),PSET:HLINE-(165
  ,152),PSET:HLINE-(160,152),PSET:
  HLINE-(158,122),PSET:HLINE-(150,
  152),PSET:HLINE-(145,152),PSET
120 HLINE(225,152)-(235,112),PSE
  T:HLINE-(255,112),PSET:HLINE-(25
  3,120),PSET:HLINE-(241,120),PSET
  :HLINE-(239,128),PSET:HLINE-(251
  ,128),PSET:HLINE-(249,136),PSET:
  HLINE-(237,136),PSET:HLINE-(235,
  144),PSET:HLINE-(247,144),PSET:H
  LINE-(245,152),PSET:HLINE-(22
  130 HLINE(185,152)-(195,112),PSE
  T:HLINE-(215,112),PSET:HLINE-(21
  3,120),PSET:HLINE-(201,120),PSET
  :HLINE-(195,144),PSET:HLINE-(201
  ,144),PSET:HLINE-(203,136),PSET:
  HLINE-(209,136),PSET:HLINE-(205,
  152),PSET:HLINE-(185,152),PSET
140 HLINE(265,152)-(275,112),PSE
  T:HLINE-(295,112),PSET:HLINE-(28
  9,136),PSET:HLINE-(285,136),PSET
  :HLINE-(285,144),PSET:HLINE-(320
  ,144),PSET:HLINE(320,152)-(277,1
  52),PSET:HLINE-(277,136),PSET:HL
  INE-(273,152),PSET:HLINE-(265,15
  2),PSET
150 HLINE(276,132)-(284,132),PSE
  T:HLINE-(288,116),PSET:HLINE-(28
  0,116),PSET:HLINE-(276,132),PSET
160 FORI=25TO265STEP40:HPAINT(I+
  4,151),3,8:NEXT
170 FORI=85TO165STEP40:HPAINT(I+
  4,79),3,8:NEXT:HPAINT(219,41),3,
  8
180 HPRINT(12,20),"By,":HPRINT(1
  5,21),"Darren Reed":HPRINT(18,22
  ),"1987"
190 DATA BD,A1,C1,81,03,26,01,39
  ,13,7C,FF,B3,20,F2:FORI=0TO018:R
  EADA$:POKE&HE00+I,VAL("&H"+A$):N
  EXT
200 DEFUSR0=&HE00:A=USR0(0)
210 WIDTH40:POKE&HFE08,5:CLS:POK
  E&HE03E,25
220 AC=65
230 GOSUB940:IFAC(32)THENAC=32
240 IFAC>255THENAC=255
250 LOCATE0,0:PRINT"ASCII:";AC;"
  ":LPOKE&H6C018,AC
260 GOSUB810
270 LOCATE20,8:PRINT"<1>OAD CHAR
  . SET";
280 LOCATE20,05:PRINT"<S>AVE CHA
  R. SET";LOCATE20,1:PRINT"<C>HAN
  GE CHAR.":LOCATE20,2:PRINT"<L>FT.
  ARROW -1";LOCATE20,3:PRINT"<R>GT
  . ARROW +1";LOCATE20,4:PRINT"<L
  >OOK AT CHAR. SET";LOCATE20,6:P
  RINT"<J>UMP TO ASCII?";LOCATE2
  0,7:PRINT"<B>LANK CHAR.";
290 COS="C"+CHR$(8)+CHR$(9)+"LSJ
  B1"
300 I$=INKEY$:IFI$=""THEN300
310 IFINSTR(COS,I$)=0THEN300 ELS
  EGOSUB930
320 ON INSTR(COS,I$)GOTO380,340,
  350,680,640,760,360,670
330 GOTO 300
340 AC=AC-1:GOTO230
350 AC=AC+1:GOTO230
360 FORI=0TO7:POKE FB+CH*8+I,0:N
  EXT:GOTO230
370 GOTO300
380 LOCATE0,10:PRINT" PRESS <SPA
  CE BAR> TO SET/RESET":PRINT"PRE
  SS <ENTER> TO RETURN TO MENU":PR
  INT" USE CURSOR KEYS TO MOVE WHI
  TE CURSOR":X=0:Y=0
390 LPOKE&H6C000+X*2+1+(Y+1)*80,
  4
400 I$=INKEY$:IFI$=""THEN400ELSE
  LPOKE&H6C000+X*2+1+(Y+1)*80,PBEK
  (&HFE08)
410 IFI$=""THENY=Y-1:GOTO480
420 IFI$=CHR$(10)THENY=Y+1:GOTO4
  80
430 IFI$=CHR$(8)THENX=X-2:GOTO48
  0
440 IFI$=CHR$(9)THENX=X+2:GOTO48
  0
450 IFI$="" THEN510
460 IFI$=CHR$(13)THENLOCATE0,10:
  PRINTSTRING$(120,32);:GOTO230
470 GOTO400
480 IF X<0 THEN X=14 ELSE IFX>14
  THENX=0
490 IF Y<0 THEN Y=7 ELSE IFY>7 T
  HENY=0
500 GOTO390
510 BY=PEEK(FB+CH*8+Y):FORI=0TO7
  :B(I)=0:NEXT
520 IFBY=>128THENB(7)=1:BY=BY-12
  8
530 IFBY=>64 THENB(6)=1:BY=BY-64
540 IFBY=>32 THENB(5)=1:BY=BY-32
550 IFBY=>16 THENB(4)=1:BY=BY-16
560 IFBY=>8 THEN B(3)=1:BY=BY-8
570 IFBY=>4 THEN B(2)=1:BY=BY-4
580 IFBY=>2 THEN B(1)=1:BY=BY-2
590 IFBY=>1 THEN B(0)=1:BY=BY-1
600 BP=7-(X/2)
610 IFB(BP)=1 THEN B(BP)=0 ELSE
  B(BP)=1
620 B1=0:FORI=0TO7:B1=B1+B(I)*(2
  ^I):NEXT
630 POKE FB+CH*8+Y,B1:GOSUB810:G
  OTO390
640 LOCATE0,17:INPUT"FILENAME (<
  7 LETTERS ) ";FMS:FMS=LEFT$(FMS+
  " ",7)
650 POKE65494,0:POKE65496,0:SAVE
  M FMS+"1.BIN",&HF09D,&HF39D,4117
  5:SAVEM FMS+"2.BIN",&HFA10,&HFE1
  0,41175
660 POKE65497,0:LOCATE0,18:PRINT
  " -< DONE >="";EXEC44539:LOCA
  TE0,16:PRINTSTRING$(120,32);:GOT
  O230
670 LOCATE0,17:INPUT"FILENAME (<
  7 LETTERS ) ";FMS:FMS=LEFT$(FMS+
  " ",7):POKE65494,0:POKE6549
  6,0:LOADM FMS+"1":LOADM FMS+"2":
  POKE65497,0:LOCATE0,18:PRINT"
  ---< DONE >---";EXEC44539:LOC
  ATE0,16:PRINTSTRING$(120,32);:GO
  TO230
680 HCOLOR8,4:HSCREEN2:FORI=32 T
  O 72:HPRINT(I-32,0),CHR$(I):NEXT
  690 FORI=73 TO 113:HPRINT(I-73,1
  ),CHR$(I):NEXT
700 FORI=114 TO 127:HPRINT(I-114
  ,2),CHR$(I-114+32):NEXT:POKE&HEF
  C9,&HFA:POKE&HEFCA,&H10
710 FORI=128 TO 154:HPRINT(I-114
  ,2),CHR$(I):NEXT
720 FORI=155 TO 195:HPRINT(I-155
  ,3),CHR$(I):NEXT
730 FORI=196 TO 236:HPRINT(I-196
  ,4),CHR$(I):NEXT
740 FORI=237 TO 255:HPRINT(I-237
  ,5),CHR$(I):NEXT:IFAC(128)THENG
  O SUB950
750 FORI=0TO40STEP2:HPRINT(I,10)
  ,CHR$(AC)+" ":NEXT:HPRINT(0,14),
```

```

STRING$(40,AC):GOSUB950:HPRINT(5
,20),"PRESS ANY KEY TO CONTINUE"
:HPRINT(0,16),"the quick brown f
ox jumps over the lazy":HPRINT(0
,17)," dog.":EXEC44539:WIDTH40:G
OTO230
760 LOCATE0,20:INPUT"ASCII TO JU
MP TO":AI
770 IF AI<32ORAI>255THEN760
780 AC=AI:LOCATE0,20:PRINTSTRING
$(80,32)::GOTO230
790 HPRINT(5,20),"PRESS ANY KEY
TO RETURN":EXEC44539:WIDTH40:GOT
O230
800 GOTO800
810 IF AC>127 THEN FB=&HFA10:CH=
AC-128 ELSE FB=&HFO9D:CH=AC-32
820 FORI=0TO7:
830 BY=PEEK(FB+I+CH*8)
840 LOCATE14,I+1:IF BY/2 <> INT(
BY/2)THEN BY=BY-1:PRINT"X"; ELSE
PRINT".";
850 LOCATE00,I+1:IF BY=>128 THEN
BY=BY-128:PRINT"X"; ELSE PRINT"
.";
860 LOCATE02,1+I:IF BY=>64 THEN
BY=BY-64:PRINT"X"; ELSE PRINT"."
;
870 LOCATE04,I+1:IF BY=>32 THEN
BY=BY-32:PRINT"X"; ELSE PRINT"."
;
880 LOCATE6,I+1:IF BY=>16 THEN B
Y=BY-16:PRINT"X"; ELSE PRINT".";
890 LOCATE8,I+1:IF BY=>8 THEN BY
=BY-8:PRINT"X"; ELSE PRINT".";
900 LOCATE10,I+1:IF BY=>4 THEN B
Y=BY-4:PRINT"X"; ELSE PRINT".";
910 LOCATE12,1+I:IF BY=>2 THEN B
Y=BY-2:PRINT"X"; ELSE PRINT".";

```

from page 25

```

940 DATA 88,E6,C8,36,E1,80,27,5,
8C,5,FF,26,F7,39,A6,82,A7,1,9C,8
8,26,F8,39,AF,C8,CA1
950 DATA 33,9E,88,E6,1,E7,80,AC,
C8,33,2D,F7,39,DC,88,CA,1F,1F,1,
9C,88,27,A,A6,84,B97
960 DATA 81,60,26,4,30,1F,20,F2,
30,1,39,DC,88,1F,2,83,0,20,10,83
,4,0,2C,3,C3,687
970 DATA 0,20,DD,88,8D,D5,A6,C8,
36,A7,80,EC,C8,33,10,AF,C8,33,1F
,2,10,8C,4,0,2F,A43
980 DATA 1F,A6,A4,A1,C8,35,27,5,
31,A8,E0,20,EE,C6,60,10,9F,88,8D
,96,E7,84,EC,C8,33,CCC
990 DATA DD,88,6F,50,16,F9,DE,10
,8E,4,0,E6,C8,35,20,E6,86,20,A7,
9F,0,88,AD,9F,A0,BFC
1000 DATA 0,27,FA,81,41,27,24,81
,4B,27,1B,81,49,27,22,81,44,27,2
E,81,53,27,5D,81,50,792
1010 DATA 27,66,81,45,27,5B,81,4
E,27,73,16,0,94,6C,59,16,FA,C,6C
,C8,32,16,FC,B0,86,977
1020 DATA 1,E6,C8,31,A7,54,A6,45
,A7,43,E7,45,16,0,95,86,FF,E6,C8
,30,20,EE,8D,63,9E,C86
1030 DATA 88,8C,5,E0,2C,17,EC,88
,20,ED,81,20,F4,8D,53,8E,5,E0,9C
,88,2F,7,EC,83,ED,C5B

```

```

920 NEXT:RETURN
930 HH=INSTR(CO$,I$):FORI=41 TO
79STEP2:LPOKE &H6C000+80*HH+1,26
:NEXT:RETURN
940 FORI=41TO79STEP2:LPOKE&H6C00
0+80*HH+1,PEEK(&HFE08):NEXT:RTU
RN
950 POKE&HEFC9,&HFO:POKE&HEFCA,&
H9D:RETURN

```

The Listing:

```

0 GOTO10
1 '***** POKESYNC *****
*** DARREN REED *****
3 SAVE"250C:3":END'9
10 DATA 9E,2B,13,E7,84,39
11 FORI=0TO026:READA$:POKE&HE00+
I,VAL("&H"+A$):NEXT
12 DATA BD,0E,00,12,8E,0E,06,10,
8E,E7,59,A6,80,A7,A0,8C,0E,0A,26
,F7,39

```

The Listing:

```

0 GOTO10
1 '***** VORTEX *****
**** DARREN REED *****
3 SAVE"250D:3":END'9
10 '
20 POKE65497,0
30 HSCREEN2:HCLS11
40 FORI=159TO0STEP-10
50 HCIRCLE(160,96),I,I/10,.6
60 HPAINT(160+I-2,96),I/10
70 NEXT

```

```

1040 DATA 88,20,20,F5,C6,20,86,6
0,A7,80,5A,26,FB,16,FE,CA,A6,C8,
35,16,FE,C0,A6,C8,36,D24
1050 DATA A7,44,20,55,DC,88,C4,E
0,83,0,1,1F,1,8C,4,0,23,47,A6,C8
,35,A7,84,20,40,934
1060 DATA DC,88,C4,E0,C3,0,20,1F
,1,8C,5,FF,24,32,A6,C8,36,20,E9,
8D,2,20,C4,A6,44,AFB
1070 DATA A7,9F,0,88,DC,88,C4,E0
,DD,88,39,81,8,27,EB,81,9,27,2C,
81,5E,27,5B,81,A,AD8
1080 DATA 10,27,0,7E,81,3,27,6,3
0,8D,1,65,8D,9,A6,44,A7,9F,0,88,
16,F9,14,10,9E,7A5
1090 DATA 88,CC,5,E0,DD,88,17,FB
,13,10,9F,88,39,31,49,86,5,1F,89
,A7,43,6F,A0,4A,26,A49
1100 DATA FB,9E,88,A6,82,81,60,2
7,FA,84,F,81,A,2D,1,4F,A7,A2,5A,
27,B,A6,82,81,60,AC4
1110 DATA 27,5,A1,C8,35,26,E9,31
,55,17,FC,92,20,3C,EC,55,9E,19,A
F,57,10,AE,84,27,13,9DA
1120 DATA 10,A3,2,27,6,AF,57,AE,
84,20,F0,AE,57,EC,2,ED,55,20,1E,
30,8D,0,F6,8D,9A,A77
1130 DATA 20,8F,EC,55,9E,19,10,A
E,84,27,EF,10,A3,2,27,4,AE,84,20
,F2,AE,84,20,DC,30,A81
1140 DATA 55,17,FC,28,6F,5C,30,8
D,0,C3,10,8E,1,D5,10,AF,5D,E6,80

```

```

80 DIMCL(33):FORI=1TO33:READCL(I
):NEXT
90 RESTORE
100 GOTO190
110 FORI=0TO15
120 READ D
130 PALETTEI,D
140 NEXT
150 EXEC44539
160 FORT=0TO3:READA:FORI=15TO0ST
EP-1
170 POKE&HFFB1+I,PEEK(&HFFB0+I):
NEXT
180 POKE&HFFB0,A:EXEC44539:NEXTT
:RESTORE
190 OF=0:CO=0:RESTORE
200 FORI=0TO15
210 PALETTEC,CL(CO+1)
220 NEXT
230 OF=0
240 C=15
250 FORI=14TO0STEP-1
260 IF C>33THENC=1
270 POKE&HFFB1+I,PEEK(&HFFB0+I)
280 NEXT
290 C=C+1
300 IF C>33 THENC=1
310 POKE&HFFB0,CL(C):GOTO250
320 PALETTE12,0:PALETTE13,63:END
330 DATA 63,62,55,54,52,38,36,37
,33,32,44,45,47,61,43,41,12,8,9,
13,11,15,29,27,31,59,30,23,22,18
,20,16,58
340 'DATA 52,38,36,37,39,35,33,3
2
350 DATA 58,16,20,18,22,23,30,59
,31,27,29,15,11,13,9,8,12,41,43,
61,47,45,44,46

```

```

,A6,80,A7,A0,6C,5C,B06
1150 DATA 5A,26,F7,17,FC,57,86,D
,A7,A4,6C,5C,6C,53,17,FF,25,1F,1
,10,83,4,0,27,2,861
1160 DATA 30,1F,AF,C8,33,A6,C8,3
5,A7,84,6C,50,16,F8,2D,9E,88,A6,
44,A7,84,1F,12,A6,A0,B70
1170 DATA A1,C8,36,27,6,10,8C,5,
FF,23,F3,31,3E,10,AF,C8,33,10,9F
,88,A6,84,A1,C8,35,AAA
1180 DATA 27,7,30,1F,8C,4,0,2C,F
2,30,1,10,8E,1,D5,10,AF,5D,5F,A6
,80,8D,39,A7,A0,87E
1190 DATA 5C,27,43,AC,C8,33,23,F
2,86,D,A7,A0,5C,27,37,F7,1,D1,E7
,5C,DC,88,CA,1F,10,B7F
1200 DATA 83,5,FF,2D,B,DD,88,86,
60,AD,9F,A0,2,CC,5,DF,C3,0,1,DD,
88,6C,53,86,20,B36
1210 DATA A7,44,16,F7,BA,2E,C,81
,60,2C,6,81,40,2C,4,8A,20,88,40,
39,30,8D,0,C,17,778
1220 DATA FE,B7,16,FE,AB,5,4C,49
,53,54,20,7,54,4F,20,4C,4F,4E,47
,7,4E,4F,54,20,4F,836
1230 DATA 4E,45,73,52,45,41,44,5
9,D,0,288

```

Here's an update, everyone will want!

WORD-PRO II

32K ECB + "Word-Pro"
BUSINESS

by Harry Hoffmann

TODAY I AM SUBMITTING a not quite complete program but an alteration to a recently published word processor program. Incidentally, I use this program to write this letter.

To alter the original program for disk and DMP 105 printer, just load the "Word-Pro" program from CoCo, May 1987, and type in the lines from "Word-Pro II".

You can, of course, load "Word-Pro II" first and MERGE it with "Word-Pro" from Neville McDonald.

All yours!

The Listing:

```
0 GOTOS
1 '***** WORD-PRO II *****
   *** HARRY HOFFMANN *****
   ** EITHER TYPE IN OR MERGE **
   **** WITH "WORD-PRO" *****
3 SAVE"258:3":END'3
5 CLSO:PRINT@32*7+9,"WORD PROCES
SOR.";
12 PRINT@353,"ALTERED FOR DISC A
ND DMP 105 BY";
13 PRINT@426,"harry hoffmann";
20 BAUD=18:STYL=19:BD=32:TB=5
22 POKE149,0:POKE150,BAUD
105 '
131 IF T$="" THEN 55
155 PRINT:PRINT"THESE ARE 200 LI
NES AVAILABLE FOR USE. IF YOU
NEED MORE, SAVE FILE TO DIS
C."
160 PRINT:PRINT"INSTRUCTIONS FOR
SAVING TO DISC AND LOADING FROM
DISC ARE INCLUDED WITH TH
OSE SECTIONS."
226 CLS:PRINT@64,"TO JOIN TWO LI
NES TYPE ONE BLANKSPACE AND ONE
DASH <-> AT THE END OF THE LIN
E.
227 PRINT:PRINT:PRINT"PRESS ANY
KEY TO CONTINUE."
228 EXEC44539
260 CLS:CLEAR5000:BAUD=18:STYL=1
9:TB=5:POKE150,BAUD
295 IF S$(X)="" THEN S$(X)="BLANK
LINE"
1145 S$(Y)="BLANK LINE"
1436 PRINT#-2,CHR$(27)CHR$(BD);C
HR$(27)CHR$(STYL);
1437 BAUD=18:STYL=19:BD=32:TB=5
1445 IF STYL=19 THEN STY$="STAND
ARD CHARACTER MODE."
1450 IF STYL=23 THEN STY$="COMPR
ESSED CHARACTER MODE."
1455 IF STYL=20 THEN STY$="CONDE
NSED CHARACTER MODE."
1456 IF BD=32 THEN BD$="BOLD OFF
"
1457 IF BD=31 THEN BD$="BOLD ON"
1470 IF BAUD=18 THEN BAU$="2400"
1476 PRINT@271,BD$;
1477 PRINT@320,"TAB =";TB;
1480 PRINT@384,"DO YOU WANT TO C
HANGE ANY Y/N?";
1525 PRINT@256,"press 1 - 600 BA
UD
                2 - 2400 B
AUD."
1545 IF T$="2" THEN BAUD=18 ELSE
GOTO 1530
1550 POKE149,0:POKE150,18
1585 PRINT@128," 1 - STANDARD CH
ARACTERS."
1590 PRINT" 2 - COMPRESSED CHARA
CTERS"
1595 PRINT" 3 - CONDENSED CHARAC
TERS"
1596 PRINT" 4 - BOLD ON
        5 - BOLD OFF
1610 IF T$="2" THEN STYL=23
1615 IF T$="3" THEN STYL=20
1616 IF T$="4" THEN BD=31
1617 IF T$="5" THEN BD=32
1618 GOTO 2535
1690 PRINT#-2,CHR$(10)
1697 IF S$(Y)="BLANK LINE" THEN S
$(Y)=" "
1703 IF S$(Y)=" " THEN S$(Y)="BLA
NK LINE"
1710 '
1750 PRINT#-2,CHR$(27)CHR$(BD)
1751 PRINT#-2,CHR$(27)CHR$(STYL)
1755 CLSO:PRINT@32*2+6,"PRINTING
PLEASE WAIT.";
1756 PRINT@128,"PRINTING";J;"COP
IES";
1760 IF STYL=23 THEN LNTH=96-TB*
2 ELSE IF STYL=20 THEN LNTH=133-
TB*2 ELSE LNTH=80-TB*2
1766 PRINT@152,"COPY:";M;
1773 IF S$(Y)="BLANK LINE" THEN
S$(Y)=" "
1795 IF T$="" THEN 1815
1810 PRINT#-2,TAB(TB);V$:GOTO 18
23
1815 PRINT#-2,TAB(TB);LEFT$(V$,L
NTH-Z)
1823 IF S$(Y)=" " THEN S$(Y)="BL
ANK LINE"
1827 IF J=M THEN 1835 ELSE 1830
1830 PRINT@192,"POSITION NEW PAP
ER AND/OR PRESS ANY KEY WHEN REA
DY FOR NEXT COPY":EXEC44539
1840 '
1841 GOTO 1875
2155 '**LOAD FROM DISC ROUTINE**
2170 CLS:PRINT@96,"LOADING FILE
FROM DISC ROUTINE."
2180 CLS:PRINT:PRINT"LOADING FIL
E FROM DISC ROUTINE."
2195 PRINT:INPUT F$
2200 CLS:PRINT@32*4,"PLEASE CHEC
K FOR THE FILE BEFORE LOAD
ING."
2205 PRINT:PRINT"THE FILE NAME I
S ";CHR$(34);F$;CHR$(34)
2230 CLS:PRINT:PRINT"PRESS ANY K
EY TO LOAD FILE."
2245 CLSO:PRINT@32*6,"LOADING FI
LE ";CHR$(34);F$;CHR$(34);
2250 '
2255 '
2260 '
2265 '
2270 '
2275 OPEN "I",#1,F$
2285 LINEINPUT #1,S$(X)
2290 IF EOF(1)=-1 THEN 2300
2300 CLOSE #1
2315 '
2335 ' **SAVING TO DISC**
2350 CLS:PRINT@96,"SAVING TO DIS
C ROUTINE."
2360 CLS:PRINT@96,"SAVING TO DIS
C ROUTINE."
2375 PRINT:INPUT F$
2380 CLS:PRINT@32*3,"GET DISC RE
ADY NOW."
2385 PRINT@32*9,"PRESS ";CHR$(34
);"Y";CHR$(34);" WHEN READY TO":
PRINT"SAVE FILE TO DISC."
2400 CLS:PRINT@32*9+6,"SAVING T
O DISC NOW.";
2405 OPEN "O",#1,F$
2410 '
2415 '
2420 '
2425 FOR Y=1 TO (X-1)
2426 IF S$(Y)=" " THEN S$(Y)="BLA
NK LINE"
2430 PRINT#1,S$(Y)
2440 CLOSE #1
2475 PRINT:PRINT"Is the disc con
continued on page 51
```


It's a 'little' long, but it's a great program.

CHATWIN MANOR

32K DEC
EDUCATION

by Bob Horne

Editors Note: Over the past few months we have had a few programs that were unprintable due to their length. But because our policy regarding printing large in magazines, we have decided to re-print those few programs which never made it.

Due to the quantity of instructions involved, it is best to have a copy of the June 1986 edition of CoCo.

Listing One

```

1 REM*****
2 REM#  GRAPHICS SCREEN *
3 REM#  CHARACTER PRINTING *
4 REM#  ROUTINE *
5 REM#  CHATWIN MANOR *
6 REM#  LISTING 1 *
7 REM*****
10 Z=0: CLEAR200,31200: FORX=31201
TO32458: READA: Z=Z+A: POKEX, A: NEXT
X: IF Z<>53732 THENCLS: SOUND200, 1
0: PRINT@256, "DATA ERROR. PLEASE
CHECK.": END
20 SAVEM"CHARGEN/BIN", 31201, 3245
8, 31201
30 END
40 DATA 77, 38, 1, 57, 52, 118, 111, 14
1, 1, 65, 150, 220, 68, 68, 68, 214
50 DATA 182, 193, 4, 39, 44, 68, 151, 1
90, 193, 1, 34, 5, 150, 221, 68, 151
60 DATA 192, 84, 37, 21, 204, 0, 176, 2
37, 141, 1, 29, 134, 240, 167, 141
70 DATA 1, 25, 134, 16, 167, 141, 1, 13
, 32, 39, 8, 190, 108, 141, 1, 12
80 DATA 32, 2, 151, 190, 150, 182, 129
, 1, 39, 4, 150, 221, 151, 192, 204
90 DATA 1, 96, 237, 141, 0, 244, 134, 2
24, 167, 141, 0, 240, 134, 32, 167
100 DATA 141, 0, 228, 238, 2, 214, 192
, 61, 219, 190, 137, 0, 211, 186, 31
110 DATA 1, 111, 141, 0, 213, 166, 248
, 2, 161, 141, 0, 206, 38, 2, 53, 246
120 DATA 109, 141, 0, 198, 52, 16, 39,
26, 230, 97, 231, 141, 0, 187, 228
130 DATA 141, 0, 188, 225, 141, 0, 179
, 38, 10, 53, 16, 236, 141, 0, 174

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140 DATA 48, 139, 52, 16, 111, 141, 0,
165, 230, 192, 193, 127, 38, 6, 134
150 DATA 8, 167, 141, 0, 153, 192, 32,
134, 9, 61, 235, 141, 0, 144, 137
160 DATA 0, 49, 141, 0, 198, 49, 171, 1
09, 141, 0, 132, 39, 11, 166, 141
170 DATA 0, 126, 230, 141, 0, 119, 61,
48, 139, 109, 141, 0, 119, 38, 36
180 DATA 166, 160, 13, 178, 38, 1, 67,
156, 183, 37, 4, 53, 16, 32, 149, 167
190 DATA 132, 166, 141, 0, 92, 129, 8,
39, 63, 230, 141, 0, 81, 58, 108, 141
200 DATA 0, 79, 32, 220, 166, 164, 68,
68, 68, 68, 141, 74, 52, 4, 166, 160
210 DATA 132, 15, 49, 1, 141, 64, 48, 3
1, 53, 2, 156, 183, 37, 5, 53, 16, 22
220 DATA 255, 97, 237, 132, 166, 141,
0, 40, 129, 8, 39, 11, 230, 141, 0
230 DATA 29, 58, 108, 141, 0, 27, 32, 1
62, 108, 141, 0, 20, 53, 16, 109, 141
240 DATA 0, 19, 38, 5, 48, 1, 22, 255, 5
0, 48, 2, 22, 255, 45, 16, 30, 15, 8
250 DATA 0, 176, 240, 0, 52, 64, 51, 14
1, 0, 17, 230, 198, 228, 132, 52, 4
260 DATA 139, 16, 230, 198, 150, 178,
61, 234, 96, 53, 194, 255, 252, 243
270 DATA 240, 207, 204, 195, 192, 63,
60, 51, 48, 15, 12, 3, 0, 0, 1, 4, 5
280 DATA 16, 17, 20, 21, 64, 65, 68, 69
, 80, 81, 84, 85, 0, 0, 0, 0, 0, 0
290 DATA 0, 0, 8, 8, 8, 8, 8, 0, 8, 0, 2
0, 20, 20, 0, 0, 0, 0, 0, 20, 20, 54
300 DATA 0, 54, 20, 20, 0, 0, 8, 30, 32,
28, 2, 60, 8, 0, 8, 18, 2, 4, 8, 16, 32
310 DATA 36, 0, 0, 16, 40, 16, 42, 3
6, 26, 0, 0, 8, 8, 16, 0, 0, 0, 0
320 DATA 4, 8, 16, 16, 16, 8, 4, 0, 0, 16
, 8, 4, 4, 4, 8, 16, 0, 0, 8, 42, 28, 28
330 DATA 42, 8, 0, 0, 0, 8, 8, 62, 8, 8
, 0, 0, 0, 0, 0, 8, 8, 16, 0, 0, 0
340 DATA 0, 0, 62, 0, 0, 0, 0, 0, 0, 0,
0, 0, 0, 8, 0, 2, 2, 4, 8, 16, 32, 32
350 DATA 0, 0, 28, 34, 38, 42, 50, 34, 2
8, 0, 0, 8, 24, 8, 8, 8, 28, 0, 0, 28
360 DATA 34, 2, 28, 32, 32, 62, 0, 0, 28
, 34, 2, 12, 2, 34, 28, 0, 0, 4, 12, 20
370 DATA 36, 62, 4, 4, 0, 0, 62, 32, 60,
2, 2, 34, 28, 0, 0, 28, 32, 32, 60, 34
380 DATA 34, 28, 0, 0, 62, 2, 4, 8, 16, 3
2, 32, 0, 0, 28, 34, 34, 28, 34, 34
390 DATA 28, 0, 0, 28, 34, 34, 30, 2, 2,
28, 0, 0, 0, 8, 0, 8, 0, 0, 0, 0
400 DATA 0, 8, 0, 8, 8, 16, 0, 0, 4, 8, 16
, 32, 16, 8, 4, 0, 0, 0, 62, 0, 62
410 DATA 0, 0, 0, 0, 16, 8, 4, 2, 4, 8, 16
, 0, 0, 28, 34, 4, 8, 0, 8, 0, 0, 28
420 DATA 34, 2, 26, 42, 58, 12, 0, 0, 8,
20, 34, 34, 62, 34, 34, 0, 0, 60, 18

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430 DATA 18, 28, 18, 18, 60, 0, 0, 28, 3
4, 32, 32, 32, 34, 28, 0, 0, 60, 18
440 DATA 18, 18, 18, 18, 60, 0, 0, 62, 3
2, 32, 60, 32, 32, 62, 0, 0, 62, 32
450 DATA 32, 60, 32, 32, 32, 0, 0, 30, 3
2, 32, 38, 34, 34, 28, 0, 0, 34, 34
460 DATA 34, 62, 34, 34, 34, 0, 0, 28, 8
, 8, 8, 8, 28, 0, 0, 2, 2, 2, 2, 34
470 DATA 28, 0, 0, 34, 36, 40, 48, 40, 3
6, 34, 0, 0, 32, 32, 32, 32, 32, 32
480 DATA 62, 0, 0, 34, 54, 42, 34, 34, 3
4, 34, 0, 0, 34, 50, 42, 38, 34, 34
490 DATA 34, 0, 0, 28, 34, 34, 34, 34, 3
4, 28, 0, 0, 60, 34, 34, 60, 32, 32
500 DATA 32, 0, 0, 28, 34, 34, 34, 42, 3
6, 26, 0, 0, 60, 34, 34, 60, 40, 36
510 DATA 34, 0, 0, 28, 34, 16, 8, 4, 34,
28, 0, 0, 62, 8, 8, 8, 8, 8, 0, 0, 34
520 DATA 34, 34, 34, 34, 34, 28, 0, 0, 3
4, 34, 34, 20, 20, 8, 8, 0, 0, 34, 34
530 DATA 34, 34, 42, 54, 34, 0, 0, 34, 3
4, 20, 8, 20, 34, 34, 0, 0, 34, 34, 20
540 DATA 20, 8, 8, 8, 0, 0, 62, 2, 4, 8, 1
6, 32, 62, 0, 0, 0, 0, 62, 52, 20, 20
550 DATA 20, 0, 0, 12, 18, 34, 62, 34, 3
6, 24, 0, 0, 16, 8, 8, 12, 20, 34, 34
560 DATA 0, 0, 8, 28, 42, 8, 8, 8, 8, 0, 0
, 8, 8, 8, 42, 28, 8, 0, 0, 8, 20, 20
570 DATA 8, 0, 0, 0, 0, 0, 0, 24, 4, 28
, 36, 26, 0, 0, 32, 32, 44, 50, 34, 34
580 DATA 60, 0, 0, 0, 0, 30, 32, 32, 32,
30, 0, 0, 2, 2, 26, 38, 34, 34, 30, 0
590 DATA 0, 0, 0, 28, 34, 62, 32, 30, 0,
0, 12, 18, 16, 56, 16, 16, 0, 0
600 DATA 0, 0, 2, 28, 34, 34, 30, 2, 28,
32, 32, 44, 50, 34, 34, 34, 0, 0, 8
610 DATA 0, 24, 8, 8, 8, 28, 0, 0, 2, 0, 6
, 2, 2, 2, 2, 18, 12, 32, 32, 36, 40
620 DATA 48, 40, 36, 0, 0, 24, 8, 8, 8, 8
, 8, 28, 0, 0, 0, 20, 42, 42, 42, 34
630 DATA 0, 0, 0, 44, 18, 18, 18, 18,
0, 0, 0, 0, 28, 34, 34, 34, 28, 0, 0
640 DATA 0, 0, 44, 50, 34, 34, 60, 32, 3
2, 0, 0, 26, 38, 34, 34, 30, 2, 2, 0
650 DATA 0, 38, 24, 16, 16, 16, 0, 0, 0,
0, 30, 32, 28, 2, 60, 0, 0, 16, 60, 16
660 DATA 16, 16, 18, 12, 0, 0, 0, 0, 36,
36, 36, 36, 26, 0, 0, 0, 34, 34, 20
670 DATA 20, 8, 0, 0, 0, 0, 34, 42, 42, 4
2, 20, 0, 0, 0, 34, 20, 8, 20, 34
680 DATA 0, 0, 0, 34, 34, 34, 38, 26,
2, 12, 0, 0, 62, 4, 8, 16, 62, 0, 0, 24
690 DATA 4, 8, 28, 0, 0, 0, 0, 0, 0, 0, 0
, 0, 16, 40, 40, 16, 0, 0, 0, 0, 16
700 DATA 48, 16, 56, 0, 0, 0, 0, 0, 48, 8
, 16, 56, 0, 0, 0, 0, 0, 0, 255
710 DATA 190, 1, 107, 15, 253, 159, 24
8

```


Listing Two

```

1 REM*****
2 REM*   CHATWIN MANOR *
3 REM*   LISTING 2 *
4 REM*   BY BOB HORNE *
5 REM*THE PEOPLE AND THE MANOR*
6 REM*   P1GEN *
7 REM*****
10 CLEAR200,31200:LOADM'CHARGEN/
BIN
20 DEFUSRO=31201:PMODE3,1:SCREEN
1,1:PCLS
30 CIRCLE(20,26),14,2,1,.90,.6
40 DRAW"C2BM14,15R3BR6R3BL5BD2D8
BD2NR2L2BD4L2NGR6FBD2BL2L3
50 PSET(16,18,3):PSET(24,18,3)
60 FORX=10TO14:CIRCLE(20,15),X,4
.8,.4,.8:NEXTX
70 FORX=10TO14:CIRCLE(21,15),X,4
.8,.8,.1:NEXTX
80 DRAW"C4BM0,47M13,35M16,45E5F5
M29,35M48,47L48BM16,45F2R5E2
90 PAINT(30,43),4,4:PAINT(5,43),
4,4:PAINT(9,43),4,4
100 PAINT(20,43),3,4
110 CIRCLE(90,23),10,2,1.5,.8,.1
120 DRAW"C2BM100,27G6D6M91,42M81
,35M78,30
130 CIRCLE(90,25),20,4,.8,.5,.8:
CIRCLE(85,25),15,4,1.9,.5,.9
140 PAINT(80,10),4,4
150 FORX=20TO25:CIRCLE(92,23),X,
4,.8,.5,7:NEXTX
160 FORX=8TO16:CIRCLE(80,15),X,4
.7,.4,.7:NEXTX
170 CIRCLE(74,26),2,3
180 DRAW"C2BM78,22E4F2BR6BU2E4BM
90,22M94,28L4E
190 DRAW"C4BM92,34H2G4":CIRCLE(8
4,23),2,3,.5:CIRCLE(94,20),2,3,.
5
200 DRAW"C2BM75,29D7C3M55,47M75,
36F9R9E4NH3F6L50":PAINT(70,43),3
,3
210 CIRCLE(130,17),12,2,2,.96,.5
5:CIRCLE(130,13),12,2,.5,.55,.97
220 CIRCLE(126,9),8,2,.8,.4,.97:
PAINT(126,7),2,2
230 CIRCLE(136,10),7,2,.8,.6,.99
:PAINT(136,8),2,2
240 FORX=126TO134STEP8:CIRCLE(X,
20),5,3,1:NEXTX
250 DRAW"C2BM130,22D5NR2NL2BD4R3
L5BF2R
260 DRAW"C4BM120,30M109,38M106,4
7R50M155,38M140,30M130,47M120,30
270 PAINT(110,45),4,4:PAINT(150,
45),4,4
280 CIRCLE(180,20),12,2,1.4,.1,.
55:CIRCLE(180,20),12,4,1.3,.55,.
1
290 CIRCLE(182,14),17,4,.8,.45,.
05:DRAW"C4BM197,16M190,29":PAINT
(194,18),4,4
300 DRAW"C2BM175,16F2M176,26R2BE
2FBD2BF2C4L3NDL3BM181,16C2ER2F
310 CIRCLE(174,18),1,3:CIRCLE(18
2,18),1,3:CIRCLE(190,25),3,3
320 DRAW"C2BM175,35M174,40M160,4
3D4R48U5M190,38NU7M174,40":PAINT
(180,45),2,2

```

```

330 CIRCLE(230,20),9,2,1.6:CIRCL
E(230,46),16,2,1.1,.5,.0
340 PSET(228,17,3):PSET(232,17,3
):CIRCLE(230,21),1,2:CIRCLE(230,
24),2,4,.7,0,.5
350 FORX=10TO14:CIRCLE(230,26),X
,4,1.7,.5,1:NEXTX
360 DRAW"C3BM225,32M230,40M238,3
2D8M241,47BM225,32D8M222,47R19":
PAINT(230,43),3,3
370 LINE(0,0)-(50,47),PSET,B:DR
A"C4":LINE(52,0)-(105,47),PSET,B
:DRAW"C2":LINE(107,0)-(158,47),P
SET,B:DRAW"C4":LINE(160,0)-(210,
47),PSET,B
380 DRAW"C2":LINE(212,0)-(255,47
),PSET,B
390 DRAW"C4":X=34:Y=65
400 A$="THE PEOPLE OF":GOSUB520
410 DRAW"C2":LINE(35,96)-(219,14
3),PSET,B:DRAW"C4BM37,121ND5R5U8
H3R10G3D7M75,119ND10M100,115ND14
M125,111M155,116M215,121D12"
420 DRAW"BM125,111U3NR10U8R10ND1
1F7D7NH7":DRAW"BM200,140NU20M215
,133":PAINT(210,130),4,4
430 CIRCLE(132,132),10,4,1.5,.5,
.05:DRAW"BM123,133M140,131":PAIN
T(126,129),3,4
440 CIRCLE(112,121),3,3:Y=121:FO
RX=155TO195STEP5:LINE(X,Y)-(X+2,
Y+4),PSET,BF:Y=Y+.5:NEXTX:Y=130:
FORX=155TO195STEP5:LINE(X,Y)-(X+
2,Y+4),PSET,BF:Y=Y+.5:NEXTX
450 DRAW"C4BM37,127M73,129":PAIN
T(40,124),4,4
460 DRAW"C2":Y=127:FORX=37TO123S
TEP2:LINE(X,Y)-(X,Y-RND(5)),PSET
:Y=Y+.2:NEXTX:FORX=139TO215STEP2
:LINE(X,Y)-(X,Y-RND(5)),PSET:Y=Y
+.2:NEXTX
470 Y=Y-2:FORX=200TO218STEP2:LIN
E(X,Y)-(X,Y-RND(5)),PSET:Y=Y-1:N
EXTX:LINE(35,132)-(125,143),PSET
:PAINT(40,136),2,2
480 DRAW"C3":X=33:Y=150:A$="CHAT
WIN MANOR":GOSUB520
490 LINE(0,181)-(255,191),PSET,B
F:DRAW"C1":X=0:Y=183:A$="ENTER T
O GO ON":GOSUB520
500 SAVEM"P1/BIN",3584,9727,0
510 END
520 POKE220,X:POKE221,Y:B$=USRO(
A$):RETURN

```

Listing Three

```

1 REM*****
2 REM*   CHATWIN MANOR *
3 REM*   LISTING 3 *
4 REM*   BY BOB HORNE *
5 REM*THE CHARACTERS AND TITLE*
6 REM*   P2 TO P7 *
7 REM*****
10 CLEAR200,31200:LOADM'CHARGEN/
BIN
20 PMODE3,1:SCREEN1,1:PCLS:LOADM
"P1/BIN
30 DIMA(61),B(64),C(64),D(61),E(
61),F(223):DEFUSRO=31201
40 GET(0,0)-(50,47),A,G:GET(52,0

```

```

)-(105,47),B,G:GET(107,0)-(160,4
7),C,G:GET(160,0)-(210,47),D,G:G
ET(212,0)-(255,47),E,G:GET(35,96
)-(220,143),F,G
50 PMODE3,1:PCLS:SCREEN1,1:GOSUB
1000:Y=Y+10:A$="GEORGE LOGAN
CHATWIN":GOSUB1030
90 PUT(8,40)-(58,87),A,PSET:Y=Y+
23:X=64:A$="OWNER OF":GOSUB1030
100 Y=Y+10:A$="THE MANOR":GOSUB
1030:Y=Y+10:A$="HE RECENTLY":GOS
UB1030
110 Y=Y+10:A$="BOUGHT THE":GOSUB
1030:Y=Y+10:A$="GOLDEN":GOSUB103
0:Y=Y+10:A$="ORANGE FOR":GOSUB10
30
120 X=16:Y=Y+10:A$="$50000. GEOR
GE":GOSUB1030:Y=Y+10:A$="HAS IT
INSURED.":GOSUB1030:Y=Y+10:A$="T
HE INSURANCE":GOSUB1030:Y=Y+10:A
$="MONEY SHOULD":GOSUB1030:Y=Y+1
0:A$="ENABLE HIM TO":GOSUB1030
130 Y=Y+10:A$="MAKE REPAIRS":GOS
UB1030:Y=Y+10:A$="TO THE MANOR'S
":GOSUB1030:Y=Y+10:A$="WESTERN W
ING.":GOSUB1030
140 GOSUB1040
150 SAVEM"P2/BIN",3584,9727,0
160 PCLS:GOSUB1000:Y=Y+10:A$="EL
IZA CAROL CHATWIN":GOSUB1030
170 PUT(8,40)-(61,87),B,PSET:Y=Y
+23:X=64:A$="GEORGE'S MA":GOSUB1
030:Y=Y+10:A$="SHE HAS":GOSUB103
0:Y=Y+10:A$="LIVED HERE":GOSUB10
30:Y=Y+10:A$="ALL HER":GOSUB1030
180 Y=Y+10:A$="LIFE. SHE":GOSUB1
030:Y=Y+10:A$="DOES NOT":GOSUB10
30:X=16:Y=Y+10:A$="LIKE THE":GOS
UB1030:Y=Y+10:A$="HOUSEKEEPER.":
GOSUB1030
190 Y=Y+10:A$="SHE DOTES ON":GOS
UB1030:Y=Y+10:A$="GRANDDAUGHTER"
:GOSUB1030:Y=Y+10:A$="MELINDA. S
HE":GOSUB1030:Y=Y+10:A$="IS 76 Y
EARS":GOSUB1030
200 Y=Y+10:A$="OLD BUT IN":GOSUB
1030:Y=Y+10:A$="GOOD HEALTH.":GO
SUB1030:GOSUB1040
210 SAVEM"P3/BIN",3584,9727,0
220 PCLS:GOSUB1000:Y=Y+10:A$="LA
RRY MARK LOWDOWN":GOSUB1030
:PUT(8,40)-(61,87),C,PSET
230 Y=Y+23:X=64:A$="LAWYER TO":G
OSUB1030:Y=Y+10:A$="THE FAMILY.":
GOSUB1030:Y=Y+10:A$="ALTHOUGH H
E":GOSUB1030:Y=Y+10:A$="HAS BEEN
":GOSUB1030
240 Y=Y+10:A$="SUCCESSFUL":GOSUB
1030:Y=Y+10:A$="IN HIS JOB":GOSU
B1030:Y=Y+10:X=16:A$="HE IS A BI
G":GOSUB1030:Y=Y+10:A$="GAMBLER
AND IT":GOSUB1030
250 Y=Y+10:A$="IS THOUGHT":GOSUB
1030:Y=Y+10:A$="THAT HE OWES":GO
SUB1030:Y=Y+10:A$="MONEY TO":GOS
UB1030:Y=Y+10:A$="SEVERAL BOOK-"
:GOSUB1030:Y=Y+10:A$="MAKERS.":G
OSUB1030
260 GOSUB1040
270 SAVEM"P4/BIN",3584,9727,0
280 PCLS:GOSUB1000:Y=Y+10:A$="SU
SAN SABA WALKER.":GOSUB1030

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```

:PUT(8,40)-(58,87),D,PSET
290 Y=Y+23:X=64:A$="FAMILY":GOSU
B1030:Y=Y+10:A$="HOUSEKEEPER":GO
SUB1030:Y=Y+10:A$="SHE IS VERY":
GOSUB1030:Y=Y+10:A$="STRICT AND"
:GOSUB1030
300 Y=Y+10:A$="DOES NOT":GOSUB10
30:Y=Y+10:A$="ALLOW ANY-":GOSUB1
030:X=16:Y=Y+10:A$="ONE INTO HER
":GOSUB1030
310 Y=Y+10:A$="KITCHEN. HER":GOS
UB1030:Y=Y+10:A$="FAMILY ONCE":G
OSUB1030:Y=Y+10:A$="HAD MONEY.":
GOSUB1030:Y=Y+10:A$="GEORGE DOES
N'T":GOSUB1030
320 Y=Y+10:A$="PAY HER MUCH":GOS
UB1030:Y=Y+10:A$="FOR ALL THE":G
OSUB1030:Y=Y+10:A$="WORK SHE DOE
S.":GOSUB1030
330 GOSUB1040
340 SAVEN"P5/BIN",3584,9727,0
350 PCLS:GOSUB1000:Y=Y+10:A$="ME
LINDA CIBA CHATWIN":GOSUB1030
360 PUT(8,40)-(51,87),E,PSET:Y=Y
+23:X=64:A$="GEORGE'S":GOSUB1030
:Y=Y+10:A$="NIECE.":GOSUB1030:Y=
Y+10:A$="HER FATHER":GOSUB1030:Y
=Y+10:A$="AND MOTHER":GOSUB1030
370 Y=Y+10:A$="WHO WAS":GOSUB103
0:Y=Y+10:A$="MARY SABATI":GOSUB1
030:X=16:Y=Y+10:A$="BEFORE HER":
GOSUB1030:Y=Y+10:A$="MARRIAGE WE
RE":GOSUB1030
380 Y=Y+10:A$="KILLED IN A":GOSU
B1030:Y=Y+10:A$="CAR ACCIDENT.":
GOSUB1030:Y=Y+10:A$="SHE BLAMES"
:GOSUB1030:Y=Y+10:A$="GEORGE WHO
WAS":GOSUB1030:Y=Y+10:A$="DRIVI
NG THE":GOSUB1030
390 Y=Y+10:A$="CAR.":GOSUB1030:G
OSUB1040
400 SAVEN"P6/BIN",3584,9727,0
410 PCLS:PUT(35,20)-(220,67),F,P
SET:DRAW"C8":LINE(0,0)-(255,191)
,PSET,B:GOSUB1040:DRAW"C7":X=32:
Y=100:A$="CHATWIN MANOR":GOSUB10
30
420 X=112:Y=125:A$="BY":GOSUB103
0:X=48:Y=150:A$="BOB HORNE":GOS
UB1030
430 SAVEN"P7/BIN",3584,9727,0
990 END
1000 DRAW"C8":LINE(0,0)-(255,191)
,PSET,B:LINE(8,33)-(247,33),PSE
T:DRAW"C7"
1010 FORZ=4TO174STEP10:CIRCLE(4,
Z),2,7:CIRCLE(251,Z),2,7:NEXTZ
1020 X=16:Y=2:A$="COMPUTER FILE-
":GOSUB1030:RETURN
1030 POKE220,X:POKE221,Y:B$=USRO
(A$):RETURN
1040 DRAW"C8":LINE(0,181)-(255,1
91),PSET,BF:X=0:Y=183:DRAW"C5":A
$="ENTER TO GO ON":GOSUB1030:RET
URN

```

Listing Four

```

1 REM*****
2 REM* CHATWIN MANOR *
3 REM* LISTING 4 *
4 REM* BY BOB HORNE *
5 REM* START *
6 REM*****
10 CLEAR500,31200:LOADM"CHARGEN/
BIN
20 PMODE3,1:PCLS5:SCREEN1,1:LOAD
M"P7/BIN
30 DEFUSR0=31201:P$="L10T10P10":
Y=183:GOSUB1000
40 S$(1)="GEORGE CHATWIN":S$(2)=
"ELIZA CHATWIN":S$(3)="LARRY LOW
DOWN":S$(4)="SUSAN WALKER":S$(5)
="MELINDA CHATWIN"
50 PMODE4,1:GOSUB1120:SCREEN1,1:
L=32:X=0:Y=50:DRAW"CO":C$=" YOU
AND YOUR PARTNER HAVE JUST ARRIV
ED IN THE COUNTRY FOR A HOLIDAY.
YOU ARE BOTH EMPLOYED BY THE 'A
CTIVE DETECTIVE AGENCY.":DRAW"C
0":GOSUB1040:GOSUB1100
60 NA$="" :FORX=32459TO32481:POKE
X,0:NEXTX
70 X=0:Y=20:C$=" PLEASE TYPE YOU
R NAME BELOW THEN PRESS ENTER. P
LEASE KEEP NAMES TO 10 LETTERS M
AXIMUM.":GOSUB1040:FORZ=64TO138S
TEP8:LINE(Z,70)-(Z+5,70),PSET:NE
XTZ:X=64:Y=65:GOSUB1130
80 FORX=1TO LEN(NA$):A=ASC(MID$(
NA$,X,1)):POKE32460+X,A:NEXTX
90 NA$(1)=NA$:NA$="" :X=0:Y=80:C$
="NOW TYPE YOUR FRIEND'S NAME AN
D PRESS RETURN":GOSUB1040:FORZ=6
4TO138STEP8:LINE(Z,110)-(Z+5,110
),PSET:NEXTZ:X=64:Y=105:GOSUB113
0
100 FORX=1TO LEN(NA$):A=ASC(MID$(
NA$,X,1)):POKE32470+X,A:NEXTX
110 NA$(2)=NA$:X=0:Y=120:C$="YOU
ARE "+NA$(1)+" AND YOUR FRIEND
IS "+NA$(2):GOSUB1040:Y=Y+10:C$=
"ARE THESE CORRECT? TYPE Y OR N"
:GOSUB1040:IN$=INKEY$
120 IN$=INKEY$:IF IN$="N" THENPC
LS5:GOTO60 ELSE IF IN$(">")Y" THEN
120
130 PCLS5:X=0:Y=20:C$=" YOU HAVE
NOT BEEN AT YOUR HOTEL FOR LONG
WHEN YOU RECEIVE AN INVITATION
FROM GEORGE CHATWIN TO VISIT CHA
TWIN MANOR.":GOSUB1040
140 Y=80:C$=" YOU HAVE KNOWN GEO
RGE FOR SOME TIME, THE AGENCY HA
VING BEEN EMPLOYED BY HIM ON AN
OCCASIONAL INVESTIGATION FOR GEO
RGE'S FIRM.":GOSUB1040:GOSUB1100
150 FORZ=0TO250STEP10:LINE(Z,0)-
(Z+5,5),PSET,BF:LINE(Z,150)-(Z+5
,155),PSET,BF:NEXTZ
160 FORZ=10TO140STEP10:LINE(0,Z)
-(5,Z+5),PSET,BF:LINE(250,Z)-(25
5,Z+5),PSET,BF:NEXTZ
170 X=136:Y=15:C$="CHATWIN MANOR
":GOSUB1040:Y=Y+10:C$="27TH MARC
H":GOSUB1040
180 X=8:Y=Y+20:C$="DEAR "+NA$(1)
+",":GOSUB1040:Y=Y+10:C$="GEORGE

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CHATWIN CORDIALLY":GOSUB1040:Y=
Y+10:C$="INVITES YOU AND YOUR FR
IEND,":GOSUB1040
190 Y=Y+10:C$=NA$(2)+" , TO VISIT
CHATWIN":GOSUB1040:Y=Y+10:C$="M
ANOR OVER THE NEXT WEEKEND.":GOS
UB1040:Y=Y+20:X=128:C$="(SIGNED)
":GOSUB1040:Y=Y+10:C$="GEORGE CH
ATWIN.":GOSUB1040
200 Y=150:GOSUB1100:X=0:Y=20:C$=
" YOU TAKE YOUR PORTABLE COMPUTE
R WITH YOU. AFTER ALL, YOU NEVER
KNOW WHEN YOU MAY BE ASKED TO I
NVESTIGATE SOMETHING.":GOSUB1040
210 Y=Y+20:C$=" "+NA$(2)+" MAKES
SURE THAT THERE ARE PLENTY OF N
OTE BOOKS AND PENCILS PACKED IN
THE LUGGAGE.":GOSUB1040:GOSUB110
0
220 X=0:Y=10:C$=" IT IS DARK WHE
N YOU ARRIVE AT THE MANOR.":GOSU
B1040
230 Y=33:C$=" GEORGE GREETES YOU
AT THE DOOR AND TAKES YOU INTO T
HE DRAWING ROOM. THERE, ALL THE
MEMBERS OF THE HOUSEHOLD AND THE
FAMILY LAWYER ARE ASSEMBLED.":G
OSUB1040:GOSUB1100
240 PMODE3,1:PCLS5:SCREEN1,1:LOA
DM"P1/BIN
250 Y=183:GOSUB1000:COLOR4,1:LIN
E(0,55)-(255,191),PRESET,BF:DRAW
"C3":X=0:Y=60:C$=" 1 2 3 4
5":GOSUB1040:Y=Y+40
260 X=0:FORZ=1TO5:C$=STR$(Z):C$=
RIGHT$(C$,LEN(C$)-1)+S$(Z):GOSUB
1040:Y=Y+10:NEXTZ
270 FORZ=Y-44 TO Y-4 STEP10:PSET
(16,Z,3):NEXTZ
280 LINE(0,181)-(255,191),PSET,B
F:DRAW"C1":Y=183:C$="ENTER TO GO
ON":GOSUB1040:GOSUB1000:PMODE4,
1:SCREEN1,1:GOSUB1120
290 Y=20:C$=" YOU ARE INTRODUCED
TO EVERYONE.":GOSUB1040:Y=Y+20:
C$=" GEORGE WALKS OVER TO A STAN
D AND UNVEILS A MARVELLOUS PIECE
OF ART DONE IN GOLD.":GOSUB1040
300 Y=Y+20:C$=" GEORGE SAYS, 'TH
IS IS MY LATEST PURCHASE - THE G
OLDEN ORANGE. IT IS INSURED FOR
$15 000. I WAS LUCKY ENOUGH
TO GET IT CHEAPLY FROM AN OLD AC
QUAINTANCE.":GOSUB1040
310 GOSUB1100:X=0:Y=20:C$=" 'I B
OUGHT IT FROM JOHN SABATINI WHO
WAS BADLY IN NEED OF READY CASH
AS HIS BANK WOULD NOT LEND HIM M
ONEY TO PAY SOME OF HIS CREDITOR
S,' GEORGE WENT ON.":GOSUB1040
320 Y=90:C$=" WHEN YOU PICK IT U
P AND STUDY IT CLOSELY, YOU ARE
OF THE OPINION THAT IT IS A SOLI
D PIECE OF GOLD AND THEREFORE MU
ST BE WORTH MUCH MORE THAN $15 0
00.":GOSUB1040:GOSUB1100
330 X=0:Y=20:C$=" LATER THAT NIG
HT, MRS. WALKER, THE HOUSEKEEPER
, MAKES HOT DRINKS FOR EVERYONE.
NOT LONG AFTERWARDS, EVERYONE R
ETIRES FOR THE NIGHT.":GOSUB1040
340 X=0:Y=90:C$=" ALL THE BED RO

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OMS ARE IN THE EASTERN WING OF T
HE MANOR. (GEORGE EXPLAINS THAT
THE WEST WING IS NOT USED AT THE
MOMENT AS IT NEEDS REPAIRS.):G
OSUB1040:GOSUB1100
350 X=0:Y=20:C$=" EARLY THE NEXT
MORNING, YOU ARE AWOKEN BY GEOR
GE CHATWIN":GOSUB1040:Y=50:C$="
'THE GOLDEN ORANGE HAS BEEN STOL
EN,' HE EXCLAIMS AS YOU RUB THE
SLEEP FROM YOUR EYES.":GOSUB1040
360 Y=100:C$=" I THOUGHT YOU LOC
KED THE DOOR WHEN WE ALL WENT TO
BED,' YOU SAY.":GOSUB1040:GOSUB
1100
370 X=0:Y=20:C$=" GEORGE SAYS, '
I DID LOCK IT.":GOSUB1040:Y=30:C
$=" "+NAS(2)+" AND YOU BOTH SAW"
:GOSUB1040:Y=Y+10:C$="ME LOCK IT
AND IT WAS STILL LOCKED WHEN I
WENT THERE THIS MORNING.":GOSUB
1040
380 GOSUB1100:X=0:Y=20:C$=" I WA
NT YOU BOTH TO INVESTIGATE AND F
IND THE THIEF. YOU KNOW, IT WAS
WORTH $50 000 NOT THE $15 000 LI
KE I SAID LAST NIGHT. NEARLY EVE
RYONE HERE WOULD KNOW THAT ALSO,
' SAYS GEORGE.":GOSUB1040
390 GOSUB1100:X=0:Y=20:C$=" YOU
AGREE TO INVESTIGATE THE THEFT."
:GOSUB1040:Y=50:C$=" AFTER BREAK
FAST YOU SET UP THE COMPUTER IN
YOUR BED ROOM AND SOON HAVE CONT
ACTED THE MAIN OFFICE.":GOSUB104
0
400 Y=110:C$=" WHILE YOU ARE WAI
TING FOR THE PRINTOUT OF THE FIL
ES ON ALL THE PEOPLE WHO HAD STA
YED THERE LAST NIGHT, YOU START
YOUR INQUIRIES.":GOSUB1040:GOSUB
1100
410 X=0:Y=20:C$=" YOU INTERVIEW
EVERYONE IN THE STUDY. LATER, YO
U BRING THE FILES THERE TOO. YOU
AND YOUR PARTNER STUDY THE FILE
S AND ALL THE NOTES YOU HAVE MAD
E.":GOSUB1040:GOSUB1100
420 Q=RND(-TIMER):G=RND(5):POKE3
2459,G
430 FORX=0TO250STEP10:LINE(X,20)
-(X+4,24),PSET,BF:NEXTX:FORX=28T
O128STEP8:LINE(0,Y)-(4,Y+4),PSET
,BF:LINE(251,Y)-(255,Y+4),PSET,B
F:NEXTY
440 X=8:Y=40:C$="WHAT WOULD YOU
LIKE TO DO :-":GOSUB1040:Y=65:C$
="1.STUDY THE FILES AND NOTES.":
GOSUB1040:Y=80:C$="2.SEARCH A RO
OM FOR CLUES.":GOSUB1040
450 Y=95:C$="3.ARREST THE THIEF.
":GOSUB1040:Y=127:LINE(0,Y-3)-(2
55,Y+9),PSET,BF:DRAW"C5":X=0:C$=
"TYPE A NUMBER PLEASE":GOSUB1040
:COLOR0,5
460 IN$=INKEY$
470 IN$=INKEY$:IF IN$="" THENLIN
E(165,Y)-(170,Y+5),PSET,BF:PLAYP
$:LINE(165,Y)-(170,Y+5),PRESET,B
F:PLAYP$:GOTO470
480 IF IN$<"1" OR IN$>"3" THEN46
0

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490 IN=VAL(IN$):GOSUB1120:IF IN=
1 THENRUN"PART 2
500 IF IN=2 THEN RUN"PART 3
510 IF IN=3 THEN RUN"PART 4
520 GOTO460
1000 COLOR0,5:IN$=INKEY$
1010 IN$=INKEY$:IF IN$="" THEN L
INE(230,Y)-(235,Y+5),PSET,BF:PLA
YP$:LINE(230,Y)-(235,Y+5),PRESET
,BF:PLAYP$:GOTO1010
1020 IF IN$=CHR$(13) THENRETURN
1030 GOTO1000
1040 POKE220,X:POKE221,Y:IF LEN(
C$)<=L THENAS=C$:GOTO1080
1050 FORT=L TO1STEP-1:IF MID$(C$
,T,1)=" " THEN1070
1060 NEXTT
1070 AS=LEFT$(C$,T):GOSUB1090:C$
=RIGHT$(C$,LEN(C$))-T):GOTO1040
1080 BS=USRO(AS):RETURN
1090 BS=USRO(AS):Y=Y+10:RETURN
1100 Y=Y+30:IF Y<100 THEN Y=100
1110 LINE(0,Y)-(255,Y+10),PSET,B
F:DRAW"C5":X=48:Y=Y+2:C$="PRESS
ENTER TO GO ON":GOSUB1040:GOSUB1
000
1120 PCLS5:COLOR0,5:RETURN
1130 IN$=INKEY$
1140 IN$=INKEY$:IF IN$="" THENLI
NE(X,Y)-(X+5,Y+5),PSET,BF:PLAYP$
:LINE(X,Y)-(X+5,Y+5),PRESET,BF:P
LAYP$:GOTO1140
1150 IF IN$=CHR$(13) AND LEN(NAS
)>0 THEN RETURN
1160 IF ASC(IN$)<65 OR ASC(IN$)>
90 THEN1130
1170 IF LEN(NAS)=>10 THEN1130
1180 NAS=NAS+IN$:C$=IN$:GOSUB104
0:X=X+8
1190 GOTO1130

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,BF:LINE(251,Y)-(255,Y+4),PSET,B
F:NEXTY
120 X=8:Y=40:C$="WHAT WOULD YOU
LIKE TO DO :-":GOSUB1040:Y=65:C$
="1.STUDY THE FILES AND NOTES.":
GOSUB1040:Y=80:C$="2.SEARCH A RO
OM FOR CLUES.":GOSUB1040
130 Y=95:C$="3.ARREST THE THIEF.
":GOSUB1040:X=0:Y=127
140 GOSUB1130
150 IF IN$<"1" OR IN$>"3" THEN14
0
160 IN=VAL(IN$):GOSUB1120:IF IN=
1 THEN2000
170 IF IN=2 THEN RUN"PART 3
180 IF IN=3 THEN RUN"PART 4
1000 COLOR0,5:IN$=INKEY$
1010 IN$=INKEY$:IF IN$="" THEN L
INE(230,Y)-(235,Y+5),PSET,BF:PLA
YP$:LINE(230,Y)-(235,Y+5),PRESET
,BF:PLAYP$:GOTO1010
1020 IF IN$=CHR$(13) THENRETURN
1030 GOTO1000
1040 POKE220,X:POKE221,Y:IF LEN(
C$)<=L THENAS=C$:GOTO1080
1050 FORT=L TO1STEP-1:IF MID$(C$
,T,1)=" " THEN1070
1060 NEXTT
1070 AS=LEFT$(C$,T):GOSUB1090:C$
=RIGHT$(C$,LEN(C$))-T):GOTO1040
1080 BS=USRO(AS):RETURN
1090 BS=USRO(AS):Y=Y+10:RETURN
1100 Y=Y+30:IF Y<100 THENY=100
1110 LINE(0,Y)-(255,Y+10),PSET,B
F:DRAW"C5":X=48:Y=Y+3:C$="PRESS
ENTER TO GO ON":GOSUB1040:GOSUB1
000
1120 PCLS5:COLOR0,5:RETURN
1130 IN$=INKEY$
1140 LINE(0,Y-3)-(255,Y+9),PSET,
BF:DRAW"C5":C$="TYPE A NUMBER PL
EASE":GOSUB1040:IN$=INKEY$:COLOR
0,5
1150 IN$=INKEY$:IF IN$="" THEN L
INE(165,Y)-(170,Y+5),PSET,BF:PLA
YP$:LINE(165,Y)-(168,Y+5),PRESET
,BF:PLAYP$:GOTO1150
1160 RETURN
2000 X=0:Y=50:C$="WHICH DO YOU W
ISH TO LOOK AT:-":GOSUB1040:Y=70
:C$="1 THE COMPUTER FILES.":GOSU
B1040:Y=90:C$="2 "+NAS(2)+"'S NO
TES.":GOSUB1040:Y=110:C$="3 BOTH
FILES AND NOTES.":GOSUB1040
2010 Y=Y+30:IF Y<100 THEN Y=100
2020 GOSUB1130
2030 IF IN$<"1" OR IN$>"3" THEN2
020
2040 IN=VAL(IN$):GOSUB1120:ON IN
GOTO2050,2230,2050
2050 X=0:Y=20:C$="WHOSE FILE DO
YOU WISH TO SEE:-"
2060 GOSUB1040:Y=50:FORZ=1TO5
2070 C$=STR$(Z)+"' "+S$(Z)+"'":GO
SUB1040
2080 Y=Y+15:NEXTZ
2090 Y=Y+30:IF Y<100 THEN Y=100
2100 GOSUB1130
2110 IF IN$<"1" OR IN$>"5" THEN2
100
2120 AN=VAL(IN$):PMODE3,1:SCREEN
1,1:PCLS5:ON AN GOTO2130,2150,21

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Listing Five

```

1 REM*****
2 REM* CHATWIN MANOR *
3 REM* LISTING 5 *
4 REM* BY BOB HORNE *
5 REM* PART 2 *
6 REM*****
10 CLEAR500,31200
20 DEFUSRO=31201:P$="L10T10P10"
30 S$(1)="GEORGE CHATWIN":S$(2)=
"ELIZA CHATWIN":S$(3)="LARRY LOW
DOWN":S$(4)="SUSAN WALKER":S$(5)
="MELINDA CHATWIN"
40 PMODE4,1:PCLS5:SCREEN1,1:DRAW
"CO":G=PEEK(32459):L=32
50 AS="" :NAS(1)="" :NAS(2)="" :FOR
X=1TO10:NA=PEEK(32460+X)
60 IF NA=0 THEN70 ELSE AS=CHR$(N
A):NAS(1)=NAS(1)+AS
70 NEXTX
80 AS="" :FORX=1TO10:NA=PEEK(3247
0+X)
90 IF NA=0 THEN100 ELSE AS=CHR$(
NA):NAS(2)=NAS(2)+AS
100 NEXTX:GOTO2000
110 FORX=0TO250STEP10:LINE(X,20)
-(X+4,24),PSET,BF:NEXTX:FORX=28T
O128STEP8:LINE(0,Y)-(4,Y+4),PSET

```



```

70,2190,2210
2130 LOADM'P2/BIN
2140 GOTO2220
2150 LOADM'P3/BIN
2160 GOTO2220
2170 LOADM'P4/BIN
2180 GOTO2220
2190 LOADM'P5/BIN
2200 GOTO2220
2210 LOADM'P6/BIN
2220 Y=183:GOSUB1000:PMODE4,1:SC
REK1,1:IF IN=1THEN GOSUB1120:GO
TO110
2230 GOSUB1120:IF IN=3 THEN BN=A
N:GOTO2300
2240 X=0:Y=20:C$="WHICH NOTES DO
YOU WISH TO SEE":GOSUB1040:Y=50
2250 FORZ=1TO5:C$=STR$(Z)+" "+S$
(Z)+":GOSUB1040
2260 Y=Y+10:NEXTZ
2270 Y=Y+30:IF Y<100 THEN Y=100
2280 GOSUB1130
2290 IF IN$<"1" OR IN$>"5" THEN2
280 ELSE BN=VAL(IN$):GOSUB1120
2300 X=16:Y=10:C$=NA$(2)+"'S NOT
ES.":GOSUB1040:X=8:Y=30:L=30:ON
BN GOTO2310,2330,2350,2360,2380
2310 C$="GEORGE LOGAN CHATWIN":G
OSUB1040:Y=50:C$=" GEORGE DOES N
OT SEEM TOO WORRIED ABOUT THE LO
SS OF THE GOLDEN ORANGE. HE SEEM
S TO BE QUITE PLEASED ABOUT COLL
ECTING THE INSURANCE MONEY.":GOS
UB1040
2320 Y=Y+20:C$="HE CLAIMS THAT H
E HAD THE BEST SLEEP FOR YEARS L
AST NIGHT.":GOTO2400
2330 C$="ELIZA CAROL CHATWIN":GO
SUB1040:Y=50:C$=" SHE IS CONVINC
ED THAT SUSAN WALKER AND LARRY L
OWDOWN HAVE TOGETHER STOLEN THE
GOLDEN ORANGE.":GOSUB1040
2340 Y=Y+20:C$=" SHE SEEMS WORRI
ED ABOUT THE FACT THAT HER GRAND
DAUGHTER, MELINDA HAS NO MONEY.
SHE CONSTANTLY CHEWED MINTIES DU
RING THE INTERVIEW.":GOTO2400
2350 C$="LARRY MARK LOWDOWN":GOS
UB1040:Y=50:C$=" ADMITS HE OWES
MONEY FROM GAMBLING. HE LOOKS TI
RED AND WORRIED BUT CLAIMS THAT
HE SLEPT WELL LAST NIGHT. -BUT,
DID HE?":GOTO2400
2360 C$="SUSAN SABA WALKER":GOSU
B1040:Y=50:C$=" CARRIES A BUNCH
OF KEYS ON HER BELT BUT NONE OF
THESE WOULD OPEN THE DRAWING ROO
M DOOR. ADMITS THAT IF SHE HAD S
TOLEW THE GOLDEN ORANGE, SHE":GO
SUB1040
2370 Y=Y+10:C$="WOULD LEAVE GEOR
GE'S EMPLOY, SELL THE GOLDEN ORA
NGE AND GIVE A LOT OF THE MONEY
TO HER FAMILY WHO ARE POOR.":GOT
O2400
2380 C$="MELINDA CIBA CHATWIN":G
OSUB1040:Y=50:C$=" SHE RELIES ON
GEORGE'S GENEROSITY FOR MONEY A
S SHE HAS NONE OF HER OWN AND IS
OUT OF WORK. SHE HEARD VOICES I
N THE GARDEN DURING THE NIGHT":G
OSUB1040

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2390 Y=Y+10:C$="AND LATER SAW LA
RRY LOWDOWN CROSSING THE LAWN AN
D ENTERING THE BUILDING."
2400 GOSUB1040:LINE(4,20)-(251,Y
+15),PSET,B:GOSUB1100:Y=32:GOTO1
10

```

Listing Six

```

1 REM*****
2 REM* CHATWIN MANOR *
3 REM* LISTING 6 *
4 REM* BY BOB HORNE *
5 REM* PART 3 *
6 REM*****
10 CLEAR500,31200
20 DEFUSRO=31201:P$="L10T10P10"
30 S$(1)="GEORGE CHATWIN":S$(2)=
"ELIZA CHATWIN":S$(3)="LARRY LOW
DOWN":S$(4)="SUSAN WALKER":S$(5)
="MELINDA CHATWIN"
40 PMODE4,1:PCLS5:SCREEN1,1:DRAW
"CO":G=PEEK(32459):L=32
50 AS="" :NA$(1)="" :NA$(2)="" :FOR
X=1TO10:NA=PEEK(32460+X)
60 IF NA=0 THEN70 ELSE AS=CHR$(N
A):NA$(1)=NA$(1)+AS
70 NEXTX
80 AS="" :FORX=1TO10:NA=PEEK(3247
0+X)
90 IF NA=0 THEN100 ELSE AS=CHR$(
NA):NA$(2)=NA$(2)+AS
100 NEXTX:GOTO2000
110 FORX=0TO250STEP10:LINE(X,20)
-(X+4,24),PSET,BF:NEXTX:FORX=28T
O128STEP8:LINE(0,Y)-(4,Y+4),PSET
,BF:LINE(251,Y)-(255,Y+4),PSET,B
F:NEXTX
120 X=8:Y=40:C$="WHAT WOULD YOU
LIKE TO DO :-":GOSUB1040:Y=65:C$
="1. STUDY THE FILES AND NOTES.":
GOSUB1040:Y=80:C$="2. SEARCH A RO
OM FOR CLUES.":GOSUB1040
130 Y=95:C$="3. ARREST THE THIEF.
":GOSUB1040:X=0:Y=127
140 GOSUB1130
150 IF IN$<"1" OR IN$>"3" THEN14
0
160 IN=VAL(IN$):GOSUB1120:IF IN=
1 THENRUN"PART 2
170 IF IN=2 THEN2000
180 IF IN=3 THEN RUN"PART 4
1000 COLOR0,5:IN$=INKEY$
1010 IN$=INKEY$:IF IN$="" THEN L
INE(230,Y)-(235,Y+5),PSET,BF:PLA
YPS:LINE(230,Y)-(235,Y+5),PSET
,BF:PLAYPS:GOTO1010
1020 IF IN$=CHR$(13) THENRETURN
1030 GOTO1000
1040 POKE220,X:POKE221,Y:IF LEN(
C$)<L THENAS=C$:GOTO1080
1050 FORI=L TO1STEP-1:IF MID$(C$
,I,1)="" THEN1070
1060 NEXTI
1070 AS=LEFT$(C$,I):GOSUB1090:C$
=RIGHT$(C$,LEN(C$)-I):GOTO1040
1080 B$=USRO(AS):RETURN
1090 B$=USRO(AS):Y=Y+10:RETURN
1100 Y=Y+30:IF Y<100 THENY=100
1110 LINE(0,Y)-(255,Y+12),PSET,B
F:DRAW"C5":X=48:Y=Y+3:C$="PRESS

```

```

ENTER TO GO ON":GOSUB1040:GOSUB1
000
1120 PCLS5:COLOR0,5:RETURN
1130 IN$=INKEY$
1140 LINE(0,Y-3)-(255,Y+9),PSET,
BF:DRAW"C5":C$="TYPE A NUMBER PL
EASE":GOSUB1040:IN$=INKEY$:COLOR
0,5
1150 IN$=INKEY$:IF IN$="" THEN L
INE(165,Y)-(170,Y+5),PSET,BF:PLA
YPS:LINE(165,Y)-(168,Y+5),PSET
,BF:PLAYPS:GOTO1150
1160 RETURN
1180 Y=Y+10:D$="" :FORZ=1TOLEN(C$
):CH$=MID$(C$,Z,1):CH=ASC(CH$)-5
:CH$=CHR$(CH)
1190 D$=D$+CH$
1200 NEXTZ:C$=D$:GOSUB1040:RETUR
N
2000 GOSUB1120:L=32:X=0:Y=10:C$=
NA$(2)+"'S DOWNSTAIRS PLAN":GOSU
B1040
2010 LINE(0,30)-(255,150),PSET,B
:DRAW"BM0,80R55BU15R15U35BD50ND7
OBR15R84BR15NU50BR15R70
2020 DRAW"BM170,80D70U50BR15R68
2030 X=24:Y=40:C$="1":GOSUB1040:
X=120:C$="3":GOSUB1040:X=216:C$=
"5":GOSUB1040
2040 X=8:Y=50:C$="STUDY":GOSUB10
40:X=96:C$="LIBRARY":GOSUB1040:X
=192:C$="LARRY'S":GOSUB1040
2050 X=24:Y=105:C$="2":GOSUB1040
:X=120:C$="4":GOSUB1040:X=208:C$
="6":GOSUB1040
2060 X=8:Y=115:C$="KITCHEN":GOSU
B1040:X=96:C$="DRAWING":GOSUB104
0:X=184:C$="SUSAN'S":GOSUB1040
2070 X=200:Y=60:C$="ROOM":GOSUB1
040:X=104:Y=125:GOSUB1040:X=192:
GOSUB1040
2080 FORX=198TO246STEP16:LINE(X,
80)-(X+8,100),PSET,BF:NEXTX:LINE(
207,85)-(241,96),PSET,BF:X=208
:Y=87:C$="7 UP":GOSUB1040
2090 X=0:Y=165
2100 GOSUB1130
2110 IF IN$<"1" OR IN$>"7" THEN2
090
2120 IN=VAL(IN$):GOSUB1120:IF IN
=7 THEN2300 ELSEX=0:Y=10:L=32:C$
=NA$(1)+"'S ROOM SEARCH NOTES.":
GOSUB1040:X=8:L=30:Y=Y+10:ON IN
GOTO2130,2140,2150,2210,2220,223
0
2130 C$="XZMJWTTIRXNXJYXZUFX%
FS":GOSUB1180:C$="TKKXJ3TISYXJ
YFQJ1YXJWJ%":GOSUB1180:C$="FV
J%KTQJWX1XUJSHXQX%FSI%STYJGTPX
3":GOTO2240
2140 C$="XNIIJSXNSX%GNXHZNY%OF
W%TZ":GOSUB1180:C$="KNSIYNT%FN
WZYXHPJYX%NSX%YXJ":GOSUB1180:C$="
SFRJ%TKRW3%FSI%RW3%QT%IT%NS3":G
OSUB1180:C$="TZ%FQXT%KNSI%F%GTI
YQJ%TKR":GOSUB1180:C$="XQJUNSL%Y
FGQJYX3":GOTO2240
2150 ON G GOTO2160,2170,2180,219
0,2200
2160 C$="XNSX%YXNX%WTTIRX%TZ%KNS
1%F":GOSUB1180:C$="GZXNSJXX%HFVI

```



```

%NVM%YMJ%SPRJ%":GOSUB1180:C$="T
K%F%GZNQINSL%WJXYTFWYNTS":GOSUB1
180:C$="KNVR%TS%NY3%FQXT1%WNYJ
S%NS":GOSUB1180:C$="UJSHNQ%WXYM
J%FRTZSY%TK%":=5553":GOTO22
40
2170 C$="MJWJ%TZ%KNSI%F%QTQQ%
UFUJW3":GOSUB1180:C$="MJS%TZ%
SWFJQ%NY1%TZ%KNSI":GOSUB1180:C
$="NY%NX%F%RNSYNJ%UFUJW3":GOTO22
40
2180 C$="TZ%KNSI%F%HWJ%J%IZU%
GJYYNSL":GOSUB1180:C$="YHNPJY%Z%
TGTNTXQ%F%QTXXSL":GOSUB1180:C$
="GJY%FSI%KTW%":6553":GOTO2240
2190 C$="TZ%KNSI%F%HWZRUQJ%WJ
HJNUY":GOSUB1180:C$="KWTR%F%OJ%J
QQJW3%NY%NX%KTW":GOSUB1180:C$="U
F%RJSY%KTW%FS%JSLFLJRSY%WNSL3":
GOTO2240
2200 C$="ZSIJW%YMJ%HTKKJ%YFGQJ
%TZ":GOSUB1180:C$="KNSI%F%HWZRU
QJ%UNJHJ%TK":GOSUB1180:C$="UFUJ
W3%NY%ZWSX%TZ%Y%T%GJ%YMJ":GOSUB
1180:C$="YNYQJ%WFLJ%TK%F%STI%JQ%G
":GOSUB1180:C$="RJQNSIF%XFGFYNS
NZHMFY%NS3":GOTO2240
2210 C$="ZNS%YMJ%I%W%NSL%V%TTR%T
Z%KNSI":GOSUB1180:C$="F%STYJ%MN
HM%WJFI":GOSUB1180:C$="RJJY%RJ
%NS%LFWIJS%FY%Z%F3R3%XF":GOTO2
240
2220 C$="ZNS%YMJ%GJ%IXNIJ%YFGQJ%
TZ":GOSUB1180:C$="KNSI%F%WFIJQ%
GWTMZWJ3":GOTO2240
2230 C$="ZSIJW%F%GTP%TZ%KNSI%
F%PJ":GOSUB1180:C$="2%ITJX%NY%K
NY%YMJ%I%W%NSL%V%TTR%ITTD":
2240 GOSUB1180
2250 IF IN=5 AND G=3 THEN2270 EL
SE IF IN=6 AND G=4 THEN2260 ELSE
2290
2260 C$="TZ%KNSI%F%QJYYJW%YT%
R%IJFW":GOSUB1180:C$="IFZLMYJW
3":GOSUB1180:C$="NY%NX%XNLSJ%I%
OTMS%XFGFYNS":GOSUB1180:C$="FS
I%FXPX%KTW%RTSJ%3":GOTO2280
2270 C$="TZ%KNSI%F%QJYYJW%KWTR
%F":GOSUB1180:C$="JQQ2PST%SWJX
IVY%TS%YMJ":GOSUB1180:C$="GFVWNJ
W%WJJK3%NY%HTSKNWRX%F":GOSUB1180
:C$="GTPNSL%KTW%Y%TUJ%TUQJ3"
2280 GOSUB1180
2290 Y=Y+30:LINE(4,25)-(251,Y),P
SET,B:GOSUB1100:L=32:GOTO110
2300 GOSUB1120:L=30:X=8:Y=10:C$=
NA$(2)+"'S UPSTAIRS PLAN":GOSUB1
040
2310 LINE(0,30)-(255,150),PSET,B
:DRAW"EMO,100R108NU20BR20ND50BR2
OR107BM128,30D50BR20R107"
2320 X=56:Y=40:C$="1":GOSUB1040:
X=184:C$="3":GOSUB1040:X=32:Y=50
:C$="GEORGE'S":GOSUB1040:X=160:C
$="ELIZA'S":GOSUB1040
2330 X=56:Y=110:C$="2":GOSUB1040
:X=184:C$="4":GOSUB1040:X=40:Y=1
20:C$="YOUR":GOSUB1040:X=152:C$=
"MELINDA'S":GOSUB1040
2340 C$="ROOM":X=40:Y=60:GOSUB10
40:X=168:GOSUB1040:X=40:Y=130:GO
SUB1040:X=168:GOSUB1040

```

```

2350 FORX=148TO243STEP18:LINE(X,
80)-(X+9,100),PSET,B:NEXTX:LINE(
175,85)-(224,96),PRESET,BF:X=176
:Y=87:C$="5 DOWN":GOSUB1040:X=0:
Y=165
2360 GOSUB1130
2370 IF IN$("1" OR IN$)"5" THEN2
360
2380 IN=VAL(IN$):GOSUB1120:IF IN
=5 THEN2000 ELSEL=30:X=0:Y=10:C$
=NA$(2)+"'S UPSTAIRS NOTES":GOSU
B1040:X=8:Y=Y+10:L=30:ON IN GOTO
2390,2400,2410,2420
2390 C$="TS%F%GJ%IXNIJ%YFGQJ%TZ
%KNSI":GOSUB1180:C$="FS%NSXZWFSH
J%UTQNH%KTW%YMJ":GOSUB1180:C$="
LTQIJS%TWFLJ%-FQZJ%FY%3333":G
OSUB1180:C$="655%555.%FSI%XTRJ%
GNQX":GOSUB1180:C$="WJVZJXYNSL%
T%JWIZJUF%RJSY3":GOTO2430
2400 C$="F%HTRUZYJ%NX%JY%ZU%T
S%F":GOSUB1180:C$="YFGQJ%NS%YMJ%
WTR3":GOTO2430
2410 C$="TZ%KNSI%F%UHFHPJY%TK%R
NSYNJX":GOSUB1180:C$="TS%F%GJ%IX
NIJ%YFGQJ3":GOTO2430
2420 C$="ZNS%YMJ%WTR%TZ%KNSI%F
":GOSUB1180:C$="Y%UJ%WNYJW%FSI%F
%YFHP%TK%ZSXJ%UFUJW3"
2430 GOSUB1180:IF IN=1 AND G=1 T
HEN2440 ELSE IF IN=3 AND G=2 THE
NY=Y+10:GOTO2460 ELSE IF IN=4 AN
D G=5 THENY=Y+10:GOTO2470 ELSE24
80
2440 C$="TZ%KNSI%F%UQFS%TK%YMJ
%JXY":GOSUB1180:C$="NSL3%NS%TS
J%TK%YMJ%WTRX%1F":GOSUB1180:C$=
"XJHWJY%HZUGTFWI%NX%XT%S3":GOSU
B1180
2450 C$="YMJWJ%NX%F%XPJYHM%TK%YM
NX":GOSUB1180:C$="XMT%NSL%YMJ%RJ
FXZWJRSYX%2":GOSUB1180:C$="OZXY
%QFVWJ%JSTZLM%YT%MTQI%YMJ":GOSUB
1180:C$="LTQIJS%TWFLJ3":GOSUB11
80:GOTO2480
2460 C$="TZ%KNSI%YMJ%SPRJ%FSI%
FIWJX":GOSUB1180:C$="TK%XTRJ%TS
J%NTR%TZ%PST%YT%GJ":GOSUB1180
:C$="F%I%JFQJW%NS%XYTQJ%SLTTI%X3":
GOSUB1180:GOTO2480
2470 C$="TZ%KNSI%F%HTU%TK%R%JQ
NSIF,X":GOSUB1180:C$="GNWY%MHJWY
NKNHFYJ3%NY%XTX":GOSUB1180:C$=
"YMFY%MJW%RTY%MJW,X%SPRJ%FX":GOS
UB1180:C$="WJFQ%XF%G%FYNS%Z%F%Z
H%TXJ":GOSUB1180:C$="WJQFYNI%TK%
OTMS%XFGFYNS3":GOSUB1180
2480 Y=Y+10:LINE(4,25)-(251,Y),P
SET,B:GOSUB1100:L=32:GOTO110

```

Listing Seven

```

1 REM*****
2 REM* CHATWIN MANOR *
3 REM* LISTING 7 *
4 REM* BY BOB HORNE *
5 REM* PART 4 *
6 REM*****
10 CLEAR500,31200
20 DEFUSR0=31201:Ps="L10T10P10"
30 S$(1)="GEORGE CHATWIN":S$(2)=

```

```

"ELIZA CHATWIN":S$(3)="LARRY LOW
DOWN":S$(4)="SUSAN WALKER":S$(5)
="MELINDA CHATWIN"
40 PMODE4,1:PCLS5:SCREEN1,1:DRAW
"CO":G=PEEK(32459):L=32
50 A$="":NA$(1)="":NA$(2)="":FOR
X=1TO10:NA=PEEK(32460+X)
60 IF NA=0 THEN70 ELSE A$=CHR$(N
A):NA$(1)=NA$(1)+A$
70 NEXTX
80 A$="":FORX=1TO10:NA=PEEK(3247
0+X)
90 IF NA=0 THEN100 ELSE A$=CHR$(
NA):NA$(2)=NA$(2)+A$
100 NEXTX:GOTO2000
110 FORX=0TO250STEP10:LINE(X,20)
-(X+4,24),PSET,BF:FORY=28T
O128STEP8:LINE(0,Y)-(4,Y+4),PSET
,BF:LINE(251,Y)-(255,Y+4),PSET,B
F:NEXTY
120 X=8:Y=40:C$="WHAT WOULD YOU
LIKE TO DO :-":GOSUB1040:Y=65:C$
="1.STUDY THE FILES AND NOTES.":
GOSUB1040:Y=80:C$="2.SEARCH A RO
OM FOR CLUES.":GOSUB1040
130 Y=95:C$="3.ARREST THE THIEF.
":GOSUB1040:X=0:Y=127
140 GOSUB1130
150 IF IN$("1" OR IN$)"3" THEN14
0
160 IN=VAL(IN$):GOSUB1120:IF IN=
1 THEN RUN"PART 2
170 IF IN=2 THEN RUN"PART 3
180 GOTO2000
1000 COLOR0,5:IN$=INKEY$
1010 IN$=INKEY$:IF IN$="" THEN L
INE(230,Y)-(235,Y+5),PSET,BF:PLA
YPS:LINE(230,Y)-(235,Y+5),PRESET
,BF:PLAYPS:GOTO1010
1020 IF IN$=CHR$(13) THENRETURN
1030 GOTO1000
1040 POKE220,X:POKE221,Y:IF LEN(
C$)<=L THENA$=C$:GOTO1080
1050 FORT=L TO1STEP-1:IF MID$(C$
,T,1)=" " THEN1070
1060 NEXTT
1070 A$=LEFT$(C$,T):GOSUB1090:C$
=RIGHT$(C$,LEN(C$)-T):GOTO1040
1080 B$=USR0(A$):RETURN
1090 B$=USR0(A$):Y=Y+10:RETURN
1100 Y=Y+30:IF Y<100 THENY=100
1110 LINE(0,Y)-(255,Y+12),PSET,B
F:DRAW"C5":X=48:Y=Y+3:C$="PRESS
ENTER TO GO ON":GOSUB1040:GOSUB1
000
1120 PCLS5:COLOR0,5:RETURN
1130 IN$=INKEY$
1140 LINE(0,Y-3)-(255,Y+9),PSET,
BF:DRAW"C5":C$="TYPE A NUMBER PL
EASE":GOSUB1040:IN$=INKEY$:COLOR
0,5
1150 IN$=INKEY$:IF IN$="" THEN L
INE(165,Y)-(170,Y+5),PSET,BF:PLA
YPS:LINE(165,Y)-(168,Y+5),PRESET
,BF:PLAYPS:GOTO1150
1160 RETURN
2000 X=0:Y=20:C$="YOU ASK EVERY
ONE TO GATHER IN THE DRAWING ROO
M AND PREPARE TO ACCUSE THE THIE
F.":GOSUB1040:GOSUB1100
2010 X=0:Y=20:C$="WHO DO YOU TH
INK THE THIEF IS?":GOSUB1040:X=3

```

2:Y=50:FORZ=1T05:C\$=STR\$(Z)+". "+
S\$(Z):GOSUB1040:Y=Y+15:NEXTZ
2020 X=0:Y=150:GOSUB1130
2030 IF IN\$(
"1" OR IN\$(
"5" THEN2
020
2040 GOSUB1120
2050 IN=VAL(IN\$):IF G(>)IN THEN25
40 ELSE X=0:Y=20:C\$="" EVERYONE
HAD AN OPPORTUNITY TO STEAL THE
GOLDEN ORANGE. THEY ALSO HAD THE
IR REASONS FOR WANTING TO STEAL
IT, SO WHY DO YOU THINK IT'S ME?
' "+S\$(G)+" ASKED.":GOSUB1040
2060 GOSUB1100:X=0:Y=0:ON G GOTO
2070,2120,2190,2250,2330
2070 C\$="" ' WHAT REALLY GAVE YOU
AWAY WAS THE BUSINESS CARD WE F
OUND WITH THE NAME OF THE RESTOR
ATION EXPERTS ON IT,' YOU SAY.":
GOSUB1040
2080 Y=Y+20:X=0:C\$="" ' WE ALSO S
AW THE INSURANCE POLICY. IT SHOW
ED THAT THE GOLDEN ORANGE WAS IN
SURED FOR \$100 000 NOT \$50 000 A
S YOU CLAIMED,' YOU ADD.":GOSUB1
040:GOSUB1100
2090 X=0:Y=0:C\$="" ' YOU ARE RIGHT
' I WAS GOING TO RESTORE THE WES
T WING AND LATER OPEN IT FOR PUB
LIC TOURS. I WAS TOLD THAT THE R
ESTORATION WOULD COST \$85 000,'
GEORGE SAID.":GOSUB1040
2100 Y=Y+20:C\$="" ' I THOUGHT THAT
TELLING YOU THE INSURANCE POLIC
Y WAS FOR ONLY \$50 000 WOULD MAK
E YOU SUSPECT SOMEONE ELSE.":GOS
UB1040:GOSUB1100
2110 X=0:Y=0:C\$="" ' I ONLY TOLD Y
OU THAT I HAD A GOOD NIGHT'S SLE
EP BECAUSE I KNEW ABOUT THE SLEE
PING PILLS IN THE KITCHEN. I THO
UGHT THAT WOULD THROW SUSPICION
ON SUSAN,' GEORGE WENT ON.":GOSU
B1040:GOSUB1100:GOTO2410
2120 C\$="" ' IN YOUR ROOM WE FOUND
A PACKET OF MINTIES. THE THIEF
HAD TO GO THROUGH THE LIBRARY TO
GET TO THE DRAWING ROOM. WE FOU
ND A MINTIE PAPER THERE,' YOU SA
Y.":GOSUB1040
2130 Y=Y+20:C\$="" ' YES. I AM THE
THIEF. I GAVE GEORGE THE SLEEPIN
G PILL IN HIS HOT DRINK AND LATE
R SNEAKED INTO HIS ROOM AND STOL
E THE KEY TO THE DRAWING ROOM,'
SAID "+S\$(G)+".":GOSUB1040:GOSUB
1100
2140 X=0:Y=0:C\$="" ' WHEN I WAS IN
THE LIBRARY, I THOUGHT I HEARD
SOMEONE IN THE KITCHEN AND SAT D
OWN TO WAIT FOR A FEW MINUTES.'
SHE SAID.":GOSUB1040
2150 Y=Y+20:C\$="" ' I HAD A MINTIE
IN MY POCKET AND DECIDED TO EAT
IT. UNFORTUNATELY I DROPPED THE
PAPER AND COULDN'T FIND IT IN T
HE DARK.' SHE ADDED.":GOSUB1040:
GOSUB1100
2160 X=0:Y=0:C\$="" ' THERE WAS NO
LIFE INSURANCE ON MELINDA'S FATH
ER AND MOTHER AND SHE HAS NO INC
OME AT ALL. I WAS GOING TO SELL

THE GOLDEN ORANGE AND GIVE THE M
ONEY TO HER,":GOSUB1040
2170 Y=Y+20:C\$="" ' I KNEW IT WAS
WORTH A LOT MORE THAN THE \$15 00
0 GEORGE SAID HE PAID FOR IT. I
COULD HAVE SOLD IT FOR A LOT MOR
E THAN THAT. THAT MONEY WOULD HA
VE SET UP MELINDA FOR THE REST O
F HER LIFE.' SHE WENT ON."
2180 GOSUB1040:GOSUB1100:GOTO241
0
2190 C\$="" ' EVERYONE KNOWS YOU OW
E MONEY BECAUSE OF YOUR GAMBLING
' WE FOUND A BETTING TICKET IN T
HE LIBRARY WHICH THE THIEF WOULD
HAVE TO GO THROUGH TO GET TO TH
E DRAWING ROOM,' YOU SAY.":GOSUB
1040
2200 Y=Y+20:C\$="" ' HOW DID YOU GE
T INTO THE DRAWING ROOM ANYWAY?'
YOU ASK.":GOSUB1040:GOSUB1100
2210 X=0:Y=0:C\$="" ' IT WAS EASY.
SUSAN AND I INTEND TO GET MARRIE
D AND WHEN I MET HER IN THE GARD
EN LAST NIGHT, SHE LET SLIP THAT
SHE HAD A KEY TO THE DRAWING RO
OM.":GOSUB1040
2220 Y=Y+20:C\$="" ' SHE EVEN TOLD
ME WHERE SHE KEPT IT. LATER THAT
NIGHT I CREPT INTO HER ROOM AND
STOLE THE KEY,' HE WENT ON.":GO
SUB1040:GOSUB1100
2230 X=0:Y=0:C\$="" ' THE BETTING T
ICKET MUST HAVE FALLEN UNNOTICED
OUT OF MY POCKET. I WAS GOING T
O SELL THE GOLDEN ORANGE AND PAY
OFF MY DEBTS AND USE THE REST T
O TRAVEL ON THE HONEYMOON - HENC
E THE TRAVEL BROCHURE YOU FOUND,
' HE WENT ON."
2240 GOSUB1040:GOSUB1100:GOTO241
0
2250 C\$="" ' WE NOTICED THAT YOUR
SECOND NAME IS SABA. THIS IS A F
AMILY NAME AND YOU ARE, OF COURS
E, THE DAUGHTER OF JOHN SABATINI
' YOU SAY.":GOSUB1040
2260 Y=Y+20:C\$="" ' YOU KNEW THAT
THE GOLDEN ORANGE WAS WORTH MUCH
MORE THAN THE AMOUNT FOR WHICH
YOUR FATHER SOLD IT.":GOSUB1040
2270 Y=Y+20:C\$="" ' THE KEY WE FOU
ND IN YOUR ROOM OPENS THE DRAWIN
G ROOM DOOR. WE ALSO FOUND A REC
EIPT, WITH YOUR NAME ON IT, FOR
AN ENGAGEMENT RING,' YOU ADD.":G
OSUB1040:GOSUB1100
2280 X=0:Y=0:C\$="" ' YES, IT IS TR
UE. I AM JOHN SABATINI'S DAUGHTER.
HE WAS A FOOL TO SELL THE GOL
DEN ORANGE FOR THAT PRICE WHEN H
E COULD HAVE PROBABLY GOT \$100 0
00 FOR IT,' SHE SAID":GOSUB1040
2290 Y=Y+20:C\$="" ' I WAS GOING TO
SELL IT AND GIVE HALF THE MONEY
TO MY FATHER. THE OTHER HALF WA
S FOR LARRY TO PAY HIS DEBTS AND
FOR OUR HONEYMOON,' SHE ADDED."
:GOSUB1040:GOSUB1100
2300 X=0:Y=0:C\$="" ' BUT, WHEN I M
ET LARRY LAST NIGHT IN THE GARDE
N AND TOLD HIM I HAD STOLEN THE

GOLDEN ORANGE, HE FLEW INTO A RA
GE AND WE HAD A TERRIBLE ROW AND
THE ENGAGEMENT WAS CALLED OFF."
:GOSUB1040
2310 Y=Y+20:C\$="" ' WHEN I CAME BA
CK INSIDE I WAS ANGRY TOO AND SA
T IN THE DARK IN THE LIBRARY FOR
A WHILE TO CALM DOWN. I CRUMPLE
D UP THE RECEIPT AND PUT IT IN M
Y POCKET BUT IT MUST HAVE FALLEN
OUT,' SHE SAID."
2320 GOSUB1040:GOSUB1100:GOTO241
0
2330 C\$="" ' WHEN WE READ THE COMP
UTER FILES WE NOTICED THAT YOUR
MOTHER'S NAME WAS SABATI. WHEN W
E INVESTIGATED, WE FOUND THAT SH
E WAS A CLOSE RELATION OF JOHN S
ABATINI, BUT FOR VARIOUS REASONS
' SHE HAD CHANGED HER NAME.":GOS
UB1040
2340 Y=Y+20:C\$="" ' YOU KNEW THIS
AND BECAUSE YOU THOUGHT THAT SAB
ATINI HAD BEEN CHEATED WHEN GEOR
GE BOUGHT THE GOLDEN ORANGE SO C
HEAPLY, YOU WERE DETERMINED TO G
ET REVENGE,' YOU SAY.":GOSUB1040
:GOSUB1100
2350 X=0:Y=0:C\$="" ' SHE REPLIES, 'A
LL THAT IS TRUE OF COURSE. I HAD
NO MONEY OF MY OWN AND UP UNTIL
NOW I HAD BEEN TRYING TO WRITE
A NOVEL IN ORDER TO EARN SOME MO
NEY. I COULD NEVER GET PAST THE
FIRST PAGE THOUGH.":GOSUB1040
2360 Y=Y+20:C\$="" ' YOU FOUND THE
PAGE, BUT I CANNOT EXPLAIN HOW I
T GOT WHERE IT DID,' SHE ADDED."
:GOSUB1040:GOSUB1100
2370 X=0:Y=0:C\$="" ' I FOUND IT IN
YOUR ROOM,' SAID LARRY, 'AND PL
ANTED IT IN ORDER TO TAKE SUSPIC
ION AWAY FROM MYSELF.":GOSUB104
0
2380 Y=Y+20:C\$="" ' YOU RAT!' RETO
RTED MELINDA, 'YOU DO HAVE AN AP
PROPRIATE SURNAME, DON'T YOU?":
GOSUB1040:GOSUB1100
2390 X=0:Y=0:C\$="" ' HOW DID YOU G
ET INTO THE DRAWING ROOM?' YOU A
SK.":GOSUB1040
2400 Y=Y+20:C\$="" ' I SAW MY GRAND
MOTHER PUT WHAT I THOUGHT WAS A
SLEEPING PILL INTO UNCLE GEORGE'
S DRINK. I KNEW HE WOULD SLEEP S
OUNDLY. I CREPT INTO HIS ROOM, S
TOLE THE KEY AND LATER PUT IT BA
CK,' SHE REPLIED.":GOSUB1040:GOS
UB1100
2410 X=0:Y=0:C\$="" ' WHERE DID YOU
HIDE THE GOLDEN ORANGE?' YOU AS
K.":GOSUB1040:Y=Y+20:C\$="" ' I KNE
W YOU WOULD NEVER LOOK IN THE LO
CKED WEST WING, SO I HID IT THER
E,' "+S\$(G)+" SAID.":GOSUB1040:
2420 Y=Y+20:C\$="" ' YOU AND "+NA\$(2
)+" LOOK AT EACH OTHER AND SHRUG
YOUR SHOULDERS.":GOSUB1040:GOSU
B1100
2430 X=0:Y=20:C\$="" ' THE NEXT MORN

continued on page 51



INFILTRATOR

GRAPHIC ADVENTURE

by Charles Bartlett

HERE IS THE recently published program "Infiltrator" modified to run on the CoCo 3.

Now, I have good news and bad news ...

First the good news.

* The program is now in one self contained unit. It does not of course require the character generator or the 15 pictures stored on disk.

* It will work on a cassette or disk system, but is presently set up for a disk system.

* Cassette users can simply edit lines 700 and 710 to provide cassette operations.

* The following commands have been implemented: "Quit", "Load" and "Save".

* The disk or cassette must be in a ready condition before selecting the save commands as no prompts are provided.

* Some bugs have been removed from the program.

* You 'must' type PCLEAR1 'before' loading the program.

* You may save or load an adventure at any point in the game.

Now for the bad news ...

* This version of "Infiltrator" has been extensively modified from the original.

* If you typed in the original program from the magazine, you will probably find that it is quicker just to type in this version, rather than try to edit the old version as much line packing and renumbering and changes have been made.

(Another good reason for getting CoCoOz on disk or tape!)
Happy adventuring!

The Listing:

```

0 GOTO10
1 '***** INFILTRATER *****
  ***** SCOTT HARVEY *****
  * MODIFIED FOR THE COCO 3 ***
  * BY CHARLES BARTLETT *****
3 SAVE"253:3":END'7
10 POKE65497,0: CLEAR1000: FORX=&H
03B6 TO &H03BD: READ A$: POKEX, VAL
("&H"+A$): NEXT: EXEC&H03B6
20 FOR K=1 TO 9: HBUFF K,400: NEXT
: HBUFF10,1400: HBUFF11,2800: ON BR
K GOTO 4060
30 DATA CC,0E,01,1F,02,7E,96,A5
40 FOR P=0 TO 15: PALETTE P,63: NE
XT: HSCREEN2: HCLS4: HGET(0,175)-(3
20,191),11: GOSUB2090: HCLS4: T1=0:
PH=0: IP=10: YP=0: HCOLOR5,0: GOSUB2
470
50 DIMR$(30),RM(30),D(30,6),V$(2
2),O$(20,3),LO(18),SC(18),C$(6)
60 DATA IN A FOREST,0,0,2,0,0,0,
OUTSIDE WEST WALL,0,0,3,1,0,0,OU
TSIDE FORTRESS WALL,0,0,4,2,0,0,
IN FRONT OF A HUGE GATE,0,0,5,3,
0,0,NEAR SOME THICK BUSH,0,0,0,4
,0,0
70 DATA IN A CAVE,0,0,0,5,0,0,IN
CELL NO.1,0,0,8,0,0,0,IN THE EL
ECTROSHOCK ROOM,0,14,0,7,0,0,IN
A LONG CORRIDOR,0,15,10,0,0,0,IN
A LARGE FOYER,1,16,0,9,0,0,IN A
DINING ROOM,0,17,12,0,0,0
80 DATA IN THE KITCHEN,0,0,0,11,
0,0,IN CELL NO. 2,7,0,0,0,0,IN
THE INTERROGATION ROOM,8,20,15,
0,0,0,IN A CORRIDOR,9,21,0,14,0,
0,IN AN EMPTY ROOM,10,22,17,0,0,
0,AT A STAIRWAY,11,0,0,16,18,0,1
N THE ATTIC,0,0,0,0,0,17,IN THE
WEAPONS ROOM,0,25,20,0,0
90 DATA 0,AT A STAIRWAY,14,0,21,
19,0,26,CORRIDOR,15,27,0,20,0,0,
IN THE LIBRARY,16,0,23,0,0,0,IN
THE H.Q. ROOM,0,0,24,22,0,0,OUT
ON A TURRET,0,0,0,23,0,0,IN THE
GUARD ROOM,19,0,0,0,0,0,IN A DAR
K BASEMENT,0,0,0,0,20,0,AT THE C
ORRIDOR'S END,21,0,0,0,0,0
100 DATA IN THE SECRET CHAMBER,2
2,0,29,0,0,0,IN A SECRET PASSAGE
,0,0,30,28,0,0,IN THE LABORATORY
,0,0,0,29,0,0
110 FOR QQ=1TO8: READA$: NEXT: R=30
: FORI=1TOR: READR$(I): FORA=1TO6: R
EADD(I,A): NEXT: NEXT
120 DATA MACHETE,MACHETE,1,1,STU
RDY AND SHARP.,LOCK,LOCK,4,-2,IT

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```

USES PASS KEYS TO OPEN.,DEAD BO
DY,BODY,6,-1,APPEARS TO BE A DEA
D GUARD.,PASS KEY,KEY,0,1,LOOKS
LIKE IT BELONGS IN A LOCK,LONG H
ANDLED SHOVEL,SHOVEL,8,1,IT IS V
ELL MADE AND STRONG
130 DATA THICK BUSH,BUSH,5,-1,LO
OKS PRETTY THICK,BOMB TIMING DEV
ICE,TIMER,13,25,IT IS A MK3 BOMB
TIMING DEVICE,LASER GUN,GUN,19,
0,IT IS CHARGED,LARGE BOOKCASE,C
ASE,22,0,LOOKS INTERESTING,EXPLO
SIVES BOOK,BOOK,0,0,LOOKS INTERE
STING
140 DATA LARGE OAK CHEST,CHEST,2
5,-1,IT IS MADE OF OAK,PLASTIC B
XPLOSIVES,EXPLOSIVES,0,0,LOOKS P
RETTY DANGEROUS,RED RUG,RUG,26,-
1,IT IS A RED PERSIAN RUG.,BOMB
CASING,CASING,0,0,IT IS HOLLOW,B
IG PADLOCK,PADL,25,-1,LOOKS TOUG
H TO CRACK.
150 DATA A BENCH,BENCH,8,-1,,REF
RIGERATOR,FRIDGE,12,-1,MAKES NOI
SE.. COCKROACHES??,A TIME BOMB,B
OMB,0,-1,IT ISN'T SET.
160 O=18: FORI=1TOO: READO$(I,1),O
$(I,2),LO(I),SC(I),O$(I,3): NEXT:
T=RND(-TIMER): FORI=1TOO: IFLO(I)=
-2 THENLO(I)=RND(O): NEXT: ELSENE
X
170 V$(1)="EXAMINE": V$(2)="INVEN
TORY": V$(3)="QUIT": V$(4)="SCORE"
: V$(5)="HELP": V$(6)="LOAD": V$(7)
="SAVE": V$(8)="GET": V$(9)="DROP"
: V$(10)="CUT": V$(11)="OPEN": V$(1
2)="SEARCH": V$(13)="DIG": V$(14)=
"SET": V$(15)="FIRE": V$(16)="LIFT
": V$(17)="BUILD"
180 V$(18)="RUN": V$(19)="READ": V
$(20)="PUSH": V$(21)="": V$(22)="
"
190 NV= 22: FORI=1TONV
200 IFLEN(V$(I))<4 THEN V$(I)=V$(
I)+CHR$(32): GOTO 200
210 V1$=V1$+LEFT$(V$(I),4): NEXT
220 FORI=1TOO
230 IFLEN(O$(I,2))<4 THENO$(I,2)
=O$(I,2)+CHR$(32): GOTO 230
240 N1$=N1$+LEFT$(O$(I,2),4): NEX
T
250 DATA NORTH,SOUTH,EAST,WEST,U
P,DOWN: FORDD=1TO6: READC$(DD): NEX
TDD
260 L=1: L5=1: T=0: SG$=STRING$(32,
217): EL$=STRING$(32,32): HCLS4: LN
=0
270 FOR I=1TO600: NEXTI: HCLS4: HLI

```



```
WE(0,0)-(320,84),PSET,B:HCOLOR3:
HPRINT(0,11),"YOU ARE ":HPRINT(8
,11),R$(L)
280 HCOLORS
290 ON L GOSUB 1150,1200,1230,12
60,1310,1350,1460,1510,1580,1620
,1690,1770,1460,1810,1580,1780,1
820,1830,1840,1850,1580,1860,187
0,1880,1890,1900,1780,1910,1920,
1930
300 HCOLOR3:HPRINT(0,12),"YOU SE
E:"
310 Z=0:FORA=1TO0
320 IFLO(A)=L THEN ZD$=ZD$+O$(A
,1)+CHR$(44):Z=1:IF LEN(ZD$)>30 A
ND ZP=0 THEN HPRINT(0,13),ZD$:ZP
=1:ZD$=""
330 NEXT:IF LEN(ZD$)<>0 THEN HPR
INT(0,14),ZD$
340 ZD$="":ZP=0:IFZ=0THENHPRINT(
0,13),"NOTHING OF INTEREST."
350 HPRINT(0,15),"OBVIOUS EXITS
LEAD: "
360 FORG=1TO6:IFD(L,G)<>0THENHP$
=HP$+C$(G)+" "
370 NEXT:HPRINT(0,16),HP$:HP$=""
380 IFLN>0 THEN HCOLOR4:HPUT(0,1
75)-(320,191),11:LN=0
390 FORI=1TO700:NEXTI:TURN$=TURN
S+1:HCOLOR4:HPRINT(10,17),I$:HCO
LOR3:I$="":HPRINT(0,17),"WHAT NO
W? ":GOSUB4020:HCOLOR4:HPUT(0,17
5)-(320,191),11:HCOLOR5
400 HCOLORS
410 IFI$=""THENHPRINT(0,18),"WHA
T?":GOTO 390
420 IF L=10 AND I$="N"ANDTI=0 TH
EN GOTO 1940
430 IF L=20 AND I$="D" AND CA=>2
THEN GOTO 2060
440 IF L=10 AND I$="N"ANDPH=1THE
NL=4:GOTO270
450 IF PH=1 THEN HPRINT(0,23),"T
IME LEFT":HPRINT(11,23),TI:TI=T
I-1
460 IF PH=1 AND TI=0 AND L<>1THE
N GOTO 2280
470 IFI$="LOOK"THEN 270
480 IFLN(I$)>1THEN 520
490 L5=L
500 G=INSTR("NSEWUD",I$):IFG=0TH
ENHPRINT(0,23),"I DON'T UNDERSTA
ND.":GOTO 390
510 IFD(L,G)>0THEN L5=D(L,G):L=L
5:GOTO 270:ELSEHPRINT(0,23),"YOU
CAN'T GO THAT WAY.":GOTO 390
520 I$=I$+" ":SP=INSTR(I$,CHR$(3
2))
530 V2$=LEFT$(I$,SP-1):N2$=MID$(
I$,SP+1):V3$=LEFT$(V2$,4):N3$=LEFT
$(N2$,4):V=INSTR(V1$,V$):N=INSTR
(N1$,N$)
540 IFV=0THENHPRINT(0,23),"I DON
'T UNDERSTAND.":GOTO 390:ELSEV=(
V-1)/4+1
550 IFN=0THENHPRINT(0,23),"I DON
'T UNDERSTAND.":GOTO 390:ELSEN=(
N-1)/4+1
560 ON V GOTO570,620,670,690,690
,700,710,720,790,810,840,900,930
,950,980,1010,1030,1060,1070,112
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0,690,690
570 IF L=8 AND N=16 THEN GOTO200
0
580 IF LO(N)<>-1 AND LO(N)<>L TH
ENHPRINT(0,22),"YOU CAN'T EXAMIN
E SOMETHING YOU DO NOT ":HPRINT(
0,23),"HAVE OR CANNOT SEE.":GOTO
390590 IFO$(N,3)=""THENHPRINT(0
,23),"NOTHING SPECIAL.":GOTO 390
600 HPRINT(0,23),O$(N,3):GOTO 39
0
610 HPRINT(0,23),"I DON'T UNDERS
TAND.":GOTO 390
620 HCLS4:HPRINT(0,0),"YOUR INVE
NTORY.":NH=0
630 FOR I=1 TO 0:IF LO(I)=-1THEN
NH=1:HPRINT(0,1),O$(I,1)
640 NEXT:IFNH=0THENHPRINT(0,1),"
NOTHING."
650 GOTO 390
660 HPRINT(0,23),"I DON'T UNDERS
TAND.":GOTO 390
670 HPRINT(0,23),"QUIT (Y/N)"
680 FG$=INKEY$:IF FG$=""THEN680
ELSE IF FG$="Y" THEN HSCREENO:CL
S:PRINT"GOODBYE.":PALETTE RGB:PO
KE65496,0:END ELSE 390
690 HPRINT(0,23),"I DON'T UNDERS
TAND.":GOTO 390
700 POKE65496,0:OPEN" I",#1,"INFI
LTR/DAT":INPUT#1,L,L5,T,O:FOR I=
1 TO 0:INPUT#1,LO(I):NEXT:CLOSE#
1:POKE65497,0:GOTO270
710 POKE65496,0:OPEN"O",#1,"INFI
LTR/DAT":PRINT#1,L,"":L5,"":T,
":":":":FOR I=1 TO 0:PRINT#1,LO(I
):":":":NEXT:CLOSE#1:POKE65497,0
:GOTO390
720 IF L=25 AND N=12 AND LO(14)<
>-1 THEN GOTO1970
730 IF LO(N)=-1 THEN HPRINT(0,23
),"YOU ALREADY HAVE IT.":GOTO243
0
740 IF LO(N)<>L THEN HPRINT(0,23
),"I DON'T SEE IT.":GOTO2430
750 IF CA=5 THEN HPRINT(0,23),"Y
OUR ARMS ARE FULL.":GOTO2430
760 IF SC(N)=-1 THENHPRINT(0,23)
,"YOU CAN'T GET THAT.":GOTO 2430
770 LO(N)=-1:CA=CA+1:HPRINT(0,23
),"OKAY. YOU HAVE IT.":GOTO2430
780 GOTO690
790 IF LO(N)=1 THEN HPRINT(0,23)
," YOU ARE NOT CARRYING IT.":GOT
O2430
800 LO(N)=L:CA=CA-1:HPRINT(0,23)
,"OKAY DROPPED.":GOTO2430
810 IF L=5 AND LO(1)=-1 AND MID$(
N1$,21,4)=""BUSH"THEN :HCLS4:HPR
INT(0,0),"YOU HAVE HACKED THROUG
H THE BUSH WHICH ":HPRINT(0,1),"
REVEALS A CAVE ENTRANCE WHICH YO
U ENTER.":L=6:GOTO 2430
820 IF L=5 AND N<>1 THEN HPRINT(
0,23), "YOU CAN'T CUT WITH THAT.
":GOTO2430
830 HPRINT(0,23),"YOU CAN'T CUT
THAT.":GOTO 2430
840 IF L=12 AND N=17 THEN GOTO 2
030
850 IFL=4 AND N=2ANDLO(4)=-1THEN
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HCLS4:HPRINT(0,0),"THE GATE OPE
NS AND YOU ENTER THE FOYER ":HPR
INT(0,1),"OF THE LARGE FORTRESS"
:L=10:GOTO2430
860 IF L=4 AND N=2AND LO(4)=0THE
N HPRINT(0,23), "YOU NEED A KEY.
.":GOTO2430
870 IF L=25 AND N=11ANDLO(15)=0
THEN HPRINT(0,22),"THE CHEST OPE
NS REVEALING":HPRINT(0,23),"SOME
EXPLOSIVES.":LO(12)=25:GOTO2430
880 IF L=25 AND N=11ANDLO(15)=25
THENHPRINT(0,23),"IT'S LOCKED T
IGHT":GOTO2430
890 HPRINT(0,23),"YOU CAN'T OPEN
THAT.":GOTO390
900 IF L=6 AND N=3THEN HPRINT(0
,23),"YOU FIND A PASS KEY IN HIS
LEFT POCKET.":LO(4)=6:GOTO2430
910 IF L=22 AND N=9 THEN HPRINT(
0,23),"YOU HAVE FOUND A BOOK ON
EXPLOSIVES.":LO(10)=22:GOTO 2430
920 HPRINT(0,23),"YOU FIND NOTHI
NG.":GOTO 390
930 IF L=7 AND LO(5)=-1 THEN HCL
S4:HPRINT(0,0),"YOU HAVE DUG A T
UNNEL AND ARE NOW IN ":HPRINT(0,
1),"CELL NO .2":L=13:GOTO2430
940 HPRINT(0,23),"YOU FIND NOTHI
NG.":GOTO390
950 IF L=30 AND LO(18)=30AND N=
18 THEN HCLS4:GOSUB4040:GOTO2430
960 IF N<>7 THEN HPRINT(0,23),"Y
OU CAN'T SET THAT.":GOTO2430
970 HPRINT(0,23),"YOU CAN'T DO T
HAT YET.":GOTO390
980 IF L=25 AND LO(8)=-1 AND N=8
THEN GOSUB4010:LO(15)=0:GOTO2430
990 IF N<>8 THEN HPRINT(0,23), "
YOU CAN'T FIRE THAT.":GOTO 2430
1000 HPRINT(0,23),"NOTHING HAPPE
NS.":GOTO390
1010 IF L=26 AND N=13THENHPRINT(
0,23),"YOU FOUND A BOMB CASING":
LO(14)=26:GOTO 2430
1020 HPRINT(0,23),"YOU CAN'T LIF
T THAT.":GOTO390
1030 IF L=30 AND N=7 AND LO(7)=-
1ANDLO(12)=-1ANDLO(14)=-1THENHPR
INT(0,23),"YOU HAVE MADE THE TIM
E BOMB.":LO(12)=0:LO(14)=0:LO(7)
=0:LO(18)=30:GOTO 2430
1040 IF L<>30ANDN=7ANDLO(7)=-1AN
DLO(12)=-1ANDLO(14)=-1THENHPRINT
(0,23),"YOU CAN'T YET.":GOTO2430
1050 HPRINT(0,23),"YOU CAN'T BUI
LD THAT.":GOTO390
1060 HPRINT(0,23),"WHY?":GOTO390
1070 IF LO(10)=-1 AND N=10 THENH
CLS4:GOSUB1090:GOTO2430
1080 GOTO1110
1090 HPRINT(0,0),"THE BOOK SAYS:
THE MK3 TIMING DEVICE":HPRINT(0
,1),"WHEN USED IN CONJUNCTION WI
TH PLASTIC":HPRINT(0,2),"EXPLOSI
VES MUST ALWAYS BE SET TO 34":HP
RINT(0,3),"SECONDS NO MATTER WHA
T. ALSO THE CASING"
1100 HPRINT(0,4),"MUST FIRST BE
FOUND FOR THE EXPLOSIVES":HPRINT
(0,5),"BEFORE HANDLING OR ELSE T
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HEY WILL TURN":HPRINT(0,6),"VOLA
TILE AND DETONATE.":RETURN
1110 HPRINT(0,23),"YOU CAN'T REA
D THAT.":GOTO390
1120 IF L=22 AND N=9 THEN HCLS4:
HPRINT(0,22),"IT REVEALS A SECRE
T CHAMBER WHICH YOU":HPRINT(0,23
),"ENTER":L=28:GOTO2430
1130 HPRINT(0,23),"NOTHING HAPPE
NS.":GOTO390
1140 GOTO 2430
1150 IF TI=26 THEN GOTO2280ELSE
IF PH=1 AND TI<26 THEN GOTO 233
ELSEHCOLOR9:FOR X=10 TO 310 STE
P 30:HLINE(X,30)-(X+10,84),PSET,
B:NEXTX
1160 FOR X=4 TO 344 STEP 46:HCIR
CLE(X,15),40,3,.60,.15,.75:NEXTX
1170 FOR X=2 TO 400 STEP 45:HPAI
NT(X,15),5,3:NEXTX
1180 IF LO(1)=1 THEN HPUT(160,68
)-(197,83),2,PSET
1190 RETURN
1200 HLINE(1,15)-(320,15),PSET:F
OR X=0 TO 315 STEP 5:HDRAW"BM"+S
TR$(X)+",15;D4R5U4":NEXT X
1210 HPAINT(128,54),3,5
1220 RETURN
1230 HLINE(1,15)-(320,15),PSET:F
ORX=0TO310 STEP 10:HDRAW"BM"+STR
$(X)+",15;D4R5U4L4":NEXT X
1240 HPAINT(128,54),3,5
1250 RETURN
1260 HLINE(1,15)-(98,15),PSET:HL
INE(158,15)-(320,15),PSET:HLINE(
99,10)-(99,84),PSET:HLINE(157,10
)-(157,84),PSET:HCIRCLE(128,10),
30,.25,.50,.0
1270 HLINE(160,54)-(168,50),PSET
,BF
1280 HLINE(98,24)-(104,26),PSET:
HLINE-(98,28),PSET:HLINE(98,64)-
(104,66),PSET:HLINE-(98,68),PSET
1290 HPAINT(50,54),3,5:HPAINT(20
0,54),3,5:HPAINT(128,54),2,5
1300 RETURN
1310 FORX=2 TO 320 STEP 35:HCIRC
LE(X,54),30,3,.55,.15,.85:NEXTX
1320 FORX=2 TO 320 STEP 35:HPAIN
T(X,54),5,3:NEXTX
1330 HPAINT(128,82),5,3
1340 RETURN
1350 HLINE(255,81)-(205,71),PSET
,B:HLINE(255,71)-(210,65),PSET,B
1360 HLINE(205,72)-(202,72),PSET
:HLINE(205,81)-(203,81),PSET
1370 HLINE(202,72)-(200,66),PSET
:HLINE-(200,62),PSET:HLINE-(197,
62),PSET:HLINE-(197,81),PSET:HLI
NE-(205,81),PSET
1380 HLINE(210,66)-(208,66),PSET
:HLINE-(206,60),PSET:HLINE-(206,
56),PSET:HLINE-(203,56),PSET:HLI
NE-(203,72),PSET
1390 HPAINT(245,66),3,5:HPAINT(2
45,78),3,5
1400 HCIRCLE(128,55),30,5,3,.50,
.0
1410 HLINE(0,54)-(255,54),PSET
1420 HPAINT(128,53),5,5
1430 HPAINT(2,2),2,5:HPAINT(234,
10),2,5
1440 IF LO(4)=6 THEN HPUT(10,65)
-(27,81),3,PSET
1450 RETURN
1460 HLINE(30,0)-(30,54),PSET:HL
INE-(255,54),PSET:HLINE(30,54)-
(0,84),PSET
1470 HDRAW"BM42,37;G10D5R100U5L1
00R100E10L100R100D5G10U5"
1480 HLINE(40,45)-(60,25),PSET:H
LINE(125,45)-(145,27),PSET
1490 IF L=13ANDLO(7)=13 THEN HPU
T(180,75)-(158,60),4,PSET
1500 RETURN
1510 HLINE(50,0)-(50,34),PSET:HL
INE-(255,34),PSET:HLINE(50,34)-
(0,84),PSET
1520 HDRAW"C2BM108,44;E30R30D10G
30U10L30D20U10R30D10U20E30G30D10
L30R30E30D10"
1530 HPAINT(134,24),3,2:HPAINT(1
63,26),3,2
1540 HDRAW"C5BM124,33;E5R5F5L15E
5L3U3H3D3H3D3H3D3H3D3H3D3H3D
3H3D3H3D3D15"
1550 HLINE(88,36)-(98,50),PSET,B
F
1560 IF LO(5)=8 THEN HPUT(160,65
)-(215,78),1,PSET
1570 RETURN
1580 HLINE(0,0)-(113,30),PSET:HL
INE(0,84)-(113,54),PSET:HLINE(25
5,0)-(143,30),PSET:HLINE(255,84)
-(143,54),PSET
1590 HLINE(113,30)-(143,54),PSET
,B
1600 HPAINT(2,20),2,5:HPAINT(253
,20),2,5
1610 RETURN
1620 HLINE(20,0)-(20,30),PSET:HL
INE-(125,30),PSET:HLINE(150,30)-
(255,30),PSET:HLINE(20,30)-
(0,84),PSET:HLINE(55,0)-(75,15),PSET,
B:HLINE(50,0)-(80,20),PSET,B:HLI
NE(190,0)-(220,20),PSET,B:HLINE(
195,0)-(215,15),PSET,B
1630 HDRAW"BM55,60;D10U10E20R20D
10U10G20D10U10L20":HDRAW"BM120,3
5;D10U5R20D5U10L20E10R20D10U5G10
U5E10U15L20D15R20"
1640 HLINE(120,84)-(130,60),PSET
:HLINE-(160,60),PSET:HLINE-(150,
84),PSET
1650 HPAINT(2,4),2,5:HPAINT(128,
3),2,5
1660 HPAINT(65,5),5,5:HPAINT(205
,5),5,5
1670 HPAINT(140,75),3,5
1680 RETURN
1690 HLINE(40,0)-(40,30),PSET:HL
INE-(255,30),PSET:HLINE(40,30)-
(0,84),PSET
1700 HLINE(60,65)-(190,65),PSET:
HLINE-(210,35),PSET:HLINE-(80,35
),PSET:HLINE-(60,65),PSET:HLINE(
90,40)-(190,40),PSET:HLINE-(185,
50),PSET:HLINE-(85,50),PSET:HLIN
E-(90,40),PSET
1710 FOR S=90 TO 205 STEP 25:HDR
AW"C2BM"+STR$(S)+",35;U15R15D15L
15C5":NEXT S
1720 FOR S=70 TO 185 STEP 25:HDR
AW"C2BM"+STR$(S)+",84;U10R15D10U
10U15L15D15C5":NEXT S
1730 FOR S=75 TO 175 STEP 25:HPA
INT(S,60),3,2:NEXT S
1740 FOR S=95 TO 210 STEP 25:HPA
INT(S,25),3,2:NEXT S
1750 HLINE(60,65)-(60,84),PSET:H
LINE(210,35)-(210,50),PSET:HLINE
(190,65)-(190,84),PSET
1760 RETURN
1770 GOSUB2390:GOSUB2780:RETURN
1780 HLINE(0,0)-(255,84),PSET,B:
HLINE(60,0)-(60,50),PSET:HLINE-
(255,50),PSET:HLINE(60,50)-(0,84)
,PSET
1790 HPAINT(10,10),6,5:HPAINT(70
,10),6,5:HPAINT(60,75),7,5
1800 RETURN
1810 GOSUB2390:GOSUB2920:RETURN
1820 GOSUB2390:GOSUB3010:RETURN
1830 GOSUB2390:GOSUB3080:RETURN
1840 GOSUB2390:GOSUB3170:IF L=19
ANDLO(8)=19THENHPUT(190,83)-(170
,68),9,PSET:HPAINT(178,70),3,5:H
PAINT(178,80),3,5:HPAINT(189,69)
,3,5:RETURN:ELSERETURN
1850 GOSUB2390:GOSUB3380:RETURN
1860 GOSUB2390:GOSUB3270:IF LO(1
0)=22 THEN HPUT(85,82)-(60,57),5
,PSET:RETURNELSERETURN
1870 GOSUB2390:GOSUB3460:RETURN
1880 GOSUB2390:GOSUB3530:RETURN
1890 GOSUB2390:GOSUB3580:IF LO(1
5)=25THEN HPUT(100,41)-(111,54),
8,PSET:RETURNELSEIFLO(12)=25THEN
HPUT(219,60)-(235,80),6,PSET:RET
URNELSERETURN
1900 GOSUB2390:GOSUB3650:IFLO(14
)=26THENHPUT(50,50)-(65,70),7,PS
ET:RETURNELSERETURN
1910 GOSUB2390:GOSUB3710:RETURN
1920 GOSUB2390:GOSUB3750:RETURN
1930 GOSUB3780:IFLO(18)=30 THEN
HPUT(198,30)-(254,76),10:RETURN
ELSE RETURN
1940 HCLS4:HPRINT(0,0),"YOU HAVE
LEFT THE FORTRESS BUT THERE":HP
RINT(0,1),"WERE GUARDS WALKING O
UTSIDE AND":HPRINT(0,2),"UNFORTU
NATELY THE HAVE SEEN YOU."
1950 HPRINT(0,3),"IN DESPERATION
YOU QUICKLY CONTACT H.Q.":HPRIN
T(0,4),"ON YOUR WATCH C.B. SET T
O THE DISTRESS":HPRINT(0,5),"FRE
QUENCY. ALL YOU GET IS A VOICE S
AYING":HPRINT(0,6),"YOU HAVE FAI
LED AND MUST BE TERMINATED"
1960 HPRINT(0,7),"RATHER THAN CA
UGHT. A CYANIDE FILLED":HPRINT(0
,8),"TOOTH IMPLANTED IN YOUR MOU
TH IS":HPRINT(0,9),"ELECTRONICAL
LY ACTIVATED AND YOU DIE":HPRIN
T(0,10),"PAINFULLY. YOUR MISSION
IS AT AN END...":GOTO2400
1970 HCLS4:HPRINT(0,0),"THE EXPL
OSIVES WERE HIGHLY UNSTABLE AND"
:HPRINT(0,1),"EXPLODED BLOWING K
OST OF YOU RIGHT BACK":HPRINT(0,
2),"TO THE FOREST. YOU SHOULD HA
VE FIGURED"
1980 HPRINT(0,3),"OUT HOW TO CON
TAIN THEM CORRECTLY.":HPRINT(0,4

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), "I WOULD SAY THIS MEANS YOU CA
NNOT": HPRINT(0,5), "FULLFILL YOUR
MISSION SO THIS IS"
1990 HPRINT(0,6), "THE END.....
": GOTO2400
2000 HCLS4: HPRINT(0,0), "AS YOU B
END DOWN TO EXAMINE THE BENCH": H
PRINT(0,1), "YOU ACCIDENTLY SET O
FF A LOW ALARM BEAM"
2010 HPRINT(0,2), "THAT WAS CROSS
ING THE FLOOR NEAR THE": HPRINT(0
,3), "BENCH. IMMEDIATELY TWO GUAR
DS RUSH IN": HPRINT(0,4), "AND BEC
AUSE YOU WERE SO CURIOUS ARE KIN
D": HPRINT(0,5), "ENOUGH TO GIVE Y
OU A DEMONSTRATION OF"
2020 HPRINT(0,6), "HOW IT WORKS.
WITH YOU AS THE": HPRINT(0,7), "DE
MONSTRATION MODEL. THEY SET IT S
O HIGH": HPRINT(0,8), "THAT IT KIL
LS YOU. ACCIDENTLY OF COURSE.": H
PRINT(0,9), "IT SEEMS YOU HAVE FA
ILED AND YOUR": HPRINT(0,10), "MIS
SION IS AT AN END....": GO
2030 HCLS4: HPRINT(0,0), "ONCE OPE
N YOU FIND OUT WHAT WAS MAKING":
HPRINT(0,1), "THE NOISE. IT WAS A
KGB AGENT HOLDING A"
2040 HPRINT(0,2), "DEVICE THAT MA
KES COCKROACH NOISUS. HE": HPRINT
(0,3), "THEN GRABS ANOTHER DEVICE
WHICH MAKES A": HPRINT(0,4), "RAT
-TAT-TAT NOISE AND FIRES IT AT Y
OU."
2050 HPRINT(0,5), "INCREDIBLY YOU
NO LONGER CARE ABOUT YOUR": HPRI
NT(0,6), "MISSION AS YOU ARE FLOA
TING ABOVE YOUR": HPRINT(0,7), "BO
DY. I DO BELIEVE YOU ARE DEAD. Y
OU": HPRINT(0,8), "HAVE FAILED YOU
R MISSION. THE END...": GOTO24
00
2060 HCLS4: HPRINT(0,0), "YOU WERE
CARRYING TOO MUCH AND HAVE": HP
RINT(0,1), "TRIGGERED OFF A WEIGH
T SENSITIVE STEP": HPRINT(0,2), "C
ONNECTED TO A SERIES OF GUNS IN
THE"
2070 HPRINT(0,3), "WALLS WHICH HA
VE NOW COMMENCED SHOOTING": HPRIN
T(0,4), "UNABLE TO AVOID THE FIRE
IN THE CONFINED"
2080 HPRINT(0,5), "SPACE THEY HAV
E TAKEN YOUR LIFE. YOU": HPRINT(0
,6), "HAVE FAILED YOUR MISSION. T
HE END.....": GOTO2400
2090 HCLS4: HDRAW"C5BM200,9;F6R6U
4R40U4L40U4L6G6": HPAINT(210,11)
,2,5
2100 HGET(200,3)-(255,16),1
2110 HDRAW"C5BM55,20;E2R26U2D2R7
D2L7D2U4;BM55,20;F5": HLINE(60,25
)-(83,20), PSET: HPAINT(63,23),3,5
2120 HGET(55,15)-(92,30),2
2130 HCLS4: HDRAW"BM100,15;R2D2L2
U2D4R2D2L2U2D4D2R4D6L4U6"
2140 HGET(100,15)-(117,31),3
2150 HCLS4: HDRAW"BM220,15;D4H4D4
H4D4H4D4H4D4H4D4": HCIRCLE(210,25
),6; HDRAW"EM210,25;D2"
2160 HGET(222,15)-(200,30),4
2170 HCLS4: HDRAW"BM170,10;E3R20G
3L20D20R20U20D20E3U20G3": HLINE(1
75,15)-(185,15), PSET: HLINE(175,1
7)-(185,17), PSET: HLINE(175,19)-(
185,19), PSET
2180 HGET(170,30)-(195,5),5
2190 HCLS4: FORX=170 TO 185 STEP4
: HDRAW"BM"+STR$(X)+"",10;D20R4U20
L4": NEXTX: HLINE(170,15)-(185,18)
, PSET, BF: HLINE(170,25)-(185,22)
, PSET, BF
2200 HGET(170,10)-(186,30),6
2210 HCLS4: HLINE(170,10)-(185,30
), PSET, B: HLINE(175,15)-(180,25)
, PSET, BF
2220 HGET(170,10)-(185,30),7
2230 HCLS4: HLINE(230,15)-(235,20
), PSET, B: HLINE(227,20)-(238,28)
, PSET, BF
2240 HGET(227,15)-(238,28),8
2250 HCLS4: HDRAW"BM60,10;D10U10L
3U5L1D5R1L1L10D2L5D1R5D2R10D5R5L
5U3L2U2"
2260 HGET(60,5)-(40,20),9
2270 RETURN
2280 GOSUB2390: GOSUB3890: FORX=1T
O1000: NEXTX
2290 HLINE(130,40)-(150,80), PSET
, BF
2300 K=140: A=140: FORX=1 TO30: K=K
+1: A=A-1: Y=40: HCIRCLE(K, Y),20,1:
HCIRCLE(A, Y),20,5: NEXT X
2310 IFL<>1 THEN2360 ELSE HPRINT(0
,13), "CONGRATULATIONS YOU HAVE CO
MPLETED THE": HPRINT(0,14), "TASK
SET DOWN FOR YOU. YOU ARE NOW A"
: HPRINT(0,15), "NATIONAL HERO AND
HAVE BEEN PROMOTED.": HPRINT(0,1
6), "YOU HAVE FINISHED MISSION IN
FILTRATE."
2320 HPRINT(0,17), "WELL DONE BUT
WHATS YOUR NEXT MISSION?": GOTO
2400
2330 HCLS4: HPRINT(0,0), "YOU SET
THE BOMB TO THE INCORRECT TIME":
HPRINT(0,1), "AND THEY HAVE DEFUS
ED IT. YOU SHOULD": HPRINT(0,2), "
HAVE FOUND OUT THE CORRECT TIME
SETTING."
2340 HPRINT(0,3), "YOU HAVE FAILE
D YOUR MISSION. THE ONLY": HPRINT
(0,4), "THING YOU CAN DO IS RUN A
WAY TO SOUTH": HPRINT(0,5), "AMERI
CA AND HOPE YOU ARE NEVER TRACKE
D"
2350 HPRINT(0,6), "DOWN OR YOU WI
LL BE KILLED. THE END....": GOTO
2400
2360 HCLS4: HPRINT(0,0), "YOU DIDN
'T GET BACK TO FOREST IN TIME": H
PRINT(0,1), "I'M SORRY AND HAVE B
EEN CAUGHT IN THE": HPRINT(0,2), "
EXPLOSION AND HAVE DIED. YOU COM
PLETED"
2370 HPRINT(0,3), "YOUR MISSION B
UT DID NOT SURVIVE. NEXT": HPRINT(
0,4), "TIME DISCOVER WHAT TIME TO
SET THE BOMB"
2380 HPRINT(0,5), "TOO. THE EN
D....": GOTO2400
2390 POKE65496,0: PALETTE RGB: RET
URN
2400 EXEC44539: HCLS4: HPRINT(0,0)
, "ANOTHER GAME Y/N?"
2410 FG$=" ": FG$=INKEY$: IF FG$="
Y" THEN RUN ELSE IF FG$="N" THEN
HSCREEN0:CLS: PRINT"GOODBYE.": EN
D
2420 GOTO 2410
2430 IFV$="GET" THEN 270
2440 IFV$="DROP" THEN 270
2450 IFV$="SEAR" THEN270
2460 GOTO390
2470 HCOLOR3:HCLS4: HLINE(0,0)-(3
20,191), PSET, B: HPRINT(10,5), "MIS
SION": HPRINT(9,6), "INFILTRATE": H
PRINT(13,7), "BY": HPRINT(8,8), "SC
OTT HARVEY": HCOLOR2: HPRINT(5,10)
, "Modified for the Coco 3": HPRIN
T(5,11), "By Charles Bartlett"
2480 HDRAW"BM100,156;U30R5D30L5R
10U30R5D30L5R10U30R5D30R5U30R5D3
0R5U30"
2490 HLINE(100,156)-(146,126), PS
ET, B
2500 HLINE(100,131)-(146,136), PS
ET, BF: HLINE(100,151)-(146,146), P
SET, BF
2510 HCIRCLE(136,138),9,3
2520 HLINE(100,156)-(109,126), PR
ESET, BF
2530 HPAINT(136,138),5,3
2540 HDRAW"BM145,131;E5;U3E3U3E3
H3L3G3H3G3H3G3H3G3H3G3H3G3D3F3D3
G3"
2550 HGET(100,110)-(156,156),10
2560 HPRINT(0,23), "DO YOU NEED I
NSTRUCTIONS Y/N": PALETTE RGB: PAL
ETTE5,20
2570 FOR S=0 TO 3
2580 HDRAW"A"+STR$(S)+"BM136,138
;U4": FORI=1TO100: NEXTI: HPAINT(13
6,138),0,3
2590 A$=INKEY$: IF A$="Y" THEN HDRA
W"A0": GOTO2630
2600 IF A$="N" THEN HDRAW"A0": RE
TURN
2610 NEXT S
2620 GOTO 2570
2630 HCLS4: A$="CODE: ONE TRANSMI
SSION": GOSUB2750
2640 A$="YOU MUST INFILTRATE THE
KARAN BASE WHICH": GOSUB2750
2650 A$="IS NOW UNDER THE CONTROL
OF THE KGB.": GOSUB2750
2660 A$="ONCE INSIDE YOU MUST FI
ND THE THREE": GOSUB2750
2670 A$="PARTS OF A TIME BOMB HI
DDEN WITHIN THE": GOSUB2750
2680 A$="FORTRESS BY PREVIOUS AG
ENTS. YOU MUST": GOSUB2750
2690 A$="THEN PLANT THE BOMB IN
THE LABORATORY": GOSUB2750
2700 A$="WHERE THE KGB ARE WORKI
NG ON A NEW SUPER": GOSUB2750: A$=
"WEAPON THAT COULD CAUSE THE DES
TRUCTION": GOSUB2750
2710 A$="OF MILLIONS OF LIVES. D
ETONATE THE BOMB": GOSUB2750: A$="
AND GET OUT.": GOSUB2750
2720 A$="OPERATION: INFILTRATE":
GOSUB2750: A$="SCREEN WILL NOW SE
LF DESTRUCT.": GOSUB2750
2730 FORI=1TO400: NEXTI: FOR X=0 T
O 100: A=RND(255): B=RND(191): HLIN

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E(128,96)-(A,B),PSET:NEXT X
2740 RETURN
2750 FORX=1TO LEN(A$)
2760 B$=MID$(A$,X,1):HPRINT(X-1,
YP),B$:FORZ=1TO RND(50):NEXTZ:NE
XTX:YP=YP+1
2770 RETURN
2780 HLINE(0,0)-(255,84),PSET,B
2790 HLINE(45,0)-(45,30),PSET:HL
INE-(0,84),PSET:HLINE(50,20)-(12
0,40),PSET,B:HLINE(140,10)-(160,
40),PSET,B:HLINE(180,15)-(200,40
),PSET,B:HLINE(183,23)-(198,37),
PSET,BF
2800 HCIRCLE(190,10),2,5:HCIRCLE
(200,10),2,5
2810 HDRAW"BM50,20;E10R25U2R2D2R
3R7U2R2D2R1R30G10D20E10U20;BM80,
12;G5R20E5L20"
2820 HDRAW"BM90,10;U5R5D1"
2830 HDRAW"BM140,10E10R20D30G10U
30E10;BM180,15;E10U5R20D5L20R20G
10D25E10U25G10"
2840 HDRAW"BM90,68;D15U15R50E20L
50G20D5R50D10U10E20D10U15"
2850 HDRAW"BM45,30R5;BM130,30R10
;BM170,30R10;BM210,30R45"
2860 HPAINT(2,10),5,5:HPAINT(60,
2),2,5
2870 HPAINT(180,2),2,5:HPAINT(22
0,2),2,5
2880 HLINE(155,17)-(157,25),PSET
,BF
2890 HPAINT(60,60),6,5:HPAINT(12
0,82),6,5
2900 HPAINT(90,35),7,5:HPAINT(12
5,25),7,5
2910 RETURN
2920 HLINE(0,0)-(255,84),PSET,B
2930 HLINE(40,0)-(40,50),PSET:HL
INE-(0,84),PSET
2940 HDRAW"BM130,5;G5R20E5L20R20
D10G10E5U10D10L5D5R10E5L10R10G5D
20G10L30E10R30L30U20E5G5R10U5L5U
10;BM155,20;D25G15E10D20R5U25G15
U5D5D20L5U20R5L5L15R5D10L5U10L10
U5D5D20R5U20"
2950 HPAINT(146,12),5,5:HPAINT(1
42,21),5,5:HPAINT(152,35),5,5:HP
AINT(120,59),5,5
2960 HDRAW"BM50,70;U10R30D10U10E
20D10U10L30G20"
2970 HDRAW"BM70,50;R15U2L6U13R1E
5D3R1D4L1U4D4D3H5L1L4D13L6D2"
2980 HDRAW"BM40,50;R20;BM90,50R2
5;BM155,50R100"
2990 HPAINT(100,10),6,5:HPAINT(2
0,40),6,5
3000 RETURN
3010 HLINE(0,0)-(255,84),PSET,B
3020 HLINE(0,70)-(255,70),PSET:HL
INE(50,10)-(80,40),PSET,B:HLINE
(55,15)-(75,35),PSET,BF:HLINE(12
0,10)-(170,70),PSET,B:HLINE(210,
10)-(240,40),PSET,B:HLINE(215,15
)-(235,35),PSET,BF
3030 HDRAW"BM120,70;U10R50L50E5R
45L40U10R40L40E5R35L30U10R30L30E
5R25L20U10R20L20E5"
3040 HPAINT(130,20),5,5
3050 HPAINT(160,65),2,5:HPAINT(1
60,58),3,5:HPAINT(160,50),2,5:HP
AINT(160,44),3,5:HPAINT(160,35),
2,5:HPAINT(160,28),3,5:HPAINT(16
0,20),2,5:HPAINT(160,14),3,5
3060 HPAINT(10,10),6,5
3070 RETURN
3080 HLINE(0,0)-(255,84),PSET,B
3090 HLINE(40,0)-(40,60),PSET:HL
INE-(255,60),PSET:HLINE(40,60)-(
0,84),PSET
3100 HLINE(60,10)-(90,40),PSET,B
:HCOLOR2:HLINE(65,15)-(85,35),PS
ET,BF:HCOLOR5:HLINE(129,10)-(145
,40),PSET,B:HLINE(145,10)-(160,4
0),PSET,B:HLINE(190,10)-(220,40
),PSET,B:HCOLOR3:HLINE(195,15)-(2
15,35),PSET,BF:HCOLOR5
3110 HCIRCLE(145,10),17.5,.50,.
50,.0
3120 HLINE(129,10)-(160,40),PSET
:HLINE(160,10)-(129,40),PSET:HPA
INT(132,25),1,5:HPAINT(158,25),1
,5:HPAINT(140,15),2,5:HPAINT(150
,35),2,5:HPAINT(140,35),3,5:HPAI
NT(150,15),3,5
3130 HDRAW"BM55,84;E15R150G15;BM
60,84E10R140G10"
3140 HPAINT(120,73),3,5
3150 HPAINT(10,10),6,5:HPAINT(11
0,10),6,5
3160 RETURN
3170 HLINE(0,0)-(255,84),PSET,B
3180 HLINE(50,0)-(50,50),PSET:HL
INE-(255,50),PSET:HLINE(50,50)-(
0,84),PSET
3190 HDRAW"BM85,20;U10L15D2L3R3D
2R3D2R2U2R5D6R5;BM80,25D15R15U15
L5D5L5U5L5D2R5L5D2R5L5D2R15D2L15
D2R15D2L15D2R15U14D2L5R5D2L5R5D2
L5"
3200 HDRAW"BM95,15;E5R10L7U2R2U5
D5R2D2R3F5L20R8U5D5R2U5D5R5U5D5R
8L8D8L5U8;BM120,35;R2U5E2H2D4U4L
3D4U4L4D4U4L5D1L2G1L1R1F1R2D1R10
L2D2R2U2D2D3"
3210 HDRAW"BM134,25U15D15L2R6L2D
5D1R2L5R1U5R2U16":HSET(135,10,5)
3220 HDRAW"BM149,10;E5DEC0D3C0D7
C5H5U5E5D5R4U5F6D5G5U7D17L2U17L1
;BM195,35;L50D2R50U2"
3230 HDRAW"BM180,10;D15R2U15L2R1
U1R1R8D1L1R2D15L2U15;BM200,10;D5
R20L3D2R3U2D2D3R3U5R7U5L30R30R1U
1D6"
3240 HDRAW"BM210,25;R5D5U5L5D15R
5U5R5D5R5U15L5D5L5R5U5R5D5R2D1R2
U2R2D2U2R2U9R2U6D6R1D12R2D3L2U3D
3R7D3L10U15"
3250 HPAINT(60,10),6,5:HPAINT(10
,10),6,5:HPAINT(130,65),7,5
3260 RETURN
3270 HLINE(0,0)-(255,84),PSET,B
3280 HLINE(60,0)-(60,50),PSET:HL
INE-(50,55),PSET:HLINE(60,50)-(9
0,50),PSET:HLINE(210,50)-(220,50
),PSET:HLINE(90,15)-(200,30),PSE
T,B:HLINE-(90,45),PSET,B:HLINE-(
200,60),PSET,B:HLINE(220,50)-(25
5,60),PSET,B
3290 HDRAW"BM90,15;E10R110G10E10
D45G10E10R10E10R25"
3300 HLINE(40,45)-(0,61),PSET:HL
INE-(10,70),PSET:HLINE-(50,51),P
SET:HLINE-(40,45),PSET:HLINE(10,
70)-(10,84),PSET:HLINE-(50,60),P
SET:HLINE-(50,50),PSET
3310 FORX=90 TO 195 STEP 4:HDRAW
"BM"+STR$(X)+"",30;U10R4D10U10L4E
2":NEXT X
3320 FOR X=90 TO 195 STEP4:HDRAW
"BM"+STR$(X)+"",45;U10R4D10U10L4E
2":NEXTX:FOR X=90 TO 195 STEP4:H
DRAW"BM"+STR$(X)+"",60;U10R4D10U1
0L4E2":NEXT X
3330 HPAINT(10,10),3,5:HPAINT(70
,10),3,5:HPAINT(70,70),1,5
3340 HLINE(210,10)-(212,45),PSET
,BF
3350 HPAINT(140,25),2,5
3360 HPAINT(20,60),6,5:HPAINT(20
,70),6,5:HPAINT(5,75),6,5
3370 RETURN
3380 HLINE(0,0)-(255,84),PSET,B
3390 HLINE(120,10)-(170,70),PSET
,B
3400 HLINE(0,70)-(255,70),PSET
3410 HDRAW"BM125,70;U10R45L40U9R
40L35U8R35L30U7R30L25U6R25L20U5R
20L15U4R15L10U3R10L5U2R5L4U2R4L3
U2R3L2U1R2L1U1R1L0"
3420 HPAINT(130,20),5,5:HPAINT(1
0,10),6,5
3430 FORY=69 TO10 STEP-1:X=169:H
PAINT(X,Y),7,5:NEXTY
3440 HPAINT(140,75),8,5
3450 RETURN
3460 HLINE(0,0)-(255,84),PSET,B:
HLINE(50,0)-(50,60),PSET:HLINE-(
0,84),PSET:HLINE(120,10)-(210,40
),PSET,B:HLINE(125,15)-(205,35),
PSET,B
3470 HDRAW"BM90,0;D10G10R20H10G1
D2L1D2R4U2L1U2;BM89,15;D1L1D2R4U
2L1U1"
3480 HDRAW"BM125,35E5U5R5U5R5D10
R10D5U5L10U5R5U10D5R15U5D5L5D5R1
0D5L5D5U5R5U5R5D5R10U10R10U5D5L5
D5R5D10U10R10D5R5"
3490 HDRAW"BM100,80;U10E20R90D10
U10G20D10U10L90;BM50,60;R60;BM20
0,60R55"
3500 HPAINT(130,20),6,5:HPAINT(1
35,30),7,5:HPAINT(150,28),8,5:HP
AINT(155,30),9,5:HPAINT(175,20),
1,5:HPAINT(185,30),2,5:HPAINT(19
5,30),3,5
3510 HPAINT(200,20),11,5:HPAINT(
10,10),5,5:HPAINT(70,10),12,5:HP
AINT(206,57),12,5
3520 RETURN
3530 HLINE(0,0)-(255,84),PSET,B
3540 FORX=0TO250STEP20:HDRAW"BM"
+STR$(X)+"",40;U10R10D10R10":NEXT
X
3550 SI=SI+1:IFSI>=10 THEN SI=0:
GOTO3560ELSEX=RND(255):Y=RND(20)
:FORN=0 TO10:HCIRCLE(X,Y),N,3,.2
5:NEXTN:GOTO3550
3560 HPAINT(128,60),8,5
3570 RETURN
3580 HLINE(0,0)-(255,84),PSET,B
3590 HLINE(50,0)-(50,60),PSET:HL
INE-(0,84),PSET:HLINE(70,40)-(14
0,70),PSET,B:HLINE(70,30)-(140,4
0),PSET,B:HLINE(105,35)-(110,50)

```

```
,PSET,B
3600 HDRAW"BM70,30;E10R70G10D10E
10V10G10L70;BM106,40C0;R3C5;BM15
0,30;D30G10"
3610 HLINE(180,10)-(200,40),PSET
,B:HDRAW"BM185,12;D8R2D5R6U5R2U8
L10;BM185,25;U2L2D2R2F10D2R2U2L2
;BM195,25;U2R2D2L2G10D2L2U2R2;BM
187,14;D2R2U2L2;BM192,14;D2R2U2L
2;BM189,17;D2R2U2L2"
3620 HLINE(50,60)-(70,60),PSET:H
LINE(150,60)-(255,60),PSET
3630 HPAINT(20,10),8,5:HPAINT(90
,10),8,5:HPAINT(100,60),7,5:HPAI
NT(145,50),7,5:HPAINT(90,35),6,5
:HPAINT(100,25),6,5:HPAINT(145,3
0),6,5
3640 RETURN
3650 HLINE(0,0)-(255,84),PSET,B
3660 HLINE(40,0)-(40,40),PSET:HL
INE-(255,40),PSET:HLINE(40,40)-(
0,84),PSET:HLINE(130,0)-(170,40)
,PSET,B
3670 HDRAW"BM130,30;R40L40E5R35L
30U10R30L30E5R25L20U10;BM70,80E3
0R120G30L120"
3680 HPAINT(160,5),3,5:HPAINT(16
0,13),2,5:HPAINT(160,20),3,5:HPA
INT(160,28),2,5:HPAINT(160,35),3
,5
3690 HPAINT(150,60),7,5:HPAINT(2
0,10),6,5:HPAINT(60,10),6,5:HPAI
NT(200,10),6,5
3700 RETURN
3710 HLINE(0,0)-(255,84),PSET,B:
HLINE(50,0)-(50,70),PSET:HLINE-(
255,70),PSET:HLINE(50,70)-(0,84)
,PSET
3720 HDRAW"BM130,45;U5D5R10D5R5U
10R5D5R5U5R5U5R10U5L5U10L5D5L10U
5L5D5L5U5L5D10R5D5L5D5L5"
3730 HPAINT(150,35),5,5:HPAINT(1
0,40),7,5:HPAINT(90,40),7,5
3740 RETURN
3750 HLINE(0,0)-(255,84),PSET,B:
HLINE(50,0)-(50,70),PSET:HLINE-(
255,70),PSET:HLINE(50,70)-(0,84)
,PSET:HLINE(140,10)-(180,50),PSE
T,B:HLINE(145,15)-(175,45),PSET,
B:HDRAW"BM152,20;D2R4U2L4;BM164,
20;D2R4U2L4"
3760 HPAINT(20,10),5,5:HPAINT(90
,10),6,5
3770 RETURN
3780 HLINE(0,0)-(255,84),PSET,B:
HLINE(50,0)-(50,50),PSET:HLINE-(
0,84),PSET:HLINE(70,40)-(190,60)
,PSET,B:HLINE(75,45)-(185,55),PS
ET,B:HLINE(230,10)-(255,60),PSET
,B:HLINE(235,15)-(245,25),PSET,B
:HLINE(238,18)-(242,23),PSET,BF
3790 HDRAW"BM70,40;E20R40;BM155,
20;R55G20D20E20U20G20;BM195,40;E
10D10G10U10;BM110,35;E10R10L10G1
0R45E10L10"
3800 HDRAW"BM130,30;U10R20D10L20
U10E5R5L5G5R20E5D10G5U10E5L10R10
E5L5D5E5D5E5D5E5D5E5D5E5D5E5
D5E5D5E5D5E5D5E5D5E5R5F10"
3810 HDRAW"BM140,18;R5U8R3E2R5U1
L5H2L4U2R3D2R3L3L6D2L15L3L3R9L9D
1L3R3L6R6R15D2R10L5D8"
3820 HDRAW"BM250,15;D5R5L5D5;BM2
55,25G5D5F5;BM235,30;R10D5L10D5R
```

```
10D5L10D5R10D5L10"
3830 HDRAW"BM230,10;E10"
3840 HPAINT(130,50),5,5:HPAINT(2
00,40),5,5:HPAINT(120,43),3,5:HP
AINT(207,30),3,5:HPAINT(100,30),
3,5
3850 HPAINT(196,35),3,5:HPAINT(1
95,37),3,5:HPAINT(197,34),3,5:HP
AINT(198,33),3,5:HPAINT(200,31),
3,5
3860 HLINE(50,50)-(70,50),PSET:H
LINE(200,50)-(230,50),PSET
3870 HPAINT(20,10),5,5:HPAINT(70
,10),6,5:HPAINT(220,20),6,5
3880 RETURN
3890 HLINE(0,0)-(255,84),PSET,B:
HLINE(70,70)-(170,80),PSET,B:HLI
NE(0,80)-(255,80),PSET:HLINE(120
,70)-(135,80),PSET,B
3900 HDRAW"BM110,30;R70G10L70E10
G10D20L10D10U10R10U20R70D20R10L1
0E10U20D20R10G10;BM170,70;E25L15
R15D10G25U10;BM70,70;E25R5;BM130
,65;D5U5R10D5"
3910 FOR X=110 TO 165 STEP10:HDR
AW"BM"+STR$(X)+"",50;U5R5D5L5":NE
XTX
3920 FOR X=105 TO 160 STEP10:HDR
AW"BM"+STR$(X)+"",60;U5R5D5L5":NE
XTX
3930 FOR X=51065 STEP10:HCIRCLE(X
,75),5:HPAINT(X,75),5,5:NEXTX
3940 FOR X=250 TO 180 STEP-10:HC
IRCLE(X,75),5:HPAINT(X,75),5,5:N
EXTX
3950 HPAINT(90,55),5,5:HPAINT(18
5,46),5,5
3960 HPAINT(90,75),1,5:HPAINT(16
0,75),1,5:HPAINT(185,60),1,5:HPA
INT(140,35),7,5:HPAINT(155,65),7
,5:HPAINT(175,40),7,5:HPAINT(180
,55),7,5
3970 HLINE(0,15)-(255,15),PSET
3980 HCIRCLE(138,15),10,,.55,.50
,.0
3990 HPAINT(10,5),2,5
4000 RETURN
4010 HCLS4:HPRINT(0,0),"THE LASE
R GUN EMITS A LOW BUZZ AND A":HP
RINT(0,1),"THIN BEAM OF RADIANT
LIGHT SHOOTC FROM":HPRINT(0,2),"
THE GUN TO THE PADLOCK MELTING I
T INTO A":HPRINT(0,3),"POOL OF B
UBBLING MOLTEN METAL.":RETURN
4020 I$=INKEY$:IFI$=""THEN4020
ELSE IFI$=CHR$(13)THEN IP=10:R
ETURN ELSE IF I$=CHR$(8) AND LE
N(I$)=0 THEN 4020 ELSE IF I$=CH
R$(8) THEN IP=IP-1:HCOLOR4:HPRIN
T(IP,17),RIGHT$(I$,1):I$=LEFT$(I
$,LEN(I$)-1):HCOLOR3:GOTO4020
4030 HPRINT(IP,17),I$:I$=I$+I$:
IP=IP+1:GOTO4020
4040 I$=""HPRINT(0,0),"HOW MANY
SECONDS 0-60"
4050 GOSUB4020:IFI$=""THEN4050 E
LSE TI=VAL(I$):HPRINT(0,1),"OKAY
SET TO ":HPRINT(12,1),TI:HPRINT
(15,1)," SECONDS.":HPRINT(0,2),"
YOU HAD BETTER GET BACK TO THE F
OREST":HPRINT(0,3),"QUICKLY.":PH
=1:RETURN
4060 POKE65496,0:PALETTE RGB
```

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```
troller connected"
2480 PRINT:PRINT"BY LISTING TO T
HE T.V., GET THE DISC RE
ADY."
2485 PRINT"WHEN READY, PRESS ANY
KEY TO GO TO NEXT STAGE."
2490 '
2500 RETURN
2515 '
2520 '
2525 PRINT#-2,CHR$(27)CHR$(19)
2526 PRINT#-2,CHR$(27)CHR$(32)
2528 '** ADDITION TO PRINTING **
** ROUTINE **
2530 END
2535 CLS:PRINT#64,"DO YOU WANT T
O CHANGE ANY MORE PRINTING STYL
E ? Y/N ";
2540 T$=INKEY$:IF T$="Y"THEN 158
0
2545 IF T$="N"THEN 2555
2550 IF T$=""THEN 345 ELSE 2540
2555 CLS:PRINT#64,"DO YOU WANT T
O SET THE TAB ?";
2560 PRINT#128,"IF NO PRESS ENTE
R IF YES TYPE NUMBER";
2565 INPUT TB
2570 IF TB<5 THEN TB=5
2575 GOTO 1620
2580 '** NEW COCO MAY 1987 P.10
```

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```
ING YOU SAY GOODBYE TO CHATWIN M
ANOR AND ITS RESIDENTS AND RESUM
E YOUR WELL-EARNED HOLIDAY, ANOT
HER CASE SUCCESSFULLY SOLVED.":G
OSUB1040:GOSUB1100
2440 X=0:Y=20:C$="" IF YOU WOULD
LIKE TO PLAY AGAIN, PRESS <P> BU
T REMEMBER THE THIEF MAY NOT BE
THE SAME PERSON - BUT, THEN AGAI
N ...":GOSUB1040:Y=Y+20:C$="" PR
ESS <E> TO END THE GAME.":GOSUB1
040:IN$=INKEY$
2450 IN$=INKEY$:IF IN$="P" THEN2
480
2460 IF IN$="E" THEN CLS:PRINT#2
68,"THE END":END
2470 GOTO2450
2480 GOSUB1120:X=0:Y=50:C$=""IF Y
OU ARE A NEW PLAYER YOU MUST STA
RT AT THE BEGINNING.":GOSUB1040
2490 Y=Y+20:C$=""IF YOU ARE NOT A
NEW PLAYER, YOU MAY SKIP THE BE
GINNING.":GOSUB1040:Y=Y+20:C$=""P
LEASE PRESS (B) IF YOU ARE A NEW
PLAYER OR (S) TO SKIP THE START
.":GOSUB1040:IN$=INKEY$
2500 IN$=INKEY$:IF IN$="" THEN25
00
2510 GOSUB1120:IF IN$="B" THENGO
SUB1120:RUN"START
2520 IF IN$("<"S" THEN IN$=INKEY$
:GOTO2500
2530 G1=PEEK(32459):G=RND(5):IF
G=G1 THEN2530 ELSEPOKE32459,G:PO
KE32481,0:GOSUB1120:GOTO110
2540 X=0:Y=20:TU=PEEK(32481)+1:P
OKE32481,TU:IF TU>2 THEN2560
2550 C$="" SORRY, THAT PERSON IS
COMPLETELY INNOCENT. YOU SHOULD
BE SUEED FOR FALSE ARREST. YOU W
ILL HAVE JUST ONE MORE CHANCE TO
ARREST THE RIGHT PERSON.":GOSUB1
040:GOSUB1100:GOTO110
2560 C$="" THAT PERSON IS INNOCEN
T ALSO. YOU AND "+WA$(2)+" ARE B
EING SUEED FOR FALSE ARREST.":GOS
UB1040:GOSUB1100:GOTO2440
```



A CoCo3 version of...

CRYSTAL

GRAPHIC ADVENTURE

by Colin North

REMEMBER "CRYSTAL" (December 1986, p59?) and how we said we couldn't print it because it was too long?? Well, we've gone two steps better.

Colin North, the author of the program, has decided to re-write the program for the CoCo 3.

Therefore it is now a fully-fledged colourful graphics adventure.

The second step, of course, is that we can print it out. It is a fairly lengthy program to type up. If you feel it is too big for you, remember, there is always the CoCoOz tape monthly.

Aim of "Crystal"

The aim of the game, for those who don't have the magazine with them, is to find your way home.

There are two ways about this:

a) Find the four crystals to fly your spaceship, or ...

b) find your way through the maze.

Your commands are simple: 'N' for north, 'S' for south, 'E' for east, 'W' for west, plus a few more commands that you'll have to find out.

The Listing:

```

0 PALETTE RGB:GOSUB1:GOTO5
1 POKE&HFFB2,13:POKE&HFFB3,54:PO
KE&HFFB4,9:POKE&HFFB5,36:POKE&HF
FB6,27:POKE&HFFB7,45:POKE&HFFB8,
38:POKE&HFFB9,58:POKE&HFFBA,33:P
OKE&HFFBB,2:POKE&HFFBC,30
2 POKE&HFFBD,53:POKE&HFFBE,56:PO
KE&HFFBF,60
3 POKE&HFFB0,0:POKE&HFFB1,63
4 RETURN
5 GOTO265
6 GOTO513
7 GOSUB188
8 GOSUB259:GOSUB260:GOSUB330:GOS
UB331
9 GOSUB281
10 IFA(1)=45 THEN12

```

```

11 GOSUB321:GOTO8
12 GOSUB13:GOTO21
13 '
14 HCLS1:HCOLOR0:GOSUB356:HDRAW'
BMO,100BU70M+132,+10R55M+132,-10
BD60M-132,-10NU40L55NU40M-132,+1
0
15 HDRAW'BM72,85U25M+20,+0ND23ER
56ND20R20ND20BR56ND23R18D25"
16 HPAINT(155,90),2,0:HPAINT(50,
50),14,0:HPAINT(150,50),14,0:HFA
INT(200,50),14,0:HPAINT(1,1),6,0
17 HCIRCLE(232,10),20,3:HPAINT(2
32,10),3,3
18 HCIRCLE(50,10),20,1,.4:HPAINT
(50,10),1,1
19 HDRAW'BM232,10C3EL25NL10BR25B
G20NG10BE20BD25ND10BU25BF20NF10B
H20BR25NR10C0"
20 HCOLOR0:X=10:Y=120:V$="YOU AR
E IN:":GOSUB292:X=10:Y=10:V$="
A COURTYARD":GOSUB292:GOSUB329:
GOSUB343:GOSUB281
21 IFA(1)=50THEN25
22 IFA(1)=45THEN195
23 IFA(1)=54THEN371
24 IFA(1)=36THEN28
25 IFA(1)=50ANDV=1THEN507ELSE7
26 GOSUB321:GOTO20
27 '
28 HCLS1:HCOLOR0
29 HLINE(0,0)-(320,100),PSET,B:H
DRAW'BM0,70R110NG30D20NR15BU20BR
35NG30R174":HDRAW'BM80,100M+30,
-10":HPAINT(85,90),14,0:HPAINT
(200,90),14,0:GOSUB30:GOTO36
30 HDRAW'BM0,40E3R1E2R1E3R1E2R1E
3R1U1R1U1R1F2R1F3R1F4R3D2F2R3F10
NF25E20R3U2E3R2F7R2F7E5F3NF10U1R
1U1R1E20R20F30R2D2R2D2NG24E20R2E
3R2F30R3E20R2F15R1E2F5R1E15R10F8
R2E3":RETURN
31 HDRAW'BM70,77S8E3R1E3R2F3R1E6
F2R1F3R1F3R1E4R1E2R1F6R1E2F10":H
DRAW'S4"
32 RETURN
33 HPAINT(1,1),6,0:HPAINT(160,40
),8,0:HPAINT(1,99),13,0
34 FORF=1TO15:X=RND(320):Y=RND(3
0):R=3+RND(7):HCIRCLE(X,Y),R,1,.
4:HPAINT(X,Y),1,1:NEXT
35 RETURN
36 HPAINT(40,60),13,0:HPAINT(220
,60),13,0:HPAINT(160,40),8,0:HFA
INT(1,1),6,0
37 HCOLOR0:X=10:Y=120:GOSUB259:V
$="A PATHWAY,MOUNTAINS.":GOSUB29
2:GOSUB330:GOSUB333:GOSUB281

```

```

38 IFA(1)=38ANDA(4)=47THEN42
39 IFA(1)=54THEN13
40 GOSUB321:GOTO37
41 '
42 HCLS1:HCOLOR0:GOSUB356
43 GOSUB30:GOSUB31:GOSUB33
44 HDRAW'BM0,77COR70BR115BD15R14
5"
45 HPAINT(1,99),2,0
46 HCOLOR0:X=10:Y=120:GOSUB259:V
$="MOUNTAINS.":GOSUB292:GOSUB330
:GOSUB343:GOSUB281
47 IFA(1)=45THEN71
48 IFA(1)=50THEN143
49 IFA(1)=54THEN28
50 IFA(1)=36THEN53
51 IFA(1)=38ANDA(4)=44THEN53
52 GOSUB321:GOTO46
53 U=1:V=10:HCLS1:GOTO55
54 '
55 HCOLOR0:POKE&HFFB5,RND(63):PO
KE&HFFB6,RND(63)
56 GOSUB356:HDRAW'BM0,20F80BH40E
80F100BH50E50F70E64":HPAINT(2,90
),5,0:HPAINT(128,96),11,0:HPAINT
(250,90),5,0:HPAINT(1,1),6,0:HFA
INT(130,1),6,0:HPAINT(300,1),6,0
57 HCOLOR0:X=10:Y=120:V$="YOU AR
E IN THE MOUNTAINS.":GOSUB292:GO
SUB330:GOSUB343:GOSUB281
58 IFA(1)=50THEN63
59 IFA(1)=45THEN64
60 IFA(1)=54THEN65
61 IFA(1)=36THEN66
62 GOSUB321:GOTO57
63 U=U-1:GOTO67
64 U=U+1:GOTO67
65 V=V-1:GOTO67
66 V=V+1:GOTO67
67 IFU=1ANDV=9THEN42ELSE68
68 IFU=11ANDV=3THEN44ELSE69
69 IFU=5ANDV=16THEN60SUB176ELSEG
OTO55
70 GOTO55
71 '
72 HCLS1:HCOLOR0:GOSUB356
73 GOSUB30:GOSUB31:GOSUB33
74 FORF=1TO100:HCOLOR0:X=RND(315
):Y=80+RND(19):HLINE(X,Y)-(X+RND
(10),Y),PSET:NEXT
75 X=10:Y=120:GOSUB259:V$="MOUNT
AINS.":GOSUB292:X=10:Y=10:V$="
AN IMPASSABLE SWAMP.":GOSUB292:G
OSUB330:GOSUB331:GOSUB335:GOSUB3
32:GOSUB281
76 IFA(1)=50THEN42
77 IFA(1)=45THEN79
78 GOSUB321:GOTO75

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79 '
80 HCLS1:HCOLOR0:GOSUB356
81 HDRAW"BM0,100S4M+192,-60U20L1
92":HDRAW"BM160,100M+60,-60NL30M
+99,-5"
82 HDRAW"BM160,20R2E5U3R2E5R2E2R
3F2R1E2R2E2R2F2R3E2R2E5"
83 HPAINT(318,2),13,0
84 HDRAW"BM40,87U30M+20,-4D28
85 FORX=197T0314STEP11:Y=16+RND(
7):HCIRCLE(X,Y),4,2,2:HPAINT(X,Y
),2,2:HCOLOR8:HLINE(X,Y)-(X,Y+10
),PSET:HCOLOR0:NEXT
86 FORX=202T0320STEP11:Y=10+RND(
7):HCIRCLE(X,Y),4,2,2:HPAINT(X,Y
),2,2:HCOLOR8:HLINE(X,Y)-(X,Y+10
),PSET:HCOLOR0:NEXT
87 HPAINT(40,99),3,0:HPAINT(1,31
),14,0:HPAINT(250,99),2,0
88 HPAINT(1,1),6,0
89 FORF=1T030:X=RND(255):Y=RND(2
0):HCIRCLE(X,Y),2,0,.75,.1,.4:WE
XT
90 X=10:Y=120:HCOLOR0:GOSUB259:W
S="THE BLACK FOREST":GOSUB292:X=
10:Y=Y+10:WS="IN THE DISTANCE.":
GOSUB292:X=10:Y=Y+10:WS="A DOORW
AY IN THE WALL.":GOSUB292:GOSUB3
30:GOSUB360:GOSUB281
91 IFA(1)=50THEN71
92 IFA(1)=45THENHCLS1:GOTO104
93 IFA(1)=54THENHCLS1:GOTO96
94 IFA(1)=38ANDA(4)=35THEN97
95 GOSUB321:GOTO90
96 GOSUB356:HLINE(0,70)-(320,70)
,PSET:HPAINT(1,1),5,0:HPAINT(1,7
1),7,0
97 '
98 HCOLOR0:POKE&HFFB5,RND(63)
99 HCOLOR0:X=10:Y=120:WS="YOU AR
E IN A PASSAGE.":GOSUB292:GOSUB3
30:GOSUB347:GOSUB331:GOSUB281
100 IFA(1)=45THEN219
101 IFA(1)=36THEN79
102 IFA(1)=54THENPOKE&HFFB5,36:G
OTO195
103 GOSUB321:GOTO99
104 GOSUB106:GOTO114
105 '
106 HCOLOR0:GOSUB356
107 HPAINT(1,1),9,0
108 FORX=10T0310STEP20:Y=40+RND(
10):HCIRCLE(X,Y),8,2,2:HPAINT(X,
Y),2,2:HCOLOR8:HLINE(X,Y)-(X,Y+2
0),PSET:NEXT:HCOLOR0
109 FORX=20T0310STEP20:Y=15+RND(
10):HCIRCLE(X,Y),8,2,2:HPAINT(X,
Y),2,2:HCOLOR8:HLINE(X,Y)-(X,Y+2
0),PSET:NEXT:HCOLOR0
110 FORX=20T0310STEP20:Y=70+RND(
10):HCIRCLE(X,Y),8,2,2:HPAINT(X,
Y),2,2:HCOLOR8:HLINE(X,Y)-(X,Y+2
0),PSET:NEXT:HCOLOR0
111 RETURN
112 POKE&HFFB9,15+RND(8)
113 RETURN
114 X=10:Y=120:HCOLOR0:WS="YOU A
RE AT THE BLACK FOREST":GOSUB292
:GOSUB330:GOSUB331:GOSUB335:GOSU
B332:GOSUB336:GOSUB281
115 IFA(1)=50THENGOSUB1:GOTO80
116 IFA(1)=45THEN118
117 GOSUB321:GOTO114
118 U=10:V=10
119 '
120 GOSUB112:X=10:Y=120:HCOLOR0:
WS="YOU ARE IN THE BLACK FOREST"
:GOSUB292:GOSUB330:GOSUB343:GOSU
B281
121 IFA(1)=45THEN125
122 IFA(1)=50THEN126
123 IFA(1)=54THEN127
124 IFA(1)=36THEN128
125 U=U+1:GOTO129
126 U=U-1:GOTO129
127 V=V+1:GOTO129
128 V=V-1:GOTO129
129 IF LT=10 THEN LT=0:GOSUB106
130 IFU=9ANDV=10THEN133
131 IFU=8ANDV=10THENGOSUB176ELSE
GOTO132
132 IFU=5ANDV=15THEN134ELSEGOTO1
20
133 GOSUB112:GOTO114
134 '
135 HCLS1:HCOLOR0:GOSUB356
136 HDRAW"BM0,100M+152,-80U10M-2
0,-10EM+55,-0M-20,+10D10L15M+15
3,+80
137 HPAINT(160,99),3,0:HPAINT(1,
1),14,0:HPAINT(318,1),14,0:HPAIN
T(160,1),6,0
138 GOSUB259:X=10:Y=Y+10:WS="HIG
H WALLS EAST AND WEST.":GOSUB292
:X=10:Y=Y+10:WS="A LONG ROAD-LEA
DS NORTH.":GOSUB292:GOSUB330:GOS
UB331:GOSUB335:GOSUB332:GOSUB336
:GOSUB281
139 IFA(1)=45THEN453
140 IFA(1)=50THENHCLS1:LT=10:GOT
O125
141 GOSUB321:GOTO134
142 GOTO142
143 '
144 HCLS1:HCOLOR0:GOSUB356:GOSUB
30
145 HCIRCLE(128,81),120,0,.1:HDR
AW"BM0,81R10BR235R10":HPAINT(128
,81),4,0
146 HPAINT(10,50),13,0:HPAINT(25
0,50),13,0:HPAINT(160,40),8,0:HP
AINT(1,1),6,0
147 HCOLOR0:X=10:Y=120:GOSUB259:
WS="HIGH MOUNTAINS.":GOSUB292:X=
10:Y=Y+10:WS="A MOUNTAIN LAKE.":
GOSUB292:GOSUB330:GOSUB331:GOSUB
281
148 IFA(1)=45THEN42
149 IFA(1)=38ANDA(4)=43THEN152
150 GOSUB321:GOTO147
151 '
152 HCLS1:HCOLOR0:GOSUB356
153 HCIRCLE(209,30),140,0,.3,0,.
7:HPAINT(314,10),4,0:HCOLOR0:HP
AINT(1,1),2,0
154 FORF=1T020:X=RND(255):Y=70+R
ND(25):HCIRCLE(X,Y),5,0,.4:HPAIN
T(X,Y),0,0:NEXT
155 X=10:Y=120:GOSUB259:WS="A LA
RGE MOUNTAIN LAKE.":GOSUB292:X=1
0:Y=Y+10:WS="STRANGE FOOTPRINTS.
":GOSUB292:GOSUB329:GOSUB331:GOS
UB281
156 IFA(1)=45THEN143
157 IFA(1)=37ANDA(8)=47THEN159
158 GOSUB321:GOTO155
159 '
160 HCLS1:HCOLOR0:GOSUB356
161 HLINE(0,70)-(320,70),PSET:HL
INE(142,40)-(180,70),PSET,B:HLIN
E(112,40)-(132,50),PSET,B:HPAINT
(1,1),14,0:HPAINT(1,99),2,0:HPAI
NT(143,41),0,0
162 HCOLOR0:X=10:Y=120:GOSUB259:
WS="AN OLD GOLD MINE.":GOSUB292:
X=10:Y=Y+10:WS="A SIGN.":GOSUB29
2:GOSUB330:GOSUB331:GOSUB281
163 IFA(1)=45THEN152
164 IFA(1)=49ANDA(6)=50THENGOSUB
358:GOSUB337:GOTO162
165 IFA(1)=38ANDA(4)=44THEN167
166 GOSUB321:GOTO162
167 IF U=>1THEN169
168 GOSUB359:GOTO162
169 '
170 HCLS1:HCOLOR0:GOSUB356
171 HCOLOR0:Q=0:QQ=0:X=0:Y=0:XX=
320:YY=100:FORZ=1T05:HLINE(X+10,
Y+10)-(X-10,YY-10),PSET,B:HPAIN
T(Q+5,QQ+5),0,0:HCOLOR0:SOUND50,
5:X=X+27:Y=Y+8:XX=XX-27:YY=YY-8:
Q=Q+27:QQ=QQ+8:NEXTZ
172 X=10:Y=120:WS="THE TIMBERS B
ROKE!!":GOSUB292:X=10:Y=Y+10:WS
="YOU HAVE FALLEN DOWN THE":GOSU
B292:X=10:Y=Y+10:WS="MINE SHAFT!
!!":GOSUB292:X=10:Y=Y+10:WS="THE
FLOOR IS":GOSUB292:X=10:Y=Y+10:
WS="CAVING IN !!!":GOSUB292:FORF
=1T04000:NEXT
173 HCLS1:HCOLOR0
174 HLINE(0,0)-(320,100),PSET,BF
175 X=10:Y=130:WS="YOU ARE FALLI
NG AGAIN":GOSUB292:FORF=200T010S
TEP-10:SOUND1,1:NEXT:SOUND10,4:
FORF=1T030:POKE&HFFB0,RND(63):HC
LS0:FORQ=1T040:NEXT:NEXT:U=10:V=
10:POKE&HFFB0,0:HCLS1:GOTO401
176 '
177 CR=CR+1:HCLS1:HCOLOR0:HLINE(
0,0)-(320,100),PSET,BF
178 HDRAW"BM128,50C1BL30E30F30G3
0H30":HPAINT(128,50),1,1:HCOLOR0
:HDRAW"BM128,50NR30L30BR20M+10,-
30BD60M-10,-30"
179 HDRAW"BM128,50C1BR35NR20BL70
NL20BR35BU35NU15BD70ND15BU35BE30
NE15BG60NG15BE30BH30NH15BF60F15"
180 HCOLOR0:X=10:Y=120:WS="YOU A
RE IN THE CRYSTAL ROOM":GOSUB292
:GOSUB361
181 GOSUB330:GOSUB343:GOSUB281
182 IFA(1)=45THENRETURN
183 IFA(1)=50THENRETURN
184 IFA(1)=54THENRETURN
185 IFA(1)=36THENRETURN
186 GOSUB321:GOTO176
187 '
188 HCLS1:HCOLOR0:GOSUB356
189 HLINE(0,100)-(320,100),PSET
190 HDRAW"BM132,100S8U20R5U1R5U1
R5D1R5D1R5D20
191 HDRAW"BM132,100;M+25,-10
192 HPAINT(142,80),3,0:HPAINT(14
2,99),2,0:HPAINT(2,2),14,0
193 RETURN

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194 '
195 HCLS1:HCOLOR0:GOSUB356
196 HLINE(0,70)-(320,70),PSET:HP
AINT(1,1),5,0:HPAINT(1,71),7,0
197 IF LT=10 THEN LT=0:GOTO204
198 GOSUB345:GOSUB330:GOSUB346:G
OSUB281
199 IFA(1)=50 THEN13
200 IFA(1)=54 THEN204
201 IFA(1)=36 THEN97
202 GOSUB321:GOTO198
203 '
204 HCOLOR0
205 POKE&HFFB5,RND(63)
206 HCOLOR0:X=10:Y=120:V$="YOU A
RE IN A PASSAGE":GOSUB292:GOSUB3
30:GOSUB347:GOSUB281
207 IFA(1)=36 THENPOKE&HFFB5,36:
GOTO195
208 IFA(1)=54 THENPOKE&HFFB5,36:
GOTO211
209 GOSUB321:GOTO206
210 '
211 HCLS1:HCOLOR0
212 GOSUB356:HPAINT(1,1),0,0
213 HCOLOR0:X=10:Y=120:V$="YOU A
RE IN A DARK ROOM":GOSUB292
214 GOSUB281
215 IFA(1)=43THENGOSUB348:GOTO21
5
216 IFA(1)=37ANDA(7)=50THEN250
217 IFA(1)=36THEN204
218 GOSUB349:GOTO213
219 '
220 HCOLOR0
221 POKE&HFFB5,RND(63)
222 IF U=0 AND V=10 THEN 223 ELS
E224
223 HCLS1:GOSUB356:HLINE(0,70)-(
320,70),PSET:HPAINT(1,1),5,0:HPA
INT(1,71),7,0
224 HCOLOR0:X=10:Y=120:V$="YOU A
RE IN A PASSAGE":GOSUB292:GOSUB
330:GOSUB331:GOSUB335:GOSUB332:G
OSUB336:GOSUB281
225 IFA(1)=50THEN97
226 IFA(1)=45THENHCLS1:GOTO228
227 GOSUB321:GOTO224
228 U=1:V=10
229 HCOLOR0:GOSUB356
230 HDRAW"BM0,80S4R20NU80M+120,-
50U10NR40U20BR40D30M+120,+50NU80
R20
231 POKE&HFFB5,RND(63)
232 HPAINT(1,1),5,0:HPAINT(318,2
),5,0:HPAINT(40,1),5,0:HPAINT(20
0,1),5,0:HPAINT(160,1),3,0:HPAI
NT(160,99),7,0
233 HCOLOR0:X=10:Y=120:GOSUB259:
V$="MANY PASSAGEWAYS":GOSUB292:
GOSUB330:GOSUB343:GOSUB281
234 IFA(1)=50THEN238
235 IFA(1)=45THEN239
236 IFA(1)=54THEN240
237 IFA(1)=36THEN241
238 U=U-1:GOTO243
239 U=U+1:GOTO243
240 V=V-1:GOTO243
241 V=V+1:GOTO243
242 GOSUB321:GOTO233
243 IFU=0ANDV=10THEN219ELSE244
244 IFU=10ANDV=1THEN251ELSE245
245 IFU=12ANDV=0THEN437ELSEGOTO2
46
246 IFU=20ANDV=20THEN251ELSE247
247 IFU=10ANDV=10THENGOSUB176ELS
E229
248 GOTO229
249 GOTO249
250 U=21:V=20
251 HCLS1:HCOLOR0:GOSUB356
252 HDRAW"BM0,100S4E80R160F80L12
0":HCIRCLE(160,20),8,0,2,.5,1:HP
AINT(150,98),3,0:HPAINT(2,2),9,0
253 HDRAW"BM80,20U20BR160D20"
254 HCOLOR0:X=10:Y=120:V$="YOU A
RE IN A LARGE":GOSUB292:X=10:Y=Y
+10:V$="WELL LIT ROOM":GOSUB292:
GOSUB330:GOSUB331:GOSUB335:GOSUB
334:GOSUB336:GOSUB281
255 IFA(1)=45THENHCLS1:GOTO229
256 IFA(1)=36THENHCLS1:LT=10:GOT
O195
257 GOSUB321:GOTO254
258 '
259 HCOLOR0:X=10:Y=120:V$="YOU S
EE:-":GOSUB292:RETURN
260 X=10:Y=130:V$="A HIGH WALL.A
N OPENING.":GOSUB292:RETURN
261 '
262 HCOLOR1:HLINE(0,150)-(255,19
0),PSET,BF
263 HCOLOR0:RETURN
264 '
265 CLEAR700
266 DIML$(57):DIMA(31)
267 FORJ=0TO30:READR$:L$(J)=R$:N
EXTJ
268 DATA BR2ND1BU2U4,BR1BU4U1BR2
D1,BR1U2L1BU2R1U2BR2D2R1BD2L1D2,
BU1R2ND1R1E1H1L2H1E1R1NU1R2,U1E4
U1BL4D1BF4D1,BR4H1U1H3E1F1G2D2F1
R1E2U1,BR2BU4U2,BR2H1U4E1,BR2E1U
4H1
269 DATA BU2E2NH2NU2NE2NF2D2,BR2
BU1U2NL2NU2R2,BR2NU1G1,BU3R4,BR2
U1,U1E4U1,BU1NE4U4E1R2F1D4G1L2H1
,R2NR2U6L1G1,NR4E4U1H1L2G1,BU1F1
R2E1U1H1NL2E1U1H1L2G1,BR3U6G3R4
270 DATA BU1F1R2E1U2H1L2G1U3R4,B
U3E1R2F1D2G1L2H1U4E1R3,E4U2L4D1,
BU1U1E1NR2H1U1E1R2F1D1G1F1D1G1L2
H1,BR1R2E1U4H1L2G1D2F1R2E1,BR2U1
BU2U1,BR1BD1E1U1BU2U1,BU3NE3F3
271 DATA BU1R4BU2L4,BR1E3H3,BU5E
1R2F1D1G1L1D1BD2D1
272 FORJ=32TO57:READR$:L$(J)=R$:
NEXTJ
273 DATA U4E2F2D2NL4D2,R3E1U1H1E
1U1H1L3R1D3NR2D3,BR4BU1H1L2G1D4F
1R2E1,R3E1U4H1L2NL1D6,R4U1BU4U1L
3NL1D3NR2D3,R1NR1U3NR2U3NL1R3D1,
BE2R1NR1D1ND1G1L1H1U4E1R2D1,U3NU
3R4NU3D3,BR1R1NR1U6NL1R1,BU1NU1F
1R1E1U5NL1R1
274 DATA R1U6NL1BD3R1E2U1BD5ND1H
2,R4U1BG1BL2U6NL1R1,U6F2E2D6,U6F
4NU4D2,BU1U4E1R2F1D4G1L2H1,R1NR1
U6NL1R2F1D1GL2,BU1U4E1R2F1D4G1D1
R1BH1L2H1,U6R3F1D1G1L1NL2F2D1,BU
1F1R2E1U1H1L2H1U1E1R2F1,BR2U6NL2
R2
275 DATA BU1NU5F1R1E1R1ND1U5,BU3
NU3F1D1F1E1U1E1U3,U6E2F2U6,U1E4
U1BL4D1F4D1,BR1R1NR1U3H2U1BR4D1G
2,BU5U1R4D1G4D1R4U1
276 CR=0
277 GOTO6
278 '
279 GOSUB341:RETURN
280 '
281 X=10:Y=180:V$="WHAT NOW?":GO
SUB292:SOUND220,2
282 GOSUB296:GOSUB337
283 RETURN
284 '
285 FORL=1TO LEN(V$):P$=MID$(V$,
L,1):IFP$=" "THEN287
286 HCOLOR0:HDRAW"BM"+STR$(X)+",
"+STR$(Y)+";S$":HDRAW L$(ASC(P$)
-33)
287 X=X+13:NEXTL
288 RETURN
289 '
290 HDRAW"BM"+STR$(X)+", "+STR$(Y
):RETURN
291 '
292 FORL=1TO LEN(V$):P$=MID$(V$,
L,1):IFP$=" "THEN294
293 HDRAW"BM"+STR$(X)+", "+STR$(Y
)+";S$":HDRAW L$(ASC(P$)-33)
294 X=X+8:NEXTL
295 RETURN
296 '
297 X=90:Y=180
298 GOSUB290
299 FORZ=1TO31
300 AS=INKEY$:IFAS=""THEN300
301 A(Z)=ASC(AS):A(Z)=A(Z)-33
302 IF ASC(AS)=13THEN313
303 IF ASC(AS)=32THEN310
304 IF ASC(AS)=8THENGOSUB314:GOT
O300
305 IF ASC(AS)<32THEN310
306 IF ASC(AS)=91THEN310
307 GOSUB290:HDRAW"C1"+L$(9):HDR
AW"CO"
308 HDRAW"BM"+STR$(X)+", "+STR$(Y
):HDRAW L$(ASC(AS)-33)
309 X=X+8:GOSUB290:X=X-8
310 X=X+8
311 NEXT
312 GOSUB321:GOTO299
313 RETURN
314 '
315 X=X-10:IFX<10THENX=10:Z=1
316 FORS=1TO10:HLINE(X,Y+2)-(X,Y
-10),PSET
317 X=X+1:NEXTS
318 HPAINT(X-5,Y-5),1,1
319 X=X-8
320 RETURN
321 '
322 HCOLOR0
323 HCOLOR0:X=10:V$="THERE IS NO
WAY TO GO":GOSUB292:X=10:Y=Y+10
:V$="IN THAT DIRECTION!":GOSUB29
2:FORP=1TO500:NEXT:GOSUB261:X=10
:Y=Y-10:V$="TRY AGAIN"
324 'GOSUB5000
325 GOSUB292
326 FORF=1TO500:NEXTF
327 GOSUB261:X=10
328 RETURN
329 '
330 X=10:Y=150:V$="DIRECTIONS.":

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GOSUB292: X=10: Y=160: RETURN
331 V$="NORTH": GOSUB292: RETURN
332 V$="SOUTH": GOSUB292: RETURN
333 V$="WEST": GOSUB292: RETURN
334 V$="EAST": GOSUB292: RETURN
335 V$="": GOSUB292: RETURN
336 V$="": GOSUB292: RETURN
337 '
338 HCOLOR1: HLINE(0,110)-(255,19
0), PSET, BF
339 RETURN
340 GOTO338
341 HCOLOR0: RETURN
342 HPAINT(128,49), 0, 0: RETURN
343 GOSUB331: GOSUB335: GOSUB332: G
OSUB335: GOSUB333: GOSUB335: GOSUB3
34: GOSUB336: RETURN
344 RETURN
345 HCOLOR0: X=10: Y=120: V$="YOU A
RE IN A HALLWAY.": GOSUB292: RETUR
N
346 GOSUB332: GOSUB335: GOSUB333: G
OSUB335: GOSUB334: GOSUB336: RETURN
347 GOSUB333: GOSUB335: GOSUB334: G
OSUB336: RETURN
348 HCOLOR0: X=10: Y=160: V$="THERE
IS A SWITCH ON THE WALL": GOSUB2
92: X=10: Y=Y+20: V$="WHAT NOW?": GO
SUB292: GOSUB296: RETURN
349 HCOLOR0: X=10: V$="IT'S TO DAR
K TO SEE!": GOSUB261: GOSUB292
350 PORF=1TO500: NEXT: GOSUB261: X=
10
351 RETURN
352 HCOLOR0: X=10: Y=160: V$="YOU C
AN'T DO THAT": GOSUB292: FORF=1TO5
00: NEXT: GOSUB261: X=10: Y=Y+10: V$=
"TRY AGAIN": GOSUB292: FORF=1TO500
: NEXT: GOSUB261: X=10: RETURN
353 HCOLOR0: X=10: Y=160: V$="YOU C
AN'T DO THAT.": GOSUB292: FORF=1TO
1000: NEXT: GOSUB261: X=10: Y=160: V$
="YOU DON'T HAVE 4 CRYSTALS!": GO
SUB292: FORF=1TO2000: NEXT: GOSUB26
1: X=10: RETURN
354 HDRAW"COBM5,100U80BR10D20NL1
0D20NL10D20NL10D20"
355 HDRAW"C1BM130,100U10NR5U10NR
5U10NR5U10BR5D40": RETURN
356 HCOLOR0: HLINE(0,0)-(320,100)
, PSET, B: RETURN
357 GOSUB331: GOSUB335: GOSUB333: G
OSUB335: GOSUB334: GOSUB336: RETURN
358 HCOLOR0: U=10: X=10: Y=120: V$="
THE SIGN READS: -": GOSUB292: X=1
0: Y=Y+20: V$=" DANGER!": GOSUB
292: X=10: Y=Y+10: V$="ROTTING TIM
BERS!": GOSUB292: FORF=1TO3000: NEX
T: RETURN
359 HCOLOR0: X=10: V$="YOU CAN'T G
O YET!": GOSUB292: X=10: Y=Y+10: V$=
"WHAT NOW?": GOSUB292: FOR F=1TO50
0: NEXT: GOSUB261: RETURN
360 GOSUB331: GOSUB335: GOSUB332: G
OSUB335: GOSUB333: GOSUB336: RETURN
361 X=10: Y=Y+10
362 IF CR=1THENV$="YOU NOW HAVE
1 CRYSTAL"
363 IF CR=2THENV$="YOU NOW HAVE
2 CRYSTALS"
364 IF CR=3THENV$="YOU NOW HAVE
3 CRYSTALS"
365 IF CR=4THENV$="YOU NOW HAVE
4 CRYSTALS"
366 IF CR>4THENV$="YOU NOW HAVE
4 CRYSTALS"
367 GOSUB292: U=RND(20): V=RND(20)
: RETURN
368 GOSUB331: GOSUB335: GOSUB332: G
OSUB336: RETURN
369 '
370 '
371 HCLS1: HCOLOR0
372 HLINE(0,0)-(320,100), PSET, B:
HLINE(0,20)-(320,50), PSET, B
373 FORN=1TO20: X=RND(320): Y=RND(
20): HCIRCLE(X,Y), 2, 0, .5, .1, .4: NE
XT
374 HCIRCLE(60,60), 20, 0, .2: HDRAW
"BM40,60D25C1M+40,+0CONU25H5G3H5
G5H2G2H4G4H2G2H3G3
375 HPAINT(60,60), 0, 0: GOSUB344: H
PAINT(60,80), 13, 0
376 HDRAW"COBM255,51L130": HCIRCL
E(160,50), 40, 0, .5, .25, .5: HCIRCLE
(160,87), 60, 0, .3, .75, 1: HCIRCLE(
240,85), 20, 0, .8, .25, .5: POKE178, 1
: HPAINT(250,90), 4, 0
377 HPAINT(1,99), 2, 0: HPAINT(1,1)
, 6, 0: HPAINT(1,30), 14, 0
378 HCOLOR0: X=10: Y=120: V$="YOU A
RE IN A LARGE ENCLOSURE": GOSUB29
2: X=10: Y=Y+10: V$="YOU SEE: -A LAK
E, AN OLD WELL.": GOSUB292: GOSUB33
0: GOSUB334: GOSUB281
379 IFA(1)=36THEN13
380 IFA(1)=38ANDA(4)=54THEN388
381 IFA(1)=38ANDA(4)=43THEN384
382 GOSUB321: GOTO378
383 '
384 HCOLOR0
385 X=10: Y=120: V$="THE LAKE HAS
A WHIRLPOOL!": GOSUB292: X=10: Y=Y
+20: V$="YOU GET PULLED UNDER!":
GOSUB292: FORF=1TO1000: NEXT: HCLS4
: X=80: Y=80: HCOLOR1: V$="YOU DROW
N!": GOSUB292: X=80: Y=85: V$="---
-----": GOSUB292: FORF=1TO500
: NEXT
386 HCOLOR0
387 FORF=1TO5000: NEXT: GOTO513
388 '
389 HCLS1: HCOLOR0
390 HLINE(0,0)-(320,100), PSET, BF
: HCIRCLE(160,50), 15, 1, .8: HPAINT(
160,50), 6, 1: HCIRCLE(132,50), 5, 3,
2: HPAINT(132,50), 3, 3
391 HDRAW"C1BM5,100U80BR10D20NL1
0D20NL10D20NL10D20"
392 HCOLOR0: X=10: Y=120: V$="YOU A
RE AT THE BOTTOM OF": GOSUB292: X=
10: Y=Y+10: V$="A DEEP WELL": GOSUB
292: X=10: Y=Y+10: V$="YOU SEE: -THE
SKY.": GOSUB292: X=10: Y=Y+10: V$="
A LADDER.": GOSUB292: X=10: Y=Y+10:
V$="A HOLE IN THE WELL WALL.": GO
SUB292
393 GOSUB281: X=10: Y=120: V$="YOU"
: GOSUB292
394 IFA(2)=36ANDA(5)=43THEN396
395 GOSUB352: GOTO392
396 HCOLOR0: X=10: Y=160: V$="O.K."
: GOSUB292: GOSUB354: FORF=1TO500: H
COLOR0: GOSUB281
397 IFA(1)=34ANDA(7)=43THEN399
398 GOSUB352: GOTO396
399 U=1: V=10
400 HCLS1
401 HCOLOR0
402 HLINE(0,0)-(320,100), PSET, B:
X=0: Y=3+RND(30): FORF=1TO10
403 HDRAW"BM"+STR$(X)+"", "+STR$(Y
)"+", S10COF2D2R1D1G1D2F3U1F2D4R1U
3R1U1E3L1U1E4F1R2": X=X+(31): NEXT
: HPAINT(2,2), 5, 0
404 HCOLOR0: HLINE(0,85)-(320,85)
, PSET: HCIRCLE(160,85), 15, 0, 2, .5,
1: HPAINT(2,82), 14, 0: HPAINT(285,8
2), 14, 0: HPAINT(1,86), 7, 0
405 POKE&HFFB5, RND(63)
406 HCOLOR0: X=10: Y=120: V$="YOU A
RE IN THE CAVERNS": GOSUB292: GOSU
B330: GOSUB343: GOSUB281
407 IFA(1)=50THEN412
408 IFA(1)=45THEN413
409 IFA(1)=54THEN414
410 IFA(1)=36THEN415
411 GOSUB321: GOTO406
412 U=U+1: GOTO417
413 U=U-1: GOTO416
414 V=V+1: GOTO416
415 V=V-1: GOTO416
416 IF LT=10 THEN LT=0: GOTO401
417 IFU=0AND V=10THEN371ELSE418
418 IF U=7AND V=14THEN422ELSEGOT
O419
419 IF U=4ANDV=5THENGOSUB176ELSE
GOTO405
420 GOTO405
421 '
422 HCLS1: HCOLOR0
423 GOSUB356: HLINE(0,40)-(320,40)
, PSET: HLINE(0,80)-(320,80), PSET
: HPAINT(1,1), 6, 0: FORF=1TO40: X=RN
D(320): Y=RND(25): HCIRCLE(X,Y), 2,
0, .75, .1, .4: NEXT
424 HPAINT(2,42), 4, 0: HCOLOR1: FOR
F=1TO80: X=RND(320): Y=40+RND(39):
P=RND(20): HLINE(X,Y)-(X+P,Y), PSE
T: NEXT: HPAINT(1,99), 2, 0
425 GOSUB259: X=10: Y=Y+10: V$="A F
AST FLOWING RIVER": GOSUB292: X=10
: Y=Y+10: V$="A FLOCK OF BIRDS": GO
SUB292: GOSUB330: GOSUB331: GOSUB33
5: GOSUB333: GOSUB336: GOSUB281
426 IFA(1)=45THENHCLS1: LT=10: GOT
O413
427 IFA(1)=54THEN430
428 GOSUB321: GOTO425
429 '
430 HCLS1: HCOLOR0: GOSUB356
431 HLINE(0,40)-(320,40), PSET: HP
AINT(1,1), 6, 0: HDRAW"BM0,80R232":
HCIRCLE(232,100), 30, 0, .7, .75, 1: H
PAINT(1,99), 2, 0
432 HPAINT(2,42), 4, 0: HCOLOR1: FOR
F=1TO100: X=RND(320): Y=40+RND(39)
: P=RND(20): HLINE(X,Y)-(X+P,Y), PS
ET: NEXT: FORF=1TO20: X=260+RND(50)
: Y=80+RND(19): P=RND(20): HLINE(X,
Y)-(X+P,Y), PSET: NEXT: HCOLOR0: FOR
F=1TO20: X=RND(320): Y=RND(25): HCI
RCLE(X,Y), 2, 0, .75, .1, .4: NEXT
433 HCOLOR0: X=10: Y=120: V$="THE R
IVER TURNS NORTH.": GOSUB292: GOSU
B330: GOSUB331: GOSUB335: GOSUB334:

```



```

GOSUB336:GOSUB281
434 IFA(1)=45THEN453
435 IFA(1)=36THEN422
436 GOSUB321:GOTO433
437 '
438 HCLS1:HCOLORO:GOSUB356
439 HCIRCLE(160,100),60,0,1.5,.5
,1:HCIRCLE(160,30),10,0,1.5,.5,1
440 HDRAW"BM100,100M+52,-70R16M+
52,+70":HPOINT(160,11),0,0:HPAINT
T(1,1),14,0:HPOINT(160,99),3,0:H
PAINT(160,28),6,0
441 GOSUB259:X=10:Y=Y+10:W$="A L
ONG TUNNEL GOING NORTH.":GOSUB29
2:GOSUB330:GOSUB331:GOSUB335:GOS
UB332:GOSUB336:GOSUB281
442 IFA(1)=45THEN453
443 IFA(1)=50THENHCLS1:GOTO238
444 GOSUB321:GOTO441
445 '
446 HCLS1:HCOLORO:GOSUB356
447 HDRAW"BMO,50R319":HPOINT(1,5
1),13,0:HPOINT(1,1),6,0:FORF=1TO
50:X=5+RND(310):Y=54+RND(46):HCI
RCLE(X,Y),4,0,.75,1:HLINE(X-4,
Y)-(X+4,Y),PSET:NEXT
448 FORF=1TO15:X=RND(319):Y=RND(
40):R=5+RND(15):HCOLOR1:HCIRCLE(
X,Y),R,1,.4:HPOINT(X,Y),1,1:NEXT
:HOLORO
449 GOSUB259:X=10:Y=Y+10:W$="A S
TONY DESERT TO THE SOUTH":GOSUB2
92:GOSUB330:GOSUB368:GOSUB281
450 IFA(1)=45THENHCLS1:GOTO64
451 IFA(1)=50THEN453
452 GOSUB321:GOTO449
453 '
454 HCLS1:HCOLORO:GOSUB356
455 HCIRCLE(160,50),60,0,.5,.65,
.9
456 HDRAW"BMO,60M+122,-33BM+85,+
5M+112,+40
457 HCIRCLE(160,80),39,0,1.2,.5,
1
458 HDRAW"BMO,80R120BR80NM-30,-1
5R120
459 HCIRCLE(130,64),40,0,1.2,.9,
1
460 HDRAW"BM169,64NM-40,-10BD15B
R30M+85,+20BL120M-45,-20
461 HDRAW"BMO,20M+82,+18BD8BR54R
29BR60BU8M+96,-30
462 HPOINT(1,1),6,0:HPOINT(160,4
0),6,0:FORF=1TO10:X=RND(320):Y=R
ND(20):HCIRCLE(X,Y),2,0,.75,.1,
.4:NEXT:HPOINT(160,30),14,0:HPAINT
T(180,99),4,0
463 POKE&HFFBB,16:HPOINT(1,40),8
,0:HPOINT(300,20),8,0:HPOINT(160
,50),11,0:HPOINT(170,60),0,0:HPA
INT(1,99),2,0:HPOINT(315,99),2,0
:HOLORO
464 GOSUB259:X=10:Y=Y+10:W$="A B
RIDGE TO THE NORTH.":GOSUB292:GO
SUB330:GOSUB368:GOSUB281
465 IFA(1)=45THEN471
466 IFA(1)=50ANDU=11ANDV=3THEN44
5
467 IFA(1)=50ANDU=5ANDV=15THEN13
4
468 IFA(1)=50ANDU=7ANDV=14THEN43
0
469 IFA(1)=50ANDU=12ANDV=0THEN43
7
470 GOSUB321:GOTO464
471 '
472 GOSUB1:HCLS1:HCOLORO:GOSUB35
6
473 HCIRCLE(128,40),90,0,.4:HPAI
NT(128,10),14,0:HCIRCLE(30,40),6
,0,1,.25,.75:HCIRCLE(226,40),6,0
,1,.75,.25
474 HDRAW"BM30,40BU6R196BD12L196
":HPOINT(30,40),0,0:HPOINT(40,40
),0,0:HPOINT(226,40),0,0:
475 FORX=68TO195STEP30:HCIRCLE(X
,25),10,0,.4:HPOINT(X,25),3,0:NE
XT
476 HCIRCLE(120,59),15,0,1.1,0,
.25:HCIRCLE(140,59),15,0,1.1,0,
.25
477 HDRAW"BM135,58R20":HPOINT(13
8,60),0,0
478 HDRAW"BM120,75M+50,+25BM+30,
-0M-58,-28":HDRAW"BM120,75M+8,+1
5M+5,-8":HCIRCLE(128,90),8,0,.4:
HPOINT(124,90),14,0
479 HDRAW"BM65,65M-20,+32M+45,-2
5":HCIRCLE(45,97),10,0,.4,.9,.8:
HPOINT(43,98),14,0
480 HDRAW"BM190,65M+20,+32M-45,-
25":HCIRCLE(210,97),10,0,.4:HPAI
NT(213,98),14,0:HPOINT(190,70),0
,0:HPOINT(70,80),0,0:HPOINT(127,
85),0,0
481 HDRAW"BMO,60M+63,+5BR128M+12
7,-5":HPOINT(1,1),6,0:HPOINT(148
,97),13,0:HPOINT(1,99),13,0:HPAI
NT(318,99),13,0:HPOINT(158,90),1
4,0:HPOINT(188,90),13,0
482 GOSUB259:W$="A SPACESHIP.":G
OSUB292:X=10:Y=Y+10:W$="A RAMP L
EADING TO A DOOR.":GOSUB292:GOSU
B330:GOSUB332:GOSUB336:GOSUB281
483 IFA(1)=50THEN453
484 IFA(1)=38ANDA(4)=49THEN486
485 GOSUB321:GOTO482
486 '
487 HCLS1:HCOLORO:GOSUB356
488 HLINE(87,10)-(232,80),PSET,B
:HDRAW"BMO,100M+87,-20BM+145,-0M
+87,+20BU100M-87,+10BL145M-87,-1
0":HCIRCLE(67,50),4,0,2:HPOINT(6
7,50),5,0:HPOINT(160,11),15,0
489 HCOLORO:HPOINT(160,1),14,0:H
POINT(1,95),3,0:HPOINT(318,95),3
,0:HPOINT(160,98),14,0
490 X=10:Y=120:W$="YOU ARE IN TH
E SPACESHIP.":GOSUB292:X=10:Y=Y+
10:W$="YOU SEE A LARGE T.V.SCREEN
N.":GOSUB292:X=10:Y=Y+10:W$="THE
RE IS A KNOB ON THE WALL.":GOSUB
292
491 GOSUB281
492 IFA(1)=51ANDA(6)=42THEN494
493 GOSUB352:GOTO490
494 FORF=1TO25:POKE&HFFB0,RND(63
):HCLS0:NEXT:POKE&HFFB0,0:HCLS1
495 X=15:Y=90:W$="AN ALIEN MESSA
GE.":GOSUB285:FORF=1TO2000:NEXT
496 HCLS1:X=10:Y=20:W$="TO FLY T
HIS SPACESHIP BACK":GOSUB292:X=1
0:Y=Y+10:W$="TO YOUR HOME ,YOU M
UST HAVE":GOSUB292:X=10:Y=Y+10:W
$="FOUR CRYSTALS.":GOSUB292:X=10
:Y=Y+10:W$="IF BY CHANCE YOU HAV
E NOT GOT":GOSUB292:X=10:Y=Y+10:
W$="THE FOUR CRYSTALS,"
497 GOSUB292:W$="YOU CAN STILL":
GOSUB292:X=10:Y=Y+10:W$="RETURN
HOME BY WAY OF A MAZE.":GOSUB292
:X=10:Y=Y+10:W$="YOU NOW HAVE TH
E PLANS TO THE":GOSUB292:X=10:Y=
Y+10:W$="ANTI-GRAVITY DEVICE.":G
OSUB292
498 X=10:Y=Y+10:W$="ONLY ONE MAZ
E REMAINS THE SAME.":GOSUB292
499 X=10:Y=120:W$="CHOOSE YOUR M
AZE:-MOUNTAINS.":GOSUB292:X=154:
Y=Y+10:W$="FOREST.":GOSUB292:UV=
1:X=154:Y=Y+10:W$="CAVERNS.":GOS
UB292:X=154:Y=Y+10:W$="PASSAGE."
:GOSUB292:X=154:Y=Y+10:W$="SPACE
SHIP.":GOSUB292:GOSUB281
500 IFA(1)=44THENU=5ANDV=10:GOTO
445
501 IFA(1)=37THENU=6ANDV=10:GOTO
134
502 IFA(1)=34THENU=7ANDV=14:GOTO
422
503 IFA(1)=47THENU=9ANDV=5:GOTO4
37
504 IFA(1)=50ANDCR=4THEN506
505 GOSUB353:GOTO499
506 FORF=1TO10:CR=RND(15):HCLSCR
:NEXT:GOSUB526
507 HCLS1:X=80:Y=60:W$="MISSION"
:GOSUB285
508 X=45:Y=100:W$="ACCOMPLISHED.
":GOSUB285
509 X=60:Y=140:W$="ANOTHER GAME
Y/N":GOSUB292:GOSUB281
510 IFA(1)=45THENHCLS1:END
511 IFA(1)=56THEN POKE65496,0:RU
NO
512 GOSUB352:GOTO509
513 HSCREEN2:HCLS
514 HDRAW"BM106,10C1R17NG20R15BR
20G20BE10R25NG10E10BR20NR20G10NR
10G10R20"
515 HDRAW"BM160,96BL30E30F30G30H
30":HPOINT(160,96),1,1:HDRAW"BM1
60,96CONR30L30BR20M+10,-30BD60M-
10,-30"
516 HDRAW"BM160,96C1BR35NR20BL70
NL20BR35BU35NU15BD70ND15BU35BE30
NE15BG6ONG15BE30BH30NH15BF60F15"
517 HDRAW"BM67,181E20M+5,+10M+25
,-10G20BR20M+30,-20D10NL15D10BR2
0NR20M+30,-20NL20BR29NR20G10NR10
G10R20"
518 FORF=1TO1000:NEXT:FORX=1TO31
:PLAY"V"+STR$(X)+"O1L1T250CDD":
NEXT:FORX=31TO1STEP-1:PLAY"V"+ST
R$(X)+"O1L1T250CDD":NEXT:FORF=1
TO1000:NEXT
519 HCLS:HCOLOR1:HLINE(72,30)-(2
47,50),PSET,BF:HOLORO:X=105:Y=4
3:W$="BY COLIN NORTH.":GOSUB292
520 HCOLOR1:HLINE(92,80)-(227,10
0),PSET,BF:HOLORO:X=119:Y=93:W$
="AUG. 1985.":GOSUB292
521 HCOLOR1:HPRINT(9,15),"MODIFI
ED FOR THE COCCO.":HPRINT(14,17)
,"MARCH. 1987."
522 POKE65497,0

```

```

523 A$=INKEY$:IFA$=""THEN523
524 A(Z)=ASC(A$):A(Z)=A(Z)-33
525 IF ASC(A$)=32THEN7ELSE523
526 PALETTERGB
527 PALETTE1,36
528 HCLS2
529 HCOLOR10:PALETTE10,9:HLINE(0
,0)-(120,80),PSET,BF
530 HDRAW"BM0,30C1R50U30R20D30R5
0D20L50D30L20U30L50"
531 HPAINT(1,42),1,1
532 HDRAW"BM0,25R25BR5R10BR5BU5U
20"
533 HDRAW"BM75,0D21BD4BR5BR14R26
D5"
534 HDRAW"BM0,0M40,25L10M-40,-1
8BL5M-36,-15":HPAINT(1,10),4,1
535 HDRAW"BM45,0D23M-37,-23":HPA
INT(1,10),4,1:HPAINT(0,5),1,1
536 HDRAW"BM75,0D23M+32,-23"
537 HDRAW"BM112,0M-34,25R8M+34,-
25
538 HDRAW"BM120,0D5M-27,+20
539 HPAINT(73,2),4,1:HPAINT(115,
2),1,1
540 HDRAW"BM0,55R30M-30,16BD5M+3
9,-21R6;M-42,+25L8R8M+36,-21D21R
5":HPAINT(1,53),4,1:HPAINT(2,78)
,1,1
541 HDRAW"BM70,80R5U23M+33,23R9M
-35,-25R7M+31,22D3NL5U7M-26,-18R
26U5":HPAINT(118,52),4,1:HPAINT(
114,75),1,1
542 A$="BU20M-4,13M-14,-6M+9,11M
-13,7M+15,-1M-4,14M+10,-11M+9,11
M-3,-14M+15,1M-13,-7M+10,-11M-14
,6M-3,-13"
543 HDRAW"BM60,140S4"+A$:HPAINT(
60,140),11,1
544 HDRAW"BM180,90S2"+A$:HPAINT(
180,90),11,1
545 HDRAW"BM230,30"+A$:HPAINT(23
0,30),11,1
546 HDRAW"BM280,80"+A$:HPAINT(28
0,80),11,1
547 HDRAW"BM230,165"+A$:HPAINT(2
30,165),11,1
548 B$="BU10M-4,7L6M+6,6M-4,7M+8
,-4M+8,4M-4,-7M+6,-6L6M-4,-7"
549 HDRAW"BM255,115S3"+B$:HPAINT
(255,115),11,1
550 POKE65496,0
551 PLAY"V30T3O3L4FB-FDPL4.B-L8B
-L4B-O4DCO3B-AB-O4L2.C
552 PLAY"O3L4FB-FDO2B-O3L4.FL8FL
4FO4DCO3B-AGL2.F
553 PLAY"L4FL4.GL8AL4B-GL4.FL8DL
4DFGB-O4E-DL2.C
554 PLAY"O3L4FL4.GL8AL4B-GL4.FL8
B-L4B-O4CL4.DQ3L8B-O4L4.CO3L8AL2
.B-
555 POKE&HFFB0,0:POKE&HFFB1,63
556 RETURN
560 SAVE"242:3":END'7

```

Enhancing Basic commands, Part 2.

LINE

16K CB
UTILITY

by George Viera

THIS IS PART 2 in the continuing saga of enhancing your Colour Basic computers' commands.

In this month's issue of CoCo, we are going to deal with the "LINE" command. The operating instructions for this utility are quite easy.

After (C)LOADING and RUNNING, CoCo will ask you:

SCREEN CLEAN (Y/N)

Answer 'Y' if this is the first time through.

You will be asked two questions; the location for the startpoint (X1 & Y1) and the location for the endpoint (X2 and Y2).

Conditions for X1, X2, Y1 & Y2 are as follows:

The 'X1' and 'Y1' locations: you can enter any number between 0 and 255 for 'X1' and any number between 0 and 191 for 'Y1'.

The 'X2' and 'Y2' locations: you can enter any number between the first 'X1' location and 255 for 'X2' and any number between the 'Y1' location and 191 for the 'Y2' position.

The graphics screen will pop up and your desired line drawn.

Then its back to the beginning and the whole thing starts over.

Coming next month: "PMODE"

The Listing:

```

0 GOTO10
1 '***** LINE *****
   **** GEORGE VIERA *****
3 SAVE"212A:3":END'8
10 '
20 CLEAR10,10239:CLS:BIT(0)=1:N=
2:FORT=1TO7:BIT(T)=N:N=N*2:NEXT
30 FORT=1TO10:READ DT:M(T)=DT+65
470:NEXTT:DATA2,5,7,8,10,13,14,1
7,18,20
40 '*****
*****GRAPHICS MODE 4,1****
50 FORT=1TO10:READ DT:V(T)=DT+65
470:NEXTT:DATA2,4,6,8,11,12,14,1

```

```

6,18,20
60 CLS:PRINT0,"SCREEN CLEANING"
:IF PEEK(10240)<0 THEN FORT=102
40TO16383:POKET,0:NEXTT:GOTO80
70 CLS:INPUT"CLEAN SCREEN (Y/N)"
;A$:IF LEFT$(A$,1)="Y" THEN POKE
10240,255:GOTO60
80 CLS:INPUT"X1:Y1";X(0),Y(0):IF
X(0)<0 OR X(0)>255 OR Y(0)<0 OR
Y(0)>191 THEN 80
90 CLS:INPUT"X2:Y2";X(1),Y(1):IF
X(1)<0 OR X(1)>255 OR Y(1)<0 OR
Y(1)>191 THEN 90
100 FORT=1TO10:POKET(T),0:NEXTT:
POKE65314,255
110 DX=X(1)-X(0):DY=Y(1)-Y(0):SX
=SGN(DX):SY=SGN(DY)
120 IF DX=0 THEN 230:*****
*SPECIAL FOR VERTICALLY LINES****
*
130 SL=DY/DX:B=Y(0)-SL*X(0)
140 T=SL*SL+1:GOSUB380:*****
*****GET SQR(T)*****
*
150 NX=1/T1*SX*NX=INCREMENT FOR
X
160 FORXT=X(0) TO X(1) STEP NX
170 X=INT(XT+.5)
180 Y=INT(SL*XT+B+.5)
190 GOSUB290
200 NEXTXT
210 SOUND200,1:FORT=1TO10:POKE V
(T),0:NEXTT:POKE65314,5:EXEC4453
9:GOTO70
220 '*****
*****VERTICAL LINE*****
230 X=X(0)
240 FOR Y=Y(0) TO Y(1) STEP SY
250 GOSUB290
260 NEXT
270 GOTO210
280 '*****
*****LINE CALCULATIONS****
290 X1=INT(X/8)
300 OF=X1+Y*32:BYTE=10240+OF
310 XMOD8=INT(X-X1*8)
320 BIT=7-XMOD8
330 VLU=BIT(BIT)
340 OLD=PEEK(BYTE)
350 MASK=VLU OR OLD
360 POKE BYTE,MASK
370 RETURN
380 IF T<=0 THEN T1=0:RETURN
390 T1=T*.5:T2=0
400 T3=(T/T1-T1)*.5
410 IF (T3=0) OR (T3=T2) THEN RE
TURN
420 T1=T1+T3:T2=T3:GOTO400

```



Yet another update.

ONO v3.1

GAME

by Charles Bartlett

Sorry for any inconvenience, but here is Ver 1.3 of ONO. The rules and instructions are the same, the only differences are that this version is smarter as an opponent, and quicker and also.

ONO was conceived, written and debugged in only four days in attempting to make the competition deadline, which on reflection was silly.

However, good things come to those that wait and since the original was submitted, ONO Ver 1.3 has become a hit with friends and family, who are avid UNO players and find themselves hard pressed to beat ONO.

That's how come I made it smarter and how the additional bug was found, everyone kept playing it and some of the smarter ones started to beat it to often, not any more though !!!

Error in Basic

I don't know if this is common knowledge, but I have found a bug in the Basic interpreter while enhancing ONO. It appears you can't do this :-

```
10 HBUFF1,100
20 REM REST OF PROGRAM
30 REM AND SO ON AND SO ON
40 HPRINT(1,1),"PLAY AGAIN Y/N"
50 IS=INKEY$:IF IS=""THEN 50
ELSE IF IS="Y" THEN RUN ELSE
IF IS="N" THEN 60 ELSE 50
60 END
```

I have not shown the HSCREEN commands in this example, just presume they are there. The above program will cause a DD error in line 10, presumably because you are trying to redimension the HBUFFer, BUT WE USED RUN, so it should have worked.

I would have thought. To get around this change RUN to RUN 20 or whatever.

I have also noticed that you cannot display the PMODE screens

while the screen is in the 40 or 80 column widths, there doesn't seem to be a logical reason why you shouldn't be able to, but I couldn't ...

The following does not work:-

```
10 WIDTH40:PRINT"MESSAGE TO
PLAYER"
20 FOR X=1 TO 1000:NEXT:REM
DELAY TO READ MESSAGE
30 PMODE4,1:PCLS:SCREEN1,1
40 REM REST OF PROGRAM
```

The Listing:

```
0 GOTO10
1 ***** ONO V3.1 *****
**** CHARLES BARTLETT ****
3 SAVE"255:3":END'1
10 CLEAR2000:PMODE0:PCLEAR1:HBUF
F1,4880:HBUFF2,3040
20 ON BRK GOTO 1560
30 ON ERR GOTO 920
40 POKE65497,0:DIM W$(26),BP(40,
1),D(108,1),C(14,3),PD(40,1),CD(
40,1):GOSUB810:HSCREEN2
50 HCLS15:HCOLOR8:GOSUB1540:FOR
K3=1 TO 5:FOR K4=1TO 10
60 MS$="BM"+STR$(K3+90)+","+STR$
(K4+90)+"S32C5"+W$(15)+"C6"+W$(1
4)+"C7"+W$(15):HDRAW MS$:NEXT K4
,K3
70 HGET(66,0)-(238,55),1:HGET(90
,56)-(224,99),2:GOSUB1530
80 HCLS15:HPUT(90,56)-(224,99),2
,PSET:HPUT(66,0)-(238,55),1,PSET
:HCOLOR8:HPRINT(5,17),"(c) 1/2/8
7 Charles Bartlett":HPRINT(1,21
),"YOUR SCORE":HPRINT(12,21),XP:
HPRINT(27,21),"MY SCORE":HPRINT(
35,21),XC:HPRINT(30,12),"Ver 1.3
"
90 B=1:FOR CY=5 TO 140 STEP 45:F
OR CX=10 TO 280 STEP 30:BP(B,0)=
CX:BP(B,1)=CY:B=B+1:NEXTCX,CY
100 SN=0:EN=0:VN=1:GOSUB480:SN=1
:EN=12:VN=2:GOSUB480:SN=13:EN=14
:VN=1:GOSUB480
110 GOSUB490:HCLS15:'SHUFFLE
120 FOR D=1 TO 108:IF D(D,0)=11
THEN D(D,0)=10:NEXT ELSE NEXT
130 Z=1:FOR Q=1 TO 13 STEP 2:PD(
Z,0)=D(Q,0):PD(Z,1)=D(Q,1):CD(Z,
0)=D(Q+1,0):CD(Z,1)=D(Q+1,1):Z=Z
+1:NEXTQ:TN=7:PC=1:CT=7
```

```
140 TC=1:FOR SP=1 TO TN:NC=PD(TC
,0):CC=PD(TC,1):GOSUB620:TC=TC+1
:NEXT
150 SP=39:NC=15:GOSUB620:SP=40:NC
=D(15,0):CC=D(15,1):DN=NC:DC=CC
:GOSUB620:Q=16
160 IF DN=13 THEN IC=DC:GOSUB420
170 IF DN=14 OR DN=12 OR DN=10 T
HEN SP=40:GOSUB290:NC=D(Q,0):CC=
D(Q,1):DN=NC:DC=CC:GOSUB620:Q=Q+
1:GOTO160
180 IF TN=0 OR CT=0 OR TN>38 OR
CT>38 THEN 1360 ELSE GOSUB540
190 GOSUB1680
200 GOSUB350:IF BUTTON(0)=0 THEN
200 ELSE SOUND100,1:SOUND100,1:
IF LC=14 THEN DC=PD(PC,1):LC=0
210 IF PD(PC,0)>12 THEN 250
220 IF PC=39 THEN GOSUB1330:GOTO
940
230 IF PD(PC,1)=DC THEN GOSUB430
:IF DN=10 THEN 180 ELSE IF DN=12
THEN GOSUB470:GOTO180 ELSE 940
240 IF PD(PC,0)=DN THEN GOSUB430
:IF DN=10 THEN 180 ELSE IF DN=12
THEN GOSUB470:GOTO180 ELSE 940
250 IF PD(PC,0)=13 THEN GOSUB430
:MS$="What is color?":GOSUB520:
GOSUB390:IF TN=0 THEN 270 ELSE 9
40
260 IF PD(PC,0)=14 THEN GOSUB370
:IF OK THEN GOSUB430:GOSUB470:GO
SUB470:LC=14:GOTO180 ELSE 280
270 IF TN=0 OR CT=0 OR TN>38 OR
CT>38 THEN 1360
280 MS$="ILLEGAL MOVE":GOSUB520:
SOUND10,3:FOR K=1 TO 1000:NEXT K
:GOTO180
290 HCOLOR15:HLINE(BP(SP,0),BP(S
P,1))-(BP(SP,0)+25,BP(SP,1)+40),
PSET,BF:RETURN
300 JO=JOYSTK(0):J1=JOYSTK(1):IF
JO<5 THEN IF PC=39 THEN PC=TN E
LSE PC=PC-1:IF PC<1 THEN PC=1
310 IF JO>60 THEN PC=PC+1:IF PC>
TN THEN PC=39
320 IF J1<5 THEN IF PC=39 THEN P
C=TN ELSE PC=PC-10:IF PC<1 THEN
PC=PC+10
330 IF J1>60 THEN PC=PC+10:IF PC
>TN THEN PC=39
340 RETURN
350 HCOLOR8:GOSUB360:HCOLOR15:GO
SUB360:GOSUB300:RETURN
360 FOR W=1 TO 2:HLINE(BP(PC,0)-
W,BP(PC,1)-W)-(BP(PC,0)+25+W,BP(
PC,1)+40+W),PSET,B:NEXT:RETURN
370 OK=-1:FOR T=1 TO TN:IF PD(T,
```



```

1)=DC AND T<>PC AND PD(T,0)<>13
AND PD(T,0)<>14 THEN OK=0:RETURN
380 NEXT:RETURN
390 IS=INKEY$:IF IS="" THEN 390 ELSE
IF IS="G" THEN IS="GREEN":IC=0
ELSE IF IS="Y" THEN IS="YELLOW"
:IC=1 ELSE IF IS="B" THEN IS="B
LUE":IC=2 ELSE IF IS="R" THEN IS
="RED":IC=3 ELSE SOUND10,2:GOTO3
90
400 SOUND200,1
410 MS$="COLOR IS "+IS:GOSUB520
420 DC=IC:HPAINT(BP(40,0)+4,BP(4
0,1)+24),IC,8:HPAINT(BP(40,0)+12
,BP(40,1)+18),IC,8:RETURN
430 SP=40:GOSUB290:SP=PC:GOSUB29
0
440 DC=PD(PC,1):DN=PD(PC,0):NC=D
N:CC=DC:SP=40:GOSUB620:IF PC<>TN
THEN PD(PC,0)=PD(TN,0):PD(PC,1)
=PD(TN,1):SP=PC:NC=PD(PC,0):CC=P
D(PC,1):GOSUB620
450 SP=TN:GOSUB290:TN=TN-1:IF PC
=TN+1 THEN PC=PC-1
460 RETURN
470 CT=CT+1:CD(CT,0)=D(Q,0):CD(C
T,1)=D(Q,1):Q=Q+1:GOSUB1680:CT=C
T+1:CD(CT,0)=D(Q,0):CD(CT,1)=D(Q
,1):Q=Q+1:GOSUB1680:RETURN
480 FOR Z=SN TO EN:FOR SU=0 TO 3
:C(Z,SU)=VN:NEXT SU,Z:RETURN
490 MS$="SHUFFLING":GOSUB520:FOR
D=1 TO 108
500 PALETTE5,RND(63):PALETTE6,RN
D(63):PALETTE7,RND(63):CN=RND(15
)-1:CC=RND(4)-1:IF C(CN,CC)=0 TH
EN 500 ELSE D(D,0)=CN:D(D,1)=CC:
C(CN,CC)=C(CN,CC)-1
510 NEXT D:RETURN
520 HCOLOR13:HLINE(0,183)-(320,1
92),PSET,BF:HCOLOR8:SOUND200,1:H
PRINT(1,23),MS$:FOR U=1 TO 1000:N
EXT:SOUND150,1:RETURN
530 MS$="INVALID INPUT":GOSUB520
:SOUND10,1:FOR H=1 TO 1000:NEXT:
GOSUB540:RETURN
540 MS$="Play which card?":GOSU
B520:HPRINT(22,23),"I HOLD":HPRI
NT(29,23),CT:IF CT>1 THEN HPRINT
(33,23),"CARDS" ELSE HPRINT(33,2
3),"CARD"
550 RETURN
560 MS$="What is color?":GOSUB
520:INPUT DC:RETURN
570 FOR QQ=1 TO TN:IF PD(QQ,1)=D
C THEN OK=0:RETURN
580 NEXT:RETURN
590 CC=15:GOSUB650:GOSUB600:DN=N
C:DC=CC
600 CX=BP(PC,0):CY=BP(PC,1):NC=P
D(PC,0):CC=PD(PC,1):RETURN
610 CX=BP(TN,0):CY=BP(TN,1):NC=P
D(TN,0):CC=PD(TN,1):GOTO630
620 CX=BP(SP,0):CY=BP(SP,1)
630 IF NC>12 THEN CC=8
640 IF NC>9 AND NC<>15 THEN OS=4
ELSE OS=0
650 HCOLOR CC:HLINE(CX,CY)-(CX+2
5,CY+40),PSET,B:HPAINT(CX+1,CY+1
),4,CC:HCIRCLE(CX+22,CY+22+OS),2
0,CC,1,.50,.75:HCIRCLE(CX+3,CY+(
18-OS)),20,CC,1,0,.25:HLINE(CX+3

```

```

,CY+14)-(CX+3,CY+36),PSET:HLINE(
CX+22,CY+2)-(CX+22,CY+20),PSET:H
PAINT(CX+1,CY+1),CC,CC
660 IF NC=14 THEN HLINE(CX+12,CY
)-(CX+12,CY+40),PSET:HLINE(CX,CY
+20)-(CX+25,CY+20),PSET:HPAINT(C
X+14,CY+22),0,8:HPAINT(CX+10,CY+
22),1,8:HPAINT(CX+10,CY+18),3,8:
HPAINT(CX+14,CY+18),2,8
670 IF CC=1 THEN CD=8 ELSE CD=4
680 IF NC>9 THEN 720
690 HNS="BM"+STR$(CX+2)+", "+STR$(
CY+2)+"C"+STR$(CD)+"S4"+NS(NC):
HDRAW HNS
700 LNS="BM"+STR$(CX+19)+", "+STR
$(CY+32)+"C"+STR$(CD)+NS(NC):HDR
AW LNS
710 FOR K2=0 TO 1:FOR K=0 TO 1:M
NS="BM"+STR$(CX+8+K)+", "+STR$(CY
+14+K2)+"C"+STR$(CC)+"S8"+NS(NC)
:HDRAW MNS:NEXT K,K2:RETURN
720 CD=4:HWS="BM"+STR$(CX+2)+", "
+STR$(CY+7)+"C"+STR$(CD)+"S4"
730 LWS="BM"+STR$(CX+2)+", "+STR$(
CY+39)+"C"+STR$(CD)+"S4"
740 IF NC=14 THEN MS$="DRAW":GOSU
B880:HVS=HWS+M1$:HDRAW HVS:MS$="F
OUR":GOSUB880:LWS=LWS+M1$:HDRAW
LWS
750 IF NC=13 THEN MS$="WILD":GOSU
B880:HVS=HWS+M1$:HDRAW HVS:MS$="C
ARD":GOSUB880:LWS=LWS+M1$:HDRAW
LWS:VN=23:GOSUB800
760 IF NC=12 THEN MS$="DRAW":GOSU
B880:HVS=HWS+M1$:HDRAW HVS:MS$="T
WO":GOSUB880:LWS=LWS+M1$:HDRAW L
WS:VN=4:GOSUB800
770 IF NC=10 THEN MS$="SKIP":GOSU
B880:HVS=HWS+M1$:HDRAW HVS:MS$="T
URN":GOSUB880:LWS=LWS+M1$:HDRAW
LWS:VN=19:GOSUB800
780 IF NC=15 THEN MS$="ONO":GOSUB
880:FOR K2=0 TO 1:FOR K1=0 TO 1:
MWS="BM"+STR$(CX+1+K1)+", "+STR$(
CY+25+K2)+"S6"+M1$:HDRAW MWS:NEX
T K1,K2
790 RETURN
800 FOR K1=0 TO 1:FOR K2=0 TO 1:
MWS="BM"+STR$(CX+7+K1)+", "+STR$(
CY+26+K2)+"C8S8"+WS(VN):HDRAW MW
S:NEXTK2,K1:RETURN
810 NS(0)="BRGD4FR2EU4HNL2BR2":N
S(1)="BR2NGD6NLRBU6BR2":NS(2)="B
DER2FDG4R4BU6BR1":NS(3)="BDER2FD
GNLFDGL2HBR5BU5":NS(4)="BD3NR4E3
ND6BR2":NS(5)="NR4D3R3FDGL2HBR5B
U5":NS(6)="BDNE4FR2EUHNL3BU3NL2
NFBR2":NS(7)="BD6UE4UNL4BR"
820 NS(8)="BRGDFNR2GDFR2EUHEUHL
2BR2":NS(9)="BD5FR2EU4HL2GDFR3BU
3BR1"
830 WS(0)="BR6":WS(1)="U5ER2FD2H
L4D3BR2":WS(2)="U6R3FDGNL3FDGNL3
BR3":WS(3)="BRNR2HU4ER2FBD4GBR3"
:WS(4)="U6R3FD4GNL3BR3":WS(5)="N
R4U3NR3U3R4BD6BR2":WS(6)="U3NR3U
3R4ED6BR2":WS(7)="BRNR2HU4ER2FBD
3NL2DGBR3":WS(8)="U3NU3R4NU3D3BR
2"
840 WS(9)="BRRU6NLRBD6LBR4"
850 WS(10)="BU2DFR2ENU5BDBR2":WS

```

```

(11)="U3NU3RNE3F3BR2":WS(12)="NU
6R4BR2":WS(13)="U6F2NDE2D6BR2":V
S(14)="U5NUF4NU5DBR2":WS(15)="BR
HU4ER2FD4GNL2BR3":WS(16)="U6R3FD
GNL3BD3BR3":WS(17)="BRHU4ER2FD4N
H2NFGNL2BR3":WS(18)="U6R3FDGNL2
F2DBR2"
860 WS(19)="BUFR2EUHL2HUER2FBD5B
R2":WS(20)="BR2U6NL2R2BD6BR2":WS
(21)="BUNU5FR2ENU5BDBR2":WS(22)=
"BU2NU4F2E2NU4BD2BR2":WS(23)="BU
NU5FENU2FENU5BDBR2":WS(24)="UE4U
BL4DF4DBR2":WS(25)="BU5NUF2ND3E2
NUBD5BR2":WS(26)="BU6R4DG4DR4BR2
"
870 RETURN
880 M1$="":FOR U=1 TO LEN(MS):M1
=ASC(MID$(MS,U,1))-64:M1$=M1$+WS
(M1):NEXT
890 IF NC=15 THEN M1$="C10"+M1$:
RETURN
900 IF CC=1 THEN M1$="C8"+M1$ EL
SE M1$="C4"+M1$
910 RETURN
920 POKE65496,0:END
930 PRINT"ERROR ";ERNO;" IN LINE
";ERLIN:GOTO920
940 IF CT=0 OR TN=0 OR CT>38 OR
TN>38 THEN 1360
950 BI=-1:BN=-1:BC=-1:MS$="MY TU
RN. I HOLD"+STR$(CT)+" CARD":
IF CT>1 THEN MS$=MS$+"S"
960 GOSUB520
970 IF TN<=3 THEN GOTO1240
980 FOR K=1 TO CT
990 IF DN=14 AND CT>1 THEN BI=1:
BN=CD(1,0):BC=CD(1,1):FOR K=2 TO
CT:IF CD(K,0)>BN THEN BN=CD(K,0
):BC=CD(K,1):BI=K:NEXT ELSE NEXT
1000 IF DN=14 AND CT>0 THEN BI=1
:GOTO 1170
1010 IF CD(K,1)=DC AND CD(K,0)=1
2 THEN BI=K:GOTO1170 ELSE IF DN=
12 AND CD(K,0)=12 THEN BI=K:GOTO
1170
1020 IF CD(K,1)=DC AND CD(K,0)=1
0 THEN BI=K:GOTO1170 ELSE IF DN=
10 AND CD(K,0)=10 THEN BI=K:GOTO
1170
1030 NEXT K
1040 BN=CD(1,0):BC=CD(1,1):OK=0
1050 IF CT=1 THEN 1090
1060 FOR K=2 TO CT:IF CD(K,0)>BN
AND CD(K,1)=DC THEN BN=CD(K,0):
BC=CD(K,1):BI=K:OK=-1
1070 IF CD(K,0)>BN AND CD(K,0)=D
N THEN BN=CD(K,0):BC=CD(K,1):BI=
K:OK=-1
1080 NEXTK:IF OK THEN 1170
1090 FOR K=1 TO CT:IF CD(K,0)=DN
OR CD(K,1)=DC THEN BI=K:GOTO117
0
1100 NEXTK
1110 FOR K=1 TO CT:IF CD(K,0)=13
THEN GOSUB1570:GOTO1170
1120 NEXTK:OK=-1:FOR K=1 TO CT:IF
CD(K,1)=DC AND CD(K,0)<>13 AND
CD(K,0)<>14 THEN OK=0
1130 NEXTK:IF OK THEN FOR K=1 TO
CT:IF CD(K,0)=14 THEN BI=K:GOTO
1170 ELSE NEXT
continued on page 63

```

The continuing saga of.....

FRICKERS FOLLIES

by Jack Fricker

THE FIRST THING that I want to look at are the patches to change the rate the drives step.

Some of you I know have drives other than the standard Tandy Drives & these drives may be able to step at the rates faster than the 30 milliseconds that is the default setting when running under RSDOS or OS-9 level 1 or level 2.

For those of you who don't know just what the stepping rate means, it is the time taken for the drive to change between 1 track and the one next to it, either stepping in or out.

There are 3 main stepping rates that concerns us, they are 30 millisecond, 20 millisecond and 6 millisecond. There are other rates such as 12 milliseconds and some of the newer higher density (3 1/2") drives can even step at 3 milliseconds.

There are various advantages to faster rates, speed and noise are the main reasons. For instance to compare the standard 30 ms & the 6 ms rate, if you are to move from track 0 to the 20th track for one read (not uncommon).

It will take the slower (30ms) drive 600 (30x20) to reach the 20th track while it will take the 6ms drive 120ms (6x30) to reach the same point. This is a bit of a simplistic way of looking at it as it is a bit more complicated than this but it is essentially correct.

The other reason for stepping faster is noise. When the drive is stepping at 20 ms what happens is the head will move 1 track, stop & tell the computer that it has moved & then the computer will tell the drive to step another track & then the drive will tell the computer that it has done so and the computer will ... and so on until the computer realizes that

it has reached the correct track.

The computer keeps count of which track the drive head is on at all times.

The same thing happens for the faster drive but it takes less time for the exchange of information & so you don't get the same start+stopping, start+stop delays. They are still there but they happen too fast for you to hear.

The step rate is actually the amount of time the computer gives the drive head to move to each track.

OK, so now we know why make the drives step faster, the next question is how to do it in OS-9 Level 2.

Under OS-9 Level 2, the Debug Command which is used to alter modules in memory has been renamed Modpatch. The advantage of the new command is that it automatically updates the module CRC when you exit from the command.

To change the modules d0 and d1 type the following:-

```
modpatch
l d0
c 14 00 03
v
l d1
c 14 00 03
v
```

You can either put this routine in your startup file & have it done every time you boot or else do it just once & use Cobble to generate a new bootable disk with the changes already made. These patches should also work for /dd.

/dd stands for Default Device. We have covered this before but I will just go over it again.

This is the drive whether Hard or Floppy or Ram disk just where your SYS directory resides. This is where your help files are stored. When you type err num,

the program looks in the default device to find the help files, also the Level 2 assembler will look there for the DEFS directory when it is released.

Meanwhile you can still use your Level 1 assembler under Level 2. Most of the other Level 1 commands will work as well with the exception of OPAK and some other programs of this type.

Last time I mentioned that there were programs locked into memory that were using up valuable memory under Level 2 on a 128k system. These programs are not actually in the OS9BOOT module but are loaded then the first shell is loaded, These programs are actually merged into the Shell (/d0/cmds/shell).

The reason that they are merged into the shell is because of the way Level 2 allocates work space. Level 2 allocates a minimum of 8k for each command or file & since the bare shell is only a few hundred bytes long other progs were merged into the shell, & so the shell + these other programs still only use up the 8k that was allocated for use by shell.

This is different from the way Level 1 allocates memory. Level 1 works in a minimum number of pages, each page being 1/4k. So that if a program is 254 bytes long Level 1 will give it 1 page (256 bytes) while Level 2 will give it 8k of memory 7 3/4 of which is wasted.

I actually removed these unwanted modules from memory and wound up with less memory than I had when they were in memory.

In reality I had the same amount of memory as I had when they were in memory, but since MDIR is one of the commands that were deleted from memory it had to be loaded from disk & when that happened L" allocated an additional 8k of memory for it. This gave me the false reading

of 8k less than I started with.

The solution to all these rarely used modules in memory is to remove them & replace them with the ones you use more often. To create a different Shell you will need the SAVE command from your Level 1 disk. Using this will enable you to save a bare bones shell.

Then you can add the commands that you want to have in memory instead of the ones chosen for you, by Tandy and Microware.

This is an example of how you can go about it. Remember not to have your completed shell longer than 8k. One byte longer and Level 2 will allocate another 8k making it 16k and so on.

```
rename /d0/cmds/shell oldshell
merge /d0/shell /d0/cmds/dir /
d0/cmds/hdir
>/d0/newshell
ident /d0/newshell * this will
tell you how
long the new shell is.
copy /d0/newshell /d0/cmds/she
ll
```

Remember to do this on a copy of your working disk & keep your working disk handy in case you make a mistake.

When you are sure you have everything right, reboot the system. Now when you boot Level 2 should have your most commonly used commands in memory & it will not cost you one byte.

Programs that are used once only and never again that session can easily be dispensed with.

There are some programs that you will need in memory such as dir, hdir, copy and so on that you should keep in memory.

Hdir? That's a new one. You already know OS-9 uses Hierarchical Directory structure, where there are directories within directories within directories & so on, this is where HDIR comes in. When you type HDIR /d0 you will get a listing of every directory and file on the disk showing which files are in which directory, sub dir and so on.

If for instance you type HDIR /d0/SYS you will only get the sub directories and files in /d0/sys.

I like the output of this version of hdir better than the one that came with my 68000 version of OS-9. In fact I thought that Level 2 would have it included but it didn't so here it is now.

This program is Public Domain so you can freely give it away. In fact it is included in the Public Domain disks that should be available from your local User Group.

Until next time

The Listing:

```
nam HDIR
ifp1
use /d0/defs/os9defs
endc
ttl Hierarchical direct
ory
*****
* user settable param
eters
*
LineLen set $50 <=$FF
MaxPaths set 10
* Lv1Offst=(LineLen-35)
/(MaxPaths-1)
Lv1Offst set $5
*****
* equates
*
Version set 1
MessLen equ $1D XferAd
-Message
KeyPath equ 0
CrtPath equ 1
ErrPath equ 2
*****
* memory
*
org $0000
Paths rmb MaxPaths+M
axPaths
Level rmb 1
MaxLevel rmb 1
Error rmb 1
StrgStrt rmb 2
StrgTemp rmb 2
StrgEnd rmb 2
FiLength rmb 2
NBufAdd rmb 2
OBufAdd rmb 2
FNamAdd rmb 2
TimeStrt rmb 2
NameBuff rmb $20
OutBuff rmb LineLen+3
FileName rmb $200-.
FileMem equ .
*****
* calculated equates
*
Filoffst equ FileName
-OutBuff-MessLen
```

```
pag
mod PrgEnd,NameOff,Prg
rm+Objct,Reent+Version,
XferAd,FileMem
NameOff fcs /hdir/
fcc / by W.L.Healton/
fcc . 01/05/85.
Edition fcb $1!
Message fdb $0A0A <1
f><1f>
fcc / Hierarchical Dire
ctory for /
XferAd clr <Level
lda #MaxPaths
sta <MaxLevel
leay NameBuff,u
sty <NBufAdd
leay OutBuff,u
sty <OBufAdd
ldd #LineLen-$10
leay d,y
sty <TimeStrt
leay FileName,u
sty <FNamAdd
TestIn lda ,x+
cmpa #$20 " "
beq TestIn
cmpa #$3B ";"
beq NoName
suba #$0D <cr>
bne OpeName
NoName leax DfltDir,pcr
bra OpeName1
DfltDir fdb $2E0D
OpeName leax ,-x
OpeName1 stx <StrgStrt
lda #dir.+read.
os9 i$open
lbcx PrintExt
stx <StrgEnd
sta <paths
leax Message,pcr
ldb #XferAd-Message
ldy <OBufAdd
lbr PutBuff
ldx <StrgStrt
clrb
PutBase lda ,x+
cmpa #$20
beq NamEnd
sta Filoffst,y
sta ,y+
incb
cmpb #31
lbcx Warning
cmpx <StrgEnd
bne PutBase
NamEnd leax Filoffst,y
stx <StrgEnd
ldx <NBufAdd
os9 f$time
bcx NoTime
```



```

Spaces ldx #20 " "          ldx #0000          beq ChangMax
sta ,y+                    os9 i$seek        cmpb #E$FNA
cmpy <TimeStrt            puls u            beq PrtFile
bcs Spaces                lbscs PutErBak   stb <Error
ldx <NBufAdd              *****          *****
ldb 1,x                    MajrLoop ldx <NBufAdd bsr PrtName
bsr Convert               ldb <Level        bsr PrtErr
lda #2F "/"               lslb              lbra Remove
sta ,y+                   lda b,u           PrtErr lbrs PutOffst
ldb 2,x current day      ldy #0020         lbrs PutErr1
bsr Convert               os9 i$read        lda #CrtPath
lda #2F "/"               bcc NoErr         lbrs WritLine
sta ,y+                   cmpb #E$EOF       rts
ldb ,x year              beq BackOut       *****
bsr Convert               stb <Error        PrtName lbrs PutLine
lda #20 " "              bsr PrtErr        lda #CrtPath
sta ,y+                   *****          lbrs WritLine
ldb 3,x current hour     BackOut tst <Level rts
bsr Convert               lbeq EndExit      *****
lda #3A ":"              ldb <Level        PrtFile bsr PrtName
sta ,y+                   lslb              lbra Remove
ldb 4,x current minute   lda b,u           *****
bsr Convert               os9 i$close       ChangMax ldx <Level
lda #3A ":"              dec <Level         sta <MaxLevel
sta ,y+                   Remove ldd <StrgEnd PutErBak lbrs PutOffst
ldb 5,x seconds          subd <FiLength    lbrs PutBFlag
bsr Convert              std <StrgEnd      lda #0D <cr>
NoTime ldd #0A0D <lf><cr> ldx <Level         sta ,y
std ,y                    lsla              lda #CrtPath
lda #CrtPath              inca              lbrs WritLine
ldx <OBufAdd              ldb a,u           dec <Level
ldy #FileName-OutBuff    clra              lbra Remove
os9 i$writln             std <FiLength     *****
lbscs Exit                bra MajrLoop      ChangLvl ldb <Level
bra NewDir               *****          incb
Convert ldx #2F          NoErr ldy <StrgEnd cmpb <MaxLevel
sta ,y                    ldx #2F "/"       lbeq Limited
Counten inc ,y           sta ,y+           lslb
subb #10                  clrb              sta b,u
bcc Counten              ldx <NBufAdd      incb
leay 1,y                  ldx ,x            ldx <FiLength+1
addb #3A $30+10          beq MajrLoop      sta b,u
stb ,y+                   Get ldx ,x        lbrs PrtName
rts                       anda #7F          inc <Level
WarnMess fcc /***Warning**/ sta ,y+ lbra NewDir
Maximum Base Directory   incb              *****
list is 30 characters/   ldx ,x+           Limited os9 i$close
fcb $0D                   bpl Get           lbrs PutLine
Warning leax WarnMess,pcr anda #7F          lbrs PutDFlag
ldb #Warning-WarnMess    sta -1,x         lda #CrtPath
ldy <OBufAdd             incb              lbrs WritLine
lbrs PutBuff             ldx #0D           lbra Remove
lda #ErrPath             sta ,x            *****
lbrs WritLine            sta ,y           PutLine lbrs PutOffst
lbra EndExit             clra              lbrs PutName
pag                       std <FiLength     rts
NewDir ldb <Level        addd <StrgEnd     *****
lslb                      std <StrgEnd      PutName ldx <NBufAdd
lda b,u                   ldx <FNamAdd      ldd <FiLength
pshs u                    lda #dir.+read.   *****
ldu #0040 skip f         os9 i$open        PutBuff ldx ,x+
ile descriptor            bcc ChangLvl     sta ,y+
                          cmpb #E$PthFul    decb

```

- continued next page

from previous page

```
    bne PutBuff
    rts
*****
WritLine ldx <OBufAdd
    ldy #LineLen
    os9 i#writln
    lbcx Exit
    rts
*****
DFlag fcc / (d)/
    fcb %0D <cr>
PutDFlag leax DFlag,pcr
    lda ,y
    ldb #PutDFlag-DFlag
    bra PutBuff
*****
BFlag fcc /^(d)^/
    fcb %0D <cr>
PutBFlag leax BFlag,pcr
    ldb #PutBFlag-BFlag
    bra PutBuff
*****
ErrMsg fcc /Error #/
PutErr leay OutBuff,u
PutErr1 leax ErrMsg,pcr
    ldb #PutErr-ErrMsg
    lbr PutBuff
    ldb <Error
    lda #2F
Count100 inca
    subb #100
    bcc Count100
    sta ,y+
    lda #3A
    Count10 deca
    addb #10
    bcc Count10
    sta ,y+
    addb #30
    stb ,y+
    lda #0D <cr>
    sta ,y
    rts
*****
PutOffst ldy <OBufAdd
    lda <Level
    ldb #Lvloffst
    mul
    beq Return
    lda #20 " "
Continue sta ,y+
    decb
    bne Continue
Return rts
*****
PrintExt stb <Error
    lbr PutErr
    lda #ErrPath
    lbr WritLine
EndExit clrb
*****
Exit os9 f*exit
*****
emod
PrgEnd equ *
end
```

from page 59

```
1140 MS$="I'm taking a card from
the pack":GOSUB520:CT=CT+1:CD(C
T,0)=D(Q,0):CD(CT,1)=D(Q,1):Q=Q+
1
1150 IF Q=109 THEN Q=1
1160 GOTO180
1170 SP=40:GOSUB290:GOSUB1300
1180 IF CD(BI,0)=14 THEN FOR EK=
1 TO 4:GOSUB1330:NEXTEK:GOSUB131
0:GOTO940
1190 IF CD(BI,0)=12 THEN FOR EK=
1 TO 2:GOSUB1330:NEXTEK:GOSUB131
0:GOTO940
1200 IF CD(BI,0)=10 THEN GOSUB13
10:GOTO 940
1210 IF CD(BI,0)=13 THEN GOSUB42
0:GOSUB1310:GOTO180
1220 GOSUB1310
1230 GOTO180
1240 FOR K=1 TO CT:IF CD(K,0)=13
THEN1270
1250 IF CD(K,0)=14 THEN IP=K:GOT
O1280
1260 NEXT:GOTO980
1270 GOSUB1570:GOTO 1170
1280 OK=-1:FOR K=1 TO CT:IF (CD(
K,1)=DC AND (CD(K,0)<>13 OR CD(K
,0)<>14)) THEN 980
1290 NEXT:BI=IP:GOTO1170
1300 DC=CD(BI,1):DN=CD(BI,0):NC=
DN:CC=DC:SP=40:GOSUB620:RETURN
1310 IF BI<CT THEN CD(BI,0)=CD(
CT,0):CD(BI,1)=CD(CT,1)
1320 CT=CT-1:RETURN
1330 TN=TN+1:PD(TN,0)=D(Q,0):PD(
TN,1)=D(Q,1):GOSUB610:Q=Q+1
```

```
1340 GOSUB1680
1350 RETURN
1360 IF CT=0 OR TN>38 THEN GOSUB
1410
1370 IF XC>500 THEN MS$="I WIN.
PLAY AGAIN (Y/N)":GOSUB520:GOTO
1520
1380 IF TN=0 OR CT>38 THEN GOSUB
1470
1390 IF XP>500 THEN MS$="YOU WI
N. PLAY AGAIN (Y/N)":GOSUB520:GO
TO1520
1400 GOTO80
1410 RS=0:FOR Y1=1 TO TN
1420 IF PD(Y1,0)=14 OR PD(Y1,0)=
13 THEN RS=RS+50:GOTO1450
1430 IF PD(Y1,0)=12 OR PD(Y1,0)=
10 THEN RS=RS+20:GOTO1450
1440 RS=RS+PD(Y1,0)
1450 NEXT:XC=XC+RS:TS$=STR$(XC):
MS$="I WIN. ":GOSUB1460:RETURN
1460 MS$=MS$+"Score"+STR$(RS)+"
Total score "+TS$:GOSUB520:SOUD
D100,1:SOUDND200,1:SOUND100,1:FOR
U=1 TO 3000:NEXT:RETURN
1470 RS=0:FOR Y1=1 TO CT
1480 IF CD(Y1,0)=14 OR CD(Y1,0)=
13 THEN RS=RS+50:GOTO1510
1490 IF CD(Y1,0)=12 OR CD(Y1,0)=
10 THEN RS=RS+20:GOTO1510
1500 RS=RS+CD(Y1,0)
1510 NEXT:XP=XP+RS:TS$=STR$(XP):
MS$="YOU WIN. ":GOSUB1460:RETURN
1520 IS=INKEY$:IF IS=""THEN 1520
ELSE IF IS="Y" THEN RUN 20 ELSE
IF IS="N" THEN 920 ELSE 1520
1530 PALETTE RGB:PALETTE15,56:PA
LETTE13,29:PALETTE10,28:FOR R=0
```

from page 29

```
350 IFBD THENHLINE(X-1,Y-1)-(X+2
1,Y+21),PRESET,B** DRAWS BOX BO
RDER
360 NEXT:GOTO230
370 DATA0,0,62,55,54,52,38,39,36
,32,37,33,44,46,61,63:** COLOUR
DATA
380 POKE&HFFD8,0:PALETTECKP** R
ETURN TO NORMAL ON BREAK
```

from page 29

```
1100 CLS:POKE65496,0:WIDTH32:END
1200 WIDTH32:PRINT@38,"BASIC CHA
RACTER CODES":AS=STRING$(32,150)
1202 PRINT@192,AS:PRINT@352,AS:P
RINT@388,"PRESS ANY KEY TO CONTI
NUE":PRINT@429,"EXIT <X>"
1205 PRINT@264,"DEC ASCII HE
X$"
1206 FOR C = 0 TO 255
1210 PRINT@295,C
1215 PRINT@304,CHR$(C)
1220 PRINT@310,HEX$(C)
1225 K$ = INKEY$:IF K$="" THEN 1
225
1230 IF K$="X" THEN GOTO190
1235 NEXT C
1255 GOTO1200
```

```
TO 3:PALETTE 5+R,R:NEXT:RETURN
1540 ZC=5:FOR R=180 TO 170 STEP-
5:FOR Z=R TO R-5 STEP-1:HCIRCLE(
160,190),Z,ZC,1,.65,.85:HCIRCLE(
160,190),Z+15,ZC,1,.65,.85:NEXTZ
:ZC=ZC+1:NEXT
1550 FOR K1=1 TO 3:FOR K2=1 TO 5
:MS$="BM"+STR$(70+K1)+" "+STR$(3
0+K2)+"S16C0"+W$(18)+"C1"+W$(1)+
"C2"+W$(9)+"C3"+W$(14)+"C0"+W$(2
)+C1"+W$(15)+"C2"+W$(23):HDRAW
MS$:NEXT K2,K1:RETURN
1560 MS$="WANT TO KEEP PLAYING (
Y/N)":GOSUB520:GOTO1520
1570 H1=0:H2=0:H3=0:H4=0:FOR JK=
1 TO CT:IF JK=K THEN 1590
1580 ON CD(JK,1)+1 GOSUB1640,16
50,1660,1670
1590 NEXT:IF H1>=H2 AND H1>=H3 A
ND H1>=H4 THEN BI=K:IC=0:CD(K,1)
=0:RETURN
1600 IF H2>=H1 AND H2>=H3 AND H2
>=H4 THEN BI=K:IC=1:CD(K,1)=1:RE
TURN
1610 IF H3>=H1 AND H3>=H2 AND H3
>=H4 THEN BI=K:IC=2:CD(K,1)=2:RE
TURN
1620 IF H4>=H1 AND H4>=H2 AND H4
>=H3 THEN BI=K:IC=3:CD(K,1)=3:RE
TURN
1630 BI=K:IC=CD(K,1):RETURN
1640 H1=H1+1:RETURN
1650 H2=H2+1:RETURN
1660 H3=H3+1:RETURN
1670 H4=H4+1:RETURN
1680 IF Q=109 THEN Q=1:RETURN EL
SE RETURN
```

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