

**WAGEI**

**136**

**01** - Thanx & Stuff

**02** - WACCI On-line

**03** - French  
Connection

**04** - Scart Connections

**05** - Contributing

**06** - Pirates Ahoy!

**07** - Ask The Internet

**08** - 101 Uses For A Dead  
CPC

**09** - Breaking Your  
CPC

**10** - Programmers'  
Patch

**11** - A-Z Of  
Computing

**12** - A Word From Dave

**13** - Famous Last  
Words

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## Thanx & Stuff

*How are you gentlemen? All your WACCI are belong to us*

As the latest coup/reorganisation/ what-have-you evolves, It Has Been Decided (with a little persuasion) that the best way to run a CPC club in 2001 is to have an editor who edits, and an administrative committee which does the administration. I know, it's not exactly rocket science. But after 15 years or so, that's the great conclusion.

Therefore this is the first in a new style of magazine. WACCI will be published every two months, on the dot, from now on. If there aren't many articles, you get a four-page magazine: if there are lots, you get 32 pages. I am – we are – confident that we can make WACCI the one essential read for CPC users all over the world.

So send us your articles. We would love some new blood – I'd like it because it makes the magazine more interesting, and Philip would like it because he's a vampire. And a malnourished one at that.

By the way, the picture in the middle isn't a permanent feature (not that one, anyway). It's the nearest you get to a cover. I don't really see the point of wasting a full page on a piece of PC clip art and a terrible pun, especially when you can waste it on a terrible picture instead.

But wait! There's more!

### **www.wacci.org.uk**

WACCI is now available on the web. The smashing new website, at the above address, contains the full contents of every issue; live discussion boards for WACCI readers; CPC software to download, links to other Internet sites, and so on.

The website and the magazine will be closely interlinked, so if you put an advert in Market Stall, it can appear on the Internet, and vice versa.

By publishing on the Internet, we can open WACCI's doors to European CPC users, one-time CPCites who still retain an affection for the machine, emulator users, and many more people who would never subscribe to the paper version but who have a lot to contribute.

The new site is the work of Angela Cook, David Cantrell, Nicholas Campbell, Brian Watson, and many more besides. There's lots more about it inside.

### **Bill Gates-free zone**

WACCI is The Amstrad CPC Magazine. There won't be any PC content, except that which is related to CPCs (emulators, Internet resources, and so on).

If you'd like to write something about PCs for the WACCI membership, you can. Just print it out yourself and ask the committee to distribute it in the same envelope. Contact Brian for details.

And the 'thanx' for this issue go to Brian, Matthew, Roy, Jonty, and everyone else who's contributed in some way.

## **No Comment**

Sorry, I've used that joke before. Fair Comment is taking a rest this issue, because there aren't any letters. As of next issue, Monsieur Philip DiRichleau will be returning to answer your letters in his inimitable fashion. So please make his day by sending us something. You can post us a disc or a print-out, send us an e-mail – whatever.

## **Fog in Channel. Europe cut off**

...has sometimes seemed to be WACCI's attitude to Europe. I'm not pretending that British readers have the same interests as European CPC users. We don't. But aren't you a little curious to know what other people do with their CPCs? I hope so. To that end, have a look at the interview on page 6.

## **The boring bits**

are on the back cover.

Enough navel-gazing already. The proof of the pudding is in the eating, which is especially good where chocolate fudge cake is concerned. So enjoy the issue.

*Richard Fairhurst*

(aka CRTC for those of you reading in European)

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## WACCI On-Line: the return of WOLI

*WACCI now has its own website (yes, again) – except this time it's intended as an active CPC centre all of its own. Brian Watson fills us in on the thinking behind the site*

Between the last issue of WACCI and this, “things have been going on.” I know, hard to believe, isn't it?

As well as the appointment of Richard Fairhurst to the position of magazine Editor, Angela Cook has agreed to head up the team of people working on the newly-registered WACCI website at [www.wacci.org.uk](http://www.wacci.org.uk).

David Cantrell is hosting it (“hosting” in this sense is a technical term; don't worry if you don't know what exactly that involves as it is not important to WACCI as long as the thing works. And it does.

This puts three people who are very good in their fields (David “does things” with the Internet for a living, Richard is a professional journalist and Angela earns her living creating websites) to work in powerful positions within WACCI and good and effective communication between them can bring big benefits for WACCI and its members.

Part of the plan proposed is that Richard and Angela will “mirror” each other's work; the magazine's content will appear on the WACCI website, and contributions (in terms of on-going interaction) appearing on the Website can be incorporated into each issue of the magazine.

### Dear Editor

Suppose, for example, someone sends an enquiry about where to locate a program from an old CPC publisher (Comsoft, perhaps) to the magazine. Previously, the Editor had just a small range of options open to satisfactorily address the enquiry, as follows:

- (1) He could answer it himself, both directly to the person asking the question and also in the next issue of the magazine for the benefit of the wider membership to read, or
- (2) he could have a ring around the people - assuming he knows who to ask - who might know the answer, then report back and publish the answer (as before) in the next issue,
- (3) he could provide a list of people for the enquirer to ring (in which case the likelihood of an answer getting published reduce dramatically), or
- (4) the Editor could reply, “blowed if I know, I'll put a bit in the next magazine if you like.”

Assuming that the Editor remembers to do that, the enquirer may have to wait up to five weeks for the publication of the magazine and any subsequent responses to find their way back before he or she is in with a chance of getting that correct response that might be urgently needed at the time of the original request. By the time that correct response has found its way back to the magazine readership (if it does find its way back via the Editor) it will be very old news indeed, and probably of little interest to the readership.

### Yours sincerely

How times have enquiries been posted in the magazine without being accompanied by “return contact” information? The Data Protection law has recently changed and there are several

amendments that affect WACCI and how we handle the personal information at our disposal. One thing I am asking the WACCI Committee to address as a matter of urgency is obtaining all the WACCI members' individual permissions to publish their contact details in connection with any enquiry that is to need a response. As to anyone declining to allow publication of that information in connection with an enquiry, I'd personally say, "then address your enquiry elsewhere." Oh, I'm a hard-hearted swine sometimes.

With the new WACCI website at our disposal, the Editor can forward any enquiry immediately upon receipt to the "Help Wanted" section on the site where it will be seen by anyone surfing in from the community of CPC users around the world. Someone is bound to come up with the answer (the web's like that) and the original questioner can receive a prompt reply by post or phone. The Editor can then also whip up a quick article for the next magazine from the responses obtained. Faster and more efficient all round and incidentally generating interesting topical content for the magazine.

Another way the new website will echo the magazine's contents is to be a searchable storage point for articles from back issues of WACCI. John Bowley started this archiving work some time ago and it is intended that every back issue of WACCI will be made available that way.

### **As I was saying...**

As I have found since being the person who actually gets the magazine printed, getting just a few copies done to respond to requests for back issues is disproportionately expensive and, anyway, stockpiling them on a "just in case.." basis is a wasteful use of someone's domestic space. I speak with feeling on that particular point!

For those who don't have internet access, and WACCI is still a CPC club, it is a relatively easy thing to ask a WACCI member who does have it to look up the necessary information, print it off, and send it back by post. All it needs is a new category for the "Helpliners" list in the printed version of the magazine so that people know who to ask.

The practical side of exchanging text and other information between the various media is no big thing for the people involved. Many of the programs used to create and handle articles are fairly well integrated with each other anyway, and conversion programs exist to translate information where this is not so.

A new feature of adopting the website as a mirror of WACCI's magazine articles is the ability to show colour in diagrams and photographs. Printing colour in the magazine has always been and always will be, I think, (for reasons of cost) an expensive option. It makes the covers look more eye-catching, certainly, but it hikes up the production price a lot and therefore we have all had to "make do" with monochrome inner pages. In future, though we will stay monochrome in the printed magazine, we will be able to refer to the Website for an alternate "Gallery" version of the images used where one exists.

### **P.S.**

As the website develops, and there is an enormous amount of relevant WACCI stuff to be put onto it, including copies of our PD/Homebrew software and our Book Library Index (with reviews added as they are done), Angela and the people working with her will also be building up a "links" page to other CPC sites that keep information that sensibly integrates with ours. That is such a huge area to talk about, I will leave coverage of it until later when the Links page is actually getting established.

As the WACCI web page grows we will be telling people who are presently not WACCI magazine subscribers about it and recommending that they pop in to see what WACCI is all about. Each new printed issue will be "echoed" on the Internet and CPC enthusiasts around the world will be able to see what we have to offer.

It never fails to amaze me how many people turn up in the various CPC Internet discussion groups, opening their conversation with something like "I had no idea this forum existed. I've had a

CPC for x years and I've suddenly started getting read errors when I try to access a disc and thought you guys might be able to help..." Indeed we can, and for a lot more than finding them drive belt replacements!

Incidentally, the magazine is financially sound, in case anyone is wondering about that side of things, and all this malarky about the integration of the printed magazine with the website is very much "as well as" not "instead of."

### **And finally**

I've said it before and I'll say it again now. There is no suggestion at all that WACCI-the-magazine is going exclusively "on-line." For all that the Internet is good for dashing in, grabbing a bit of information and dashing out again, there is nothing quite like having a nice substantial printed magazine come plopping through one's letterbox from time to time (schedule? What schedule?) (*Er, Mr Watson, this magazine would have been delivered almost two weeks earlier had I not been waiting for you to deliver this very article, so less of your cheek – Richard*) and, as I've made the point frequently before, WACCI is a CPC users club and that presumes that the members no internet access.

WACCI's priorities are clear in terms of serving CPC enthusiasts, but they are widening too to include new ways of doing that.

### **Editorial comment**

That's the world according to Brian, anyway. I don't think you'll necessarily find that everyone involved in the website agrees with every word written above. I'm not really bothered about having a whole world of people to help Philip (and myself) with Fair Comment, for example. I think we can probably manage your questions quite well as it is.

But opening up WACCI to a whole range of people who'd never consider subscribing – emulator users, for example, European users, and those who simply retain a fondness for the old CPC – is something that I'm very keen on. What's significant is that the collective website team, as expressed through the WACCI mailing list (which anyone is welcome to subscribe to), agrees that publishing a website in tandem with the magazine is the way forward. So we're going to. – *Richard*

### **Never mind the spiel, what's on the ruddy site?**

Here's what's lined up for the WACCI website in the forthcoming weeks – by the time you read this, the first features should already be there.

- Current issue of WACCI. Exactly what you're holding in your hands now, in a web-friendly form.
- Links. A comprehensive guide to other CPC Internet resources.
- Message board/help wanted. Post messages and requests for help for other site users to see.
- On-line chat. Converse with other WACCI members and CPC users in real time.
- Software downloads. The WACCI PD library, together with programs from Robot PD and the world of the CPC, available to download for your real CPC or emulator.
- Frequently asked questions. Common CPC problems solved.
- About WACCI. Useful information about the club and magazine.

As the site develops, there'll be back issues, answers to the most frequently asked CPC questions, titbits of CPC news, and anything else we can think of. Or, come to think of it, anything else you suggest! All help is very welcome.

To e-mail Angela, the webmistress, write to [angela@midnight.uk.com](mailto:angela@midnight.uk.com). If you would like to join the WACCI mailing list for future discussions, there are full details on the website.

And if you want to consult the website on your CPC screen rather than any of this modern PC

stuff, watch this space...

# The French Connection

*What CPC support still exists in Europe? What drives people in France and Germany to stick with their Amstrads? As part of WACCI's expanding international outlook, Roy Everett spoke to leading French CPCer, Julien Nevo – aka Targhan of the Arkos coding group*



## **Roy: When did you and Orphée get the idea to start the Arkos group, and who have been the members of the group, and what are their CPC talents? Why Arkos?**

*Julien:* Well, it was long before, probably in 93/94. At this time, we were only the Demoniak fanzine team, which included Orphée (main editor at the time, coder) (and Julian's brother), Rainbird (editor, coder, graphist) and me (editor, coder, musician). But soon our coding level was getting better and better with the learning of the assembler language, and demomaking really attracted us. So we decided to create a group, Arkos, that would represent all our productions, demos and fanzines.

But why the name Arkos? As far as I can remember, Orphée chose this name from the Ancient Greek word arkaos which means to command. It sounded great, but the meaning didn't really represent our ambitions, so he removed the second a and the group became ARKOS. And it still sounded great!

By the time two more members had joined Arkos: The first one was Starman, who came in '95 or '96. He was a beginner in assembler but had very good and original ideas. The only production he made under the Arkos name (and for the CPC scene, I think) was a demo called Dangerous. It's quite strange, but original. Sadly we didn't have many news from him since, but I know he often has a look at the latest CPC productions.

The other member was the well known Epsilon, who was previously in Power System. He was an artist, coder and musician (!) and was very productive, so if you are a little involved in the CPC scene, you can't miss his demos! He also made a discmag called New Arcade. Under the Arkos name, he produced his Anthology demo, a very good 3-part demo. Sadly, he left for military service, and gave up the CPC for 3 years. Nowadays, he's back on the CPC, but has returned into Power System. He is also producing his first professional musical album under the name Capwest, with a guitarist and a singer. Good luck!

## **What keeps you interested in the CPC?**

It's a question I often ask to myself this time. Why am I on CPC? Probably because the CPC is a machine that allows to create, to code your ideas very quickly. If you want to code an effect, you can go to DAMS (*the most popular assembler in France, comparable to Maxam – Richard*) in 2 seconds (if you've got a Ramcard!), and if the CPC crashes, that's your fault and not because of a bug in DAMS or AMSDOS. You are really in contact with every byte of the machine, which is ready to do exactly what you want to do. I couldn't code on a PC, because I think I would be more a slave than a real coder. On the PC, you have to know many many things about Windows if you just want to open a window, draw a line, make a sound...

It is clear that the CPC needs innovations. In particular, I'm talking about demomaking innovations (after all, I am French !), as every time I release a demo or a fanzine, I try to make something that has never been seen before. I think it's the aim of every demomaker: to improve, to

imagine, to impress.

I won't leave the CPC scene before I have done all that I have to do. I have many ideas of demos, many ideas to write, and I hope I will be able to produce all of them. My aim on CPC is to make good productions, but as much for others as for myself. I want to prove to others what it was possible to do on the CPC, but also to myself that I was able to do it... Demomakers have selfish goals, you might say... And you'd be right.

## **What inspired you to write your disc fanzine, *Demoniak*, and are the challenges still present?**

When we started out on the CPC, it was clear that we would not be able to create demos, or technical things. If we wanted to be known to the CPC scene – and that was our aim – we had to find another way. Making a discmag is well suited to beginners, because you don't have to be a coder or a musician or an artist. Or at least, you don't have to be good at any of those. That's why so many disc/paper mags were released.

But only a few survived more than two issues, because they were not interesting enough. In *Demoniak*, we tried to have a good and justified critical sense, a nice sense of humour, and articles that would interest everyone. But we were young, and though every issue was ambitious, issues one and two were not very successful. The third issue was strongly improved by the full involvement of Rainbird who provided wonderful graphics. This issue also corresponds to our real arrival into the scene.

Our principal sources of inspiration was the fanzine *Amazing Fanzine*, a wonderful papermag which included all the things I listed before! But also *Disc Full*, which was a very stylish mag: not always interesting, but so beautifully designed (MADE was the artist...).

Our aim with *Demoniak* was always to be good critics, and to spread news and ideas about the scene. I think our 7th issue is the best we did in this way.

Sadly, at this time, the scene is not very productive, so *Demoniak* 8 might be released in half a year... We don't want to make a discmag that would talk solely about us! A discmag deals with the scene, the sceners, their productions. As long as the scene is alive, *Demoniak* will be released.

## **Ok, the standard questions:**

*What are your favourite demos; games, both commercial and PD; magazines, paper and disc-based; coding group, yesterday and today; and utility, commercial and PD.*

*Demo:* probably S&KOH by Overflow, because of the graphics, the design, and the fact that the demo is always changing. There's always something moving. I also love the old demo *Synergy* by Benjy and Strooky, for its ideas and good design. If I could include a megademo, I would choose *Voyage '93*: not for the design (!), but for the good variety of effects the demo shows.

I'm sorry, but I'm not fond of the latest demos. Even if *Ecole Buissoniere* is technically wonderful and well designed, there is something I prefer in old demos... Nostalgia, perhaps ?

*Games:* I don't play on CPC any more, but I used to spend hours on *Renegade* (I can win 4 times in a single game !). Also *Elite* and *Cholo*, for their concept, originality and incredible long life time.

*PD game:* *Black Land* really interested me for a long time: the graphics are very good and the code must be so hard to do. *Fres Fighter* is also a big work, but is sadly not much fun... I prefer *Yie Ar Kung Fu*.

*Disc fanzine:* There aren't many these days. I like *Ovation*, and *Eurowacci* is really nice (sorry, Philip : I forgot to include the *Eurowacci* reviews in *Demoniak* 7, even though they were written! I am ashamed...)

*Paper fanzine:* Sorry, English papermags never interested me much. But I love the French *Amslive*, *Another World*, and *Drapeau Noir*.

*Coding group:* The best of alltime is probably Logon System, if we're talking about the technical aspect. But the Longshot demos never stuck me to the screen for hours. In fact, my favourite part of The Demo is the Megalomaniak part by Digit.

So, my favourite group is not Logon, but... well, I don't know! Every group makes good things, but I can't choose one more than another... And I am not interested by the technical competition that often makes for uninteresting demos. Nowadays, the group that has the best coding potential is Overlanders.. But I won't choose them.

*Utility:* The best commercial tools I use are DAMS, Semword, and a bit of OCP Art Studio. DAMS because it's the best friend of a coder, and the worst enemy of MAXAM; Semword, because I still can't write a text under Protex, and OCP because... there is nothing better! (*GPaint?* – Richard)

*PD utility:* I don't have to think twice about this: the BSC Soundtrakker, because it's the best of its category. I also like the Cheese cruncher by Antoine, and Turbo Imploder by Crown – still the best for crunching Demoniak articles.



*Julien Nevo - aka Targhan of the Arkos coding group*

### **You attend most of the French CPC meetings. What's so good about them? Do you think that there would be a place for a pan-European meeting?**

Meeting another CPCists is a normal step when you love demomaking. And it's true for every kind of interest! If you like painting, you will feel attracted by museums – you need human contact to gain motivation. I write my demos for the people I meet in the meetings, so it's normal that I meet them! They are all friends, you know. When those people will bore me, when I won't feel happy to meet them again and again, I'll be closer to giving up my demomaking activities. And the people gathered here have knowledge you don't have, so if you've got a problem, you can tell them what it is! There is so much to learn.

I think a Eurometing is a good idea, but to be honest... some countries are perhaps incompatible. I mean, a meeting between French people, demomakers, and English people, users generally, would perhaps be a waste of time. (*You might be surprised* – Richard) I don't think we would have anything to learn from each others. I'm not tempted to use all the utilities ATM often talks about, while I think my demos (and even my discmag) might bore many English people. Am I wrong?

But I think that French, German and Greek people really have the same way of thinking. We have

the same goals. When Antitec and IND (from Greece) came to Ze Meeting 2000, we had great conversations (when we understood what they were talking about! They have such strange spelling... Hopefully, IND speaks French well!).

Such a Euromeeting would be really useful to the scene. It would create links between the countries, as one doesn't always know the existence of the others...

### **Emmanuel Roussin ventured across the channel to see a WACCI Convention for himself. Has it ever occurred to you to do likewise?**

No, I never go abroad for a meeting. And for the reasons I mentioned above, I don't think that would be a real benefit for me to go to a WACCI convention. Don't feel hurt by my words, that's not my intention. But I think I wouldn't find anything interesting to me. But a travel to Greece or Germany is something to think about seriously.

### **A bit about yourself. What are your personal interests outside the CPC?**

I was a student in computer science... but it didn't interest me a lot. Another passion is music. I love groups like Yes, Genesis, Dream Theatre, King Crimson – progressive music in general. My compositions on CPC were in fact very useful to me, as they convinced me to become a professional musician. I have been a bass player for 3 years now, and I work (alone for the moment) on an rock album which is 80% written.

### **When did you get a CPC? What was the set-up?**

Probably in '86 or '87, I don't exactly know. It was a CPC 464 our neighbour sold us because his wife thought he was spending too much time on it... I can thank her! It came with Fruity Frank, Alien-8, and that's all I think... But Orphée bought some games, and we had a CPC club nearby, so we, too, spent many many hours on CPC... We had a CPC 6128 two years later.

### **OK, you had Orphée, but who else did you get in contact with initially?**

The first contact we had was Tronic. We wrote to him because we saw his address in the Paradise Demo, by Paradox, and we wanted to interview him in Demoniak 1. He left the CPC one or two years later, but was a good contact.

The second contact was Tony from Maxi-Micro, and this guy is probably the most incredible guy we ever contacted. In fact, I don't remember how we entered in contact, but Tony helped us in so many ways... graphics, music, news... He really made all he could for us to get motivated and to improve our fanzine. He also coded the superb turn-disc of Demoniak 3. If we are here, that's because of him!

We also met Ramlaid and the team of his then fanzine Croco World, as they were living 60 km from our home! And we're still good friends.

### **What stimulated you and why?**

We were beginning to get known! Demoniak was reviewed in many fanzines, and it was quite appreciated. What we did was not made for nothing and nobody. To receive a letter in which is written that your discmag is good, is really enjoyable. To read your name in a greeting scrolltext is great. How could we stop here?

### **What holds your interest now?**

Always the same thing : to receive greetings and congratulations. We work hard on our productions, but I think they are well received. When we released Demoniak 6, we had only a few replies: nearly

no-one seemed to have read it! We were very disappointed. We made Demoniak 7 in order to counter this.

### **What has been your biggest disappointment?**

Probably the loss of contact with our graphist, Rainbird, who disappeared to America. We know he's back, so we're happy! But generally, there is less and less contact with the sceners... We are all getting older, and more and more busy...

### **Your greatest achievement?**

I'm quite proud about Demoniak 7, in which I wrote many many things. I think it touched the scene, which was my aim. I'm also quite proud about my Big'o'full'o'demo, even if some CRTCs don't accept it very well.



### **Before we go any further, what are your CPC productions to date?**

Seven Demoniak issues, of course. My first demo was the Rastablast part of the Power System Megademo. I coded the Digiblast part in the Bordelik demo IV from Arkos. One of the three parts of the Terror under the Xmas Tree from Arkos. The three part demo Big'o'full'o'demo, also from ARKOS. The tool Rastarkos.

I made musics for every demo listed here, and also for Deep Space by Tom & Jerry, Acid Music Box 3, and other Arkos demos I didn't code.

### **Emulators. Which do you use and of the crop which do you rate and why? Will the emulator, as opposed to the actual CPC, be the future?**

I use WinAPE1.8b (by Richard Wilson), because it allows you to assemble infinitely long source code. That's my main problem nowadays: my code is too big to fit the CPC memory! Demoniak 7 had to be finished on an emulator, because the source was too big for DAMS!

I also use emulators when I need a lot of precalculated data. I write the code in BASIC, and when the CPC makes the calculations, I use a 3000 Mhz CPC! NoCash CPC is a very fast emulator, very good for precalculations: I use it in this case. When I want to see a demo, I use Arnold or Caprice32.

But generally, emulators should just be used when you don't have a CPC at hand... at work, for example (!). Or when the CPC tools are not good enough. That's why I finish my code with WinAPE.

Emulators are not the future, but allow you to go beyond some CPC hardware and software weaknesses, where they exist.

### **Of the people on the CPC, who do you consider yourself to be closest to?**

Eheh, it's a funny question! I think Ramlaid from Mortel is the guy I know the best. Because we

live quite near to each other, we often meet for non-CPC reasons. We were also in the same college.

### **Who have you found a great help over the years in understanding the complexities of the CPC?**

As I said before, Tony of Maxi-Micro was one of our first contacts. Among all he sent us, was a tutorial he wrote, which talked about rasters in assembler. I and Orphée studied this code, and after this we were able to create little codes. He also sent us his fullscreen-code. This code allowed us to use fullscreen in every article of Demoniak 4... So Tony was our first teacher.

We found also much information in Amstrad Cent Pour Cent magazine, still published at the time. But a great help came from the many meetings we went to, where you can ask every questions you have, and are sure to find the answers.

But to answer your last question, I think that without Tony, we would have given up, or have begun to learn machine code much later.

### **What's your opinion of the demo scene?**

The demo scene is the only thing that makes us stay on CPC. Sadly, it is quite weak these last years.

### **And the game scene?**

Dead? If we discount Bollaware (who have left the CPC), who still creates good games? But I don't really care about games on CPC. If I want to play, I generally use a PC.

### **Each country's coders?**

I think the French scene is the most productive on the CPC... I know most of the sceners, and they are all very cool. How could I say anything else? I wish the productivity will increase. Nothing has happened these last months.

It's said that the German scene is dead, but I don't have any contact with any German coders.

The Greek scene is strange: a group can appear and disappear two weeks later! But some Greek coders are really good.

I don't have any contact with any English coders... But generally English productions don't interest me a lot. There is always a war or two angry people fighting each other...

If you want to contact me for Demoniak or anything else, write to:

NEVO Julien

Le Louya

35290 Gael

France

Website: <http://members.tripod.com/~arkos>

Goodbye!

# Unfinished Business: SCART Connections

## part two

*In WACCI 135, Terry Ward explained the ins and outs of SCART connections, used to connect audio and video equipment together. We conclude his article below*

Function Switching (pin 8)

Logical '0': zero to +2.0V.

Logical '1': +9.5V to +12V.

Input resistance: less than 10 kOhms.

Input capacitance: less than 2 nFarad.

Load resistance for compliance testing: -10 kOhms.

When contact acts as an output, output resistance less than 1 kOhm.

Blanking (pin 16)

Logical '0': zero to +0.4V.

Logical '1': +1.0V to +3.0V.

Impedance: 75 ohms.

Logic '1' corresponds to blanking active; the external Red, Green and Blue primary colour signals are then displayed on the screen.

Cordsets

A number of different connecting cables are available, as follows:

Type U (Universal): where all the 21 contacts are made at each end. Coded or coloured black.

Type V (Universal minus audio signals). Includes all the inter-connections of contacts 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, and 21. Coded or coloured white.

Type C (Universal minus RGB colour signals). Includes all the inter-connections of contacts 1, 2, 3, 4, 6, 8, 10, 12, 17, 18, 19, 20, and 21. Coded or coloured grey.

Type A (Universal minus video signals). Includes all the inter-connections of contacts 1, 2, 3, 4, 6, 8, 10, 12, and 21. Coded or coloured yellow.

Also available are SCART plugs with individual connectors on the other end – Phono, Co-axial, DIN with various number of pins, etc. – and a cable to a box with a number of SCART sockets, which allows a number of units to be inter-connected.

Cordsets which have the same connectors at each end, i.e. two plugs with male pins or two sockets with female connectors, have the audio and composite video connections crossed over. So for example, pin 3 at one end is connected to pin 6 at the other, hence interconnecting the audio signals between the two pieces of equipment.

Similarly, pin 19 and pin 20 are crossed in the cable to connect the composite input and output video signals of two units.

Cordsets which have a plug at one end and a socket at the other do not have any connections crossed over, since they are really just extension cordsets.

# WACCI 137: how to contribute

In the next issue of WACCI, we will feature the return of Fair Comment and Market Stall – if, that is, you send us your letters and advertisements. We will also be featuring anything else you care to write about. So send those articles in!

All contributions, including Fair Comment and Market Stall, should be sent direct to Richard at 5 Nine Acres Close, Charlbury, Oxfordshire OX7 3RD (or e-mail [richard@systemeD.net](mailto:richard@systemeD.net)). CPC, PC, and Mac discs are all fine: but if you're using a PC or Mac, do not save in Microsoft bleeding Word format, otherwise we will have to kill you. Use Rich Text Format or plain text.

Please include a printed copy. (If it's only a short letter or advert, don't worry about sending a disc – I'll type it in.) Enclose an SAE, not just a stamp, if you want your disc returned.

And we would love to hear from you on any subject remotely CPC-related – the more the merrier. Thank you!

## Deadlines

WACCI 137 completed: 28th June

WACCI 138 in production: 1st July

WACCI 138 final deadline: 1st August

WACCI 138 completed: 23rd August

# Pirates Ahoy!

*Romantic Robot's Multiface was one of the most popular CPC peripherals of all time. Richard Fairhurst explains what it does and how it works*

Clever name, Multiface. An interface that does many things. Also completely untrue: the Multiface wasn't an interface like a serial interface, which let you plug new kinds of gubbins into your CPC. It just sat on the back of your CPC and did its thing. Singular.

But that was enough. Because the thing in question, for many CPC users, was a godsend. Loading games from tape is tedious: many games were available only on tape, or on disc at an extortionate price: many CPC users had disc drives. Ergo, why not think of an easy way of getting games from tape to disc?

Romantic Robot did. The Multiface took an exact copy of what was in memory at the present moment, and saved it to disc, ready for you to reload at your leisure. All you had to do was press a little red button then select 'Save' from the menu that appeared.

It was such a good idea that at least three other companies had the same plan, and brought out similar-sounding devices, of which the Datel Imager is the only one I remember. In one of those happy coincidences of commerce and merit, the Multiface was the best of the lot, and also the one which survived.

## Revision History

Strictly speaking, the device we all know as 'the Multiface' was in fact the Multiface Two – something that confused Amstrad Action no end. The original version (the Multiface One, if you like) was in fact a Spectrum peripheral. Romantic Robot later applied the concept to the Amiga and the ST with very little success, as games for these platforms were inevitably multi-loads. They now make their living selling classical CDs. Funny old world.

Needless to say, this concept of a 'universal backup (oh, ok, piracy) device' worried software houses no end, and there were no end of rumours that the Multiface and its ilk would be banned under the Copyright & Patents Act of 1990. In the end, all that happened was that Romantic Robot got the chance to run 'Buy now! before it's banned' adverts, provoking lots of panic sales. They then continued to sell the Multiface. Several years later, they tried the same trick with 'The CPC is no longer a viable platform – so we're selling off our last Multifaces!'. This supposed last shipment lasted about two years.

## Anti-Multiface

To return to the subject of Amstrad Action, one (wilful?) misconception they put about was that Multifaces were serial-numbered. Thus you couldn't run Multiface copies with anyone else's machine. Needless to say, this was b... – er, balderdash – as the only check made (in later Multifaces) was on machine type. This meant that you couldn't run copies made on a 464 on a 6128, or vice versa: and of course, you needed a Multiface to run them at all.

Tant pis. Enter Serge Querne, usually known as Longshot, the founder of Logon System, but in this case masquerading as Magic Software's Merlin J Bond. His rather spiffing utility, Anti-Multiface (aka Multimag), made Multiface copies into stand-alone programs.

Suddenly, you could run Multiface copies on any CPC, from the B:-drive, without a Multiface even. You needed 128k, of course, and the original program couldn't use extra memory. But these were small prices to pay. With this tool, the Multiface reverted from its sheep-like backup identity to its original wolf persona as Ultimate Facilitator of Mass Piracy. Except no European cracker would be seen dead using one.

## How did it work?

This was really ingenious, and I'm indebted to Rob Scott for explaining it.

Any CPC program can find out what's in memory at the moment. It's the PEEK command in BASIC, and the very foundation of machine code. You, too, can save the contents of memory to disc just with the following line:

```
OPENOUT "filename" : FOR n=0 TO 65535 : PRINT#9,CHR$(PEEK(n)); : NEXT : CLOSEOUT
```

Needless to say, the Multiface did just that (except written in machine code). If I could get £40 for that one line of program, I'd be smiling.

But that only records what's in memory. The CPC also has a barrage of dedicated chips to control the display (the CRTC), colours and memory configuration (the VGA), sound and the keyboard (the PSG), and so on. There is no equivalent of the PEEK command for these chips. So how do you find out what the settings are – what colours are in use, what size and mode the screen is in, and so on?

It works like this. The CPC sends instructions to these chips using the OUT command. Each chip has a different address. So you can send the value 1 to the CRTC with the command OUT &BC00,1; you can send the same value to the VGA with the command OUT &7F00,1; and so on.

The CPC uses the same command to send instructions to anything bolted onto the expansion port. So if you have a 464 with a DDI-1 disc drive connected, typing OUT &FA7E,1 will turn the disc motor on. (It works on a 664 and a 6128, too, proving that the CPC sees no difference between internal and external chips.)

But the instruction doesn't magically go to the right chip: it goes to all of them. When we sent our instruction OUT &BC00,1 to the CRTC, the VGA will have seen it, as will your disc drive, your Multiface, and anything else you've got connected. They just think "oh, this is going to &BC00 – so it's meant for the CRTC", and ignore it.

At least, the disc drive and VGA ignore it. The Multiface memorises it, thereby building up a record of what you've told each chip to do. To change the screen mode to MODE 2, for example, you send a particular byte to the VGA. The VGA gets the byte, and changes to MODE 2: the Multiface gets it, and makes a little note "we're in MODE 2".

All of these settings are saved on disc as part of your backup. So when you load the Multiface-saved copy, it knows exactly how to set up each chip.

## Toolkit

When I said that the Multiface only did one thing, I was lying. It does two. Just about.

There's a very basic memory editor built into the Multiface, which enables you to view and edit the current contents of your CPC's memory. Er, that's about it. Something I always found useful is that it would work in both hexadecimal and plain vanilla decimal numbers – so if I'd lost my scientific calculator (again), I still had a hex-to-decimal converter at my fingertips.

Something more people found useful was that you could change crucial parts of a game – notably the memory location that holds your current number of lives. Change it from 3 to 250, and you're laughing. AA would print lists of such 'Multiface pokes' every issue.

## Eat my Multiface

Many games, and even the odd demo, picked up on the presence of a Multiface. In order to stop illegal copying (or in the case of the demos, just to look smart), they would then refuse to work.

Most notorious of all was Elmssoft's Zap't'Balls. Run it with the Multiface plugged in, press the red button, and you'd get a rather rude message. Ironically, one of the much-vaunted cracks of Zap't'Balls was accomplished largely with the Multiface's latterday rival – Siren Software's Hackit. See BTL 2 for more.

To get around this, Romantic Robot put an on/off switch on the Multiface. When it was turned on, you could make copies, reload games saved with the Multiface, and use the toolkit. When it was

turned off, you couldn't. Seems fine.

But some games constantly checked for the presence of a Multiface. If you turned your Multiface on even one fiftieth of a second before pressing the red button, the game would crash. Since not even Richard Wildey has reactions that sharp, you were still lumbered.

Romantic Robot came up with a typically elegant solution. The Multiface was always off, until you pressed the red button. Then it turned itself on just in time to bring up the menu allowing you to save your game. This done, you pressed 'R' to return to the game, at which the Multiface turned itself off again.

There is a small flaw in this solution, of course – namely that if the Multiface is always turned off, you can't load your saved games, which require the Multiface to be turned on before they'll run. So Romantic Robot added a blue button. This reset your CPC and turned the Multiface on at the same time. If you wanted to run a game that objected to the presence of a Multiface, you just pressed the red button followed by 'R' for return.

It may all sound complicated, but it worked in almost 100% of cases.

## **Multiface Software**

Some programs were written to co-operate with the Multiface, rather than fight against it. The Insider, Tearaway, TUSS (The Ultimate Sprite Searcher) and Soundhacker were all hacking programs designed to expand the capabilities of the Multiface: the first-named was written by Romantic Robot, while the others were all third party products. The Insider was also unique in that you could still press 'R' to return to the program currently running.

TUSS and Soundhacker, by Richard Wildey and Rob Scott respectively, were particularly specialised tools. TUSS helped you to nick graphics out of other people's games: Soundhacker helped you to nick Soundtrækker tunes from demos and fanzines. Amstrad Action (them again) once tested Tearaway against TUSS, found in favour of Tearaway, and then completely disproved their findings by using TUSS, not Tearaway, to remove the nipples from the covertape version of Stormlord.

Both Doctor Fegg and Richard 'The Executioner' Wilson started work on powerful hacking programs which would work with the Multiface, titled Dr Fegg's Hack Pack and Amigo respectively. Neither was ever finished.

## **Fifteen years later**

The Multiface originally sold for £40 or so. These days, £15 is a fair second-hand price: any less and you've got a good deal.

Most CPC emulators provide equivalents of the Multiface's two main features. Instant copies can be made with the 'snapshots' feature, creating files with an .SNA extension that can be easily reloaded. The toolkit, meanwhile, has been replicated with whizzy new disassemblers/monitors/what-have-you. Of course, since emulators can't load files from tape, it's not really the same any more.

## **Epilogue: AA again**

The various complexities of the Multiface meant that Amstrad Action readers were always writing in with questions. It's actually quite hard to come up with attractive illustrations in a computer magazine. So AA always used to print a picture of a Multiface.

Until one fateful day, when the usual spot was blank. The caption said it all: "We used our picture of the Multiface so much that it wore out. So this is blank until we get round to taking a new one."



## Ask the Internet

*Help is just a few clicks of the mouse away. Brian Watson suggests several ports of call for the puzzled CPCer*

Many CPC enthusiasts now have, at least, some access to the Internet even if they don't have a PC or Mac of their own.

With a choice of CPC-related magazines now hard to find, and bi-monthly issues of WACCI too infrequent to get a fast response to an urgent enquiry, the only option might seem to be the telephone. Well, yes, the telephone is a good option if you know who to call and the Help-liner list in each copy of WACCI is certainly the best place to start. But what if you need help at once? This is where the internet really comes into its own.

Probably the best starting point is the FAQ (frequently asked questions) file that is maintained as a web page by Emmanuel Roussin, the creator of the comp.sys.amstrad.8bit newsgroup, of which more later...

### Ceci n'est pas un PC

Anyway, as this is not a PC magazine, I'm assuming that if you have access to a PC you can get past the basic operations of it, such as how to switch it on and load up your web browser software. So, once you've done that, go to the following address: [www.genesis8bit.com](http://www.genesis8bit.com).

Once there, and I am assuming you will click on the English union flag rather than the French tricolore, you will find that you are in the English language version of the site and that the counter says that about 18,000 visits to the page have been made before yours! As you see, it's a popular site for CPC enthusiasts and a very good springboard for getting an immediate answer to your enquiry.

Your first call should be to the index of options that is on the left of the screen. In it click on the word "FAQ", for the "Frequently Asked Questions", section. It is just that; a list of questions that have been frequently asked in the newsgroup and elsewhere together with the current answers as far as Emmanuel knows them. It is an amazing CPC compendium, with a wealth of information that may answer your enquiry at once, plus a list of links to people and organisations from the global community of CPC enthusiasts that may be a good second line of enquiry if you still haven't found quite what you need.

One of the links that will appear there soon (if it hasn't already) is the one to WACCI's own website at [www.wacci.org.uk](http://www.wacci.org.uk). It is hoped that it will bring its own strengths and distinctive voice to CPC user support including fuller contact details of those WACCI members who are prepared to offer Helpline support. To keep reprinting that in full in every issue of the magazine would be wasteful of the space, but in a website one can afford to "stretch out a little".



### This is the newwws

Another good source of help is the comp.sys.amstrad.8bit newsgroup (as previously mentioned).

This is like a rolling noticeboard of headed conversations on (mostly!) Amstrad-related topics so you can post a message headed “Solution to The Bard wanted”, say, and the chances are someone will post a follow-up message telling you where to find a map, or perhaps even the full solution, to this once-popular adventure game.

I’m amazed how many “lurkers” there are who read the amstrad.8bit newsgroup but don’t actually post messages to it. This became evident when I advertised that I was setting up an e-list for people who want to get or dispose of old computer kit. Within a day I had had nine people sign up for it. They were all interested in the CPC stuff I had to dispose of, and I had heard of none of them before!

But note that you can’t just type this address into your web browser: you need to set up a ‘news-reading’ program. You can use a dedicated piece of software, and most e-mail programs (such as Outlook Express) also provide this facility. Consult the help files, or ask your Internet Service Provider, if you’re not sure how to go about it.

### **Dial E for pizza**

E-lists: now there’s another option for obtaining your CPC user support. To explain, it’s like signing up for a newsletter that then arrives in the e-mail inbox of all the subscribers to it. It costs nothing to join, you can post a message to it yourself (such as your hypothetical “Solution to The Bard wanted” request) and you can unsubscribe from the list whenever you choose to.

The most obvious ones are the WACCI, CPC and 8bitkit e-lists, though there are many others for more specialist discussions. Did you know, for example, that some CPC hobbyists are designing and planning to build a new version of the CPC? There are three e-lists dealing with various aspects of that particular project. *(And we’ll have an article on that very thing in a future issue. – Richard)*

So, there you are, a bit of CPC assistance at your fingertips when WACCI or the phone are just not quite enough.

### **Our dear Watson**

If you would like further help with any of the sources of help mentioned in third article, please phone me one evening on 01353 777006, e-mail me at [brian@spheroid.demon.co.uk](mailto:brian@spheroid.demon.co.uk), or write to me at the Sutton address on the front page of this issue of WACCI.



# 101 Uses for a Dead CPC

*Is your Amstrad exhausted? Past it? Terminally tired? Dead to the world? Brian Watson knows just how it feels*

You may have seen those amusing little books with titles such as “101 Uses For A Dead Cat” and so on. You may even have been given one for Christmas or a birthday as, from my connections in the gift business, I know they sell by the shedload!

Well in the same spirit, I offer you “Uses For a Dead CPC”. This is not as silly as it may at first sound. CPC enthusiasts are notorious hoarders - yes, that does include you - and I’d be prepared to bet that you have at least one bit of apparently-dead CPC kit cluttering up the place somewhere in the house because “it would be a shame to throw it out” and “you never know when...” You know it’s true.

## All for one

One of the much-vaunted advantages of the CPC series when they were sold new was that it was an “all in one box” computer; it came complete with a monitor, so the new user did not have to sacrifice the use of the family television or buy a separate monitor to use the new computer as they would if they’d fallen for the seductive patter of the salesman offering the charms of a Sinclair Spectrum or a Commodore C64, for example.

In fact the CPCs were, and are, modular in that the keyboard part and the monitor were not supplied “hard-wired” together and were designed to have bits, such as an external disc drive, added and/or interchanged later.

Not everything in the CPC/CPC Plus series fits everything, but here are some fairly obvious suggestions for using the still-working parts of otherwise-dead CPCs.

## Replacing your monitor

Has your monitor failed in some way? A broken carrying handle is no big problem as the broken bits can be removed easily enough, but what if the monitor has developed a flickery display? Perhaps one or more of its socket connections are broken or loose? Or has the power supply unit (which is the same as that fitted to a SAM Coupe/Elite computer, by the way) started requiring all ROMs to be unplugged before it will fire up the computer?

In all these cases, we can assume that the keyboard unit is probably fine, so simply replace the problematic monitor with another one.

If you don’t play games much, a mono monitor can be a very acceptable substitute for text-only display or, if it’s a mono one you are getting rid of, why not take the opportunity to upgrade to a colour monitor? Remember, if you have an disc drive to power, the simplest solution is to get a monitor with a socket that will drive it. Otherwise, you’ll need to get an external power pack.

## Fixing disc drives

The most common symptom of an impending CPC problem where a disc drive is fitted is the intermittent appearance of “READ FAIL” notices on the screen and your program failing to launch promptly every time. The chances are that it is only the belt in the drive that has stretched and replacing it with a new one will cure the problem, but what if it is something more serious? I don’t want to alarm you, but what if the disc drive heads are worn out or the heads have got knocked well

out of alignment?

CPC 3" disc drive mechanisms are interchangeable and, if you are stuck with no A: drive on a Sunday afternoon, the unit that can be taken out of an external B: drive unit will make an acceptable swap to get you out of trouble.

Incidentally, the 3" drive mechanisms from a PCW can be used in some circumstances, but you are best advised to stick to using CPC mechanisms for spares if you are not sure where the compatibility problems may be encountered.



### **Reviving tape decks**

Now that's disc drive users given a few options, but CPC464 tape users deserve a rescue route too. Of course, the obvious solution is to have a disc drive fitted to use in times of trouble but, failing that, what if the tape deck starts failing? Option one in your trouble-shooting routine is to clean the tape heads with the appropriate solvent applied with a cotton wool stick and option two is to check the tape heads' alignment. Once you've done both of those and found you are still getting problems, you can start plundering another 464.

Belts on a tape mechanism can stretch and fail as easily as they can in a disc drive, but taking one out of a working tape drive is asking for trouble as you will probably stretch it while doing the swap. Far better to transfer the whole mechanism from a keyboard unit in a 464 which has developed another fault.

### **Internal surgery**

And that brings me to the other parts of a keyboard unit. The cases themselves are quite robust, but can be swapped within each type – 464 for 464, 664 for 664, etc – in most cases. There are some variations, however, so check carefully where all the screwpoints and all the "ins and outs" sockets are located even if, on a cursory glance, they appear to be the same.

Another variation, if you are planning a little remedial swapping, is in the actual keys units themselves. Earlier types have higher keys set in the case than later models, at least on the 464s. Get past that hurdle though and, as long as you find connections in the same places once you open the computers up, you can replace one keys unit with the other. If you do encounter the different types of keyboard unit and you know that the second one works though its monitor has conked out, just swap the whole keyboard rather than try to cannibalise it for its parts.

Replacing individual keys in a keyboard is fraught with fiddly difficulties and I recommend you either replace the letters on them (if that's the problem) with rub-down letters and seal them with clear nail varnish, or swap a whole keys unit rather than messing about trying to replace just one or a few if they are actually failing to work.

Well, that's a few simple interchanges of spares that might get you out of trouble. So, don't throw away that bit of CPC because, really, "it would be a shame to throw it out" and "you never know when..."

You can subscribe to Brian's 8bitkit 'sales and wants' e-mail list via the WACCI website. Alternatively, WACCI is always happy to take your Market Stall ads at the usual address.



## And now... how to break your CPC again

*Jonty presents: the Patent WACCI Disc A-side/B-side Conversion Method. (Right. Let's see how good Quark XPress's spell-checker really is. – Richard)*

Do you own a 5.25" or similar drive? Are you only using a single side of the disks because you don't understand how to use a utility like MS800, Maxidos or even the Bonzo suite? Then here is a method I found allows me to use both sides of a 5.25" disk when I don't want to use a non-standard format method.

### What's required

A pair of sharp scissors  
A sharp pencil  
A ruler, or straight-edged card etc.

### How to do it

With the pencil, draw two straight lines across the face of the disk cover from the present cut-out notch over to the opposite edge. Cut a notch the same size (approx 0.25cm – that's 1/10in) out from the opposite edge. As long as you don't over-cut, the notch you shouldn't hit the actual disk itself.

Now draw two lines across the face of the disk cover, from the small hole which sits at eleven o'clock to the large central hole. Cut out a slot roughly a centimetre from the large central hole. Turn the disk over and repeat the action at point X from the small hole, which should now be sitting at roughly two o'clock. You are cutting over the top of the actual disk this time, so try and keep the scissors raised from the disc face.

### And finally

Format the disc using whatever utility you prefer: verify the disc before using it. If all cut edges are flat, there should be no problems with the disc from now!

### Please note

Anyone who damages their disks trying out this method has done so on the understanding that they have carried out the work incorrectly! I have simply described a working method and make no guarantees to this method working if not carried out with extreme caution.

### Jonty's Diary

For future reference I WILL be PC based from the end of this month and will be learning to use the new machine as fast as possible (*sorry, the spell-checker appears to have imploded – Richard*). For those who may wish to contact me who are stern-fast CPC'ers I WILL be keeping my CPC active until I can't repair or get spare parts for it. I WILL STILL be contactable with 3", 3.5" as well as

5.25" disks. I can and AM doing artwork for PC as well as CPC games adventure etc and can be contacted/SMS'd at: 07899 822528.

I have a NEW BT land line number that is no longer PD, and apologise to those who may have been trying to reach me at the old number since the 25th of this month.

I will be setting up a multi-media games related website and email address contact point in the nearest possible future. Once this takes place I WILL inform everyone who may be interested in Wacci as well as DARKSIDE Night Life etc.

ANYONE creating a CPC, PC, PLAY STATION etc based game that requires additional artwork - or assistance with artwork based ideas contact me and we'll talk.

Night Life#7 IS being written over the next couple of months and WILL be available from issue#1/#7 in ALL CPC disk formats and PC formats in the near future.

YOURS SCINCERELY

Jonty.



## Programmers' Patch

*Matthew Phillips puts the obscure RAM Music Machine to good use by connecting an Acorn RiscPC to his faithful CPC*

Well, it's a year now since this column last appeared in WACCI, and that one had been written just after the WACCI gathering in Peterborough in September 1999, so what have I been up to in all that time? What delight of programming expertise (ahem) will be served up for your delight? Hang on, that's "delight" twice in one sentence. Bother.

Last time we were looking at the possibility of installing a "virtual" hard drive on the CPC, by writing some clever software to communicate with a bigger computer over an RS232 serial link, and get the bigger computer to store the data and pretend to be a hard drive. Unfortunately, despite having such a long break, I had done very little towards this goal, so with just two days to the magazine deadline, I got out my notes and started working out how to patch CP/M Plus as I had promised.

I knew that the files I needed were somewhere on a floppy disc. I have most of my old discs copied as DSK files (disc images) on the Acorn RiscPC which we use most of the time. The disc images are useful for using with Andreas Stroiczek's CPC emulator, which we probably use more than the real CPC now!

Unfortunately the disc I wanted was not among these, so I turned on the CPC and started going through the discs. I found the files quite quickly on a data formatted 3.5 inch disc. To get them to the Acorn, however, I needed to copy them to a 3 inch disc, and then put a PC format disc in the 3.5 inch drive to copy the files across. This was where I hit a problem. None of the discs I put in the old 3 inch A drive worked. I just got "disc missing", and "read fail". As I was feeling adventurous, I took the computer and disc drive apart and gave them a good vacuum clean, but that did not help. I think it must be the drive belt, and I do not have a spare. Time to order one from that nice Mr Watson.

Except that I need the files now to write the article for Monday's deadline.

Perhaps I can use the PCW to transfer the file. My PCW has a 3.5 inch drive, and PCWs read data format discs. I could copy the file to the M drive, put a PCW format disc in drive B, and save it to that. The Acorn reads PCW format discs fine. There is one problem. While the PCW reads data format discs in the 3 inch A drive, it does not read them in the 3.5 inch B drive, because it assumes that the forty tracks are spread twice as wide as as they really are. So that solution will not work.

Right! The CPC has an RS232 interface, and so does the Acorn. Can I hook them up and transfer the file like that? Probably, but one of the things I still need to do is to learn how to program the serial interface properly, so I have no ready-written code to hand. It could take a while to get it to work.

### Talking computers

What about MIDI? The CPC and the Acorn each have a MIDI interface. I have never programmed the Acorn's MIDI interface, but it might not be too hard, and I have a useful little RSX to transmit bytes from the CPC which appeared in this column in issue 120 (March/April 1998). It is also on the Programmers' Patch disc, which you can get from the WACCI PD library. Funnily enough, I

have a copy of that disc, so I dug it out to see what I could do.

The listings in with this article are the result! There is a CPC BASIC listing which poke in the machine code needed to do the job. The machine code is listed in the assembly language listing, so you can see how it works. Finally, there is a BBC BASIC listing for the RiscPC (or any RISC OS computer).

Though intended for musical instruments to talk to each other, MIDI is just a special kind of serial link which transmits data in bytes. I was hoping just to be able to send the files I wanted byte by byte over the MIDI link and receive them on the Acorn. However, the Acorn MIDI interface knows rather more about MIDI than the CPC does, and tries to fill in “missing” commands (running status is the technical MIDI term), so this can muck things up. I therefore had to develop a protocol to send the file safely.

The whole file is packaged into a system exclusive message. This is a special MIDI message beginning with the byte &F0 which is designed for manufacturers to use to send special data. We can then send whatever bytes we wish without the Acorn MIDI interface inserting extra command codes for us. After sending &F0, the program then sends the filename, terminated by a null byte.

It is not safe to send some bytes greater than 128 in a system exclusive message, so for those, I decided to send them as a null byte followed by the value with 128 subtracted. To send the null byte itself, we send two nulls in a row.

If you look at the assembly language listing (over the page), you will see how the CPC sends the file, byte by byte, doing these conversions as required. The BBC BASIC program then does exactly the opposite to receive the file and save it to disc. To send a file from the CPC, you just set a string variable to the name of the file you want to transfer, and then do:

```
CALL &8000,@filename$,0
```

That’s assuming you are using a RAM Music Machine. The zero should be changed to 1 for the EMR MIDI interface, or 2 for the DHCP interface.

All in all, it took just an hour to get it all working. The assembly listing was written on the Acorn and assembled using the ZMAC assembler. This is different from the CP/M ZMAC on one of the PD discs. The Acorn ZMAC is a port of an assembler which is maintained by Mark Rison, who is writing CPC/IP for connecting CPCs to the internet. After assembling on the Acorn, I then typed the hex codes in on the CPC to make the CPC BASIC listing. Once the utility was working, I then used it to transfer the listing back to the Acorn so that I could e-mail it to Richard for the magazine!

### **In an ideal world...**

Of course, many improvements could be made, for example to have a checksum so that you can verify that the data has transferred correctly. Also, it only copes with ASCII files at present, so that needs sorting out if I am to use it regularly. If I can get it read and transfer the contents of a whole disc, then that could be a quick method of copying the rest of my discs across to the Acorn.

Now I have transferred the files, perhaps by next time, I will have put them to use in patching CP/M Plus like I originally intended. If any of you want particular things covered in this column, just write in to Fair Comment, or e-mail me on [progpatch@sinenomine.freemove.co.uk](mailto:progpatch@sinenomine.freemove.co.uk) – it’s always good to hear what people have found useful. I would be particularly interested to hear from anyone who has a MIDI interface or an RS232 interface, and what you use it for.

### **The CPC BASIC loader**

```
1 REM Sends ASCII files over MIDI
2 REM using very simple protocol
3 REM CALL &8000,@filename$,i%
4 REM where i%=0 RAM Music Machine
5 REM       i%=1 EMR interface
6 REM       i%=2 DHCP interface
```

```

7 :
10 SYMBOL AFTER 256:MEMORY &7FFF
20 RESTORE 100:er=0:addr=HIMEM+1
30 FOR i%=0 TO 16:READ cod$:chk%=0
40 FOR j%=0 TO 11:a%=VAL("&"MID$(cod$,j%*2+1,2))
50 POKE addr,a:chk%=chk%+a:addr=addr+1:NEXT
60 IF chk%VAL("&"RIGHT$(cod$,3)) THEN PRINT"Error in line"100+i%*10:er=1
70 NEXT
80 IF er=0 THEN PRINT"Sendfile installed"
90 :
100 DATA FE02C0DD7E0011698001060041C
110 DATA 216F80B728093D2175802803376
120 DATA 217B80EDB0CD6980DD6E02DD699
130 DATA 660346235E23666B110052E536C
140 DATA C5CD77BCD1E1D03EF0CD6C8082E
150 DATA 7E23CD6C801520F8AFCD6C805EF
160 DATA CD80BC3015FE81380857AFCD5E0
170 DATA 6C807AD680CD6C80B7CC6C806E4
180 DATA 18E6CD7ABC3EF71803C38180615
190 DATA C39E80C38180C39E80C38D80756
200 DATA C3AD80C39980C3BC8001ECF87B0
210 DATA 3E03ED793E15ED79C901F2F8614
220 DATA 3E03ED793E16ED79C901E0F8603
230 DATA 18F201EEF8F5ED78E60228FA755
240 DATA F10DED79C901F2F8F5ED78E6858
250 DATA 0228FAF10CED79C901E0F818641
260 DATA EF000000000000000000000000EF

```

## **An Election Broadcast on behalf of the Acorn Party**

Some of you may not know what I mean when I talk about our Acorn RISC OS computer. Acorn were perhaps most famous for designing the BBC Micro, but in 1988 they brought out the Archimedes, based around the ARM processor which they had designed themselves (I believe Brian Watson knows one of the people involved). It was very popular in schools, but if you have met RISC OS computers there, they were probably old ones, rather than the modern machines which are still being made and developed. RISC OS is used in all sorts of situations where people need a robust computer system, such as in harbour radar systems and to run TV's "Who wants to be a millionaire?".

There has been fuss in the past about whether WACCI should cover PCs, but for me the objection has always been that PCs are such boring computers. They are so common, and they are not half so much fun to program. Take a quick look at the BBC BASIC listing for the Acorn, and you will see the SYS command. This allows you to call the firmware directly, using a name for the routine rather than a meaningless address. You can specify what is to go in the registers upon entry, and you can read back the registers and flags on exit. Simplicity itself. For more information on RISC OS computers, see [www.riscos.org](http://www.riscos.org).

## **CPC assembly listing**

```

ORG &8000

..sendfile
CP 2
RET NZ          ;exit if no. of parameters <> 2

;set up jumpblocks for chosen MIDI interface
LD A,(IX+0)
LD DE,jmpreset
LD BC,emrblocks-ramblocks
LD HL,ramblocks

```

```

OR A
JR Z,copyblocks
DEC A
LD HL,emrblocks
JR Z,copyblocks
LD HL,dhcpblocks
..copyblocks
LDIR
CALL jmpreset      ;reset the interface

;find filename and open file
LD L,(IX+2)
LD H,(IX+3)
LD B,(HL)      ;length of string is now in B
INC HL
LD E,(HL)
INC HL
LD H,(HL)
LD L,E      ;address of string is now in HL
LD DE,&5200  ;address of 2k buffer
PUSH HL
PUSH BC
CALL &BC77  ;open the file to read
POP DE
POP HL
RET NC      ;exit if error

;send &F0 to start a system exclusive message
LD A,&F0
CALL jmpmidisend

;send the filename terminated by a NULL byte
..sendname
LD A,(HL)
INC HL
CALL jmpmidisend
DEC D
JR NZ,sendname
XOR A
CALL jmpmidisend

;read the file a byte at a time
..readloop
CALL &BC80
JR NC,close  ;finish upon EOF or error
CP &81
JR C,notbig
;if the byte is greater than 128...
LD D,A
;...first send a null byte...
XOR A
CALL jmpmidisend
LD A,D
;...then send the byte less 128.
SUB &80
..notbig
CALL jmpmidisend
;if the byte was an actual zero, send it again.
OR A
CALL Z,jmpmidisend
JR readloop

..close
CALL &BC7A

```

```
LD A,&F7
JR jmpmidisend ;end system exclusive message
;these are altered to suit chosen interface
```

```
..jmpreset
JP ramreset
..jmpmidisend
JP ramsend
```

```
..ramblocks
JP ramreset
JP ramsend
```

```
..emrblocks
JP emrreset
JP emrsend
```

```
..dhcblocks
JP dhcpreset
JP dhcpsend
```

```
..ramreset
LD BC,&F8EC
LD A,3
OUT (C),A
LD A,&15
OUT (C),A
RET
```

```
..emrreset
LD BC,&F8F2
..ehrcommon
LD A,3
OUT (C),A
LD A,&16
OUT (C),A
RET
```

```
..dhcpreset
LD BC,&F8E0
JR ehrcommon
```

```
..ramsend
LD BC,&F8EE
PUSH AF
..ramslp
IN A,(C)
AND 2
JR Z,ramslp
POP AF
DEC C
OUT (C),A
RET
```

```
..emrsend
LD BC,&F8F2
..ehscommon
PUSH AF
..ehsslp
IN A,(C)
AND 2
JR Z,ehsslp
POP AF
INC C
```

```

OUT (C),A
RET

..dhcpcsend
LD BC,&F8E0
JR ehscommon

```

## Acorn BASIC listing

```

REM Reset MIDI interface
SYS"MIDI_Init",0 TO ,h%

REPEAT
REM Wait for a system exclusive message
WHILE FNgetMidiByte<>&F0:ENDWHILE

REM Read the null-terminated filename
filename$="":a%=FNgetMidiByte
WHILE a%<>0
REM Convert "." to "/" for RISC OS
IF a%=ASC(".") THEN a%=ASC("/")
IF a%>32 THEN filename$+=CHR$(a%)
a%=FNgetMidiByte
ENDWHILE

REM Open the file for output
PRINT"Receiving "filename$
fh%=OPENOUT(filename$)

REM Read the rest of the bytes
a%=FNgetMidiByte
WHILE a%<>&F7
REM Zero is a special case
IF a%=0 THEN
a%=FNgetMidiByte
IF a%>0 THEN a%+=128
ENDIF
BPUT#fh%,a%
a%=FNgetMidiByte
ENDWHILE
CLOSE#fh%
OSCLI("SetType "+filename$+" Text")
PRINT"File received and saved."
UNTIL FALSE

DEFFNgetMidiByte
REPEAT
SYS"MIDI_RxByte",0 TO byte%
UNTIL byte% AND 1<<24
=byte% AND &FF

```



## The A-Z of the CPC: Amstrad

*Our alphabetical look at all things CPC begins with a history of the company that made it by Richard Fairhurst*

In the beginning was the word. And the word was Amstrad. And the word was a rather corny conflation of AMS (Alan Michael Sugar) and Trading. And when Adam Shade came to name his PD library, he called it Dartsma, possibly because he thought it'd be amusing to reverse such a well-known name, but more probably because he just couldn't spell it.

In the last 25 years, Amstrad has gone from rags to riches to (let's be charitable) obscurity. It hurried along a couple of revolutions – consumer electronics, home computing – that were happening anyway. Nothing more. When the history of home computing comes to be written, Alan Sugar's company will merit a couple of index entries and a few paragraphs on the PCW word-processor.

### The dark ages

Incidentally, this is a history crying out to be written. The story of the over-optimistic start-ups, many clustered around Cambridge, launching almost one new home computer a month, neatly predates today's dot-com boom and bust. Remember the Computers Lynx? The Flan Enterprise? The Jupiter Ace? The Dragon 32? Exactly.

Pioneering games coders such as David Braben (Elite), Geoff Crammond (Sentinel) and Matthew Smith (Manic Miner/Jet Set Willy) are celebrated only in Internet fan sites. I doubt any book currently in print includes the word LocoScript. But these were the computers, the programmers, the programs that set the scene for today's chips-with-everything lifestyle.

But while garage start-ups such as Apple and Commodore (in the US) and, later, Sinclair and Acorn (over here) were pioneering home computing, Alan Sugar was selling hi-fi lids from the back of his van, doing the rounds of East London markets. His subsequent excursions into audio equipment had a plug on the back, but were just as technologically basic. Amstrad products were cheap. Not necessarily good value, certainly not high fidelity, but cheap.

Stories about Sugar's wheeling and dealing are legion. Perhaps the best one relates how he managed to get High Street giant Dixons to sell his products. Granted an audience with proprietor Stanley Kalms, he proceeded to extol the virtues of his latest amplifier import. Kalms knew it was rubbish. So, probably, did Sugar.

But Kalms wanted to keep Sugar sweet, because he had contacts in the Far East that could potentially be useful sources for Dixons' own brands, such as Saisho. All right, says Kalms, we'll put your amp in the catalogue. We won't stock it in the stores, but we'll let our customers order it. (Not that they would.)

Sugar agreed. The next week, he gave one of his relatives the money to order an amp from Dixons. The order was duly processed, and a Dixons flunkey phoned Sugar to obtain what they expected would be the one and only Amstrad amp they'd ever sell. "Don't be so bloody stupid," snapped Sugar. "I'm not sending you one amp. You've got to order at least a hundred!"

Then there's the old one about the Amstrad stereo unit with a button marked "Sound Quality Boost". Some inquisitive soul opened the system up and found it wasn't connected to anything.

## **The genesis of Arnold**

On such business acumen did Amstrad prosper, until Sugar, casting round for a new outlet for affordable electronics, lighted upon the computer market.

The conception of the CPC has been well chronicled, notably in Amstrad Action. The original design team envisaged a machine based around the 6502 processor, because that was what Commodore's VIC-20 used – one of the best-selling computers of the time, but already on its way out.

The project was go. The designers weren't. Proving inadequate to the task, they were swiftly booted out, and replaced with names still familiar to CPC users: Locomotive Software, William Poel, and so on. The result was the original CPC 464, a well-built, easy-to-use home computer, which broke no new ground over and above the standards of the time – Sinclair ZX Spectrum, Commodore 64, BBC Micro – but was sensibly priced and intelligently packaged.

This showed in two ways. Firstly, the CPC was a one-box solution: take it out the box, plug it in, and away you go. The tape drive was built in, so there was no more faffing around with adjusting volume levels before a game would load – standard practice on Sinclair's machines. The power supply was in the dedicated monitor: the CPC's competitors needed an external unit and the use of your telly. By selling the computer, tape deck and monitor combination together, Sugar's baby commanded a higher price – higher profits – yet seemed good value to the customer.

Secondly, there was Amsoft, Amstrad's software arm. It didn't program much itself, preferring to commission outside programming teams or small software houses. But it ensured that, when you bought a CPC, there was a ready-made library of games, educational programs, and even the odd word-processor to choose from. Instantly, the CPC had eclipsed the Enterprises and Lynxes, and was on a par with the Spectrum and C64. The less said about the actual games, the better.

And that, with one or two refinements, is the same CPC we know today. Expansion kits (disc drives, Amstrad-branded printers, serial interfaces and modems) followed in due course. The disc drive was soon incorporated into the main computer, resulting in the short-lived (but twiffic) 664 and the perennial 6128 – intended to spearhead Amstrad's failed drive into the American market, but soon revived as the flagship CPC back home.

The CPC design remained unchanged until the ill-fated Plus machines, a story in themselves. Amstrad ceased production of the Plus in 1992 or so – a fact singularly unreported outside French magazine Amstrad Cent Pour Cent.

Meanwhile, Sugar was keeping busy. The one-box approach was repeated in 1986 to produce the PCW 8256, a word-processor with distinct similarities to the CPC. £399 got you a computer, monitor, word-processing software, disc drive and printer; another good deal, and to this day, the PCW is what most laymen associate with the word 'Amstrad'. It, too, spawned a host of derivative machines with varying memory, disc drive and printer configurations.

Then came the PC. IBM's unexciting business computer, for that's all it was in the mid-1980s, had been cloned a thousand times in the States – notably by Compaq. It had even been cloned over here, by some outfit called Advance. But once again, no-one had done the one-box solution as cheaply as Amstrad was to.

The entry-level PC1512, with monochrome monitor and 512k memory, could be yours for the price of a PCW. (Though you didn't get the printer.) Colour versions, upgraded specs (the PC1640), and 'luggable' laptops (the PPC512 and 640) followed. All did rather well – well enough, at any rate, for Amstrad to be able to afford to buy Sinclair Research, its main British rival.

## **Back to basics**

Sir Clive Sinclair's company had pioneered British home computing. After the simple ZX80 and ZX81 came 1982's phenomenally successful ZX Spectrum, an affordable colour computer with barely serviceable sound and a bizarre rubber keyboard. Cheap, cheerful, and easy-ish to use, the public loved it. In Britain, neither the CPC nor America's Commodore 64 ever caught up with the 'Speccy'.

But Sinclair's next-generation computer, the partially 16-bit QL (for Quantum Leap), was a disaster. The firmware was ridiculously bugged. Deliveries were slow, even by Sinclair standards (about on a par with Robot PD, in fact). And flashes of brilliance in the design, such as the elegant Motorola 68008 processor, were countered by the idiotic decision to use unreliable Microdrive tape cartridges instead of discs.

Both this and the ill-fated C5 three-wheel scooter (and you remember that) exhausted Sinclair financially. The Spectrum Plus and 128 offered very little more than the original 48k model. Buyers were tempted by the sexy-looking Commodore Amiga and Atari ST, which leapfrogged the forgotten QL. Sinclair embarked on a project to replace the Spectrum – the SuperSpectrum, or Loki – but no longer had the resources to follow it through.

Alan Sugar wasn't the first wheeler-dealer offering Sinclair a lifeline. That honour went to fat crook Robert Maxwell, whose Daily Mirror even printed an edition headlined 'Maxwell Saves Sinclair'. He didn't.

In fact, neither did Sugar, even if he did buy the company. The Sinclair brand was only to last a few more years. Amstrad repackaged the Spectrum twice, first as the Plus 2 – a Spectrum 128 with proper keys and a tape recorder stuck on the side – then as the Plus 3, the same thing but with a 3-inch disc drive instead. The similarities to the CPCs were more than skin deep: the Plus 3's disc operating system was written by Locomotive, and could even read PCW discs.

(Another digression: this is one of the most fascinating pieces of firmware ever to grace an 8-bit machine. The Plus 3 DOS was chocker with self-test modes, hidden displays, and other 'Easter Eggs' that could be activated by obscure combinations of keys.)

The other Sinclair was the PC200, a dismal home PC cased in Sinclair black. With similar capabilities to the PC1640, it was Amstrad's first attempt to challenge the ST and Amiga. Though eerily prescient in anticipating the PC's modern-day role as all-round entertainment station, the PC200 nonetheless tanked. The Amiga, in particular, had set new standards in graphics and sound, giving rise to spectacular new games like Xenon, Populous, Lemmings and Dungeon Master. The PC200 went 'beep' and displayed a handful of feeble colours – making it, if nothing else, an ideal inheritor of the Sinclair tradition.

## **Beginning of the end**

Meanwhile, the Amstrad brand continued to appear on a series of steadily faster PCs. Some were quite nifty, most fairly average in an increasingly competitive market. The most ill-fated was the PC2000 series, which had followed the 1640. It was a decent enough compromise between price and performance. But the hard drive controllers, bought in (as was standard practice) from a US company, simply didn't work.

In latter years, Amstrad would attribute its decline in the PC market to this one event. The faulty components, claimed Sugar, had cost his company its good reputation, and forced an ignominious retreat from the High Street computer retailers.

This line of argument garnered some sympathy and, more importantly for Amstrad's chairman, generous compensation. Sugar even established a subsidiary, Amslit, whose sole purpose was to lead litigation against Western Digital et al. It thrived while the rest of Amstrad's computer division withered.

Because to blame a few dodgy microcontrollers for the failure of a market-leading company is palpable nonsense. In reality, the market had moved on. Cheap was no longer enough by itself. Today, PC buyers are either looking for a brand – Dell, IBM, Compaq – or a bog-standard clone assembled by a low-margin specialist like Tiny, Time, or one of the countless local PC dealers.

Amstrad, which never had a reputation for quality nor especially low prices, was caught in the middle. But unlike similar companies such as Packard Bell, it never managed to tie up the distribution deals with Dixons which would have saved it. Indeed, in one particularly ill-judged outburst, Sugar announced that PC prices were too low, Amstrad would be putting its prices up, and it expected other manufacturers to follow suit. Sugar's rivals couldn't believe their luck – and kept

on selling PCs to the same people who'd once bought PCWs.

In time, the last Amstrad-branded PC appeared. Sugar bought a company called Viglen, one of the better PC manufacturers. It continued in its own way until another restructuring saw it sold off again. Amstrad continued to make stereos, videos, and other dependables. And Sugar squandered a large part of his personal fortune on Tottenham Hotspur.

### **The sad case of the missing scrollbars**

One part of Amstrad keeps alive the spirit of the mid-'80s: the Innovations division. It retains Sugar's preoccupation with all-in-one solutions, which he first spotted in the electronics emporia of Tokyo. The infamous PCW16, a short-lived and deeply flawed successor to the popular word-processor, sprang from this division. So did the Amstrad E-m@iler, the company's current great white hope. This phone with keypad provides simple e-mail facilities without the need for a PC, and you'll find boxes of them cluttering up a Dixons near you.

Another neat idea, but not one which is showing any signs of setting the world alight. Like the PCW16, its design is too compromised to take on the all-pervasive PC. Why no web browser – even a simple WAP one? Why does Amstrad attempt to make money from flogging print-like adverts that appear on the E-m@iler's screen, when a simple e-commerce facility would have opened up great possibilities for selling books, CDs, groceries and the rest to a captive market? Who, in short, does Sugar think he's kidding?

Amstrad has long been an irrelevance in the computer market. Products like the PCW16 and E-m@iler are viewed with benign amusement by the technology press, and, one suspects, the rest of the world. And now that he's finished annoying Spurs supporters, it seems unlikely that Alan Sugar will make much difference to people's lives ever again.

But for everyone reading this magazine, he did – and for hundreds of programmers, thousands of small businesses, and tens of thousands of game-players. The CPC and PCW were small steps in the long haul which transformed computers from playthings for precocious teenagers into the ubiquitous home appliance. The PC and PCW brought computers into offices that had previously managed with only a calculator and a card index.

Look around, and you will find computers everywhere. Now look back at your CPC. In its modest way, this is where it all began.

### **Disclaimer**

This article is not the result of searches through Amstrad's archives. Nor is it even a competent hack-job rephrasing David Thomas's biography of Alan Sugar (quite a fun book, and worth digging out). It's just how I remember it from years of reading Popular Computing Weekly, New Computer Express and the like. So don't quote me on any of it!

In future instalments of the A–Z of the CPC, we will continue with BASIC, CP/M, desktop publishing, emulators, fanzines, and lots of other wonderful stuff I haven't thought of yet. Except for Z, which can really only be one thing.



## A Word from Dave

Firstly I would like to wish Richard all the very best in taking over the post of Editor.

When I took over from John's long absence, I thought that there would be a lot of articles in the pipeline awaiting publication. How wrong I was. To be quite frank with you all, I struggled to make up the three issues under my editorship. Some of the articles I wrote myself, under the alias of "I don't know who sent this in".

I felt that I could no longer give the time, and I don't have the knowledge to produce any more issues. Believe me, it does take a lot of time putting a magazine together without the help of articles – although if one has plenty of articles to play with, I'm sure the job is a lot easier. I did find it a struggle getting to grips with the Microsoft Publisher program – not a bit like the PowerPage program that Richard wrote.

We can all hope that Richard can keep the magazine going, as I know a lot of you look forward to receiving it. With Richard being very knowledgeable, I look forward to his first issue. But I will stress that Richard will need help, as on one's own, it is difficult. So for the last time from me, please do send in something to publish.

I would like to thank those who gave me the support and sent e-mails, phone calls and the like while I was editor. I'm not leaving the CPC scene: I still have a 6128 plus machine which is used for odds and ends.

Dave Stitson

Rest Home for Retired WACCI Editors

*All the best Dave, and thanks for all your work and kind wishes – Richard)*

# Famous last words

The size of WACCI 137 entirely depends on your contributions. So if you're stuck for something to write, how about:

- Tips and tricks for that 'old favourite' piece of software you use... or a critical reappraisal
- Details of the whizzy new software you're developing
- Why you still use a CPC
- Reviews of new software (and there's plenty of it, so if you'd like to be put on our list of reviewers, drop Richard a line. I'd especially like to hear from people with CPC Plus machines.)
- Your opinion of WACCI 136 or the website

As detailed on page 9, contributions for WACCI 137 would be appreciated by 1st August.