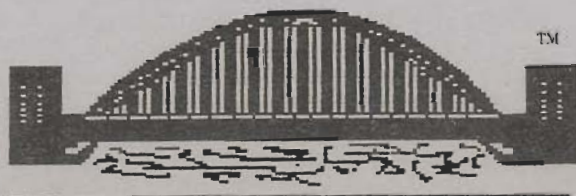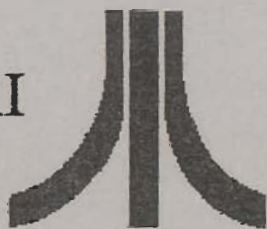# TYNE & WEAR

TM

ATARI 8-BIT

USER GROUP

Issue 29

September/October 1997

TWAUG NEWSLETTER

Publishing

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Max's Comments

In this issue I am talking about Desktop Publishing, programs available on the ST. The first DTP, this is the abbreviation for Desktop Publishing, is Timeworks 2 Publisher. I like this program and yet there are other publishing programs much more advanced and do much more than Timeworks can. For instance Calamus is the tops, I've version 1.9n but the latest version SL96 suppose to be better still, the only drawback to that program is the price, a bit to much for me at the present time. I will write about Calamus in next issue.

In the last few weeks Alan and myself got ourselves hooked up to the outside world, mind you we are still in the infant stage at the moment, but we are finding our feet slowly. So anyone who would like to send us some articles can do so now via E-Mail.

Alan's e-mail: a.b.t@zetnet.co.uk

Max's e-mail: amg@zetnet.co.uk

Why don't you try and have a go by sending me some material to include in the newsletter.

I am waiting for replies.

⬅ for **Snail-Mail**
Post it to this
address

TWAUG NEWSLETTER

PUBLISHING!

This new look newsletter is set up with the Desktop Publishing program "TIMEWORKS 2", on the Mega 1 ST with 4 meg memory. Files are converted to ASCII and transferred to the ST with TARI-TALK. Those files are then imported into the DTP and printed with the Canon BJ-30 Bubble Jet Printer at 360 dpi, with excellent result.
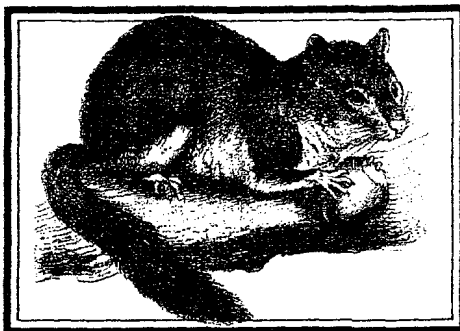
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ISSUE CONTENT

Requesting Help

In the last few issues I have asked for some material to help me out in producing the newsletter, but unfortunately nothing has been forthcoming.

You probably know that I am past my sell-by-date now, once you get that far, that matter they call brain, starts slowing down. I can remember when I was twenty one, I didn't had to think hard for new ideas, now it's the opposite. I don't want anybody to feel sorry for me, every body can look forward to this, why I am saying it is because the work is getting harder every time I start a new issue. You see I am more or less doing this newsletter by myself, bar the odd article I receive, I search for material and when need be type it out set it up and print it. I cannot work on the newsletter day and half the night the way I use to do it, that ¾ of a century is catching up on me. After all it is your newsletter, a little contribution towards it goes a long way, especially sharing your knowledge with every body.

If I had been a professional writer it would make the job of producing a newsletter much easier, but I am far from that. I have to spend a lot of time browsing through magazines for suitable stuff of interest, just to give me food for thought for future articles, that takes up a lot of my time and in the end I seem to loose heart to carry on. You probably have noticed that the last couple of issues have come óut late and this one is later still, reason - no material and having to do my personal work as well. I don't mind setting up this work and printing it, I still enjoy it, but I would like you to lend me a hand by sending articles.

The last time I received any mail was after the survey in issue 25, I haven't had anything since, sorry I am telling a lie, I've included in this issue an article by D.E. Fogerty for which I am very grateful.

Well there we are, I have said my piece and now if some of you writers lend me a hand I will produce this newsletter on time again, and saving the time searching for material. I am sure there are people out there who got some material stashed away somewhere and probably think that nobody wants to read it. So please dig it out and keep the newsletter ticking over and keep supporting the

" ATARI "

FILE TRANSFER WITH KERMIT

By Dennis Fogerty.

It was nice of you fellows at T.W.A.U.G to reply in Newsletter #28 to my enquiry about the TARI-TALK interface. Since writing, I have been lucky enough to be offered an 850 Interface complete with manual at a reasonable price which, naturally, I snapped up. It was originally advertised in a bundle of computer, disk drive, softeware, etc, and the owner wasn't interested in selling seperately. However, it couldn't have sold as expected because, a few weeks later, I was offered the 850 Interface seperately.

Considering TARI-TALK is no longer available I guess any article on it would have limited interest, although I can't help wondering what trials and problems you had setting the whole thing up. Are you so proficient in computers and comms that everything fell neatly into place? I had a terrible time getting my computers to talk to each other - mainly through ignorance - and I thought you might be interested in my antics!

But from the beginning. For several years I have been writing my life story on a 800XL, upgraded to 256K, in the hope that, when finished, it will generate some interest within my family. I am using TEXTPRO 4.5+ and printing a draft copy as I go with DAISY-DOT III on a Citizen 120D printer. Although a bit slow, DD3 gives such a superior finish that, when all the writing and correcting is finished, I will probably use it for the final 2 or 3 copies. At the moment I am about half-way through and already have a pile of XL disks full of text files; not forgetting the backups! Now, having got so far and with reams more to write, I am fearful of hardware breakdown preventing me from completing it. All that hard work down the drain! It doesn't bear thinking of, especially as I also have a Atari 520 STFM upgraded to 1 meg which is rarely used.

While retaining the XL as my main machine it seemed a sensible approach to port my text files across to the ST. By keeping the transfers up-to-date I would have every word duplicated on 3.5 inch disks then, if my XL died, the work could still be completed. Fingers crossed, there will be no breakdowns but there is nothing like being prepared. Famous last words?

I should have been aware that thinking about a setup like that and actually getting it to work is two different things. Now and again I have read various articles on comms programmes, including their manuals, but none was written in sufficient

FILE TRANSFER WITH KERMIT

detail for an ignoramus like myself to set things up from scratch - not until Roger Lacey's article appeared in T.W.A.U.G Newsletter #27 which provided a wealth of information. Thanks Roger. And if I hadn't already bought the 850 interface I could have built Roger's interface for less money.

I already had v.1.2 of the Kermit comms software for the 800XL and I knew that Page 6 had the ST version in their ST PD library. Now, armed with the 850, all I needed was a null modem cable. Fairly adept with a soldering iron I decided to make up my own cable and the article mentioned that only 3 connections were needed for most comms packages - Rx Data, Tx Data and Common. Nothing could be simpler. I do, however, have misgivings about the reliability of magazine wiring diagrams, (T.W.A.U.G Newsletter excepted, of course!), and I would hate to see my computers go up in smoke. In this case, however, the pin-outs are well documented in the relevant manuals and the cable was soon completed.

Despite all my triple checking, the two computers just wouldn't respond to each other. More document studying, and I discovered the ST needed RS232 configuration software, (one was already built into v1.2). Luckily I

had it on another disk so no bother there and, after setting the Baud rate on both Kermits to 9600, I tried again. Amazingly I found porting over to the ST worked fine - but not back to the XL. That direction was, of course, not essential for my purpose but, if things don't work to specification, it keeps niggling in my mind.

I altered parameters every way - except the Baud rate, after all that had worked o.k. After a lot of swearing, and time wasting, I came to the conclusion that maybe the ST required additional connections, such as Carrier Detect, Clear to Send, etc. Out came the soldering iron once again and, this time, with a 7-core ribbon cable, a new cable was assembled. I needn't have bothered though because that didn't work either and I almost gave up the whole idea.

There was only one parameter remaining - the Baud rate. 9600 bps is the highest speed with my XL Kermit so I began selecting the lower speeds and, eventually, at 2400 bps I discovered the ST transferred files on to the XL perfectly. I still can't help but wonder why. I would expect the later computer to be much faster; no wonder the Classic is still so popular.

I must admit to being rather disappointed at the slow speed of

FILE TRANSFER WITH KERMIT

such transfers after reading that modern modems can use 14400bps. In comparison, 2400 must be dead slow but I really am in no hurry so, with things having, at long last, turned out as planned, there is no reason for change.

Now I am thinking of ARCing the files which should use less disk space and speed up transfers. That will require more experimenting and provide me with more excuses for not doing the washing up. So begins my search for suitable ARC programmes compatible with both my computers - any advice from readers?

Reply by Max:

Well Dennis, I am pleased to read that you too like TextPro and Daisy-Dot III. As you probably can recall, the first 18 issues of the TWAUG newsletters were all set-up and printed with TextPro and Daisy-Dot and I also thought how great these programs were and I still do, they are a bit slow when doing a lot of printing. The slowness never bothered me, at least it showed that you could do more with the 8-bit than just play games.

Useless Instructions: I too think that the instructions that come with most

programs are inadequate for beginners. I have been struggling for a couple of weeks with a program before I finally got that dam thing working and I always thought I was far enough advanced now to work things out quickly. So you see Dennis, you aren't the only one who has problems with programs. I have spoken to a lot of people and they said the same thing and most of these persons I've spoken to are much more advanced in computing than I am, or ever will be.

☆ **ARC Program:** I don't think there is a program that's compatible with both machines. The best way to go about that is to port the files to the ST and then compress them, there are some good ARCing programs for the ST available, get in touch with Alan and I am sure he can fix you up with a good program.

☆ **Updated Library Disk:** I don't think we have had any new software since the PD library disk was included as an issue disk. I will have a word with Alan about it to see if he had anything new from our supplier.

DESKTOP PUBLISHING
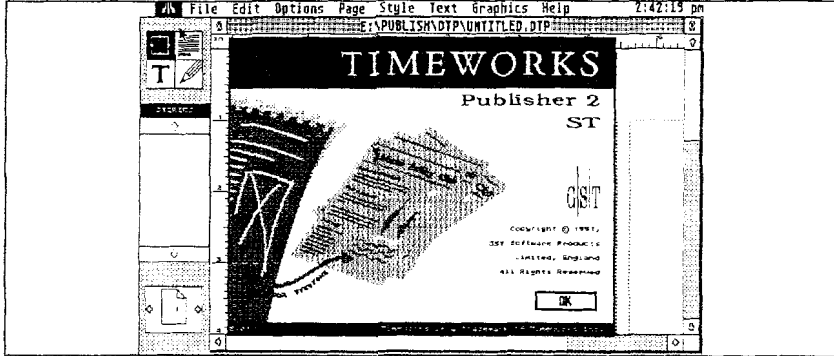
The Timeworks Publisher billboard

As promised in last issue here is the article on Timeworks 2 Desktop Publishing. Timeworks isn't one of the best DTP, but I must say it is one of the easiest to work with, this newsletter has been done entirely with Timeworks 2, this should show you what it can do and I can tell you it does a lot more besides. It lacks a number of options which I would have liked to have seen to be included and that is the rotation of text and images.

The first thing you've must do is to install the program, Timeworks cannot be run directly from the disks on which Timeworks arrives. There are seven disks and they include the main program, the fonts and drivers. When run from floppy disks you must first of all prepare three disks, and

label them as "Startup & Overlays" one "Fonts" and the third "Data". Of course if you have a hard drive it would make life much easier and you wouldn't have the need to swap disks constantly. If you have only one floppy drive be prepared to swap the disks when requested and that means swapping the source disks and also the destination disks. If on the other hand you have two floppy drives life is a little easier but you are still swapping disks in both drives.

I've included the paragraph above just to let you know that when you install Timeworks you must keep your mind on the job in hand if you want to install the program in one sitting. Boot your system and if possible without any accessories and Auto folders, that's how I've done it. Next insert the

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Master disk #1 of Timeworks, all the disks of Timeworks are labelled "Master Disk #1 to Master Disk #7.

Open drive A and then click on INSTALL.APP, once you clicked on Install the copying will begin. You haven't got time to make a cup of coffee, just watch the screen and follow the prompts. The first dialog displayed on the screen is the Installation option, that is for "New Installation", just click on OK. I am sure the next dialog box is to select the drives, you either have a single floppy, or second external floppy or a hard drive. For a single floppy click on OK, the dialog box will display whatever kind of setup you've got, another dialog will come up on screen with the prompt for the screen resolution and this will also be displayed automatically, I must mention here that Timeworks will only run on ST medium, ST high, TT medium or ST high resolutions.

The next dialog box asks you to select a printer, if I am not mistaken, you select your printer from a list displayed and it is also showing you the dpi - dot per inch your selected printer is capable of printing - most printers are Epson compatable. My 24 pin Star was capable of printing at 360 dpi and so is my Bubblejet, and

while we are on the subject of printers, you can add more than one printer into the timeworks, but you must run the FONTWID.APP for each individual printer. After all that the next screen asks you if you want to change your mind before the long process of copying the files begins, this screen displays the name of printer selected, the dpi capable of printing and the screen resolution, and at the bottom of that dialog box is the option to abort or to install, click on one of those two to continue. This dialog box will be displayed throughout the instalation of timeworks, but secondary dialog boxes will be displayed on top of that one requesting you to insert the next master disk, either in drive 1 or drive 2.

When the instalation has been successful a dialog box will be displayed saying - "Before you can successfully run Timeworks Publisher 2.0 you must reboot your machine so that GDOS is re-installed and then run FONTWID.APP" - click on OK. When you click on OK the screen goes blank momentarily and then start up again but I am not quite sure if it reboots the computer, which of course you must do to run FONT-WID.APP. If you cannot see on the screen GDOS 1.1 installed when it

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re-boots, just switch the computer OFF and ON again with the newly created Startup & Overlay disk in drive A, this will load the GDOS and the system that handles the fonts and on screen graphics. When the desktop comes up swap the disk with the one you labelled Fonts, open the window and click on FONTWID.APP program. This will create another two files on the fonts disk relating to the fonts you have chosen, they are called PUBLISH.WID and SCREEN.WID. If it had been successful it will tell you so on the screen, after that you are ready for your first session.

I must tell you here and now that when you are installing Timeworks on disks you cannot choose -"Additional Fonts"- because you haven't got the free space needed for the fonts. The program selects only the Basic fonts and installs them, but with a hard drive the additional fonts can be selected and the installation program will do the rest. Just to give you an idea how much memory the fonts in Timeworks take up here is the amount of bytes the fonts in my set up need and that's 5 430 130 Bytes, in words "five million, four hundred and thirty thousand, one hundred and thirty". In other words you need a hard drive with loads of free space.

Timeworks 2.0 had been updated to Timeworks 2.4 with SpeedoGDOS 5 around 1995, but a lot of people found it to be a pain in the neck. I know quite a number of people who could not install it and yet I hadn't any problems installing it into my system. I only got my Timeworks 2.4 and SpeedoGDOS in 1996, it was just before Compo folded, I was lucky I guess, but I was unable to get those extra fonts that were available, again too slow I guess. I am sometimes too slow to catch cold.

Now when you run Timeworks with floppy drive you will find it is rather slow, but if run on high resolution screen the display is much more scrisp and clear than on a medium resolution screen. (The very first time I used timeworks it was on a medium resolution screen.) It certainly didn't do my eyes any good, now running it on a high resolution screen it is much more to my liking especially doing the work on the newsletter.

If you have a single floppy set up you may have to swap Startup and Font disks several times if you have 1Mb of Ram or less, but eventially you will see Timeworks open-screen. Timeworks is a frame-based DTP program which means a page is created by drawing frames on a blank

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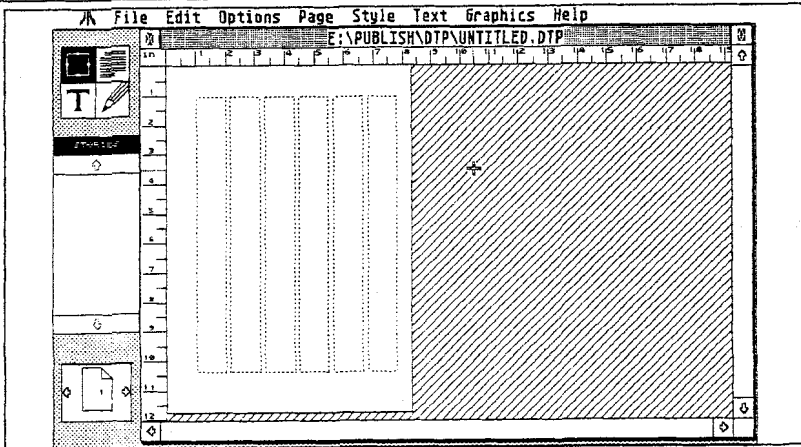
The screen display 1 above is viewed as FULL page

page and then adding text or graphics to each frame as required. When Timeworks is first loaded the program starts up in Frame mode. The screen display 1 above is how Timeworks presents you with the first screen, the very top line is the drop down menu line, down the left side of the screen is the Toolkit icons, there four of them, below that is the Browser, it displays the files, pictures and text styles and the very bottom the page number you are working on. These six columns in perforated lines are only a guide and they are not printed out. As you can see the square box icon is in inverse that's because it is the Frame mode icon, as mentioned above, because the

first step in creating a document is to draw the frames to hold the text and pictures.

As you can see by this page you are reading they are 5 frames of text. Look at the very top one first, - i.e TWAUG NEWSLETTER - I drew the frame starting at the left corner of the perforated frames displayed above, right across and down. It really doesn't matter how deep you draw the frame, the size can be changed once you type in the text. Once the frame is drawn select the Text mode by clicking onto the large T icon which will change into inverse. Next move the mouse cursor which has now changed into an I-beam when

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moved into the frame you have just drawn, now click the left button and start typing. The text you have typed in is not very impressive.

To make the text stand out, like the headline above on this page, you must switch to Paragraph mode by clicking on the icon in the toolkit, this is the icon with the lines in it. The mouse pointer has now changed into a Paragraph symbol ¶ when you move it into the frame. Now select the text by clicking on it, the text is now highlighted and at the same time a list of style names appear in the browser. The style name Body Text is highlighted, that means the text you have type into the box is in Body Text style. While the text is still highlighted click on Headline and watch the text change, you don't need to stick to only those four styles in the Browser, you can add different names styles with different text sizes.

Phew!! So far so good. If for instance the frame you have drawn is too small and the text has vanished, don't panic, just click on the frame mode icon top left of the toolkit, then click the mouse pointer, which changed it's shape to a cross when moved into the frame you have drawn, to select it. When the frame has been selected small squares appear around the

frame, it's with those small squares that you resize the frame. If you move that cross onto the small square and press and hold the left button, you will notice that the cross has change to a pointing finger, press and hold the left mouse button and drag the frame down to make it larger and you soon will see the text you have typed large and centered. You can of course also drag the frame to left or right by pointing to the squares on the left or right side of the frame. Pointing to the corner squares you can drag the frame down left or right at the same time, the centre squares are for resizing the frame straight down or left or right.

It is also very important that you actually get into the habit of saving the layouts occcassionally, or better still more often just in case of a lock-up, that has happened to me a few times and had to restart the whole layout. When you do the saving you will be asked by the program to swap disks and that means inserting the Data labelled disk before your work is saved. Don't panic, a dialog box is displayed requesting to insert the appropriate disk before anything ever happens.

How about emphasizing small paragraphs with the Bullet Paragraph
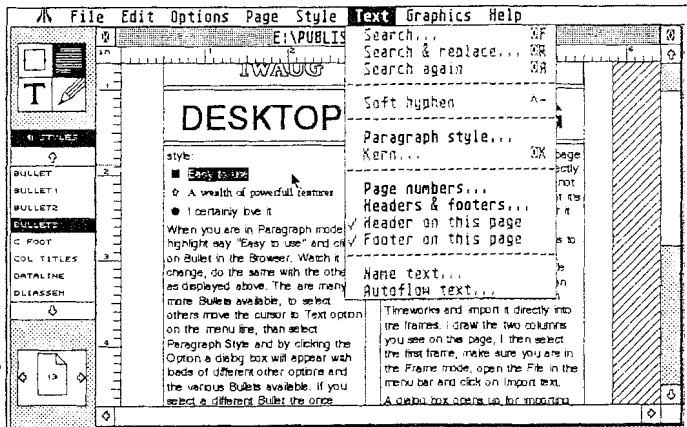
DESKTOP PUBLISHING

style:

- ■ Easy to use
- ☆ A wealth of powerfull features
- ● I certainly love it

When you are in Paragraph mode, highlight say "Easy to use" and click on Bullet in the Browser. Watch it change, do the same with the others as displayed above. The are many more Bullets available, to select others move the cursor to Text option on the menu line, than select Paragraph Style and by clicking the Option a dialog box will appear with loads of different other options and the various Bullets available. If you select a different Bullet the once selected on the screen will change to the one you've just chosen. To have a few different Bullets on the same page you must change Bullet to a different name or just add a 1 behind it. Will say you want to change "I certainly love it" to something else go into Text menu, select Paragraph style then choose the New style name and change the name Bullet to Bullet1 or add 2 this way you

can have as many different styles on the same page. You can add many more text styles the same way, there is so much more you can do.

When you want to enter a lot of text lets say the two columns on this page or like this full article, typing it directly into the columns in Timeworks is not recommended, the reason for that it's a bit slow and you cannot transfer it into the next column when one column overflows. The best way is to import the text from a word processor. I type all my long article into a word processor save it as an ASCII file into the Stories folder in Timeworks and import it directly into the frames. I draw the two columns you see on this page, I then select the first frame, make sure you are in the Frame mode, open the File in the

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menu bar and click on Import text.

A dialog box opens up for importing text with a number of different text formats, with the text I saved being in ASCII format I select that particular format and click on OK. The Item Selector is displayed, this allows you to select the story you wish to import, then click on OK. After a few moments the file name appears in the Browser and with the frame being selected you can watch the frame filling up with the text also. Now click on the frame to select it and click on the text name in the Browser and hey presto the frame fills up with text. You can do that with more than two columns, or if you are using only one column, it works the same way.

Stories flow into frames in page order. For example, all the frames allocated to one story on page 1 will be filled before the frames on page 2. Above I said to select the frame and click on the file name in the Browser to fill up the second column, all this can be achieved automatically by activating the "Autoflow text" in the Text menu. If you already have frames linked to a story on say Page 1 and 3 and then decide to include some of that story in a frame on Page 2, you will find that part of that story which was in the frames on Page 3

will automatically move over into the new frame on Page 2. And subsequently sections of the story will also flow in to replace the contents of the frames on Page 3. - Can you blame me for using Timeworks on an ST instead of continuously using the Classic machines with TextPro and Daisy-Dot, where I had to manipulate every bit of text manually. - Also when the frames are resized, the story is reformatted to fit the frames. The story in subsequent frames is also adjusted so that it flows correctly.

When a story has been imported into the frames you can include images. You can draw another frame anywhere in among the text or even right across the full page and import a picture into that frame. When drawing that frame you will see the text being repelled by the frame, do not worry about that we can rectify that easily. Use the Options menu and click on Repel text, a form is displayed where you can switch off repel text completely or set it to zero for the text to flow around the frame and only have a small gap between the text and the frame border. There is also an option to flow the text around the contour of iregular objects.

The frames you draw will not print

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out, they are only visible on screen, if you fancy a border around like the very top frame on this page you select the Options menu again. Click on Frame border and it gives you the choice of different border sizes and also the choice to place the border all-around just the top or just the bottom or just the sides. For my top frame I chose all-around and a modest thicknes.

The dropped capital letters is a popular design feature to add a special touch to plain blocks of text. That's the reason I include them when I think about it. It's easily achieved, but you will need the manual beside you for the beginning anyway. I don't find it difficult to include the drop caps.

Another good feature is setting up Sales Figures Tables, these can be achieved using the Tab option selecting the Paragraph style in the Text menu. The fourth icon is the Drawing mode, the bottom right icon, it allows simple graphics objects to be added to your frames. Click on the drawing mode icon and after the disk access have a look at the new Browser: icons of simple drawing tools. To use this, the frame you want to draw in must be selected so that a grid of dots is visible. Select the frame in Frame mode first, then use Draw mode and click on the frame again to make the grid of dots appear. Now choose the tool you want from the left - the Drawing mode displayed in the screen display below - and use the mouse to draw.

The available drawing tools:

- straight lines
  straight line box
  box with rounded corners
  circle
  ellipse
  polylines
  freehand line
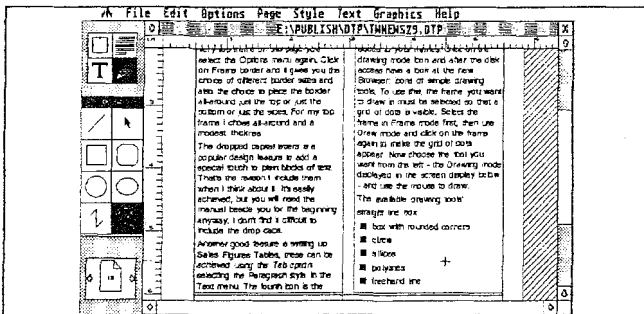
DESKTOP PUBLISHING

NEWSLETTER

NEWSLETTER

NEWSLETTER

NEWSLETTER

NEWSLETTER

This page displays some 3D effects that can be achieved with Timeworks 2.
I thought I may as well show you some different type of the shadow effect.

GRAPHICS MODES

Continuing Dave Russell's Atari graphics modes series

Lets continue in this issue looking at Graphics modes 4 and 6. We looked at Modes 3, 5 and 7 in the last issue and bi-passed 4 and 6.

These are still "map" modes, but they only allow two colours to be used. If you're wondering why anyone should want to limit themselves to two colours, the answer is memory. By way of a slight digression, let's see why this should be so.

We talk about a bit of information and because the word bit is used in everyday language it's easy to forget that it has a precise meaning in this context.

Hi-res

graphics in

modes 4 and 6

When someone offers you some more food and you say "Well, maybe just a bit more, please", you're using the word in a very imprecise way.

In information processing terms, bit is a contraction of the two words binary digit. We say that one bit of information has been transmitted if the number of possible outcomes has been halved.

Suppose I toss a coin and tell you that the outcome is heads. I've given you one bit of information because I've reduced the possibilities from two to one. Before I transmitted any information, the outcome could have been heads or tails.

Suppose your task is to guess which square on an otherwise empty chess-board contains a pawn. If I tell you that it

GRAPHICS MODES

isn't in the left-hand half of the board, once again I've given you one bit of information.

In the case of the chess board I've reduced the possibilities from 64 to 32. With the coin I reduced the possibilities from two to one. In both cases I have provided the same amount of information - one bit.

If you've been following Mike Bibby's Bit Wise series, you'll be quite familiar with binary notation, so let's work our way back towards the graphics screen.

If you think about a simple black-and-white screen, each pixel can either be white-lit-or black-unlit. that is, we can describe the pixel's state using only one binary digit. Let's say 1 represents lit and 0 represents unlit.

We could now describe a complete screen as a string of 1s and 0s and we could store this information in memory.

Suppose now we have the option of each pixel not only being lit but being coloured red. That is, each pixel can be lit or unlit, and if lit can be white or red.

Our single binary digit can't convey all this information, so we need to introduce another one. We could then describe each pixel's state as 00 -

unlit, 01 - white lit - or 11 - red lit. There is another possible combination, 10 -red unlit - but in this case it doesn't make much sense.

It's easy to see that if we wanted to describe a screen containing this much information we'd need a bigger string of 1s and 0s. If even more colours were possible, we'd need an even bigger string.

This information is held in the micro's RAM memory and so we can see that if we want more colours available we have to allocate more memory to hold the possible colour information.

The other variable in the equation is the size of the pixel or the resolution. A high resolution screen has many pixels per row of screen and therefore needs more information-holding space than a low resolution screen.

Mode 4 has the same resolution as Mode 5 - 40 rows x 80 columns plus a text window. However because only two colours are available in Mode 4, it takes up less memory than Mode 5.

Similarly Mode 6 has the same resolution as Mode 7 - 80 rows x 160 columns plus text window - but again with only two available colours.

We can do much the same as we did in Modes 3, 5 and 7. For example,

GRAPHICS MODES

type GR.4 and the screen should clear to black with blue text window at the bottom.

If you enter:

COLOR 1:PLOT 5,5

you'll see our old friend the orange square. To give us a bit more to look at, enter:

DRAWTO 30,9

The colour of the plotted point defaults to orange but we can alter it by setting register 0. If you enter:

SETCOLOR 0,7,4

you alter register 0 to colour 7, luminance 4 and the orange blocks change to a nice deep blue.

The colour information for the background is held in register 4, so if you type:

SETCOLOR 4,5,6

the black should change into purple - colour 5 - with luminance 6.

The colours for the plotted points and the background are the two colours. We could also change the colour of the text window via register 2. Try:

SETCOLOR 2,12,4

for example. You should now have blue blocks, purple background and green text window - revolting, isn't it?

Blue, purple, green... that's three

colours. However, we haven't discovered an undocumented aspect of Mode 4. We've cheated by counting the colour of the text window which is really a bit of Mode 0. If we used a full-screen Mode 4, the text window would disappear and we'd be back to two colours.

If we specify COLOR 2 for the plotted points, we plot them in the back-ground colour. If there's nothing already on the screen we wouldn't see any effect of this. However, one way to erase part of the display is to re-plot it in the background colour.

For example, try entering:

COLOR 2:PLOT 5,5:
DRAWTO 30,9

and the line should disappear.

In addition to PLOTting, we can still PRINT #6 as we did in Mode 5. For example, enter:

POSITION 20,20:PRINT
#6;"111110000011111"

and you should see lines appear where the 1s are printed and a space in between them where the 0s are.

If you're looking for ways of saving memory, it's worth noting that using PRINT #6 is generally more economical than PLOTting pairs of data points. This means that a

GRAPHICS MODES

combination of Mode 4 and PRINT #6 can be a very economical way of producing a display.

Although we can see the display simply by looking, there are times when your program needs to "see" the display. That is, it needs to know whether a particular screen location contains anything.

For example, you may be bouncing a ball around the screen and need to know if it has hit a wall.

Atari Basic provides a graphics command which will look at a screen location and say what is there. The command is LOCATE and the form it takes is:

LOCATE X,Y,Z

where X and Y are the coordinates of the screen location and the contents of the location are stored in Z.

If you press Reset and enter GR.4 to get back to a clear Mode 4 screen, then enter:

COLOR 1:PLOT 40,20

you'll once again be confronted by an orange square. If you now type:

LOCATE 40,20,Z:PRINT Z

the number 1 should be printed in the text window.

If you now enter:

LOCATE 40,19,Z:PRINT Z

the number 0 should appear in the text window. In the first case, the 1 signified that location 40,20 contained a coloured pixel whereas the 0 in the second case signified an unlit pixel.

You can use the information gained from looking at the screen to determine what happens next in your program. For example, if your ball has hit a wall, you must change its direction to simulate a bounce.

For example, enter:

LOCATE 40,20,Z:IF Z=1
THEN SETCOLOR 4,5,6

and see the effect. Because we plotted a point at 40,20 the LOCATE command assigned a value of 1 to the variable Z. The IF Z=1 test returns a value of "true" so the THEN part of the command is carried out. In this case the colour in register 4 is altered and the background once again becomes purple.

The LOCATE command is very useful but behaves slightly differently depending on which mode you've selected. If you're in Modes 0, 1 or 2 the LOCATE returns a value between 0 and 255.

If you've selected Modes 3, 5 or 7 then LOCATE will return a value of 0, 1, 2 or 3. As we've just seen, in Modes 4 and 6 the LOCATE

20

GRAPHICS MODES

command returns either 0 or 1.

If you recall the earlier articles in this series, you've probably worked out the correspondence between the characteristics of the mode and the values that LOCATE returns.

Even so, I suggest you try out the LOCATE command in all the graphics modes that we've covered so far and get familiar with its results.

Now let's turn our attention to Mode 8, which has the highest resolution of all the modes. In its full-screen form, Mode 8 offers 192x320 columns - or, to put it another way, 61440 pixels.

With this many pixels, we can't "afford" any memory to hold colour information, so we can only display a single colour, although the border and background can be different colours.

Plotted points are the same colour as the background, but we can set the luminance of the plotted points - just as well really, otherwise we'd never see them...

Colour register 2 controls the colour and luminance of the background. Type GR.8 to get to an empty Mode 8 screen. It looks like a regular Mode 0 screen but the word Ready is positioned close to the bottom. Now enter:

SETCOLOR 2,4,6

Mode 8 offers superb detail, but it really is a right little memory muncher

GRAPHICS MODES

and the screen will turn purple.

To demonstrate that you do have Mode 8 and not Mode 0, press Return three times. All text has now disappeared out of the text window, leaving only the cursor on the bottom line.

The colour and luminance of the border are controlled by register 4. We can demonstrate this by entering:

SETCOLOR 4,8,2

which should yield a blue - colour 8 - border with luminance value of 2 around the purple screen.

If we want to plot to the screen, we still need to precede the PLOT command with a COLOR 1 command. In Mode 8 this gives the same colour as the background but takes the luminance from colour register 1. Try entering:

COLOR 1:PLOT 20,20:
DRAWTO 100,100

This should produce a thin sloping line which is a bit faint and therefore difficult to see.

To improve visibility, we need to make the line's luminance either much lighter or much darker. That is, we need to increase the contrast between the line and the background.

The luminance of plotted points is

taken from the information in register 1, so to get a darker line we can either:

SETCOLOR 1,1,2

and to get a lighter line we can enter:

SETCOLOR 1,1,14

Notice that the text in the text window is the same luminance as the plotted points. It goes dark and light as the line goes dark and light.

You'll remember that the second parameter in the SETCOLOR command specifies the colour to be used. However, in Mode 8 the colour specified in register 1 is ignored. Only luminance parameter is used.

This means that you can use any number. Try:

SETCOLOR 1,12,14

and you shouldn't see any difference.

The COLOR 2 command has the same hue and luminance as the background so it can be used to erase a section of the display as we can see above.

For example, enter:

COLOR 2:PLOT 20,20:
DRAWTO 50,50

and you should see the upper section of the line disappear.

Program I

GRAPHICS MODES

Mode 8 has at least one interesting

```
10 GRAPHICS 8

20 SETCOLOR 2,0,0

30 COLOR 1

40 FOR A=100 TO 200 STEP 2

50 FOR B=0 TO 100 STEP 2

60 PLOT A,B

70 PLOT A+1,B+1
```

effect that you might not predict and we can demonstrate it with the aid of Program I. Enter the listing and then Run it.

This simple program does nothing more than draw a series of vertical lines. However, you should see an

Program II

effect which you might not expect to

```
10 GRAPHICS 8+16
20 SETCOLOR 1,1,14:SETCOLOR
2,0,0
30 FOR X=0 TO 318 STEP 3
40 COLOR 1:PLOT 159,0:DRAWTO
X,191
50 COLOR 0:PLOT 159,0:DRAWTO
X+1,191
60 NEXT X
70 GOTO 70
```

see in a single-colour mode.

In fact, it is a well-documented effect called "artifacting" and is a result of the way in which televisions handle colour.

The effect can be more dramatic on an American television because of the different system used to produce a coloured image.

Program II gives one of the best demonstrations of the effect on a UK set, it was written by Judson Pewther for Compute! magazine. While you're looking at it, keep telling yourself that Mode 8 is a single colour mode...

Incidentally, line 70 may confuse you if you've not used a full-screen before.

Normally, Mode 8 has Mode 0 text window at the bottom. For any of the split-screen modes we can display a full screen by adding 16 to the GRAPHICS statement, as in line 10. This could have been written as GR.24 with the same result.

The problem with removing the text window in this way is that the system will revert to Mode 0 when the program finishes. You can see the effect by typing GR.24 when you're in Mode 0. The screen flashes as Mode 8 is displayed, but then you're back in Mode 0.

All line 70 does, is stop the program

GRAPHICS MODES

"Keep telling yourself that 8 is a single colour mode„

from ending by creating an endless loop. Press Break or Reset to get out of the loop.

Mode 8 has another characteristic which can also be used to advantage.

As a map mode, writing text is not all that easy. However, by one of those happy accidents that occur now and then, the pixel size in Mode 8 just happens to be the same as in Mode 0.

You can't "write" direct to the Mode 8 screen as you can in Mode 0, but all the data required to generate the Mode 0 characters are held in ROM.

If you've been following this series you'll remember that the last series we copied the data down into RAM in order to redefine some of it.

Program III uses this fact in order to put Mode 0 characters on a Mode 8 screen.

It does this by converting each character in STRING$ into internal code, finding that character in the

ROM character set and then poking the data for that character directly into the screen area of RAM.

In fact, if you run Program III as listed, it suffers from exactly the problem that we discussed in the last article. We could combine the redefining program from the last issue with Program III, but as a temporary "kludge" try adding line 145 as follows:

145 IF X=64 THEN POKE LOC+BYTE*40,0:GOTO 160

This technique of writing the Mode 0 character data to the screen will only work with Mode 8 because the two modes have the same pixel size. However, if you're adventurous you might like to devise ways of writing text to other map modes.

After all, the data for 8x8 matrix characters are already in ROM and it seems a shame to waste them. Maybe there's a way of using them in a modified form for other modes.

GRAPHICS MODES

Mode 8 offers you the best possible resolution of your Atari modes at èthe cost of about 8k of RAM memory. Therefore, applications that use èit will be those which need the resolution for fine drawing but don't need a lot of memory for calculations.

Graphics command.

I assume that your machine has a particular chip which some earlier models lacked. The chip in question is referred to as GTIA, or Graphics Television Interface Adaptor and its predecessor was referred to as CTIA.

```
10 DIM STRING$(10),X$(1)
20 STRING$="ATARI USER"
30 X=15:Y=80
40 GRAPHICS 8
50 SCREEN=PEEK(88)+256*PEEK(89)
60 LOC=SCREEN+Y*40+X
70 FOR CHAR=1 TO LEN(STRING$)
80 X$=STRING$(CHAR,CHAR)
90 X=ASC(X$)
100 IF X>127 THEN X=X-128
110 IF X>31 AND X<96 THEN X=X-32
120 IF X<32 THEN X=X-64
130 CHARLOC=57344+X*8
140 FOR BYTE=0 TO 7
150 POKE LOC+BYTE*40,PEEK(CHARLOC+BYTE
)
160 NEXT BYTE
170 LOC=LOC+1
180 NEXT CHAR
```

If you have got an older machine and don't know which chip it contains, try entering Program I, a simple routine which cycles through colours and luminances.

If you do have the GTIA the whole of your television screen will cycle through the colours because the border and background are indistinguishable. However, if your machine contains the earlier CTIA the border will be a different colour from the background and so will be visible.

So far in this series we've looked at Modes 0 to 8. Assuming that you're still with me, then let us take a look at modes 9, 10 and 11. You can access these in the same way as the other modes we've considered, using the

Press Break or Reset to stop the program.

Press Reset to get an empty Mode 0 screen with the Ready prompt at the top. Now type:

GRAPHICS 9

GRAPHICS MODES

```
10 REM MANDALA
20 GRAPHICS 8+16
30 COLOR 1:PLOT 150,90
40 FOR X=0 TO 100 STEP INT(RND(0)*10+1
)
50 DRAWTO 150,190-X
60 DRAWTO 150-X,100
70 DRAWTO 150,X
80 DRAWTO 150+X,100
90 NEXT X
100 FOR DELAY=1 TO 750:NEXT DELAY
110 RUN
```

The Mandala program illustrates the artifacting effect

and press Return. The brief flash you'll see is Mode 9, but once the command has been executed the system reverts to Mode 0. If you want to see Mode 9 you've got to keep it there somehow. In fact we used the method above to keep a full-screen Mode 8. All that's involved is putting the system into a never-ending loop. With a program you can simply use a line which GOTOs to itself. For example:

10 GRAPHICS 9
20 GOTO 20

In immediate execution mode you can use the FOR . . . NEXT construction to create an endless loop. For example, type:

FOR A=1 TO 2 STEP 0:
GRAPHICS 9:NEXT A

and press Return. The fact that we've used a step size of 0 means the A never reaches its upper limit so the loop goes on forever.

The blank screen which cofronts you is Mode 9. Unfortunately there's not much you can do with it in this state. The machine is locked in the loop and so most of the keys produce no response.

```
10 GRAPHICS 9
20 FOR C=0 TO 15
30 FOR L=0 TO 16
40 SETCOLOR 4,C,L
50 FOR DELAY=1 TO 50:NEXT DELAY
60 NEXT L
70 NEXT C
80 GOTO 20
```

Program I

Modes 9, 10 and 11 all have the same resolution of 192 rows x 80 columns with no possibility of a usefull text window unless you're prepared to use a display list interrupt and/or redefine the character set.

GRAPHICS MODES

If you've been following Mike Rowe's series of Display List in TWAUG you'll know what to do, but for now I'll assume that these modes don't have

YOU CAN GET

any text capabilities.

You can produce a Mode 9 screen with a separate window at the bottom very easily. Simply type GRAPHICS 8 and then POKE 623,64. However, if you try this you'll soon see why I used the phrase "useful text window" earlier.

GRAPHICS FROM

In Mode 9 you can only use one colour, but you can have up to 16 luminances of that colour on the screen.

Mode 11 is the opposite, with 16 available colours but only one luminance.

Mode 10 is a bit different in that it allows one background and eight foreground colours. However, using these colours from Basic is not as simple as for the other two modes, so we'll leave Mode 10 until the end.

In Modes 9 and 11 we

STUNNING 3D

use a combination of SETCOLOR and COLOR commands. Only colour register 4 is used, so in Mode 9 the colour is selected with:

SETCOLOR 4,colour 0

while in Mode 11 the luminance is selected with:

SETCOLOR **4,0,luminance**

In Mode 9 the COLOR command is used to select one of the 16 levels of

ONLY ONE COLOUR

luminance, while in Mode 11 the same command is used to select one of the 16 colours.

GRAPHICS MODES

To see the difference between the two modes type in Program II and run it. This produces a simple Mode 9 starburst which cycles through the colours and luminances. When you've had enough of that Break out and list the program. To convert it to Mode 11 we need to change lines 10 and 30.

Alter line 10 to read:

10 GRAPHICS 11:C=0

and alter line 30 to read:

30 SETCOLOR 4,0,C

If you now run the program you

```
10 GRAPHICS 9:C=0
20 C=C+1:IF C>15 THEN C=0
30 SETCOLOR 4,C,0
40 FOR X=0 TO 15
50 RX=INT(RND(0)*80):RY=INT(RND(0)*190)
60 COLOR X
70 PLOT 40,95
80 DRAWTO RX,RY
90 NEXT X
100 GOTO 20
```

Program II

should see the same starburst pattern but in a multi-coloured single-luminance Mode 9´version.

You might think that having only one colour available, as in Mode 9, is a severe limitation on what you can display. However, the fact that you

can have 16 luminances means that you can produce some stunning 3D graphics.

Rather than tax my brain to produce an example of such a display, Program III does the job admirably. It was sent in by Dean Rossiter, of Wellingborough.

If you fancy a different colour you'll need to alter line 10. As usual, a well-placed loop will cause the program to cycle through all the colours.

To see the sort of colourful effect that Mode 11 can give, enter and run Program IV. Its squashed appearance illustrates the pixel shape in these modes. With more rows than columns, pixels are long and thin.

Mode 10 allows nine independent colours, each with its own luminance, but there aren't nine colour registers, are there? Certainly the SETCOLOR command can only be used to access registers 0 to 4.

This is the problem with colour selection in Mode 10. Some of the registers can be accessed via SETCOLOR but the others must have the appropriate value POKEd in.

Rather than try to mix the two

methods, I recommend that when using Mode 10 you always POKE the colour registers. Of the two methods this is the only one which can be used on all the registers, and so is simpler.

To be accurate, we don't actually poke the registers themselves.

```
5 REM ***    PENCILS ***
6 REM ***        BY     ***
7 REM *** Dean Rossiter ***
10 GRAPHICS 9:SETCOLOR 4,2,0
20 LX=13:RX=55:Y=48:PX=67:PY=60
30 GOSUB 1000:REM ***Pencil 1***
40 LX=13:RX=55:Y=78:PX=67:PY=90
50 GOSUB 1000:REM ***Pencil 2***
60 LX=10:RX=52:Y=64:PX=64:PY=76
70 GOSUB 1000:REM ***Pencil 3***
80 POKE 77,0:GOTO 80
1000 REM *** Main Routine ***
1001 A=Y:FOR T=2 TO 14:COLOR T
1002 PLOT LX,Y:DRAWTO RX,Y
1003 Y=Y+1:NEXT T
1004 FOR T=14 TO 2 STEP -1:COLOR T
1005 PLOT LX,Y:DRAWTO RX,Y
1006 Y=Y+1:NEXT T
1007 Y=A:FOR T+2 TO 14:COLOR T
1008 PLOT PX,PY:DRAWTO RX,Y
1009 Y=Y+1:NEXT T
1010 FOR T=14 TO 2 STEP -1:COLOR T
1011 PLOT PX,PY:DRAWTO RX,Y
1012 Y=Y+1:NEXT T
1013 COLOR 0:PLOT PX,PY:RETURN
```

Program III

Rather, we poke their "shadows" in RAM. However, this is a detail which we need not take any further here.

The locations which contain the colour information are 704 to 712. These locations correspond to the commands COLOR 0 to COLOR 8 respectively.

The value which is poked into the register needs to contain not only the colour information but also the luminance information. You arrive at the value by using the formula:

X=(Colour*16)+Luminance

where X is the value which gets poked into the register.

For example, suppose you want to specify Colour 5 with Luminance 8, a sort of light purple colour. The value to be poked would be (5 * 16) + 8 = 88.

Since COLOR 0 controls the background colour, and this command corresponds to the register in location 704, we can change the background colour by poking location 704. Using the light purple colour that we've just calculated as 88, try entering the following:

FOR I=1 TO 2 STEP 0:
GR.10:POKE 704,88:NEXT I

Once again we've used the STEP 0 trick to set up a perpetual loop so that the Mode 10 screen is constantly displayed. If all has gone according to plan, your screen should be filled with colour/luminance combination 88, or light purple.

We can use the fact that the registers are all in adjacent locations to produce some interesting effects. Suppose, for example, that we load

```
10 GRAPHICS 11
20 COL=0:DIR=1
30 FOR A=0 TO 79
40 COL=COL+DIR
50 COLOR COL
60 IF COL>16 OR COL<1 THEN DIR=-DIR:GO
TO 40
70 PLOT A,0:DRAWTO A,A:DRAWTO 0,A
80 NEXT A
90 GOTO 90
```

Program IV

the registers with particular values, we can then move the values "along" one register and move the last value back to the beginning.

This will have the effect of creating a "circle" of colour and we can use this to produce an effect of movement. If your eyes aren't feeling too tired, try entering Program V.

Lines 10 to 120 load the registers with random values and then draw bands of these colours across the screen. Each band is five rows deep. Lines 130 to 190 then shuffle the registers around constantly, producing the movement effect.

since the colour values are selected randomly, the display will be different each time you run the program. Use Break to give your eyes a rest every now and then.

If you want to choose a random background colour too, change line 30 to read:

30 FOR A=0 TO 8

Because these modes require the GTIA chip, you'll sometimes see them referred to as the GTIA modes.

This chip's job is to interpret the data passed to it by the Antic chip, and in fact Modes 9, 10 and 11 are three different interpretations of Mode 8. Consequently they require the same amount of memory - 8k.

```
10 C=0
20 GRAPHICS 10
30 FOR A=1 TO 8
40 POKE 704+A,INT(RND(0)*256)
50 NEXT A
60 FOR Y=0 TO 188 STEP 5
70 C=C+1:IF C>8 THEN C=1
80 COLOR C
90 FOR Z=0 TO 4
100 PLOT 0,Y+Z:DRAWTO 79,Y+Z
110 NEXT Z
120 NEXT Y
130 A=PEEK(705)
140 FOR B=705 TO 711
150 POKE B,PEEK (B+1)
160 NEXT B
170 POKE 712,A
180 FOR DELAY=1 TO 20:NEXT DELAY
190 GOTO 130
```

Program V

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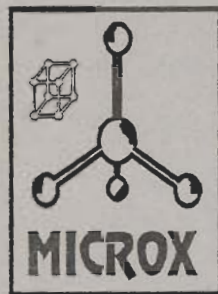### The OL'HACKERS ATARI USER GROUP INC.

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