

you think would be of interest to your fellow members. If you have a friend or know of someone with a 99er, do yourself a favour and bring them in contact with the ENNERCUS.

Speaking of volunteering assistance, I willingly accept the help offered by Suren to operate the BBS for us. He is more than qualified to handle the task and I hear that he is quite proficient in assembly language programming. The club is still short of a fast automatic modem to place on line, but we hope to be able to rectify this, and all the remaining transfers (phone line, hardware, and software...) by the time you read this. At first the BBS will run on the club system with a SSSD Drive and the Horizon 256k Ramdisk. Anyone with extra hardware to upgrade this system (long term loan or gifts accepted) please contact Suren at 465-1395. We will try to retain the present phone number, if not possible, we will requisition a new one as soon as possible.

At the April meeting we will hold a question and answer period to cover all subjects that you hold at heart, be it hardware, software, elected officials, the Club administration, meetings, or projects, etc. here's your chance to be heard. Win has taken over from Jim for the co-ordination of this year's meet in Innisfail. Contact him if you can help with Carpooling or would like to present a demo, or have some equipment to trade, buy/sell.

The elections are coming in June. Jamie has been appointed the Election committee chairman and will keep you informed of the proceedings. For my part I will not be seeking re-election due to my move to Kingston, Ontario this summer. Shane Aucoin has made it known that he would accept this post if elected. I might miss some of the coming meetings due to travel outside of the Province during the next few months. I intend to keep my membership to the ENNERCUS even after I leave the Province and encourage you to support your club and executive by taking a greater part in the activities.

};------(News Letter)-----};

GENERAL MEETING (March).

by: Andrew Webster.

No information received as yet.

BITMAP MODE IN c99.

: TIBBS Download.

If any of you have attempted to use Jay Holavac's BITMAP routines, you'll be unpleasantly surprised if you attempt to perform any file I/O while the bitmap environment is active; CONSOLE LOCKUP! Don't despair, there is a work-around for this dilemma.

First, let's elaborate on why we have a problem. While Bitmap mode appears to provide enhanced graphics capabilities, they don't come cheap. Bitmap mode requires a pattern descriptor table of 1800 hex bytes a color table of 1800 hex bytes and a screen image table of 300 hex bytes. This represents a total of 3300 hex bytes out of a total of 3FFF hex bytes available. You might say, what's the problem? I still have CFF bytes free. Well, that's not quite true. When Texas Instruments set up the bitmap environment for the 4A, they did not permit all these tables to fit in one contiguous area. For example, the pattern descriptor table can reside at either VDP address >0000->17FF or >2000->37FF. The same holds true for the color table. The VDP area >3708->3FFF is used by the disk controller Rom, therefore memory contention exists. One way to get around this contention is to save the areas of the VDP chip that you'll need later. I have written a public domain TI Artist file viewer which saves the entire VDP chip, but that is sorta wasteful. Actually you only need to save the area of the VDP chip >0000->0FFF and >37 00-3FFF. If you're really squeezed for space, you can cutdown the first VDP area to >0800->1000. Before doing any bitmap functions, save the select areas of the VDP chip to memory, perform all your I/O, switch over to bitmap mode (set up the 1st 6 VDP registers), perform the bitmap functions of your choice. To return back to text mode, reload the VDP chip with the areas you had saved, switch over to text mode (setup the 1st 6 VDP registers) and you're back again.

Bitmap mode gets its enhanced graphic capabilities by treating the screen as 3 different screens. Each screen consists of 8 rows of characters and 32 characters across the row. Surprisingly, this just happens to equal 256 characters. Since we have 3 screens, you could think of bitmap mode to have 768 unique character patterns. The pattern descriptor table contains 6144 bytes and when you divide that by the 768 unique character patterns available, you'll notice that each character is defined by 8 bytes. These 8 bytes represent a character of 8x8 pixels. If I wanted to place 4 horizontal parallel lines on the screen, I'd probably define the characters with a pattern of "FF00FF00FF00FF00". The fact that the character is defined in the pattern descriptor table, does not mean it will be visible on the screen. Each eight pixels of the character is capable of both a foreground color and a background color. Each character could have all 16 colors in each character. To make a character visible, a color pattern should be enabled for the 8 byte character pattern. If we wanted to define the previously mentioned parallel lines as dark blue lines on a white background, then the color entry would be "4F4F4F4F4F4F4F".

Now that we've gone over bitmap mode, let's describe how to load some of the popular bitmap pictures available to the 4A community. One of the first type of files available were the TI-Artist files. TI-Artist files are 25 sectors in size, memory image files, and end in either P or C. Surprisingly, these files are 6144 bytes (>1800) in length. Knowing this, it's easy to determine exactly what P (Pattern Descriptor Table) and C (Color Table) signify. To load a TI-Artist file load the pattern descriptor table. If a color table file exists, load that one next. It will most likely be necessary to load the color file in a VDP area >1800->3000 rather than >2000-37FF to avoid memory contention. Once loaded, just relocate the VDP memory to where it belongs via VMBR and VMBW routines. Below are some basic assembly instructions to do that for you.

```

/** move color table for TI art
** move VDP >1F00->36FF to
** VDP >2000->37FF
**/

#asm
LI 3,>3600
LI 4,>3700
LI 5,>0100
MLOOP MOV 3,0
LI 1,BUFF1
LI 2,>0100
BLWP @VMBR
MOV 4,0
LI 1,BUFF1
LI 2,>0100
BLWP @VMBW
S 5,4
S 5,3
CI 4,>1E00
JNE MLOOP
#endasm

```

If a C (Color file) doesn't exist, you'll have to select a foreground and a background color and set up the entire color table using those two colors. Lastly, you'll need to set up the screen image table. This area of VDP is 768 bytes in length. Each sector should contain values between 0 and 255. Remember, no two bytes can be redundant in a sector.

The next format available to us is GRAPHX format. This format is a bit more encompassing because all three tables are included in the memory image file. The first 24 sectors (6144 bytes) are the pattern descriptor table. The next 3 sectors contain the screen image table. The next 26 sectors are sorta packed to avoid problems with the VDP memory used by the DSR routines for the disk controller. Sectors 28 through 30 are actually the last 3 sectors of the color table. The only thing you'll have to do is move VDP area >1800->10FF to >3500->37FF and the color picture

should be distinguishable once you set up the VDP registers for bitmap mode. In case you are curious, sectors 31 and 32 are of no consequence. The author wanted to make load/save function use only one file, therefore 2 unused sectors got saved; a relatively small price to pay.

The last format for bitmap viewers are encoded graphics often referred to as RLE (Run Length Encoded) files. There are two types of files commonly used for this format. The first is Display/Fixed 128 files which are quite common on PC boards. The other format is Display/Variable 80 format, most likely a product of Travis Watford and his OMEGA emulator. In any case, both files use the same encoding scheme and are only to be used to set up the Pattern Descriptor table. I've appended a file on RLE pictures to the end of this document since it did such a good job of describing the encoding scheme. This file was extracted from one of the services without an author's name attached to it.

Hopefully, this document will provide other c99 enthusiasts and graphics lovers with enough info to write their own creations using the bitmap environment.

EXECUTIVE MEETING (March).

by: Andrew Webster.

No information received as yet.

------(News Letter)-----

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