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EDITORIAL

Hello everyone,

Welcome to the first trading table for this year, hopefully everybody will be satisfied with what is sold and purchased. If this trading table is run successfully the club could possibly hold a few more later on in the year. Also there is a demonstration on the MPS1230 printer by R. Cloosterman. Next month there will be excellent demonstrations on the graphics grabbing from different mediums outside the C64 format, using the VIDEO DIGITISER. Plus a new item only recently bought out for the C64, a scanner. The HANDYSCANNER is the only scanner available for the C64, be there and see how it works.

This month's issue of the DISPATCH DISK there are the following items and articles:- Book & Magazine Library List plus the March Book Review by R. Cloosterman. The second part of the Turbomaster review, A Technical View. The second section of the Monster Puzzle, you use the answers from last month's puzzle to complete this month's Puzzle, good luck!. The regular items such as the Pokes and Peeks, Editorial and Dispatch Disk Notes appear as usual.

If any member has any worth while material that you consider of interest to other club members or the club, send or hand it to a committee member or myself for publication. The more articles I receive the better.

JAN VAN DE BELT - THE EDITOR



MARCH 1991

**VOL. 5
NO. 3**

64 / 128 NEWSLETTER



POKES AND PEEKS (SPRITES)

* *****
* POKES and PEEKS are an essential part of sprite programming, for
* example, POKE 2040,248 is the pointer address for starting address
* 15872 (248x64) for the sprite data of sprite #0. The usual way to
* include sprite data in BASIC programs is with READ and DATA
* statements. You hold the decimal values in a series of DATA statements.
* The READ statements POKES the data into a place in RAM separate from
* the program itself, when the program is RUN. The READ and DATA
* statements would look something like this:-

```
100 FOR =0 TO 62
110 READ AB
120 POKE 15872+F,AB NEXT
200 DATA
210 DATA
220 DATA
```

* It must be mentioned that the computer must also be told where to
* find the sprite data - ie, it's pointer. In the program above, you'd
* also need a line like this:- 90 POKE 2040,248.
* Line 90 directs the computer to look at address 15872(248x64) to
* find the data for sprite #0. With this procedure you can SAVE and LOAD
* a program containing sprite data in the same way as you'd SAVE and LOAD
* any regular BASIC program.

* *****

HINTS AND TIPS (FOR GAMES FANATIC'S)

* *****

TRANTOR

BUGGY BOY

* Here's a hack for Trantor
* which will give you not only
* infinite time, but infinite energy
* and flamethrowers.

* Here's a set of Pokes that
* will give you unlimited time on
* each of the Buggy Boy courses.

* Type in and Run the program
* below and follow the on-screen
* prompt to load the game itself.

* Load the game and
* reset your 64 on the course
* selection screen.

TYPE IN THE FOLLOWING DATA:

```
20 SYS 65371:PRINT CHR$(15)
30 FOR A=320 TO 367:READ B:POKE A,
B:NEXT
40 PRINT "INSERT THE TRANTOR TAPE"
50 INPUT "PRESS RETURN TO LOAD";
LOAD
60 SYS 336
70 DATA 169,36,141,40,57,169,165,
141
80 DATA 186,33,141,7,63,76,54,25
90 DATA 32,44,247,32,108,245,169,
99
100 DATA 141,100,8,169,1,141,101,8
110 DATA 76,16,8,169,64,141,140,19
120 DATA 169,1,141,141,19,76,0,16
```

```
POKE 4768,133
POKE 4769,20
POKE 39927,96
POKE 2048,32
POKE 2049,104
POKE 2050,13
SYS 2560
```

MAGAZINE & BOOK LIBRARY LIST

As promised last month, I am supplying an updated list of all the books and magazines currently in the Library. This list has all the books, not just the new ones that have been added.

Australian Commodore

& Amiga Review	July '89	Computes Commodore Collection	Volume Two
"	Dec. '89	CompuTel's Gazette	November 1984
"	Mar. '90	"	December 1984
"	Apr. '90	"	June 1985
"	May '90	"	June 1986
"	June '90	"	July 1986
"	July '90	" (2 Issues)	September 1986
"	Aug. '90	"	November 1986
"	Sept. '90	"	December 1986
"	Oct. '90	"	May 1987
"	Nov. '90	"	August 1987
"	Dec. '90	"	December 1987
A.C.A.R. Annual	1990	"	July 1988
Ahoy	November 1988	"	October 1988
Ahoy	December 1988	"	January 1989
Aust. Personal Comp.	Dec/Jan 88/89	"	February 1989
Austaralian Electronics Monthly	May '86	"	March 1989
Commodore	Issue 32 Vol.15 No.4	"	April 1989
"	June 1989	"	May 1989
"	October 1989	" (2 Issues)	July 1989
"	November 1989	"	September 1989
"	December 1989	"	November 1989
"	January 1990	"	December 1989
"	April 1990		
Commodore Vic 20 Basic 1.		Ideas Book for the Commodore 64.....	
Commodore Vic 20 Basic 2.		MacWorld	June 1990
Commodore 128 Programming Secrets		PC Magazine	May 1990
Commodore 128 Reference Guide for Programmers		Telecom Discovery	Winter 1990
Commodore 64 Exposed		"	September 1990
Commodore Disk Users Hand Book 1987.		Your Computer (YC)	November 1988
Commodore Hardware Buyers Guide.		"	April 1989
Commodore Run	October 1989	"	May 1989
" "	December 1989	"	August 1989
Commodore User	December 1985	"	November 1989
Compute	December 1983	"	December 1989
"	March 1984	"	January 1990
"	March 1985	Zap 64	June 1988
"	May 1985	"	April 1989
"	July 1986	50 Basic exercises for the C= 64.....	
"	June 1988	Electronics Australia	June 1990
		Electronics Today International	August 1986

By Robert M. Cloosterman

MARCH BOOK REVIEW

The book I chose to review this month is "COMPUTE!'s COMMODORE COLLECTION - VOLUME TWO". It has twenty seven games, graphics and sound routines, educational programs, applications, utilities, and programming aides for both the VIC-20 and the Commodore 64. This book contains an Automatic Proofreader for Basic programs and Machine Language Editor for typing in Machine Language programs, aides for typing in programs to get them error free.

Obviously I have not tried out all the programs in this book yet or I'll not be writing this article yet, so I will review each article as best as I can. The programs are as follows :

CHAPTER ONE - GAMES

CHESS Try to outwit your computer with this multilevel chess game, a joystick is required. A two part program done in basic. The game has five skill levels, choice of Black or White pieces, play against the computer or have the computer play against itself, you can even set up a board already half played and continue from there.

JACKPOT Now you can play a slot machine without the danger of losing your money. Four different temper levels (how hard you pull the lever) accompanied by colors and graphics on the 64 version. Done in Basic programming in both the 64 and VIC versions.

NIRRAD'S LABYRINTH Hidden gold, invisible trap doors, and a fearsome creature named Boogens add excitement to this treasure hunting adventure. Joystick required. Before the game starts you are asked how many bags of gold you want to find and also if you want to challenge the Boogens. One Basic program for the 64.

TRIDENT Join the crew of the U.S.S. Trident and test your skills in this exciting naval simulation. Four skill levels are selected with the function keys. Joystick required and programmed in Machine language for the 64 only.

CANYON RUNNER Pilot your craft between jagged canyon walls in this arcade style test of reflexes and nerve. Two Joysticks are required for the 64 version and you can either fly a helicopter solo or a two player version where one of you is being pursued by pirates. Nine different skill levels and three canyon width choices, also you have five copters each to start with. Written in machine language for the 64 game.

CHAPTER TWO - EDUCATION

LEARNING TO COUNT Designed for children from kindergarten to year three. Designed for children to count objects and type in the number, rewarded with a smiling face and a melody if correct but a wrong answer you get "SORRY! TRY AGAIN". Done in Basic.

ROBOT MATH An Arithmetic program that allows you to add or subtract and write the answer as you would on paper, (ie from right to left). A robot helps out in changing the maths problems over if correctly answered, you only have three goes at answering and you are also on a time limit. Basic.

HOMONYM PRACTICE Homonyms are words that sound the same but mean and spelt differently. This program selects sentences at random and asks for the correct spelling. Written in two Basic programs for the 64 (one for the VIC 20).

FRENCH TUTOR "French Tutor" is a helpful study aid designed for students who are learning or strengthening French vocabulary and translation skills. One Basic program for the 64.

UP OR DOWN Is a program designed to help beginning music students learn to read music. It illustrates several ways that sound can be used to enhance a program. Allows a student to learn and also experiment. Done in Basic.

BUILD A QUIZ Lets you to build or create a multiple - choice tests on any subject you choose, it allows you to save that test to Tape or Disk for latter use. When the Quiz is in use, answers will be required and will be rewarded with a musicale note for correct and a buzzer for incorrect with a final score at the completion of the quiz. Program done in Basic.

CHAPTER THREE - APPLICATIONS

SPEEDSCRIPT CUSTOMIZER This program allows you to customize the default values of SpeedScript to your own needs as well as customizing printer drivers. Written in Basic.

MEMO WRITER Is a mini word processor that's handy for memos, notes or lists. A word processor that only works on one screen at a time and allows you to send to printer or save on disk for latter use. Written in Basic which allows you to customize it to your own needs.

MAKING CALENDARS This allows you to produce a calendar on the screen, a wall calendar and a year calendar. Written in Basic so it can be modified for other printers and computers if needed.

THERAPY Is a play around type of program in trying to demonstrate some artificial intelligence (if possible). Written in Basic. Has possibilities! .Ed.

THE INDEXER Designed to provide an indexing system for articles in magazines (ie Computes Gazette). All the information is stored in the program so it does not rely on a disk or tape for it's data storage. Also written in Basic.

CHAPTER FOUR - GRAPHICS & SOUND

VIC HI-RES SKETCHPAD For the VIC 20 only.

SDA: SSprite Design Aid for the Commodore 64 only and is written in Basic. This allows you to design a Sprite on the screen using a joystick and save it and later use or modify it if you wish.

MULTICHAR A multicolor character editor that offers high-resolution characters, joystick control and many other options. Basic program for the VIC only.

THE MAGIC POINTER Is a machine language program that allows you to put a pointer on the screen. For the VIC 20 only.

SOUND SHAPER Manipulates volume and frequency to give your Commodore a smoother, more musical sound. Written in Basic for the 64 & VIC 20.

VIC PIANO Turn your VIC 20 into a Piano. Basic.

THE MOZART MACHINE The techniques described in this program, your computer can compose music. The compositions are unmistakably Mozartian in style. Program written in Basic.

CHAPTER FIVE - UTILITIES & PROGRAMMING AIDS

COLOR CHART Check out all the possible combinations of character colors and background colors with this short program which is written in Basic.

CURSOR "GET" This small Basic program lets you create a cursor for use during GET routines for any 64 or VIC.

FILE COPIER is a Basic utility that lets you transfer files from one disk to another, using a single drive, without worrying about starting addresses or machine language. VIC 20 or 64.

1540/1541 DISK HOUSEKEEPING A simple utility to help you clean up the clutter on your disk drive. Basic.

ML TRACER A single-step machine language tracer to solve problems with de-bugging and studying a program in ROM. Basic.

LIST FREEZER A very short Basic program for pausing a program listing on your monitor screen.

REFMAP A cross-reference map utility for the expanded VIC 20. Basic.

DATA FILES For the VIC or 64. You can give yourself more free memory by storing files on tape or disk. The programs show you how to set up, write to, and read from either tape or disk files. Three short Basic programs.

APPENDICES

- A A BEGINNER'S GUIDE TO TYPING IN PROGRAMS** The whats and whys on programs.
- B HOW TO TYPE IN PROGRAMS** Shows you the symbols that you see on the screen when using a combination of two keys in Quote mode etc.
- C THE AUTOMATIC PROOFREADER** A Basic program for error checking while typing in other Basic programs.
- D MACHINE LANGUAGE EDITOR** For typing in machine language programs.
- E & F SCREEN LOCATION TABLE** Grids for the VIC 20 and 64 screen location.
- G & H SCREEN AND COLOR LOCATION** Grids for the color location on the VIC & 64.
- I SCREEN COLOR CODES** Color codes for the VIC and more for the 64.
- J SCREEN & BORDER COLORS** VIC 20 only.
- K ASCII CODES.**
- L SCREEN CODES.**
- M VIC KEYCODES.**
- N COMMODORE 64 KEYCODES.**

TURBO MASTER CPU A TECHNICAL VIEW

The Magic Inside A Commodore 64 Processor Accelerator

This article by Steven C. Schnedler originally appeared in the March 1989 issue of *Computer Shopper* magazine. Copyright © 1989 Steven C. Schnedler and *Computer Shopper*.

You may have seen advertisements or articles describing C64 processor accelerator boards and cartridges that plug into the expansion port. These do something which almost seems impossible; they increase the 6502 microprocessor clock rate from 1 MHz to 4 MHz for four times faster program execution speed. This article will not tell you all you need to know to make such a cartridge. But for the technically inclined or curious it provides an overview of some of the basic operating principles, which turn out to be rather straightforward. This article may dispel some of the mystery or even disbelief surrounding these products.

This article is based on the design of the Turbo Master CPU™ accelerator from Schnedler Systems. (Do not confuse a processor accelerator with other so-called accelerator cartridges or Kernal ROM replacements which merely speed up disk Load and Save. A processor accelerator is quite different.)

A processor accelerator greatly benefits processor-intensive applications like screen graphics; wordprocessor operations such as scrolling, search-and-replace and insert; and spreadsheet recalculation. All of these take one-fourth the time.

What Limits Commodore C64 Processing Speed

The heart of a Commodore C64 is a 6510 microprocessor, which is a slightly modified 6502 microprocessor. What may be viewed as the "heartbeat" of the 6502 is the 1 MHz processor clock. (Actually it's 1.0225 MHz.) This corresponds to one million beats or clock cycles per second. Many 6502 machine language instructions take only two or three clock cycles to execute. A few take six or seven, maximum. (The 6502 is a very efficient processor.) In any event, the processing speed of any particular program, whatever language used to write it, is proportional to the processor clock rate.

So why not just modify a C64 with a faster clock, like a 4 MHz clock?

The problems would be substantial. Most of the components in a C64 have a rated speed matched to the 1 MHz clock rate. Moreover, the whole system is rather carefully coordinated from the standpoint of timing. Here are just a few examples: The existing 6510 rated at 1 MHz would simply cease to function if the clock rate were increased much beyond that. RAM memory speed would not be sufficient for reliable reads

and writes. The operating system ROMs would not be fast enough to deliver data in time for the processor. The various peripheral chips (6526 CIAs and 6581 SID) could not keep up. Operation of the 6567 VIC (video) chip would be greatly confused. VIC normally carefully interleaves its access to the system address and data busses with access by the microprocessor.

The Solution is an Auxiliary Computer

The first step in designing an accelerator is to find a 6502-compatible processor capable of operating at a faster clock rate. A two-times increase to 2 MHz would hardly be worth the trouble, but a four-times increase to 4 MHz is quite significant. A good choice is the 65C02, a CMOS version of the 6502 readily available at clock rates of 4 MHz, and even higher. The 4 MHz processor clock (actually 4.09 MHz) can be generated by dividing the 8.1818 MHz C64 video "dot clock" by two, which has the advantage of facilitating synchronization with the C64.

Next memory must be considered. If a 4 MHz 65C02 attempted to operate out of the regular C64 RAM, little or no net increase in speed would result because the 65C02 would be spending most of its time waiting for the RAM. So the entire 64K of C64 RAM is duplicated in the accelerator, fast enough to operate at 4 MHz, and the 65C02 operates out of that fast RAM. Similarly, the Basic and Kernal operating system ROMs are duplicated in fast EPROM.

Thus at the core of an accelerator is a rather complete microprocessor system, including a 65C02 clocked at 4 MHz, 64K RAM and EPROM. This system has its own address and data busses, independent of the C64 address and data busses. As a minor detail, the 6510 on-chip port at register address \$01 is emulated with a TTL latch to provide LORAM, HIRAM and CHAREN duplicating C64 bank switching so programs can access RAM "under" ROM. Standard address decoding is provided so the 65C02 processor can properly access RAM or ROM under all C64 bank configurations for full emulation.

Interface to the C64

At this point we essentially have another computer, much faster, but in fact useless as a practical matter because it has no I/O. That's where interface to the C64 must be considered. This is also where the details are a bit more complex, so read carefully.

An initial step is to entirely disable the 1 MHz 6510 microprocessor inside the C64. This is easy because the designers of the C64 provided

TURBO MASTER CPU A TECHNICAL VIEW

at the expansion port a "DMA" (Direct Memory Access) input line which, when active (grounded), disables the processor so an external device can directly access RAM for high-speed data transfer independent of the processor. (The Commodore 1764 RAM Expander also uses the DMA line.) With DMA active, the accelerator has access to essentially all the hardware resources inside the C64 without interference from the 6510.

Some form of organized communication must be provided between the address and data busses in the accelerator (the accelerator system bus) and the address and data busses inside the C64 (the C64 system bus), complicated by the fact that these two system busses are operating at quite different speeds. This is accomplished by standard TTL logic parallel latches which function to receive and momentarily store data and/or address information from one system bus at the appropriate time during the clock cycle of the one system, and then to output the information to the other system bus at an appropriate time during the clock cycle of the other system. Relatively complex timing control logic is needed to coordinate all of this. In any event, as an end result the accelerator has the ability to access memory and I/O chips on the C64 system bus.

In the Commodore 64, the address range hex \$D000 through \$DFFF is assigned to I/O. Specifically in this range are the two 6526 CIA chip registers (keyboard, joysticks, serial bus and video bank), the 6581 SID chip registers (sound), the 6567 VIC chip registers (video mode), and color RAM. When a program calls for I/O operations to any of these registers as recognized by the address decoding on the accelerator, the accelerator simply writes to or reads from the C64 I/O registers or color RAM as required. The latches and timing control logic mentioned above ensure a coordinated data transfer.

Copy of RAM Data

Only one ingredient in this overview of principles remains -- how can the VIC chip access screen character data, sprite data, graphics bitmap data and bitmap color data produced by a program? From the programmer's point of view things are quite simple; information written or POKed to RAM either directly or through the operating system simply appears on the screen courtesy of the VIC chip. From the hardware point of view the situation is more complex.

A critical consideration from the standpoint of accelerator design is that the video data must be in regular C64 RAM for the VIC chip to have access to it for display. However, the 65C02 accelerator processor operates out of its own 64K of fast RAM on a separate system bus which the VIC chip does not access, and this is where programs put their video data.

Moreover, there is little predictability; the RAM addresses which the VIC chip must access can be almost anything as determined by a program's particular selection of video bank and video mode.

The solution is to maintain a copy in regular C64 RAM of *everything* the 65C02 writes to its own fast accelerator RAM. To accomplish this, the latches and timing control logic mentioned above perform a coordinated data write to C64 RAM every time the 65C02 writes to RAM. Even though these writes to C64 RAM must necessarily occur at 1 MHz, as a practical matter the 65C02 can continue on at the full 4 MHz speed. The reason is that, during normal execution of 6502 machine language instructions, the processor spends on average far fewer than one out of four processor clock cycles writing to RAM. Most of the clock cycles are spent reading from RAM, but the accelerator never needs to read from C64 RAM. So while a write to C64 RAM is pending or taking place from the TTL parallel latches mentioned above, the fast 65C02 continues on with subsequent clock cycles, at least the first two or three of which will be reads. In rare instances a write to C64 RAM will still be pending or taking place when new write data is ready from the fast 65C02. In these instances, the 4 MHz clock is slightly stretched to implement a delay.

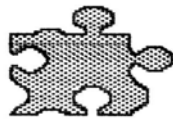
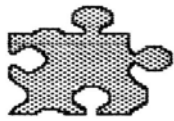
VIC Chip Speed

We've been told that an accelerator can't possibly speed up screen operations because the 6567 VIC (video) chip still operates at its same 1 MHz speed. This however in fact is not a limitation. In particular, the VIC chip operates at a speed determined by the frame rate of the video monitor in accordance with established television standards. This aspect of the operation is not speeded up by the accelerator, nor could it be if the video monitor is to operate properly. *What is increased by four times is the rate at which data is written into screen memory, and that data rate is what results in much faster screen operations.* So the accelerator in effect presents data much faster to the VIC chip, and it remains for the VIC chip to retrieve the data at its own proper rate.

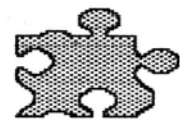
Conclusion

If you have stayed with us to this point you should have a good overview of how a C64 accelerator works in principle. Although it may seem so at first, there's no real magic involved; just careful design and attention to many details.

*Turbo Master CPU is available directly from
Schneider Systems, 25 Eastwood Road,
P.O. Box 5964, Asheville, North Carolina 28813.
Telephone (704) 274-4646.*



COMPUTER PUZZLE
MARCH MONSTER PUZZLE
TRIPLE CROSSWORD



PART TWO

WHAT IS EXPRESSED AS A PERCENTAGE OF ERROR?
 FIND THE ANSWERS OF LAST MONTH'S PUZZLE IN
 THIS WORD SEARCH. YOU WILL HAVE TO FIND
 OUT WHERE THE VOWELS GO TO BE ABLE TO
 SOLVE THE PUZZLE. I HAVE GIVEN TWO CLUES.

FOR THE BRIGHT SPARKS

TRIPLE MONSTER

B	V	R	P	R	N	T	Q	R	R	D	G	L	F	H	B	
R	R	D	S	T	R	N	G			P	D		P		O	
P			S	R	M	B	P	C	N	R	S	M	T	R	M	O
F								T		B	R					T
Y	Z	T	K	L	D	R	T	S	G	F	H		D	N	K	S
C	D	C	P	D	R	E	H	N	R	C	G	C	T			T
N	R	R	L	N	G	B	L	G						Y	R	
			D	T	H	L	B	R	N	P	T	M				A
D	F	N	K	R	N	B	C	M	B	P	N	T	V	P		P
M	B	F		R	R	L	T	K	P	E	P					P
	Y	C	N	D	D	C	L	M	S	P	M	N	I			
D	B	W	M	W	G	G	P	S	R	T	N					
	K	D			P	T	L	D	D	P	C	A	D	L	G	
R	D	R	R	D	T	S	Y	K	Y	R	R	B	L	C		
	S	G	M	N	T	D	N	R	T	N	V	D				

FOR SALE

One Riteman C+ printer \$200. See R. Cloosterman.

DISPATCH DISK NOTES

COMMITTEE 1990-91

President R. Cloosterman 382-0781
Secretary Ms. C. Van De Belt 382-8660
Treasurer A. Morrison 085 56-5013
Newsletter ED. J. Van De Belt 382-8660
64 Librarian J. Carey 294-8447
128 Librarian M. Tippins 381-3181

Our Disk and Magazine libraries are open at each general meeting from 7:30pm.

If you have any contributions for the newsletter, see Rob, Jeff or Jan.

NEXT MEETING

Our next general meeting will be held on the 20th MARCH 1991 7:30pm.
SUBJECT : VIDEO DIGITISER and the HANDYSCANNER 64 by R. Gasson.

LOCATION :- Meetings are held in the house behind the Salvation Army Hall at 186 Elizabeth Rd. in Morphett Vale, just in from Beach Rd.

MEETING RULES

- 1) NO SMOKING
- 2) NO DRINKING
- 3) NO SWEARING

Through the generosity of the Salvation Army, we are allowed to use the facilities in this house, in return for which we give them a relatively small donation. We ask for your co-operation in respect to the above.

While we can not control what people do away from our club meetings, Piracy of copyright material can not be condoned at our meetings.

DISCLAIMER

The views expressed in this newsletter are those of the writers, and are not necessarily those of the club's committee or members.

The use of the word "COMMODORE" in no way implies any connection with any organisation bearing that name.

No part of "THE DISPATCH DISK" may be copied or reproduced in any way without the written permission of the committee and the author.

WANTED

ASSISTANCE REQUIRED -THE CLUB STILL NEEDS THE ASSISTANCE OF SEVERAL MEMBERS IN THE FOLLOWING AREAS:-

- 1) Newsletter contributions
- 2) Expert Register. PLEASE help us to help others with their problems.

DEMONSTRATION TOPICS -If you have any requests for topics you would like to see demonstrated, speak up. Even, if it has already been done, and you missed it let us know. If there is reasonable interest, it can probably be repeated.

FUTURE MEETINGS - Help us to spread the word of our existence. Write out some small notices and place them where people will see them. Your local supermarket usually has a notice board as do some Newsagencies and Delis.

FOR SALE

PUBLIC DOMAIN SOFTWARE - We have a large range of PUBLIC DOMAIN Software for sale through our library. Prices represents very good value. Catalogue disks are also available for only \$1.00. See Jeff at tonight's meeting for any enquires.

CHEAP DISKS -How much do you pay for your blank disks?. The club is making bulk purchase of disks to help members save some money. The price of these disks is 70c per disk, which works out to be \$7.00 for a packet of 10. If you are interested in some, see Rob at tonight's meeting.

MEMBERSHIP FEES

The scale of membership fees for this year will be as follows :-

Joining Fee for new members \$5.00
Membership fee (to A.G.M) \$10.00

All previous members who have not renewed their membership are unfinancial and will have to rejoin the club and pay the joining fee again in order to add items to the club's disk and magazine libraries, we need money, so please pay up promptly.