

bi-monthly periodical of the Exidy Sorcerer Gebruikers Groep

a translation in English of the original Dutch version



The L O G I C partner to a Sorcerer

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CONTENTS OF THIS ISSUE

ESGG-information and service	page 2
Info	3
From other magazines	4
Input	4
Inquiry 1984	5
Listing CompuData CBIOS (CP/M 2.2)	6
Printing off-screen	7
CP/M modifications (2)	9
Exidy 30 tracks MPI disk controller (3)	15
Controllerboard modification	17
Increase the speed of the serial port	17
Exidy Robotica (1)	18
Chiptips	21

INFO.

- * The number of subscribers to the Dutch version of the ESGG-periodical at the moment of the dead-line for this issue is 978. The English version counts 30 subscribers (some did not renew their subscription up to now). The first number almost equals the number of members of the users group!
- * Since the last Sorcerer Day there is quite a lot of software available. Two new cassettes and one new diskette! Among the cassette programs there are a.o. the explanation and demonstration of the light-pen now available through the ESGG-service for DF1. 50,=. If the stock of these pens has been sold out at the Sorcerer Day, it may take some time before your order can be delivered!
- * If all goes well, we are to issue a new cassette at the HCC Days too (being number 18!). And if everything turns out as expected, then that cassette hold the complete catalog of all issued cassettes!
- * From the afore mentioned you might deduct that the ESGG is going to be present at the HCC Days. As we all earn our daily bread working for somebody else, we only are there on Saturday November 17! See you at the HCC Days at Utrecht!
- * In this here issue of the periodical you are to find a number of important articles: The ESGG Enquiry 1984, an announcement from Fred Knottenbelt on the being available of the complete CBIOS listing, an article by the same author (in co-production with Fedde Ringenaldus) concerning improvements to implement into MOVCPM for the BIOS and finally the controlling of robot-arms (if these arms are quick enough, they might perhaps be programmed to do this 'stupid' typing!).
- * The ever returning award for the article is this time for mr.
F. Knottenbelt
Boedapeststraat 23
Haarlem
for his fine article, with program, for looking at the calling of BDOS calls by Exbasic. Congratulations, Fred!
- * As the Sorcerer Day is taking place right after the preparatory work for this issue, it is not possible to tell you the whereabouts! I safely may presume all visitors to be content. In advance I like to poke fun at the many volunteers for their disinterested co-operation: Thank you all very much!
- * This Sorcerer Day we did not run a technical corner! A Problem? We did not consider it so, but if you feel otherwise, feel free to let uw know. We try to take your opinion and wishes into account as much as possible!
- * Did you create new programs between the release of the previous and this issue, then send them (when putting them at the disposal of fellow-members) to Wim Warning for the cassette library and to Hermine Bakker for the diskette-library. They will be grateful for it!
- * Have you discovered special things, made improvements in existing programs or alike things, do not think "Ah, someone else presumably has figured that out!", but send your idea, design or improvement (preferably with version number of the program concerned) to the editor. In this way one helps the other!!
- * If you are going to send something for publication to the editor, pre-

ferably do so as a wp-file on cassette. The speed for that is 1200 Bd. Please use motor-control for writing to cassette. In that way a cassette is easily read, without wondering in what way the article had been saved! Thanks for the co-operation.

- * Recently quite a lot of 'small' advertisers had sent the text for their advert not to the editor, but either to the treasurer or to the secretary! Consider that this may cause delay and is also not mentioned in the agreements for sending in adverts. Please look at it, before addressing your advert? Thank you.
- * This 'months' proverb: When everyone thinks that someone else is going to do it, nothing happens! (Did you yet think of helping board or editor?..... Well?

FROM OTHER MAGAZINES.

- * Databus nr. 8 : A series of a special on the chip; question whether it is an employer or an employed (nr. 9). An outline of the 8087 numerical data processor (also nr. 9).
- * PCM nr. 8 + 9 : Explanation and operation of a modem. Which modem will suit your system. Magictable, a new database. Annex: Wordprocessors. 9: Open access: 6 programs in a single package!
- * Elektuur 251 : The big bang!!! An explanation on modems, with a novelty, the newly released Elektuur -directly to the phone line connectable modem-kit. The assembled modem will be tested by the TS of the magazine and may be approved according Telecom standards! Also a doubter: Is it a RAM or an EPROM card; need Applikator.

INPUT.

- * Regarding the experiences of Marten de Boer -ESGG number 15- the author of the program High Resolution Graphics, Dany Rosseel from Westende (Belgium), added the next:
At the following addresses adaptations need to be made:

address	was	becomes	explanation
0F	00	D0	has to be RET NC, instead of NOP
7F	A7	01	has to be LD BC,0 instead of AND A
EC	F0	F8	has to be LD BC,F800 instead of F000

The first error had not yet been detected, probably as it only occurs when the 'V'-value is inputted to large.

The last error has been corrected right by mr. De Boer.

The second error actually concerned the contents of address 7F, being wrong. However by changing byte 80 into 06 (LD B,0) the programs is working good. Byte 7F then can become 00 (NOP) or remain A7 (AND A).

Thank you, mr. De Boer for these corrections.

- * From mr. Theo Bartlett from Silverton (RSA) we received, with some articles, a request for information on the way to make the STAR Gemini-10X printer print graphics with the help of Sorcerer. He tells:
I have a STAR Gemini-10X printer, being a copy of the Epson, however being cheaper. This printer has the advantage of using ordinary typewriter ribbon, instead of a cassette. I tried to find out what would happen to the little square of Hermine Bakker (ESGG number 14), but found that it was impossible with EXBASIC or MBASIC to have the printer

use the graphics mode with the Sorcerer. Dipswitches should be set, which I had not done as the printer works well with SPELLBINDER and with my ZX SPECTRUM. Perhaps there is someone who may explain to me how I can get the graphics out with my Sorcerer (I guess it has something to do with the graphics of the Sorcerer that uses ASCII coeds up to 255).

Mr. Bartlett, you are right. It has to do with the eighth bit to be sent by the computer to the printer. To enable this, one should use the Sorcerers parallel driver. Inside the printer the setting of one or more dipswitches need changing. If you also like to have the use of the Centronics routine, a little more need to be done (switching of the Strobe, create a switchable LF-signal, send the eighth bit to the correct place in the printer). We will publish on this soon.

- * From messrs C.A. Freeman from Stanford-Le-Hope (Eng.), Gary Pewitt from Roy Utah (USA) and H. Chantaket from Bangkok (Thail.) we get requests for a listing of available software. First of all we have to point out that ESGG has no listings in hard-copy of available software. Next is that most of the software, as well as the annexing documentation is mainly in Dutch. There is a bright spot however: At this moment we are working on a kind of listing of all previously issued software. This synopsis, constructed in the same manner as the cassette indexes, is going to be recorded on a shortly to be released cassette. So hang on..
- * At Deventer and Voorburg new settlements of the TREND GROUP chain are opened. At Deventer this is MICRO CENTRUM DEVENTER B.V., in the Geert Grootestraat 44, phone 05700-11555. The company Verkruijsen en Van Maaren B.V. in the Koningin Julianalaan 72 is the Voorburg branch. The phonenumber there is 070-875848. Both companies a successful start.

INQUIRY 1984.

In the, yet gray past, even before the ESGG periodical existed, the board had instituted an enquiry. In that form there were only two questions. The number of positive answers to the first question resulted in the already 16th number of the periodical now being under your eyes.

There was quite a lot going on, before the board did agree making an inquiry. This was mainly because the heap of work that comes with an inquiry and partially because the follow-up resulting in a lot of work too and finally the question whether an inquiry actually is useful.

It is good policy to state clearly first what is going to be achieved by an inquiry and if the information to be gathered might be collected otherwise. The more clearly one can bring the usefulness of an inquiry to the persons questioned, the more they are willing to co-operate in such an inquiry.

This time too, there has been a lot of preceding discussions on usefulness and goal of a new inquiry among readers and members. Finally they did see that with the right questions asked, the usefulness would prove. In the meantime one of the members, mr. Fred Strang, did agree to start the layout of form and questions and so we entered the second stage. After having judged and edited the questions the board agreed on the inquiry form that is in this very issue.

What is the goal of this inquiry?

To be able to offer the necessary help in various fields, it is necessary

to know what kind of equipment our members/readers own. Besides we like to know to whom we can go when our knowledge (including that in our direct environment) is lacking. United we do stand!

All questions are serving that goal. The more questionnaires we receive back, of course after being completed, the more chance there is in solving problems taken to us. An actual situation of 'for you and by you!'. It is our intention to give this inquiry form to the foreign readers too, thus creating a worldwide information field.

I therefore express the boards hope that all inquiry forms are returned. We really regret that we are unable to prepay the postage, but there is no way to have this arranged from here. If you intend to fill out this form, do it rightaway.... in this way you could not forget to fill out, is not it?

Welmoed Jonker.

LISTING COMPUDATA CBIOS (CP/M 2.2).

By Fred Knottenbelt.

In the years passed, a lot of pressure has been brought to bear upon me by the ESGG to publish the listing of the CBIOS of the Exidy Sorcerer CP/M 2.2, made by me.

I had the necessary objections to it. At first there are some point needing clarifying about the operation of the BIOS. At second many an interested person is going to address to me with an avalanche of questions for further information. At third I fear that many a user may think to have these improvements made in a glance. Regarding this I like to express that changing the BIOS needs knowledge and skill. One is correcting directly next to the hardware (e.g. the disk controls) and not everyone is capable of recognizing the consequences of an implemented change. This is a specialists works. Even the designers of the BIOS have dropped stitches! Besides the problems already been published, I may mention the RAM refresh not keeping within its specifications while accessing disks (fortunately the RAMs are most of times so good that no problems occur).

Finally I gave in for the pressure with the condition that nobody tries to contact me for further explanation. Whenever one is calling for information, I shall disconnect at once. Questions written to me shall remain without reply. I really do not have the time to dig into them. If you can not agree with this condition you should not proceed reading.

The decisive factor to start publishing is that I feel that this listing should have come together with CP/M. Even now that the Sorcerer is to be considered history, CompuDATA is still not willing to publish the BIOS. The listing is of the BIOS version 1.92 (March 1982). The most serious of errors in it have been subject in an article in ESGG and were triggering a modified version 2.0. The adaptations have been made in such a manner that the code remained in its place. The listing has the addresses referring to the 48K version of CP/M.

Some among you feel that the CompuDATA CBIOS is a badly written piece of software. I have to disagree with that opinion. A self modifying code has been used. As the maintenance is not of our concern, no harm is done, in fact, it leads to efficient use of memory and a higher speed. Of course each of us would choose a different solution for the same problem and one can pick some spots where a better solution would be preferred, however this does not make the software bad. The CP/M obtained is compact and quick and has many good qualities (some being implemented, other being prepared but not activated).

How about such a disassembly?

One starts by having a disassembler creating a file, in which all instruction codes are being replaced by a, for us more real and understandable mnemonic, e.g. 7E becomes LD A, (HL) and DD 36 05 20 becomes LD (IX+5), 20H. Next to do is finding the areas where a possible message in ASCII code has been. The disassembler has taken this code for machine code and has replaced them by mnemonics (some disassemblers are so clever that they can spot ASCII code, within certain limits). This however turns out to be nonsense in the program. Then the messages are fed into the source text. And now the tremendous job starts: Trying to understand what functions the processor is going to execute according to the instructions. This requires a great deal of patience (looking at the same code over and over and trying to understand its purpose). A huge problem is that very often subroutines are being called that call other subroutines in their turn etc.. It then happens quite often that one does not know from where the subroutine had been called, the moment it is finally understood!

A multiplication routine can drive one mad (when starting and not knowing it is a multiplication routine). In this case of the BIOS however, high knowledge of the surrounding hardware, above all of CP/M itself is a necessity. Otherwise it is not possible to understand the Blocking/deblocking, or the reason of a subroutine being written in a certain way. The disassembly of the BIOS in concern has taken in its first shape some six weeks (each day from early morning to late at night and of course several disk crashes in between!). Thereafter the rough edges have been polished in the next two years and many a question had been cleared (but not all!). Of course one needs to make listings over and over to keep track and oversight of the proceeding disassembly. In this case a total of 2000 sheets of paper and of course the necessary ribbons have been used.

I put the listing (approximately 40 pages) at your disposal in a printed form (offset). Those being interested have to contribute for the expenses. I have to estimate the number of persons interested, which I do not consider too high in such a specialistic affair (many among you will find it cheaper to order one copy and use the company's photo copier to multiply to the desired number at the bosses expense.

Those being interested are invited to remit Dfl. 40,00 to the post account number 3600507 of F.H. Knottenbelt at Haarlem, in order to obtain a copy. This amount has to be in my possess within 2 months upon the issuing of this number of the periodical. THEREAFTER the required number of copies is being printed and mailed. From that final date no listing can be ordered!! If (e.g. due to the afore mentioned 'Dutch disease') the number of persons interested is too small, I abandon the publication and the money deposited will be refunded.

PRINTING OFF-SCREEN.

It has been quiet for some time, but now there is something from Rob de Beer again. If you take a look at the thing he has send us this time, you will understand the long silence. An easy readable gem on a special way to use the PRINT statement. If you have been waiting for this for some specific purpose, then do show the result to us, linked to Rob's thinking!

The Sorcerer has print-possibilities literally and figuratively rising far above the 1920 RAM's that create the video screen. In fact all the other RAM's can be printed in and they are numerous. Actually the print freedom is even greater outside than inside the 30x64 screen, in which the cursor is kept imprisoned by the video-driver. Once the cursor has escaped from these boundaries, it can go on without obstruction. And the nice fact now is that the cursor-pointers from HIMEM-6 till HIMEM-3 continue their work

as before making printing fully controlled.

I will try to explain the simplicity of the printing from Basic and the use of it, further in this article. The use of printing outside the screen is being explained and a small application program will be given. If you do not know exactly what function the cursor-pointers have, I suggest you to read the article "Romping with routines" in ESGG #6.

Principle.

If the cursorpointers are 0, the cursor is in the left-upper corner of the screen, at address -3968 (F080). What happens if we fill the pointers with the value +3968? Would the cursor move to address 0000? This actually proves to be so!

Try it.

We now make a demo-program and start very simple. Because the starting address of the cursor-pointers depends on the amount of RAM of your Sorcerer, we call this address (HIMEM-6) from now on P. So the contents of P and P+1 hold the line-pointer and that of P+2 and P+3 the column-pointer. This one is not going to be in the picture as we only have use for the 2 byte line pointer to be able to send the cursor to all the 64K memory locations. To fill the line pointer, P, its address has to be known and this is to be achieved by the next Basic line that I do not explain to prevent straying:

```
20 P=PEEK(-4095):P=P+256*(P>127):P=PEEK(-4096)+P*256-6
```

Moving the cursor to address 0, printing there let's say AAA, is done using this:

```
55 S=3968: X=P: GOSUB 90
60 PRINT"AAA": END
90 POKE X,S AND 255: POKE X+1,S/256: RETURN
```

We now have satisfied the principle above. The POKES of line 90 are putting the value 3968 in pointer P with P+1, so from address 0 till 2 AAA (ASCII 41H) is being printed. However before running this little program it is advised to fill the addresses 00-FF with nulls (easy with chiptip 1 in ESGG #11). Another hint: After typing RUN, push the CLEAR key and then BYE and DU 0 FF. You will not only discover AAA actually has been printed, but also that there is something else from address 40H on: 52 45 41 44 59, which means READY. And you can be sure that 64 locations from there, being at location 80H, there has been the code of the cursor character (5F), but that has disappeared upon pressing Clear. So the Sorcerer reacts while printing off-screen in the same way it is used to on screen. We can avoid READY by finishing the PRINT-statement at line 60 with a CHR\$(12) or (17), which will put the cursor on screen again.

How usefull is AAA ?

The use of AAA at address 0000 might seem dubious, but perhaps you discover a useful application. We can develop the program a little as follows:

```
25 RESTORE 85
30 S=PEEK(445)+256*PEEK(446)+5
45 PRINT:PRINT"Type your text":PRINT
50 INPUT T$: IF T$="ZZZ" THEN 70
55 S=S+3968: X=P: GOSUB 90
60 PRINT T$CHR$(12)
85 :
```


Lines 55 and 60 are now changed a bit. The printing is not longer at address 0, but at address S, being achieved in lines 25 and 30. RESTORE 85 makes that the starting-address at line 85 is put into the Basic-pointer 445/446, being the address of the 00 with which each Basic line starts. Thus S is the address of the colon (:) at line 85. (As you see: RESTORE nn is not limited to DATA-lines!)

If you give a RUN now, it becomes a little critical for INPUT is asking often for text, but at this stage that text may only contain a single character; otherwise the program stop execution after line 85! I advise you also to use the token (GRAPHIC-1) for LIST. And if everything goes well a list will follow, as the LIST-token is printed (via line 60) at the place where the colon was, at line 85.

Printing text at a DATA-line.

For this application we add the following:

```

10 POKE 440,44: REM space for 10kb text
15 CLEAR 200
25 READ A$
35 IF T THEN 45
40 T=S-6
60 PRINT T$,"CHR$(12)
65 GOTO 25
70 FOR U=0 TO 2: POKE S+U,0: NEXT: REM trailing zero's
75 S=S+1: X=T: GOSUB 90
80 X=441: S=S+2: GOSUB 90: POKE 439,PEEK(X): POKE 440,PEEK(442)
95 :
99 DATA,: REM the text is printed here

```

Lines 25 and 60 are changed now. Change in line 30 +5 into +1. Keep LIST at line 85.

Lines 25 and 30 now take care of S receiving the address of the colon at line 99, making printing starting there. To every string you input, line 60 adds a comma, making the address following this comma being placed in S through lines 25-30. Thus you can continue inputting text, provided it does not contain comma's or colons. Each line of text has to be closed by a RETURN. If you hit REPEAT thereafter, the last string you typed in will be inserted again. Type ZZZ to escape.

Line 10 advances the End of Basic pointer 10 kilobytes, in order to create space for the text, caring afterwards by line 80 that the pointer links up again. The link-pointer of line 99 has to be adapted also, this happens via lines 40 and 75.

If you like to use the above in practice, the application will require the necessary implementation. The article only has been ment to bring the possibility of off-screen printing into the open, and demonstrate a few varieties of it. One of the best applications perhaps is the filling of a text-buffer, as done in the program BIKO2, that is to be on a future ESGG tape. If you just need to print one character, there is no advantage in this method, poking then is easier. However if longer strings are in concern this printing is quicker. There are also aid functions to the PRINT-statement (,;/TAB/SPC) that could be used. Add at line 60 after PRINT, a comma and see what happens.

CP/M MODIFICATIONS (2).

Did I mention last time as a remarkable thing the contagiousness of

reading someone else's chiptips, it also proves to become common to cooperate in writing or producing. We already have seen some expertise by Fred Knottenbelt, now he has produced in a joint venture with Fedde Ringenaldus a contribution to the refining and improvement of the CP/M program.

In concern is the improvement/change of CP/M version 2.2 softsectored (CompuData BIOS 1.92 and 1.93):

If you like to make one of the following changes in your EXMOVCPM, then do so with the utmost care. A mistake could reveal itself after a long time, but have a disastrous effect (for your files, it is..). I advise you to read the part on the version number at the end of this article. We must prevent all kinds of versions of the Operating System turn up later, of which one does not know what changes were made then!

1. Larger directories.

When using a disk drive with larger capacity (e.g. 77 or 80 tracks double sided) one soon encounters the problem of not being able to add new files, although the disk is not full yet. The reason is that only 128 filenames are allowed. The following changes in EXMOVCPM will enable a maximum of 256 directory entries.

Load EXMOVCPM.COM with DDT or SID. Do not forget to note the length! Make the following changes:

addr	old contents	new contents	addr	old contents	new contents
2099	C0	F0	206E/6F	31 1E	51 1E
20A8	C0	F0	2070/71	FF 1D	1F 1E
20B7	C0	F0	2082/83	83 1E	C3 1E
20C6	C0	F0	2084/85	51 1E	91 1E
2097	7F	FF	2594/95	23 1E	83 1E
20A6	7F	FF	25D5/D6	A3 1E	03 1F
20B5	7F	FF	2695/96	A3 1E	03 1F
20C4	7F	FF	26E8/E9	A3 1E	03 1F
209B	20	40			
20AA	20	40			
20B9	20	40			
20C8	20	40			

You are only to use this CP/M version for new formatted disks as there is a larger area reserved for the directory (was 4k, becomes 8k). This area was originally in use for files.

It is permitted to read disks with smaller directory in drive B:, if a disk with a large directory is in drive A:. However writing to it can be dangerous: if there will be over 128 filenames on the disk in B:, the first part of a file is being overwritten!

You cannot have a disk with a small directory in A: and one with a large directory in B:, as directory entries of B: could be overwritten by a file! That is because the kind of system in drive A: is determining. If you have more entries in the directory, the system will be slower.

2. Error during retry.

There is a very serious error in the BIOS of CP/M 2.2.

If the system has to make over 4 retries because of problems in writing a file or the directory, the system loses the correct sector number and wri-

tes the data to any given sector. This has disastrous consequences, in particular in the directory! This error does not occur while reading files.

This error can be corrected with the following changes in EXMOVCPM.COM.

24D5/6/7 contains: DB 2A B9 . This becomes: CD F5 15 (CALL 15F5H).

1FF5 and next (not used locations in BDOS):

```

1FF5: DB 2A      IN  A,(02AH) ;original instructions that
1FF7: B9        CP   C      ; are replaced by CALL 15F5H
1FF8: F5        PUSH AF
1FF9: 3A 20 1D  LD   A,(CURSEC) ;get current sector and
1FFC: D3 2A     OUT  (02AH),A ; restore track register
1FFE: F1        POP  AF
1FFF: C9        RET

```

You also have to adapt the relocation-table. This table starts at 2900H. Each bit in it matches a byte in EXMOVCPM.

When CP/M is moved, the high-order bytes of many CP/M addresses have to be adapted. Each bit set in the table matches an address part to be adapted. When a byte at address A in EXMOVCPM has to be moved, the matching bit in the relocation-table has to be set. You can find the byte containing that bit with the following formula: $2900H + INT((A-900H)/8)$. The remnant points to the bit to be set, counted from the left.

In the above modifications, the contents of address 24D7 is to be moved. This means, that from the byte at address 2C7A in the relocation-table, bit 0 is to be set. As there was already 80 in it, it is to become 81. The contents of address 1FFB is also to be moved. To do so address 2BDF of the relocation-table is to be filled with 20.

To resume: 2C7A actually 80, becomes 81 and 2BDF actually 00, becomes 20.

3. WARM BOOT ERROR.

Another error in the BIOS is that if one performs a warm start after having reset, by GO 0, nothing happens for a while and then the error-message "wboot.err" appears. Actually this error occurs upon each disk-access right after reset. Users of the well-known DEVSYS-pack are undoubtedly familiar with this when trying to load a file from, or write it to disk, after a reset.

This error can be corrected by the following changes in EXMOVCPM. A table not used (Readerstatus) in the BIOS is overwritten:

234D/E/F actually: 79 FE 03 becomes: CD EE 17 (CALL 17EEH).

```

21EE: 3E D0     LD   A,0D0H ;force interrupt command
21F0: D3 28     OUT  (28H),A ; to controller
21F2: 79        LD   A,C ;original instructions
21F3: FE 03     CP   MAXDRV ; replaced by CALL 17EEH
21F5: C9        RET

```

2C1D/E: 55 54 becomes 54 00 and 2C49: 00 becomes 01.

4. Autostart at COLD BOOT.

When one likes to connect a video display, replacing the function of the monitor, at the serial port, one can make a special CP/M version causing the output to go to that serial port (instead of to the regular monitor). Now you loose the possibility to address the cursor in the usual way. You

need to use e.g. the Van Montfort monitor, as the original Exidy monitor bungles the serial port.

First make a program named EXTVID.COM, as follows:

Boot CP/M, Reset the computer (without ROM-pack!)
Enter the following from address 100:

```

100: 3E C0      LD  A,0C0H      ;init RS-232 to high speed
102: FD 77 45   LD  (IY+45H),A ; (80H for low speed)
105: FD 77 3D   LD  (IY+3DH),A
108: 3E 1F      LD  A,1FH       ;init UART to 8 databits,
10A: D3 FE      OUT (OFEH),A   ; no parity, 2 stopbits
10C: 2A 01 00   LD  HL,(1)      ;determine address BIOS
10F: 11 3D 02   LD  DE,240H-3
112: 19         ADD  HL,DE
113: 36 18      LD  (HL),18H    ;replace CALL VIDEO by a
115: 23         INC  HL      ; JR TAPOUT.in the BIOS
116: 36 27      LD  (HL),27H   ; (no automatic wrap around
                    ; at the end of the line
118: C3 00 00   JP  0          ;warm boot

```

Go back to CP/M with GO 0. This program is to be saved by:
SAVE 1 EXTVID.COM. It is wise to make this file R/O with STAT.

When one likes to use another set up for the UART, the following applies:

bit 1 and 0	10 = 7 databits	11 = 8 databits
bit 2	0 = 1 stop bit	1 = 2 stopbits
bit 3	0 = odd parity	1 = even parity
bit 4	0 = parity on	1 = parity off

Hereafter the following changes in EXMOVCPM are made, making an auto-start upon booting, for EXTVID (at cold boot only).

27C4/5/6 was CD 09 E0. Becomes 00 00 00.

```

28CE: 28 13     JR  Z,NOAUTO-$ ;no key: no auto command
28D0: 21 EA 1E  LD  HL,CMDADR  ;address of auto-command
28D3: 7E       LD  A,(HL)     ;get # of bytes
28D4: B7       OR  A
28D5: 28 0C     JR  Z,NOAUTO-$ ;exit if 0
28D7: 79       LD  A,C       ;save disk#
28D8: 4E       LD  C,(HL)
28D9: 0C       INC  C
28DA: 0C       INC  C
28DB: 06 00     LD  B,0       ;BC = # of bytes
28DD: 11 07 00  LD  DE,7     ;startaddress inputbuffer
28E0: ED B0     LDIR        ;move name to buffer
28E2: 4F       LD  C,A       ;restore disk#
28E3: 21 00 00  LD  HL,0     ;NOAUTO
28E6: 22 7D 17  LD  (GOCPM),HL
28E9: E9       JP  (HL)
28EA: 06 45 58  DEFB 6,'EXTVID',0 ;CMDADR
28ED: 54 56 49         ;(6 = length of command)
28F0: 44
28F1: 00       DEFB 0          ;end of name

```

272E/2F/30: 31 FF 1E becomes 31 00 20.

2CFA/B/C/D 90 00 00 00 becomes 20 01 04 80.

When CP/M is cold booted now, without a key down, a normal start is made and the output goes to the monitor. However when a key is held down during the cold start (any key, s.g. the space) the sign-on message will appear on the monitor. Thereafter release the key. All output will go to the serial port from now on.

If you like EXBASIC to be this way, modifications need to be made in it, as EXBASIC directs its output directly to the video driver in the monitor and also initializes the serial port to cassette upon start.

This modifications for EXBASIC version 5.04/2 are:

```
5D10/1/2/3: 23 11 1B E0 becomes: 5E 23 56 00
SEA9/A/B : CD 32 39 becomes: 00 00 00
```

Of course it is possible to take any other command for the command EXTVID, in the afore mentioned routine (do not forget to adapt the length!), however this program has to be on disk as a COM file (except when it is one of the internal commands like DIR or USER x). The command is to be followed by 0.

The function of holding a key down can be reversed by entering at address 28CE 20 instead of 28. The command then always is executed except when a key is down.

5. Error in console-status table.

A few changes important when using the serial port for console I/O: The addresses 21EA/EB contain 76 18 and the addresses 21EC/ED contain F8 17. These values have to be swapped in pairs.

6. Some patches from Digital Research.

1CD2/3/4 was 0D 0D C2 DF 12 becomes 00 00 21 00 00.

1350/1/2 was CD 23 09 becomes CD 2A 09.

7. Changing to 80 tracks (eventually double-sided).

In the BIOS a maximum of 77 tracks is supposed. This can be altered into 80 tracks by the following changes:

2048 becomes 50; 2777 is 4E, becomes 51; 277B is 4D, becomes 50.

EXFORMAT and EXCOPY also need adapting.

The default value in EXFORMAT version 1.52 is at address 102 and may be changed into 50. Double side may be effected by placing 01 at address 111.

There are several versions of EXCOPY. By typing EXCOPY ? you will see the version#, and a few pages of explanation.

In all versions the contents of address 102 (4D) is to be changed into 50. The changes are:

```
-for version 3.53:   3A2/3 is FE 4D, becomes FE 50
                   3A6/7   3E 4D,   "   3E 50
                   15D8/9  37 37,   "   38 30
```

-for version 3.54 the same change goes for the addresses 3AD/E, 3B1/2 and 15E4/5.

When working with 77 or 80 tracks double-sided, it is wise to change the maximum number of entries into 256, as mentioned at the beginning of this article.

Mind that when working with 77 or 80 tracks double-sided the disk capacity is so large that the maximum number of Allocation Blocks becomes larger than FF. This means that in the directory 2 bytes are used to indicate the Allocation Blocks (in the other systems only one byte is used for that). Now when one has an 80 track double-sided systemdisk in A: and one uses a 40 track double-sided drive for B: and putting a double-sided formatted disk in it with the same sectorformat as in A:, one is not able to read it as the same table in the BIOS is being used. The Allocation Blocks are also pointed to in a different manner. Single sided disks (40 as well as 80 tracks) can be read, as a different table is used then. For this reason one should explicitly abandon writing to the disk in B:!

There are 80 track drives like TEAC that can be switched to 40 tracks. It is not advised to write 40 track disks on these drives as the track, written by the 80 track drive is narrower. Reading of such a disk on a 40 track drive may cause trouble. Reading of 40 track disks of course is possible.

B. Repeating already known changes.

The RUB key can have the same function as ctrl-H, by changing address 141B/C into 18 EA (ESGG-9).

Changing the contents of 224A into 3F will give you auto wrap-around at the end of a line (only for version 1.92).

At locations 204B, 205F and 2073 the track-to-track speed can be defined by means of the right 2 bits. Also 5B at address 24E3 may be changed into 58 (ESGG-9).

In some versions of EXMOVCPM some villain (we know his name) has set the Speed-Mask to 0. This could give serious problems whenever you try to use this version with a slower drive! At location 2377 has to be 03. The track-to-track speed can be set at the addresses mentioned above.

You may change from single-sided CP/M to double-sided by changing the 00 at location 2049 into FF. Of course one need to format the disks double-sided. To do so one may put 01 instead of 00 at address 111 in EXFORMAT.

One can use 3 drives by setting bit 3 at location 2073 (the fourth from the right) to 0 and change at location 2074 14 into 0C. With the normal values the C:-drive is simulated at the B:-drive and one receives warnings to exchange the disks in time.

NEW VERSION NUMBER.

We like to suggest that one issues a new version number once the changes in the BIOS have been made, showing by the sign-on message that an improved version is being used. The suggestion is to choose 2.0x for this number (from address 2852 entering: 32 2E 30 'x'). With 'x' (x may range from 0 to F) one can point out whether large directories are being used, if auto-start is being implemented, if the system is suited for 3 drives and if the track-to-track speed is, or is not the maximum. Remind to use ASCII code for 'x'.

Furthermore we like to suggest to change the load date at address 28A0 into June 10, 1984; (code: 4A 75 6E 65 20 31 30 2C 20 31 39 38 34 3B). In the future we then can refer to this version. In the version 2.0 the changes mentioned in 2, 3, 5 and 8 need to be inserted.

x is to be constructed as:
bit3 = 1: large directory (maximum 256 names)

bit2 = 1: auto-start implemented
 bit1 = 1: 3 drives implemented
 bit0 = 1: track-track speed 12, 20 or 30 mS

All modern drives can operate at maximum track-to-track speed (6 mS). The Micropolis drives need according specifications 30 mS, the older BASF drives 12 mS, the MPI drives need 6 mS.

GENERAL REMARKS:

When CP/M gives an error-message for a write or read error at track xx sector yy this does not mean that the disk is defective at that track. It also is possible that CP/M tried to go to track xx and did not succeed in doing so.

Inside the BIOS the interrupt is dis- and enabled regularly, without examining whether the interrupt was on. This means that when returning from CP/M the interrupt is on, regardless whether it was or not set by the user-program. This is not easy to change.

When you have a disk formatted double-sided and you format it again single-sided you are in trouble when there is a double sided system disk in slot A: and the said disk in B:. Because the single-side formatting does not change the format at the other side of the disk. The system finds a double-sided disk in B:, and writes to or reads from it double-sided! It is obvious that this may cause serious errors!

There is a need for an UNFORMAT program that corrupts the information at B:-side. There also is a need for a program with which one can detect a disk being double-sided formatted and also indicating the number of bytes per sector. If there is time, we will take a shot at it.

When logging-in at drive B: and try to start a program not on this drive, the system will automatically look for it at drive A: (system disk!) and then loads it from it if possible. When using a 3 drive system and logging-in at C:, the looking for also takes place at A:-drive (not at B:).

When one likes to load a program (COM file) in memory without starting it, one may enter the name (without .COM) followed by a space and a control character, e.g. CTRL-L. CP/M then loads the program and clears the screen (caused by CTRL-L) and returns to prompt mode. By going to monitor through RESET (without a pack in the slot!) one now may dump the program or make the necessary changes. This is a smart way especially when the program is too large to be loaded by DDT.

We think this will do for the time being.

EXIDY 30 TRACKS MPI-DISK CONTROLLER (5).

Well dear readers, all things come to an end and so does the report of Henk Warnitz concerning his experiences with the MPI-disk controller. This time he did not have additional remarks to the previous part, so we start rightaway.

7. Contact problems.

Problems:

- All kinds of undefinable and inconceivable errors that took a lot of my time before I understood the nature of the errors.

Cause:

- Bad quality IC-sockets and plugs.

Cure:

- Wherever possible, remove the sockets and solder the IC's directly into the board. Only use sockets with gold contacts for the ROMs and the controller chip.
- Use for connectors to diskdrives only gold-contact types. The other connectors of the Sorcerer did have gold-contacted ones.

8. The Sorcerer computer.*Problems:*

- Loss of video-image after black horizontal lines across the screen.

Cause:

- Bad connector between the transformer and the stabilisator-board. I read in an Australian publication that the plug used is not fit for the job.

Cure:

- Remove the plug, and solder the wires directly to the contacts.
- I have heard a lot about Sorcerers suffering from bad IC-sockets. The solution is the same as with the disk. Only for the UART, the Z80, the monitor ROMs, RAMs, the character-generator and the video-RAMs sockets are needed. I myself had no trouble with them, only with the power supply plug.
- About the problems of using quick RAMs or not in the Sorcerer the wildest stories are heard. It is however likelier that a RAM does not meet its specifications. 200 nS RAMs are fast enough for 4 Mhz, so they also will be fast enough for a Sorcerer running at 2,1 MHz. And what about the S100 cable? It also may be the cause, as it is a kind of antenna, thus pooring a lot of junk into the Sorcerer. There is quite a lot possible with the Z80 in Wait, or Interrupts up to Reset. I know of someone's Sorcerer being tilted after having connected drives, without having trouble before. I guess that user has no problems after having carried out all of the aforementioned changes.

POSTSCRIPT:

Of course I have not worked out or found the solutions myself alone. This article is the product of a users group of which a number of members solve their problems as a team. I therefore like to mention some of them. In particular Gerard Evers from Almere, without his assistance (twice to 4 in the night) I would not have been succesful in getting the d... thing running. His contributions are the solutions for the S100 cable, the 5 Volt power supply and realization of the data separator diagram; Loek Riemens from Hoogland contributed the idea for the data separator IC and finally Fred Knottenbelt from Haarlem and Jan Bonsel from Zeist.

Software-changes on CP/M from 30 to 40 tracks do not belong in this article. It already lasted too long. For that you better look in the ESGG-periodical. I have sent the complete assembler source of CP/M 1.42/3 to Charles Netteler for those that like digging into it. The source has been reconstructed by Jan Bonsel. I really enjoyed getting to the bottom of the team-work of hard-en software. I can ensure you that the above changes enable you to have a 40 tracks CP/M.

Postscript from the editors:

We actually never have heard of the problem mentioned in item 7! A plug not being suited for a current seems a little awkward to us. That plug may be dirty or make bad contact. In that regard a direct connection always is a better solution. Nevertheless different opinions in some fields, this group has brought forward several sensible items, from which the reader possibly may profit. For the extensive report and annexes (diagrams) all of the contributors are thanked.

CONTROLLERBOARD MODIFICATION.

Mr. B. Geraads from Kessel has been following the series from Henk Warnitz on the modifications of the MPI disk controller to the last part and now informs us of his findings.

After having gathered my courage, due to my limited experience in the hardware field, I have carried out the modifications of the controller board, described by Henk Warnitz.

Contrary to what Henk had predicted, all worked well directly, to say for a quarter of an hour. From then write errors occurred from the high tracks when formatting, until after some time a disk could not be written on at all.

The factor time and a little freon on the controller chip making these problems vanish, were pointing to thermal problems inside that chip.

I will spare you the description of all of my efforts, as that easily fills a page. Co-incidence - the parasitic capacity of the test wire-handed the solution to me! A capacitor of 500 pF connected to the write pin 31 of the controller chip and to ground made a fine working 40 track diskdrive again.

I only hope there is someone that is able to elucidate this solution with an explanation.

If there are more ESGG-members planning to carry out these changes, they should consider joining the order for the data separator IC as the company Auriema adds a DF1. 25,00 to the order of a single IC!

INCREASE THE SPEED OF THE SERIAL PORT.

The Baudrate of the serial port can be increased to 9600 Baud by cutting the track going to the left from IC-14D pt.13, and make a connection between that point of the IC and pt.10 of IC-14H. This change has no effect to the Baudrate of the cassette interface. This clock is asymmetrical. The UART often gives parity-errors in receive mode in this configuration, as a result of the asymmetrical clock. This is of course only noticeable if the parity actually is being checked. If a separate clock-oscillator is used (153 kHz), this problem does not occur.

Another solution is to make a modification to obtain a symmetrical clock of about 153 kHz. This however will cause the clock frequency (for the cassette interface too) to be a 2% too low. We did not experience problems from this.

Cut the following tracks:

IC-13H pt. 9 (upper side)	IC-14H pt. 13 (upper side)
IC-14H pt. 9 (bottom side)	IC-14H pt. 15 (bottom).
IC-14H pt. 13 (upper side)	

Make the following connections:

IC-14H pt 9 to IC-14H pt. 16. IC-16E pt. 8 to IC-13H pt. 9.
 IC-14H pt. 12 to IC-15H pt. 2. IC-16E pt. 9 to IC-13H pt. 15.
 IC-14H pt. 14 to IC-14D pt. 13.

EXIDY ROBOTICA (1).

At the latest Sorcerer Day Wim van Grieken has lectured on the possibilities of controlling robot arms with the Exidy Sorcerer. From questions he learned there is much interest for this subject, therefore he agreed in writing his lecture for the periodical. We really do regret not being able to publish this article in one piece, in concern with the available space. In the familiar manner we have created a series, of which the first part is now before your eyes.

This explanation by Wim is really worth it, especially to novices, even those new in electronics, in particular because of the smooth manner he is leading the newcomer into the land of the transistor and the chip.

Introduction.

The subject of the lecture was to run a robot arm with the use of a computer. For this purpose I used the TANDY ARMATRON robot. This robot arm originally has only one motor for the six possible movements. These movements are:

- right/left rotation of the entire arm
- up/down movement of the entire arm
- right/left movement of the forearm
- up/down movement of the hand
- right/left rotation of the hand
- opening/closing of the fingers

It is obvious that when choosing for running each movement separately, this creates a need for six instead of one motor. Therefore six motors have been installed each taking care of a different movement. By changing polarity of the motors the direction of the rotation can be changed. To be able to explain the electronic diagram, the next subjects are being handled:

- use of the Exidy parallel port
- use of a decoder/demultiplexer
- motor connection diagram

Use of the Exidy parallel port.

In the Exidy Sorcerer's manual there is a listing of the connections of the parallel port, with the derivable signals. Ref. page 49.

The parallel interface has a 25 pin connector. Among these, 8 pins are for signalling to the outside world and 8 pins are for reception of signals.

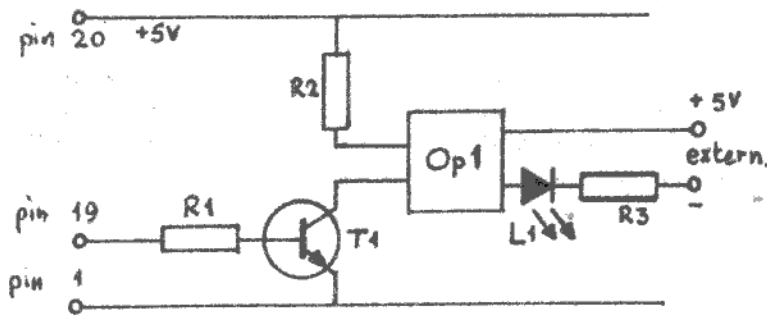
The OUT-pins:

Pin nr.	bit	OUT 255,*
16	0	2 ⁰ = 1
17	1	2 ¹ = 2
18	2	2 ² = 4
19	3	2 ³ = 8
7	4	2 ⁴ = 16

The OUT-pins:

Pin nr.	bit	OUT 255,*
6	5	$2^5= 32$
5	6	$2^6= 64$
4	7	$2^7=128$

This is operating the following way: When we give in Basic -for example in a program- the command OUT 255,8 we have a 5 Volt signal at pin 19. With this signal we can run something.



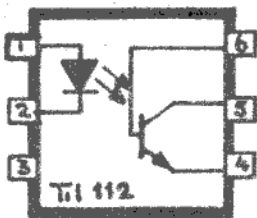
Pin 20 is a 5 Volt power supply from the computer

Pin 1 is the 'ground' of the computer.

(drawing 1)

explanation: T1 = transistor BC548
 Op1= optocoupler Ttl 112
 L1 = LED 6V.
 R1 = resistor 3k3 Ohm
 R2 = ,, 150 Ohm
 R3 = ,, 270 Ohm.

The opto-coupler is used to obtain a galvanic separation of the computer and the 'outside world'. Operation is as follows:



When the LED (light emitting diode) lights, then the transistor is conducting and a current is going through the opto-coupler from pin 5 to connection number 5.

(drawing 2)

The OUT 255,8 instruction causes the lighting of the LED of drawing 1. Now when multiplying this diagram 8 times (for each OUT pin an alike situation as is in drawing 1) then we are able to show all of the OUT bits. For example we could create a running light with the next Basic program:

```

10 OUT 255,0
20 FOR X=0 TO 7
30 Y=2^X
40 OUT 255,Y
50 FOR I=1 TO 100: NEXT I
60 OUT 255,0
70 NEXT X
80 END
    
```

Remark 1: Start a control program always with OUT 255,0 (line 10) to avoid unexpected surprises.

Remark 2: At line 50 a time loop has brought in for increase the effect of the demo.

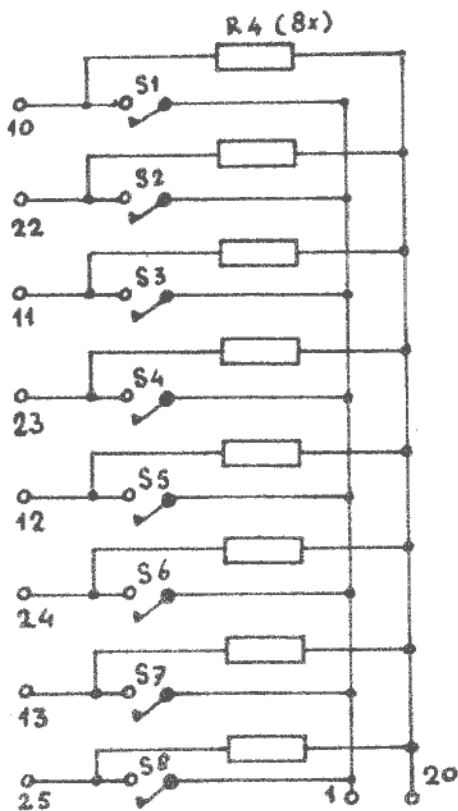
The INP-pins:

Did we explain about running things in the afore part, now we will discuss controlling with the help of the parallel port. There are 8 INPUT pins at

our disposal.

pin nr.	bit	INP(255),*
10	0	2 ⁰ = 1
22	1	2 ¹ = 2
11	2	2 ² = 4
23	3	2 ³ = 8
12	4	2 ⁴ = 16
24	5	2 ⁵ = 32
13	6	2 ⁶ = 64
25	7	2 ⁷ =128

Now we can make the computer 'read' whatever is going to be offered to him (or is it her?). E.g. at pin 12 there is a tension of 5 Volt while the tension at the remaining INP pins is 0 Volt. The command PRINT INP(255) results in the answer 16 (after having RETURNed). The concerning diagram:



S1-8 = break switches
R4 = 10 KΩ

Unused all switches have closed contacts and connect the INP pins to ground (=0 Volt).

If a switch is toggled then the current is disconnected and the pin is connected to 5 Volt through a 10K pull-up resistor.

The resistor is to make a 'hard' 5 Volt signal.

(drawing 3)

This next demo program is to explain things.

```
10 Y=INP(255)
20 PRINT Y;
30 GOTO 10
```

Remark: Use CTRL-C to stop execution.

The computer now constantly 'reads' (that is until CTRL-C is pressed) the INPUTport 255.

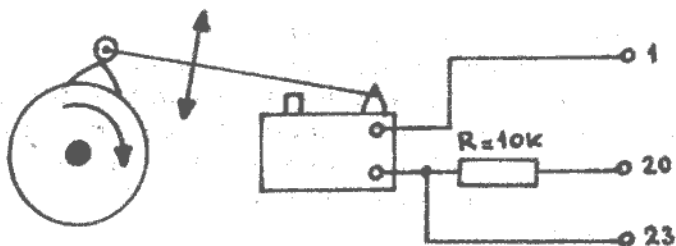
This INPUT/OUTPUT (I/O) might be combined as follows, for extending the demonstration:

```
10 OUT 255,0
20 Y=INP(255)
30 OUT 255,Y
40 IF Y=0 THEN 50
50 GOTO 10
```

Remarks: Line 40 is to see to it that the OUT-signal is staying as long as a key is being pressed.

In this way also pulses can be counted using INP(255).

We then for instance use a disc or a wheel with one or more cams. These cams can be used to operate a micro switch. Operating the switch in this regard is breaking an electrically contact.



(drawing 4)

pin 23 (-->bit 3-->2^3=8)

With this next program the theory of operation is explained:

```

10 X=0
20 IF INP(255)<>8 THEN 20
30 IF INP(255)<>0 THEN 30
40 X=X+1
50 PRINT X
60 GOTO 20
    
```

(to be continued)

CHIPTIPS.

To end the notes and remarks of mr. De Witte, here follows the last part. We hope that old-timers as well as novices have been able to use these series to their advantage.

1. In order to have Basic programs start automatically, the program has to be saved in monitor. Those of you trying to load a Basic program, of which the name started with the character 'G' (e.g. 'GREAT'), already know that this will not work. The program is invisible as the monitor command for autostart is 'LOG' (mind the 'G'). In order to save such a program in Basic you are to use the command 'CLOADG GREAT'. It is possible that you get an ERROR after having loaded, when an autostart-program was expected. To achieve this, do the following:

```

0 REM CR          (add this line to the program.)
BYE CR           (to the MONITOR)
DU 1B7 1B8 CR
  X Y           (End-Address of the program)
SE F=NN         (NN=HEX number, sg. 55=U for Utility)
SA GREAT 1B7 YX CR
PP CR           (Warm start back to Basic)
CLOADGGREAT CR  (Autostart. Could also with)
LOG GREAT       (or only LOG)
    
```

If a CSAVE'd BASIC program has been loaded in MONITOR, it is not possible to run it after a 'PP'. The solution.... In MONITOR:

```

-----GO D384 CR-----
    
```

After READY, you may LIST or RUN.

2. If you have saved the contents of the screen on tape and you load it afterwards, it is mutilated by the FILE-message. To avoid this do the following in MONITOR:

```

-----SE 0=S CR-----
    
```

The screen does not show what you type-in (this is called 'ECHO' to the screen). Once the screen 'is loaded' (from tape), return to ECHO with

CTRL-Q and with SE O=V CR. Do mind that '>' (the PROMPT-sign) and the cursor can mutilate characters on the screen. If you move with '@' the cursor, you can repair the character under it.

3. With the program COPIE (on the first ESGG software-tapes) from mr. De-gema, you can copy a program for the second time. This can be handy if you just ran out of tape. Stop recorder #1, and hold the RUN/STOP-key down till the prompt-sign appears. Put both recorders stand-by again. If the COPIE-program is still at its original address (FE00), just type 'GO FECC', the program which is still in memory will be saved again to recorder #2, and the program continues as meant. If it happens that the HEADER has been changed by the loading of the next program, that does have to be at another address then it is enough to use the FI command. If the name of the program to be saved appears,

hold down RUN/STOP and GO FECC to have a proper SAVE and COPIE continues as before. If the name of the header needs a repair you may do this in the next manner:

```

-----MO BFDO BFFF F200 CR (piece of MWA with FILE-naam)
      EN BFE8 CR (start of FILE-name in HEX)
      BFE8:47 52 4F 4F 54/CR (here is 'GREAT')
      GO FECC CR (programma is SAVED with
                  FILE-name GREAT)

```

4. *And then the wordprocessor fauled, all text has gone*

.....but of course not.....

There really is something gone, being the first 11 lines. To retrieve the remainder, do the following:

```

      EN 80F CR (Make it OD)
-----MO 80F 8CF 810 CR (Filled with 'CR')-----
      GO 5003 CR (Most of the text is back)

```

If you like to keep the SOURCE (=text), as produced with the wordprocessor it is a *must* to SAVE it on tape while being in the MONITOR, as the FILE-type is the same as the one of BASIC and MONITOR. The programs then always can be kept together on tape and be easily copied. Make it a habit to always back-up a tape twice and keep it in a safe place. If something might go wrong, no real harm is done. This also counts for floppy-users; those disks have a rather short guaranteed life.... "IT COULD HAPPEN TO YOU!"...

Saving in Monitor goes like this:

```

      DU 80F 0 CR (search the last 03=End Of File)
      SE X=5003 CR (SEt the Warm-Start Address)
-----SA NAME 80F 48EF-----

```

Once the WPPac 'runs', go to MONITOR, LOG NAME; the editor will be working, and the text is available.

5. Without the generous and able assistance of our unique Van Montfort group, this avalanche of hints would not have been possible. As far as I know, they are the only ones still creating hard- and software exclusively for the Sorcerer. Let us continue supporting them, in order to let them continue their good work for OUR Exidy!

FROM THE EDITOR.

Our information is going around the world, to help you Sorcerer users out there, but what about the information you have? Do you keep it to yourself because you think that it is not much? Please let the other readers be the judge of that and send in your information!

Maybe you have learned from magazines that the production of the Exidy Sorcerer computer will be ceased 1984 by its manufacturer, CompuData from 's Hertogenbosch. This however does not mean that your possession now is going to be worthless!

The Exidy Sorcerer Gebruikers Groep (Users Group) is actively engaged in the development of new possibilities for a better use of your computer. Among these developments are not only the developments in the software area, but also those concerning hardware. Besides improvements that correct the existing errors in hardware, there are also improvements that make the use easier and userfriendly, like *extra keys to your numerical pad* (not yet in the service due to the unreasonably high price of original caps from CompuData; you may be able to fulfill the installation yourself following the instruction of this 'luxury').

Regarding the software we mention the improvements of the Basic pack *extension BEXT8*) and the through the software service available communication programs *Basicode* and *Viewdata* (telecommunication, Dutch Telecom Standard) and also a very useful Pascalversion. The latest development is a lightpen with demo software.

Besides the hobby-developments there are also several business firms and members handling developments commercially. Here we can mention:

From members:

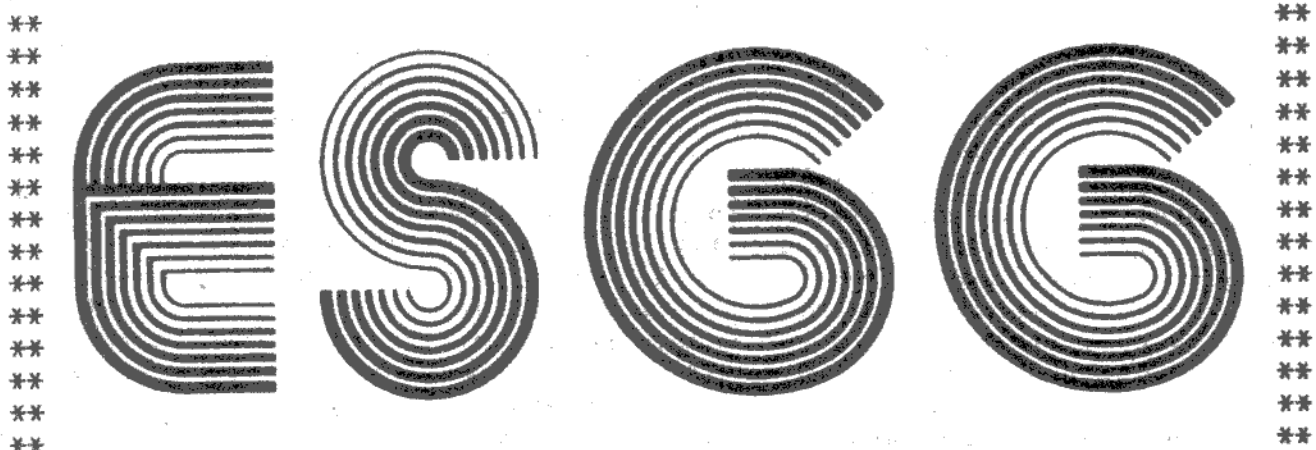
- parallel cable for connecting a printer (make and type to be referred to; MX-80 cable available), that then automatically can be controlled *either centronics or parallel (with graphics)*. The price: approx. Dfl. 100,=;
- A very fine improved diskversion of Exidy WP-pack (this form has been printed using it!). Both articles supplied by:
A. van Duijvenbode, Gemshoorn 40, 3068 HL Rotterdam.
- Various software (quality!) like the *Van Monfort monitor version 1.3* with many good options and a good review in ESC. Then there is the program *EXPAN* (a friendly help in correcting and disassembling of ml programs) and the program *Grafplot* (a look-alike of *Graftrax*), enabling your printer of drawing (together with the afore mentioned cable) hires graphics or single dot printing with a resolution of 960x8 dots; price *expan* approx. Dfl. 150,=, *grafplot* approx. Dfl. 180,=; the monitor version 1.3 price approx. f. 165,=; supplied by: Gebr. Van Montfort, Smedestraat 13, 6411 CR Heerlen.

In the commercial area:

- A fine diskcontrollercard, capable of handling 40 or 77 tracks diskdrives, supplied by firma *Caicom*, Nijverheidsstraat 22, 2802 AL Gouda, costing Dfl. 700,=.
- Diskdrives, make *Shugart*, in 40 or 77 tracks outfit. Are built together to a station of two drives, with powersupply and *Caicom controller*, in case for Dfl. 3250,= (40 tracks model). Other and different compositions, or single parts can be supplied. Prices upon request. Supplied by: Fa. A. Nettelers, Sumatraweg 13, 3072 ZP Rotterdam.

Remarks: *In general all prices concern so-called 'collect-prices'. Shipping/transportation freight is extra. Payment is usually in advance; whether C.O.D. is possible depends on the supplier. You are to contact the supplier in that regard.*

The prices mentioned here are subject to unannounced changed and merely indicate the average, current prices. No claims for delivery of goods can be made in reference with the prices mentioned in this information.



The L O G I C partner to a Sorcerer

For whom is the ESGG?

For anyone being interested in the use and the possibilities of the Exidy Sorcerer.

Why the ESGG?

Because the ESGG tries to give as much knowledge to the possibilities of the Exidy Sorcerer and especially to the possibilities in the use of the Exidy Sorcerer, outside as well as inside the Hobby Computer Club of the Netherlands.

What does the ESGG?

Software distribution: We only supply software that is free of COPYRIGHT (so-called Public Domain Software) on collect cassette and on diskette.

For Exidy Standard Basic we supply a Basic EXTension in EPROM, that expands the possibilities of the Basic Pack very much.

Hardware development: Non commercial designs, that is designed by members and put at the disposal of the other members, are judged by ESGG and -if of importance to others- produced (e.g. video inverter).

Sorcerer days: Twice a year (usually in March and September) ESGG organizes these meeting places of many a Sorcerer user. These days meanwhile have become well-known.

Publications: Our bi-monthly issued ESGG-periodical, full of things worth knowing about the Sorcerer and alike matters. For only DF1. 27,50 (in Europe) or DF1. 32,50 for non European countries you can insure yourself of the most recent information concerning your Sorcerer! (see page 2). In the running subscription year we supply all issued numbers!

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