

SVI & MSX

SPECTRAVIDEO



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INTRODUCTION

By. P.W. Deckert (E.D.)

Another fun Newsletter hits the road. They never get any easier but they sure get more interesting.

How about you M.S.X. Computer owners it's about time you all started to send in Articles and Programs. I have had some queries about the lack of M.S.X. stuff. We try as best we can, but in the end the articles we print must reflect the articles we receive.

Sorry about the slight increase in Newsletter Costs but as Life and Inflation Have there way, the cost of living is continuously spiraling upwards. So no apologies it's just a fact of life.

The new Year Book will be held at the lower price of \$20 for one more month only, so as to help new members get their back issues.

The Letter I have included below is a sample of many requests we receive on how to copy software. Our official policy is not to help members pirate software and so we cannot help. We know pirating is a fact of life when you own a computer, so keep looking around. Some one will help you.

The second part of the letter we can help you with. You will find an excellent article on the subject in this newsletter.

Happy computing see you all next Newsletter.

Dear Peter,
I have been trying to transfer some games from cassette to disk without much luck. Could you let me know if there are SPECTRON, ARMoured ASSULT and KUNGFU MASTER. Is there anything available that allows a complete screen dump to an Epson compatible printer?
The games that I have been trying to transfer are SPECTRON, ARMoured ASSULT and KUNGFU MASTER.
Yours sincerely,

TAYLON
GENCIES

PTY.
LTD.

(Incorporated in South Australia)



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18th March, 1986

Dear Club Member,

Our company has been given the task of locating good software writers throughout Australia.

An opportunity exists for individuals or groups to have programmes published on an International World Wide market.

Full protection is offered by an established well known international company together with renumeration by way of a lump sum royalty payment in advance plus on going royalties for the life of the programme.

I urge you to submit your favourite programme to us, together with instructions and descriptions of the programme, for evaluation to capitalise on the popularity of the home and personal computer market.

Should your programme be of satisfactory standard you are on your way to earning good returns for your efforts.

Should you require further details please do not hesitate in contacting me. Rest assured of confidentiality and security. I look forward to your submission.

Yours faithfully,

Leon Forgan,
Director.

lf.lf.

SERIAL PRINTER, RS232, REAL TIME CLOCK CARD

By. G. Kraushaar.

Not having the seemingly unlimited resources of some members, and having acquired a few serial printers from various sources, I set about making my own serial printer interface.

While I was at it, I thought why not kill two birds at once.

With the addition of only a few extra components, I signed a software switchable RS232 and SPR interface. Revision 001 was approaching testing stage when Steve McNamee published his RS232 interface, So when Rev 001 blew up and took both the Computer and the Disk Controller with it (motto NEVER work on hardware modifications at 2am), I designed Rev 002 to be software compatible with his card rather than the SV one.

By the time I had this Revision off the drawing board, Australian Electronics Monthly (AEM) had published a you-beaut Real Time Clock for the Microbee.... Well anything they can do SV can do better so Rev 003 was born especially since there was a bit of spare space on the card I was using.

A brief word about how the circuit operates.... There are essentially two distinct circuits- a serial/parallel converter and a real time clock.

First the serial/parallel converter:

ICs 5, 6 & 7 are decoder chips which drive one of eight output lines low according to the configuration of input pulses. Pins 1,2&3 select the line once the chip has been selected by the appropriate signals on pins 4, 5 & 6. Thus with a bit of care, each chip can decode up to six lines.

IC5 is effectively board select; IC6 picks the RS232 interface functions (including parameters needed for the SPR), IC7 controls the operation of the serial printer. IC4 is a specialist divisor chip allowing selection of independent baud rates for transmit and receive.

The divisor is selected according to the byte on the data lines when Port [OCH] is active. Note that the low order nibble is Receive clock and the high order nibble is Transmit clock. See table 1 for details, but [71H] is the correct byte to load for Viatel operation, and [55H] is for 300bd operation.

ICs 10, 11, 13 & 15 provide buffering for the Data Bus. IC13 is optional if your expander is sparsely populated, but is still recommended as this board alone approaches the maximum fanout capability of 74LS series chips; six from a maximum of ten.

IC10 is the controlling gate for the RS232 Status Register; gates 2b, 8c, 8d, 9c, 9d & 11b are the sweepers required for the SPR Status Word. Note that pin 5 of RS232 plug B is the handshaking line for my SPR. You may need to modify this part of the circuit to tailor to your printer.

IC12 is a one-shot used to hold the O/P to the SPR port long enough for the serial data to reach the printer. Since the delay is critical (too short and garbage is printed, too long and timing problems will occur if you are transmitting to both the RS232 and SPR at the same time), I recommend the use of a multi-turn trimpot for the resistor in the network. To find the values for resistor(R1) and capacitor(C1), first estimate the time delay needed: divide the baud rate by the number of bits sent.

Next use the formula $T = (0.32 \times R \times C \times (1 + (0.7/R))) \times 10^{-6}$.

Where R=resistor(ohms) C=capacitor(picofarads) and T/1000 is calculated above. Note that the formula is only valid for $C > 1000\text{pF}$, and that capacitor values are notoriously unreliable. Also R should be $> 5\text{k}$.

E.G. For a 1200bd printer with 1 start, 7 data, no parity and 1 stop bits, Bits=1+7+0+1=9; $T = 9/1200 \times 10^3 = 7.5\text{mS/char}$; $C_2 = 4700\text{pF}$, $R_1 = 5\text{k}6$ yields an 8.4mS pulse So Use a 4700pF capacitor and a 10k trimpot for the above configuration If using a trimpot as suggested, final adjustment can be made by running LISTING 1 and turning the trimpot from maximum until the printer stops working, then back off until the printer starts working again.

DIVISOR : DCBA	DESIRED : BD RATE	ACTUAL : BD RATE	DEVIATION PER CENT
0000	50.00	50.00	0.0000
0001	75.00	75.00	0.0000
0010	110.00	109.93	0.0100
0011	134.50	134.50	0.0000
0100	150.00	150.00	0.0000
0101	300.00	300.00	0.0000
0110	600.00	600.00	0.0000
0111	1200.00	1200.00	0.0000
1000	1800.00	1796.49	0.1949
1001	2000.00	1994.81	0.2597
1010	2400.00	2400.00	0.0000
1011	3600.00	3614.11	0.3921
1100	4800.00	4800.00	0.0000
1101	7200.00	7144.19	0.7751
1110	9600.00	9600.00	0.0000
1111	19200.00	19200.00	0.0000

TABLE 1
Control nibble vs baud rate

IC3 is a dedicated UART (Universal Asynchronous Receiver Transmitter) which handles most of the work of the serial/parallel conversion.

Turning now to the schematic for the real time clock. Again most of the work is handled by a single chip - in this case IC14. This is a "low threshold metal-gate CMOS circuit that functions as a real time clock and calendar in bus-oriented microprocessor systems" (I quote the data sheet). If you really want more detail refer to the NOV

1985 AEM which includes both the project mentioned above and the data sheet for the chip. Back issues can be purchased from the publisher. The battery supplies backup power to IC14 when the computer power is switched off, R2 is a current limiter for charging the battery, and D1 is there to stop the battery trying to run the entire computer! Timing is derived from XT2 and C2 is for fine tuning the oscillator.

What more can I say? The remaining gates handle the enable functions for the various control lines needed.

		BIT	EFFECT
		76543210	
		:	:
TABLE 2.		1XXXXXXX	No Parity
DETAIL		OXXXOxxx	Odd Parity
PORT [OBH]		OXXX1XXX	Even Parity
(X=Don't care)		XOXXXXXX	One Stop Bit
(Any other)		X1OOXXXX	1.5 Stop Bits;
		:	Five Bits/Character
		X1@XXXX	Two Stop Bits
		XXOOXXXX	five Bits per Character
		XXO1XXXX	Six Bits per Character
		XX10XXXX	Seven Bits per Character
		XX11XXXX	Eight Bits per Character
		:	
			Programming information

- Port 08h RS232 Status register. Bits 7,0 must both be 1 before transmitting another character. When bit 6 is 1, there is a character waiting at the UART
- 09H RS232 Received character register. Where incoming data appears.
- 0AH RS232 Transmit buffer. Outgoing data must be sent here.
- OBH RS232/SPR Control register. Must be pre-conditioned for the requirements of the receiving device. See table 2.
- OCH RS232/SPR Divisor Select. Must be pre-conditioned for the appropriate baud rate(s). See table 1. The byte loaded takes the form TTTTRRRRB.
- ODH RTC Interrupt Register. A zero on bit 0 indicates an interrupt has occurred. Interrogate [4FH] to find out which it is. Interrupts must be handled within 16.6mS.
- 10H SPR Data register. Data for the serial printer must be sent here. [LPRINT] ETC. Handle this automatically.
- 12H SPR Status register. Bit 0 must be 0 before another character is sent [LLIST] [LPRINT] etc. handle this automatically.

40H	RTC test mode register. Normally set to zero. See data sheet for more info.			
41H	RTC tenths of seconds	(0-9)	Read only	
42H	RTC Units of seconds	(0-5)	Read only	
43H	RTC Tens of seconds	(0-9)	Read only	
44H	RTC Units of minutes	(0-9)	Read/Write	
45H	RTC Tens of minutes	(0-5)	Read/Write	
46H	RTC Units of hours	(0-9)	Read/Write	
47H	RTC Tens of hours	(0-2)	Read/Write	
48H	RTC Units of days	(0-9)	Read/Write	
49H	RTC Tens of days	(0-3)	Read/Write	
4AH	RTC Day of week	(0-6)	Read/Write	
4BH	RTC Units of months	(0-9)	Read/Write	
4CH	RTC Tens of months	(0-1)	Read/Write	
4DH	RTC Years (See Table 3)		Write only	
4EH	RTC Stop/Start	(0/1)	Write only	
4FH	RTC Interrupt/Status. See Tab.4		Read/Write	

YEAR	DATA	mode	FUNCTION	DATA
	3210			3210
leap year	1000	Read	Reset	0000
leap year+1	0100		60sec signal interrupt	X100
leap year+2	0010		5.0 sec interrupt	X010
leap year+3	0001		0.5 sec interrupt	X001
		Write	No Interrupt	0000
			60 sec interrupt (single)	0100
TABLE 3. Detail-Register 4DH			60 sec interrupt (contin.)	1100
			5.0 sec interrupt (single)	0010
			5.0 sec interrupt (contin.)	1010
TABLE 4. Detail-register 4FH (x=indeterminate)			0.5 sec interrupt (single)	0001
			0.5 sec interrupt (contin.)	1001

Construction details are left to the reader, but the following points should be noted:

1. The RTC chip is static sensitive and very expensive (~\$40). Use a socket and insert it last. Take handling precautions with all ICs.
2. Layout is not critical. The prototype was wire wrapped to an ex main-frame pwa.
3. If you can't find a breadboard (eg. Veroboard) with a 50 pin edge connector, try using a second piece of veroboard to pick up the extra signals. Run wires between the two boards....Clumsy and unprofessional, but it works!
4. If all else fails, contact me. I am currently working on:
 - (a) a pcb for this circuit
 - (b) an experimenter's pwa designed specifically for SV601. They are currently on a back burner, but if sufficient interest is shown, I will move them up the priority list.
5. Hopefully by next month I will have a few sample programs to run on the RTC. Especially one that sets it.
6. There is no need to construct all parts of the project. I leave it to your commonsense to work out what components are necessary for each part.
7. If planning to use the card to drive a VDU (This card then becomes a VERY cheap "80 column card" as well if you can get the VDU at the right price) and a serial printer, then the one shot timing becomes very critical and should be set up using a CRO.

Finally a very brief word on the blow up I mentioned before. The CP and disk controller actually blew up when I pulled the expander apart with power still on. The prototype wasn't damaged - it just didn't work I won't go into detail on the controller fault (But watch the library catalogue for my comprehensive Disk Tester). The CP fault, however, was very simple, and probably very common:

A quick examination of the bus pinouts of the SV328/318 (refer to handbook) reveals that the wait line for the CP is adjacent to the 12V line.

If you follow the WAIT line back you come to IC19(74LS74). replace this and up she came. The wait line prevents the Z80 from executing any instructions!

The major symptom was a blank screen (NOT snowy).

By the way, there were a number of errors that had crept into Steve's article. They are corrected in this one. Of course I will have generated many of my own!

TABLE 5. Pin connections not on diagram

IC.	5v	Gnd	+12v	-12v	No Connection
1	-	7	14	1	2,3,11,12,13
2	14	7	-	-	2,5,8,9,10,11,12,13
3	1	3,21	-	-	2
4	2	11	-	-	9,10
5	6,16	8	-	-	7,9,10,12,13
6	16	8	-	-	7,9
7	6,16	8	-	-	7,9,10,11,12,14
8	14	7	-	-	-
9	14	7	-	-	-
10	16	8	-	-	-
11	16	8	-	-	4,5,6,9,10,11,12
12	2,3,14	7	-	-	5,6,7,9,10,11,12
13	20	10	-	-	-
14	-	8	-	-	-
15	14	7	-	-	2,12
16	14	7	-	-	11,12,13

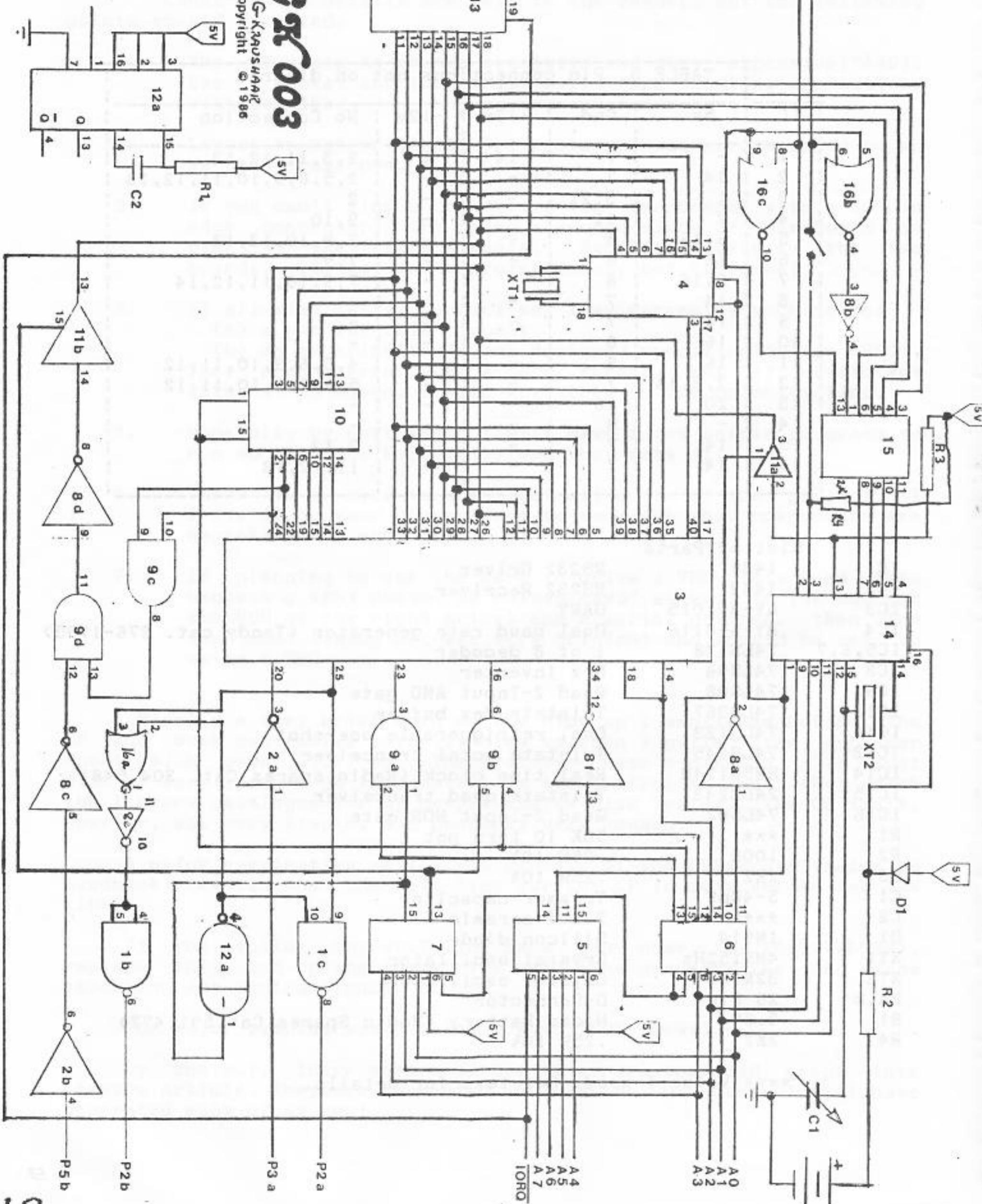
List of Parts

IC1	1488	RS232 Driver
IC2	1489	RS232 Receiver
IC3	AY-3-1015	UART
IC4	AY-5-8116	Dual baud rate generator (Tandy cat. 276-1795)
IC5,6,7	74LS138	1 of 8 decoder
IC8	74LS04	Hex Inverter
IC9	74LS08	Quad 2-Input AND gate
IC10,11	74LS367	Tristate Hex buffer
IC12	74LS123	Dual retriggerable one-shot
IC13	74LS245	Tristate octal tranceiver
IC14	MM58174N	Real time clock (Radio spares Cat. 304.548)
IC15	74LS243	Tristate quad tranceiver
IC16	74LS02	Quad 2-input NOR gate
R1	***	50K 10 turn pot
R2	100R	.25W 10%
R3	2K2	.25W 10%
C1	5-40pF	Trimmer capacitor
C2	***	2.2uf ceramic
D1	1N914	Silicon diode
XT1	4M9152Hz	Crystal oscillator
XT2	32K768	Crystal oscillator
Pa,b	25 P1n	D-Connector
B1	3.6V	Nicad Battery (Radio Spares Cat. 591.477)
R4	2K2	.25W 10%

***= Value I used. See text for details.

gπ003

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LISTING "1"

by : G. Kraushaar

This Program may be entered using the 'INPUT' program from Newsletter 2 - 2 (NOV. 84.) or The Year Book.

```
HB    1 'program preconditions UART for 1200bd ,no parity,istop bit an
      d 8 data bits, then repetitively sends 'A' to the list de
      vice.
FP    2 'Adjust potentiometer R1 until garbage is printed. This happen
      s when SPROUT is dropped before serial transfer is complet
      e. Then turn R1 back until 'A'
AK    3 'appears again.This adjustment is only necessary if you plan t
      o use the card for both listing and communications at the
      same time. Note that if your
GI    4 'serial list device is not configured as above,then line 10 w
      ill need to be configured accordingly. The delay loop is
      present so that a logic probe may be used conveniently for tr
      ouble- shooting.
KM    10 OUT&HB,&HB0:OUT&HC,&H77
CK    20 OUT16,65
BM    30 FORI=1TO500:NEXT
AD    40 GOT020
END
```

PROGRAM LISTER

by : G. Kraushaar

This Program may be entered using the 'INPUT' program from Newsletter 2 - 2 (NOV. 84.) or The Year Book.

```
HH    10 'Elementary program to format print of an ASCII file to a basic se
      rial printer
BE    20 'In this case a GE terminet 1200.No attempt has been made to bre
      ak lines between
IB    30 'WORDS AS IT IS INTENDED MAINLY FOR PROGRAM LISTINGS
CL    40 '
BE    50 'The following line tailors the program to suit printer in use:N
      N=line length;FC=fill characters required for normal printing
FE    60 CLEAR1000:OUT&HB,&HB0:MAXFILES=2:NN=88:FC=36
EC    70 CLOSE#2:INPUT "disk(1/2/3<=end>)";D:ON D GOTO 90,100,180
DA    80 BEEP:GOT070
HN    90 D$="1:";CLS:FILES:GOT0110
BP    100 D$="2:";CLS:FILES2
FC    110 F$="" INPUT"filename([CR]for new diskelse fffff.fff)";F$:IFF$=
      "GOT070
AN    120 F1$=D$+F$;OPENF1$FOR INPUT AS #2
MH    130 LPRINT:LPRINT:LPRINT"                                FILE : ";F$;STRING$(7
      +LEN(F$),8);"____";STRING$(LEN(F$),"_");LPRINT
GF    140 IFEOF(2)THEN 70 ELSE LINEINPUT#2,L$
BD    150 LN=LEN(L$):IF LN<FC THEN L$=L$+SPACE$(36-LN)
AP    160 IF LN<=NN THEN LPRINTL$;GOT0140
BH    170 LPRINT LEFT$(L$,NN);L$=RIGHT$(L$,LN-NN):GOT0150
BC    180 END
END
```

LIBRARY ARTICLE

by J. Collins.

What a month this has been.....plenty of activity on the library software scene, many new owner-new members needing assistance, the telephone running hot most evenings, and mostly on the Editors' part, having to get the 1985 Year Book ready for distribution. As well as that of course we need to keep on top of this issue to avoid getting behind. Whew !!!!! who'd be mad enough to get involved with home computers ?

On the subject of the telephone I must make a request here for members to remember to look at the clock before they ring either the Editor or myself. I know how easy it is to get involved with working on a project, find you need to ask someone for help and pick up the phone and ring. If that occurs at a reasonable hour then no harm done, but if you've been head down for hours you might just look at the clock before you call. We both don't mind calls for help as long as they are at reasonable hours. I stated in a previous article that 6.00pm to 9.00pm was okay but we've decided that from the time this issue is out we are going to limit the weeknight call hours to between 6.00pm and 8.00pm. This will be firmly adhered to so if you call outside these hours you will not get the answers you were looking for. We have mentioned this before but for the benefit of any members who may have forgotten, and for those new members not yet aware I am going to repeat it. Both the Editor and myself work for a living, and we are not employed by the S.A.U.G. We receive no payment of any kind for running the group. The S.A.U.G. is totally non-profit with all incoming funds being used to provide services for the members. Some callers have expressed surprise when ringing during normal working hours that we are not available, and can not be contacted at our workplace. Let me make it quite clear here and now that this is definitely not on. **DO NOT RING AT ANY TIME OUTSIDE THE HOURS OF 6.00PM TO 8.00PM ON WEEKNIGHTS.**

Response to the Competition Software special offers has been very good and the low price is being extended for a further month from issue date of this newsletter so for those who haven't grabbed the opportunity I mention this again. I've added a list of what is on each disk/cassette to whet your appetites but space limitations prevent my giving any more details. The names of the programs will give you some clues.

CP/M LIBRARY NOTE....

Members who have single-sided double-density disk drives and use CP/M should note that if they are ordering GRAF.COM it will be necessary to order or provide two formatted disks for supply of this software as it will not fit on one SSDD disk. I should have mentioned this in the original article. Users with double-sided double-density drives need only one disk.

CONTINUED PAGE 16

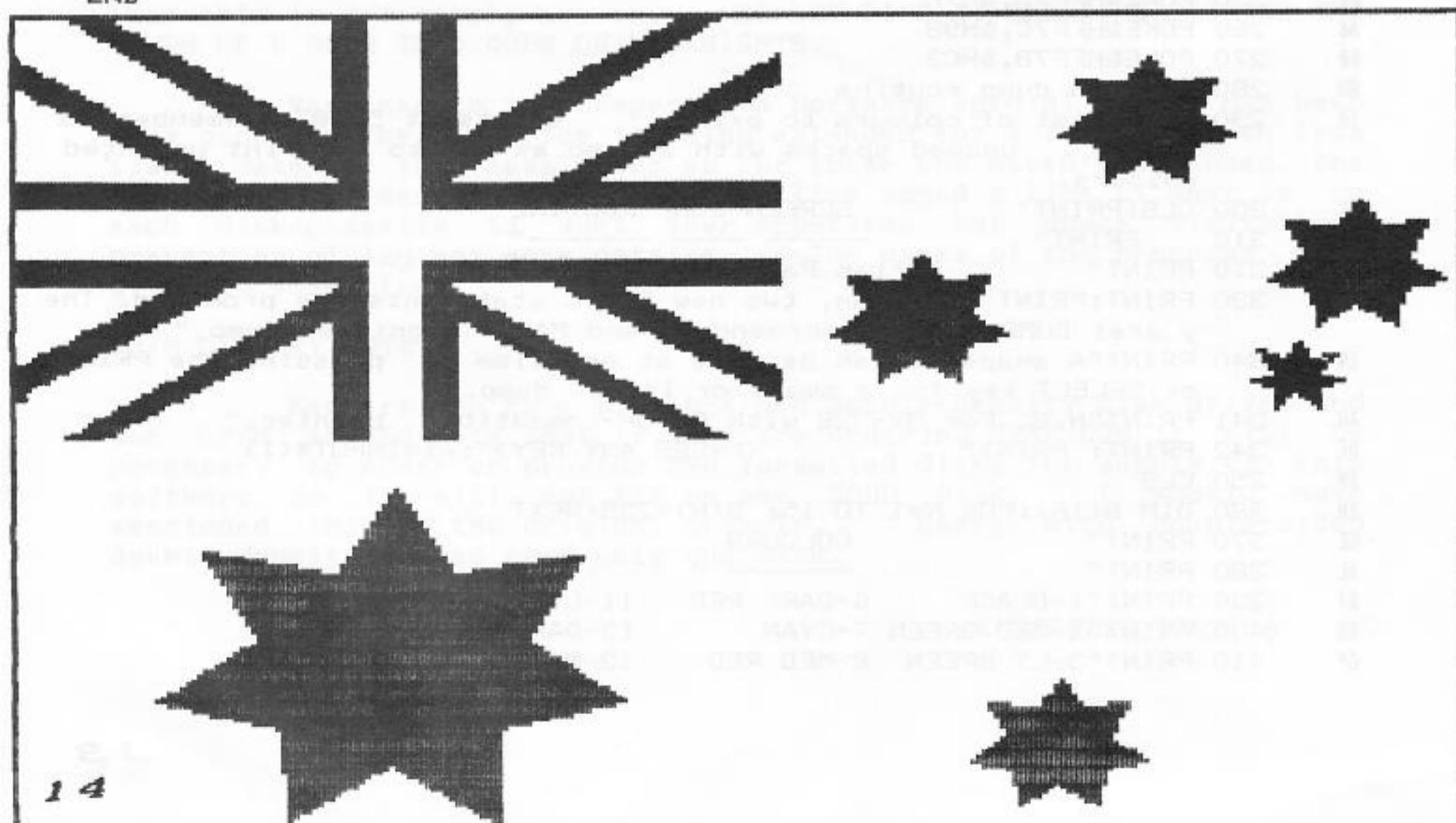
SCREEN DUMP**(318/328)**

by : B. Parker

This Program may be entered using the 'INPUT' program from Newsletter 2 - 2 (NOV. 84.) or The Year Book.

BB 10 ' Brian Parker 28/1/85
CD 20 CLEAR100,53605!
FC 30 ' copy rom to ram
AB 40 DEFUSR0=53600!
JK 50 FORX=53600!TO53678!:READA\$:POKEX,VAL("&h"+A\$):NEXT
DN 60 A=USR(0)
EA 70 DATAf3,21,00,00,11,a0,Bc,01,02,40,ed,b0,3e,0f,d3,88,3e,fd,d3,8c,
00,00,21,a0,Bc,11,00,00,01,02,40,ed,b0,3e,0f,d3,88,3e,ff,d3,8c,2
1,00,40,11,a0,Bc,01,02,40,ed,b0,3e,0f,d3,88,3e,dd,d3,8c,21,a0,8c
,11,00,40,01,02,40,ed,b0,3e,dd,32,61,7b,c9,00,00
DP 80 ' changes to basic
ID 90 ' creates two new commands
BK 100 ' DUMP is a small screen dump
HF 110 ' MAG is a magnified screen dump
DJ 120 ' N.B. these are at the expence of MDM and DIAL
EO 130 POKE897,ASC("U")
EE 140 POKE898,ASC("M")
FB 150 POKE899,ASC("P")+128
EJ 160 POKE547,&H7F
CF 170 POKE548,&HD1
CG 180 POKE1123,ASC("A")
DI 190 POKE1124,ASC("G")+128
EC 200 POKE545,&H76
CO 210 POKE546,&HD1
BC 220 ' setting select key for a large dump and print key for small
dump
DN 230 FORX=&H7F98T0&H7FAB:READA\$:POKEX,VAL("&h"+A\$):NEXT
CJ 240 DATAf5,79,fe,45,20,04,f1,c3,7f,d1,fe,44,20,04,f1,c3,76,d1,f1,c9
AI 250 POKE&HFF7D,&H7F
AG 260 POKE&HFF7C,&H9B
BD 270 POKE&HFF7B,&HC3
GH 280 'screen dump routine
IM 290 'the list of colours to print starts at 53607. Remember to
fill unused spaces with 255 so as not to print unwanted
colours.
CK 300 CLS:PRINT" SCREEN DUMP ROUTINE"
AE 310 PRINT" -----"
DD 320 PRINT" Brian Parker 28/1/85
AK 330 PRINT:PRINT"When run, two new BASIC statements are produced. The
y are: DUMP = small screendump and MAG = magnified dump."
IN 340 PRINT"A snapshot can be done at any time by pressing the PRINT
or SELECT key for a small or large dump."
AH 341 PRINT"N.B. For SV-328 with Epson-compatible printer."
DF 342 PRINT: PRINT" <PRESS ANY KEY>":A\$=INPUT\$(1)
BM 350 CLS
EM 360 DIM B(16):FOR N=1 TO 15: B(N)=255:NEXT
CE 370 PRINT" COLOURS "
AL 380 PRINT" ----- "
BJ 390 PRINT"1-BLACK 6-DARK RED 11-LT YELLOW"
BD 400 PRINT"2-MED GREEN 7-CYAN 12-DARK GREEN"
CP 410 PRINT"3-LT GREEN 8-MED RED 13-MAGENTA"

```
DO 420 PRINT"4-DARK BLUE 9-LT RED      14-GREY"
CH 430 PRINT"5-LT BLUE    10-DK YELLOW 15-WHITE"
FP 440 PRINT:PRINT"Enter the colours to dump."
FG 450 PRINT"Enter '0' when finished."
EI 460 INPUTA$:A=VAL(A$)
CN 470 IF A=0 THEN 510
AM 480 IF A<0 OR A>15 THEN PRINT"Out of range!":GOTO 460
AD 490 B(A)=A
AK 500 GOTO 460
DP 510 FOR X=53607! TO 53621!
EE 520 W=W+1
EJ 530 POKE X,B(W)
DE 540 NEXT X
MD 550 FOR X=53622! TO 53930!:READ A$:POKE X,VAL("&h"+A$):NEXT
BJ 560 DATA f3,f5,c5,d5,e5,3e,1,18,07,f3,f5,c5,d5,e5,0,32,65,d1,3a,3a
     ,fe,3d,c2,a5,d2,3e,1,32,66,d1,1e,1b,cd,a7,d1,1e,41,cd,a7,d1,1e,0
     8,cd,a7,d1,c3,d9,d1
CJ 570 DATA Adb,12,e6,01,20,fa,7b,d3,10,af,d3,11,3d,d3,11,c9,1e,0a,cd,a7,
     d1,1e,1b,cd,a7,d1,1e,4b,cd,a7,d1,1e,00,cd,a7,d1,1e,01,3a,65,d1,3
     d,20,2,1e,2,cd,a7,d1,c9 ~
GN 580 DATA Adb,85,21,f7,ff,11,00,00,01,08,00,09,7d,fe,ff,20,2b,db,9a,e6,
     f0,f6,06,d3,96,db,99,e6,22,ca,a5,d2,3a,65,d1,3d,20,13,3a,66,d1,3
     d,28,08,25,3e,1,32,66,d1,18,05,3e,0,32,66,d1,cd,b7,d1,01,08,00,0
     9,01,81,08,ed,69,ed,61,00,00,00,db,84,a2,37,20,1,3f ~
ON 590 DATA cb,ec,ed,69,ed,61,0,0,0,db,84,30,0c,e6,f0,cb,3f,cb,3f,cb,
     cb,3f,18,02,e6,0f,d9,06,0f,21,67,d1,4e,b9,28,07,23,10,f9,37,3f,1
     8,01,37,d9,cb,ac ~
MP 600 DATA CB,1B,2B,10,bd,3a,65,d1,3d,20,20,3a,66,d1,3d,20,08,cb,23,cb,
     23,cb,23,cb,23,06,4,cb,2b,cb,23,cb,11,cb,23,cb,11,10,f4,59,cd,a7
     ,d1,CD,a7,d1,CB,3A,20,89,7C,FE,17,28,3,c3,de,d1,7d,fe,f7,28,3,c3
     ,de,d1,3a,66,d1,3d,28,03,c3,de,d1,e1,D1,C1,F1,FB,C9 ~
AL 610 PRINT"Program Completed.":NEW
END
```

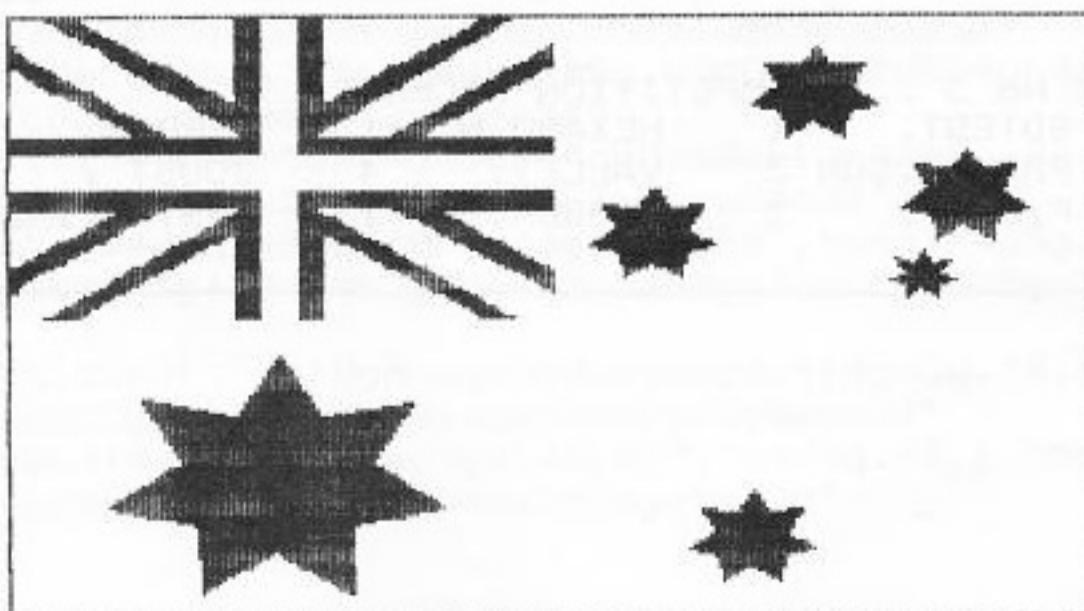


Oz-Flag

by : P. White

This Program may be entered using the 'INPUT' program from Newsletter 2 - 2 (NOV. 84.).

```
FF    10 COLOR 15,4,1
EH    20 SCREEN 1
EP    30 FOR D=1 TO 6
MA    40 READ B,C,X,Y
GL    50 FOR A=0 TO 6.2 STEP 6.28/7
LP    60 LINE(B*SIN(A)+X,B*COS(A)+Y)-(C*SIN(A+6.28/14)+X,C*COS(A+6.28/14)
      +Y),15:LINE-(B*SIN(A+6.28/7)+X,B*COS(A+6.28/7)+Y),15:NEXT A:PAINT
      T(X,Y),15
FI    70 NEXT D
BC    80 DATA 23,40,64,148
BP    90 DATA 9,15,175,167
CB   100 DATA 9,15,190,25
BC   110 DATA 9,15,152,70
BG   120 DATA 9,15,225,58
AL   130 DATA 4,8,215,83
GJ   140 LINE(0,15)-(0,0),15:LINE-(15,0),15:LINE-(128,81),15:LINE-(128,96
      ),15:LINE-(113,96),15:LINE-(0,15),15:PAINT(5,5),15
AG   150 LINE(0,81)-(0,96),15:LINE-(15,96),15:LINE-(128,15),15:LINE-(128,
      0),15:LINE-(113,0),15:LINE-(0,81),15:PAINT(5,90),15:PAINT(120,10
      ),15
BF   160 LINE(54,0)-(74,96),15,BF
CA   170 LINE(0,38)-(128,61),15,BF
AH   180 LINE(60,0)-(68,96),8,BF
AM   190 LINE(0,44)-(128,55),8,BF
DK   200 LINE(120,0)-(74,37),8:LINE-(90,37),8:LINE-(128,8),8:LINE-(128,0
      ),8:PAINT(125,3),8
EP   210 LINE(8,0)-(54,37),8:LINE-(38,37),8:LINE-(0,8),8:LINE-(0,0),8:PAI
      NT(5,3),8
HO   220 LINE(8,96)-(54,61),8:LINE-(38,61),8:LINE-(0,88),8:LINE-(0,96),8:
      LINE-(8,96),8:PAINT(5,93),8
IA   230 LINE(120,96)-(74,61),8:LINE-(90,61),8:LINE-(128,88),8:LINE-(128,
      96),8:LINE-(120,96),8:PAINT(125,93),8
GA   235 LINE (0,0)-(256,198),,B
AD   240 GOTO 240
END
```



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DRAGON.	1	TOADER.	2	SPECTR.MIN	1	SORT.BAS	2	ATOM.	1
PGGOLF.	2	SOLOCH.ECK	1						

CONTENTS OF DISK No 2 ... COMPETITION PACKAGE

TURTLE.	2	HOOKEY.	2	DMINER.	2	MAZE.	2	HSCORE.	2
ROTATE.	1	SPECTR.POK	2	DBPROF.V01	3	SUPERD.RAW	2	OZFLAG.	1
L-BOUT.	1	STARDU.	3						

CONTENTS OF DISK No 3 ... COMPETITION PACKAGE

GU328.	3	SDTEST.	1	HEXAGO.N	1	TERROR.	3	first.	1
CYCLE.	1	PACPER.SON	3	VALLEY.	4	JOUST.	2	SNAKE.	1
SOUND.	2	F/EDIT.	2	DIGGER.	1	MASTRM.IND	2		

NEVER (328/318 M. S. X.)

by : M. Fitzgerald

This Program may be entered using the 'INPUT' program from Newsletter 2 - 2 (NOV. 84.).

FJ 5 'Never going back Again
CF 10 PLAY"s1m10000t200o414r1r1r1", "v11t200o414r4gr4f#8g.o5d8o4go5d8o4
gr4g8f#.a", "v10o2t20014go3go2do3do2go3go2do3do2go3go2do3d"
JK 20 PLAY"r1r1r1", "o4go5d8o4go5d8o4gb8ab8ab8ab8ab8ab8", "o2go3go2do3do
2do3do2do3do2do3do2do3d"
MF 30 PLAY"r1r4.o5d2m5000r8o4d8dd2d8", "o4g.a8bag1ggr4f#8g8", "o2go3go2d
o3do2go3go2do3do2go3go2do3d"
KC 40 PLAY"o4g.a8gb2r2r4r1", "go5d8o4go5d8o4gr4g8f#.ago5d8o4go5d8o4g", "
o2go3go2do3do2go3go2do3do2go3go2go3g"
EJ 50 PLAY"r1r1r1r4.o5m10000d2m5000r8", "o4b8ab8ab8ab8ab8g.a8bag1", "
o2do3do2do3do2do3do2go3go2do3do2go3go2do3d"
AE 60 PLAY"o4d.d.dg.a8gbr1", "r4o4gr4f#8g.o5d8o4go5d8o4gr4g8f#.a", "o2go
3go2do3do2go3go2do3do2go3go2do3d"
HF 70 PLAY"r1r1r1r1", "o4go5d8o4go5d8o4gb8ab8ab8ab8g.a8ba", "o2go3
go2do3do2do3do2do3do2do3do2go3go2do3d"
HJ 80 PLAY"r4r8o5m10000d2m5000r8r1r4gg.a.bar4", "o4g1r4o5g.f#.18gdo4go5
gdo4go5gdo414go5gf#2", "o2go3go2do3do2go3go2do3do2go3go2do3do2go3
go2do3d"
JK 90 PLAY"r4gg.a.bar4r1", "18gdo4go5gdo4go5gdo414go5g.f#.18gdo4go5gdo4
go514g", "o2go3go2do3do2go3go2do3do2go3go2do3d"
NB 100 PLAY"r2r4r8o418go5ddo4bbag4ga14b.r2", "o4r4g.f#.g.o5d.o4f#8g.gr4f
#8g8", "o2eo3eo1bo2beo3eo2do3do2go3go2do3d"
AJ 110 PLAY"r1r1r1r1", "14o4go5d8o4go5d8o4gr4f#r4o5d8o4go5d8o4gb8ab8a
b8a8", "o2go3go2do3do2go3go2do3do2go3go2do3do2do3d"
J6 120 PLAY"r1r1r4.o5m10000d2m5000r8r1", "a8b8ab8ab8g.a8bag2g.g.gr4f#8g8
", "o2do3do2do3do2go3go2do3do2go3go2do3do2go3go2do3d"
D0 130 PLAY"r1r1r1r1", "go5d8o4go5d8o4g8d8r4g8f#.ago5d8o4go5d8o4gb8ab8ab
8a8", "o2go3go2do3do2go3go2do3do2go3go2do3do2do3d"
H0 140 PLAY"r1r1r4.o5m10000d2m5000r8r1", "a8b8ab8ab8g.a8bag1r4o5gr8f#.,"
"o2do3do2do3do2go3go2do3do2go3go2do3do2go3go2do3d"
GA 150 PLAY"r1r1r1r1", "18gdo4go5gdo4go5gdo4g4o5go4bo5f#c4o4go5gdo4go5gd
o4go5gd14r4gr8f#.," "o2go3go2do3do2go3go2do3do2go3go2do3d"
OH 160 PLAY"r1r1r1", "18gdo4go5go4ggo514dr4o4gr8f#.g.o5d.o4f#8g8", "o2go3
go2do3do2eo3eo1bo2beo3eo2do3d"
HK 170 PLAY"o4d8dd2d8", "14o4ggr4f#8g8", "o2go3go2do3d"
HF 180 PLAY"o4g.a8gb2r2r4r1", "go5d8o4go5d8o4gr4g8f#.ago5d8o4go5d8o4g", "
o2go3go2do3do2go3go2do3do2go3go2go3g"
HG 190 PLAY"r1r1r1r4.o5m10000d2m5000r8", "o4b8ab8ab8ab8ab8g.a8bag1", "
o2do3do2do3do2do3do2go3go2do3do2go3go2do3d"
DM 200 PLAY"o4d.d.dg.a8gbr1", "r4o4gr4f#8g.o5d8o4go5d8o4gr4g8f#.a", "o2go
3go2do3do2go3go2do3do2go3go2do3d"
KN 210 PLAY"r1r1r1r1", "o4go5d8o4go5d8o4gb8ab8ab8ab8ab8g.a8ba", "o2go3
go2do3do2do3do2do3do2go3go2do3d"
LB 220 PLAY"r4r8o5m10000d2m5000r8r1r4gg.a.bar4", "o4g1r4o5g.f#.18gdo4go5
gdo4go5gdo414go5gf#2", "o2go3go2do3do2go3go2do3do2go3go2do3d"
NC 230 PLAY"r4gg.a.bar4r1", "18gdo4go5gdo4go5gdo414go5g.f#.18gdo4go5gdo4
go514g", "o2go3go2do3do2go3go2do3do2go3go2do3d"
MD 240 PLAY"r2r4r8o418go5ddo4bbag4ga14b.r2", "o4r4g.f#.g.o5d.o4f#8g.gr4f
#8g8", "o2eo3eo1bo2beo3eo2do3do2go3go2do3d"

```
A6    250 PLAY"r1r1r1r1", "14o4go5d8o4go5d8o4gr4gr4f#r4o5d8o4go5d8o4gb8ab8a  
     b8a8", "o2go3go2do3do2go3go2do3do2go3go2go3go2do3do2do3d"  
CM    260 PLAY"r1r1s0m20000t70o4g1", "a8b8ab8ab8g. a8bas0m20000t70d1", "o2do3  
     do2do3do2go3go2do3do2s0m20000t70g1"  
AM    270 FORT=1T05000:NEXT  
END
```



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