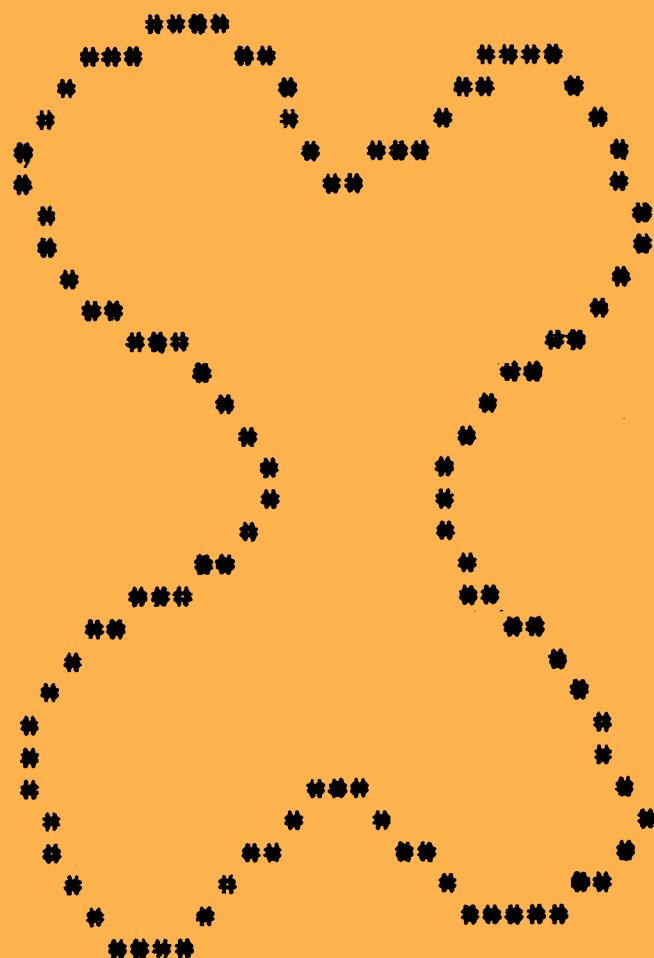


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# DREAMER Nö 11

## JULY '81.

N.S.W. 6800 USERS GROUP,



## **WOULDN'T IT BE GREAT IF**

- \* You could see the results of each keystroke as you enter data.
- \* You could see the data displayed in 2-byte blocks.
- \* You could see the last 4 of these blocks on the screen at any time.
- \* You could then, not only increment the addresses, but also decrement them.

## **WOULDN'T IT BE EVEN BETTER IF**

- \* Each CHIP-8 instruction could be disassembled and its meaning displayed.
- \* Your programs were not wiped out if you hit "Tape Load" by mistake instead of "Tape Dump".
- \* The old MEMOD was retained for those who insist that "Life wasn't meant to be easy".
- \* All these functions could be called, in any order, from a 9-option command loop.

## **AND WOULDN'T IT BE JUST PERFECT IF**

- \* All this was available on an EPROM which just replaced CHIPOS.
- \* This new EPROM was totally compatible with all previous software.
- \* It was also independant of any hardware modification including memory and I/O expansion.
- \* It in no way superceeded, replaced or depended upon your DREAMSOFT No.1 EPROM - but in fact complemented it.

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## DREAMER

No. 11

JULY, 1981.

Welcome to issue No. 11, the first of our second subscription period, and thank you for 'sticking with us'. We will do our best to justify your faith, by attempting to provide an interesting and varied newsletter for you.

Did you try the mini-programs on last month's cover? They both work. The short one is our old friend, the 'Random Dot Generator', the larger one is a fun one from Graeme, key it in and see what it does. While on the subject of covers, if the 'Knot-So-Easy' program goes too fast for you to study the knot, we have reproduced it on the front cover of this issue, so you can study it at your leisure.

We have received several letters lately which have started off, "I have developed XXXX (something or other) for the DREAM, are you interested in it?", or something similar. The answer is YES! YES! YES! We are interested in ANYTHING AND EVERYTHING to do with the DREAM, BUT, we are very, very busy, (Graeme works a 40 hour week, and spends 30-35 hours a week at University and studying, while Garry works 60 odd hours every week, and has a wife and two children who also like him to spend some time with them,) so you can see, we just do not have the time to answer all your letters. If we did answer them all, we would never get the newsletter out to you each month, so please, if you have something you have developed and think we could use, or would like to show us, don't write and ask do we want to see it, put some effort into writing an article about it, and send it in to us. You should all be familiar by now with the type of format we require. It doesn't matter if it is not typed, as long as it is legible, I will correct the spelling and grammar, (you should see Graeme's,) and type it for you. For the same reasons, please do not be upset if it takes several weeks (or months) to get an answer to your letter, as we must put them aside until we have the time to answer them, and that sometimes takes ages.

We have had a few queries about the CHIPOS manual which we often refer to. This was produced by Michael Bauer as an aid to understanding the workings of the CHIPOS EPROM, and was available directly from him, but we do not know whether it is still available. We will find out from Michael and let you know next month if you can still get a copy.

Graham Leadbeater tells us that now that the No.2 Eprom from the 'DREAMSOFT' crew is available, they have several new projects 'in the pipeline', including a 32K PROM board, a 16K Dynamic RAM board with Hi-Res graphics, and a Machine Code Disassembler. Sounds great, we will let you know when they are available. Have a look at the advert. in this issue for the Dreamsoft No.2 package, we have not seen one yet, but it seems they do just about everything except talk!

EGG-ON-FACE Department : After saying that we had not heard from any big winners who had used numbers chosen by the computer with the 'Lotto Number Selector' program published in Issue No.4, we received a letter from Jim Panos, the author of the program, telling us that using the numbers selected by the computer continuously every week since then, he has had a \$1,300-00 Second Division prize, and two further minor prizes, (3rd and 4th Division), and has decided to invest his winnings in a new Sorcerer computer. Congratulations Jim, well done.

The Video Cassette Recorder Controller article is not in this issue after all. After looking at it again, Graeme has decided that it is too complex for beginners, and even the average enthusiast would have trouble with it, as it involves some modifications to the recorder itself, which would void any warranty, and should only be attempted by an experienced technician, as they are very complicated and touchy machines. If you feel that you have the necessary technical expertise and experience and would like to have a go at it, drop us a line and we will send you the details of how Graeme did it, but again, we must stress that this is not one for the beginner. Instead, next month, we will have an article on using the DREAM as an automatic timer to switch things on and off.

NEXT MONTH, we will have;

- A High Resolution Display Mod. for your DREAM, by Michael Bauer.
- STORYTELLER, by Bruce Mitchell. Let the Computer tell your children their bed-time story.
- An INDEX, for issues 1 to 10 of the DREAMER, courtesy of Ed. Farrell.
- DREAM TIME, switch things on and off with your Dream.
- TIME TRIAL, Drive a racing car, using your JOYSTICK.
- A FULLY AUTOMATIC FOUR WHEEL POKER MACHINE, from Jim Panos.  
(Win your wife's housekeeping money to buy more bits for your Dream.)
- DODGIT, by Fred Lever Jnr. (Try to cross a busy street without being run over.)
- DUEL, by Neville Harlick. (Shoot the enemy before he shoots you.)
- Plus, articles on an EPROM expansion, a Memod modification, and modified Alien and Alpha Display programs.

I hope we can fit all that lot in. You will have to wait until next month to see whether we managed it!

HAPPY DREAMING,

GARRY and GRAEME.

\*\*\*\*\*

#### ERRATTA

In the article 'Dream Connections', Page 4 of Issue No.10, the pin connections for the PIA2B socket show Pin 8 as CA2, this should be CB2. Pin 1 is shown as CA1, this should be CB1. Our thanks to J.Reynolds of [REDACTED] for pointing this out.

Garry.

\*\*\*\*\*

#### SHORT DEBUGGING HINTS

LEE De VRIES.

When keying in data from a listing, errors can occur where an incorrect instruction occurs. For this reason, data should always be saved on tape BEFORE attempting to RUN the program.

I have found that when incorrect instructions occur, one of the following results:-

1. A complete crash! System goes haywire and generally most data is destroyed.
2. The program will not run. No data is destroyed.
3. The system returns to the monitor program.

Cases 1 and 2 are best fixed by placing F000 at strategic points to see how far you can get. Don't forget to replace the initial data when removing the 'Return to Monitor' instruction.

Case 3. In this case, unlike the ones above, the interpreter could not interpret the code at all and returns you to the monitor.

Examine the Pseudo Program Counter at 0022,3, which will point to the instruction after the faulty one.

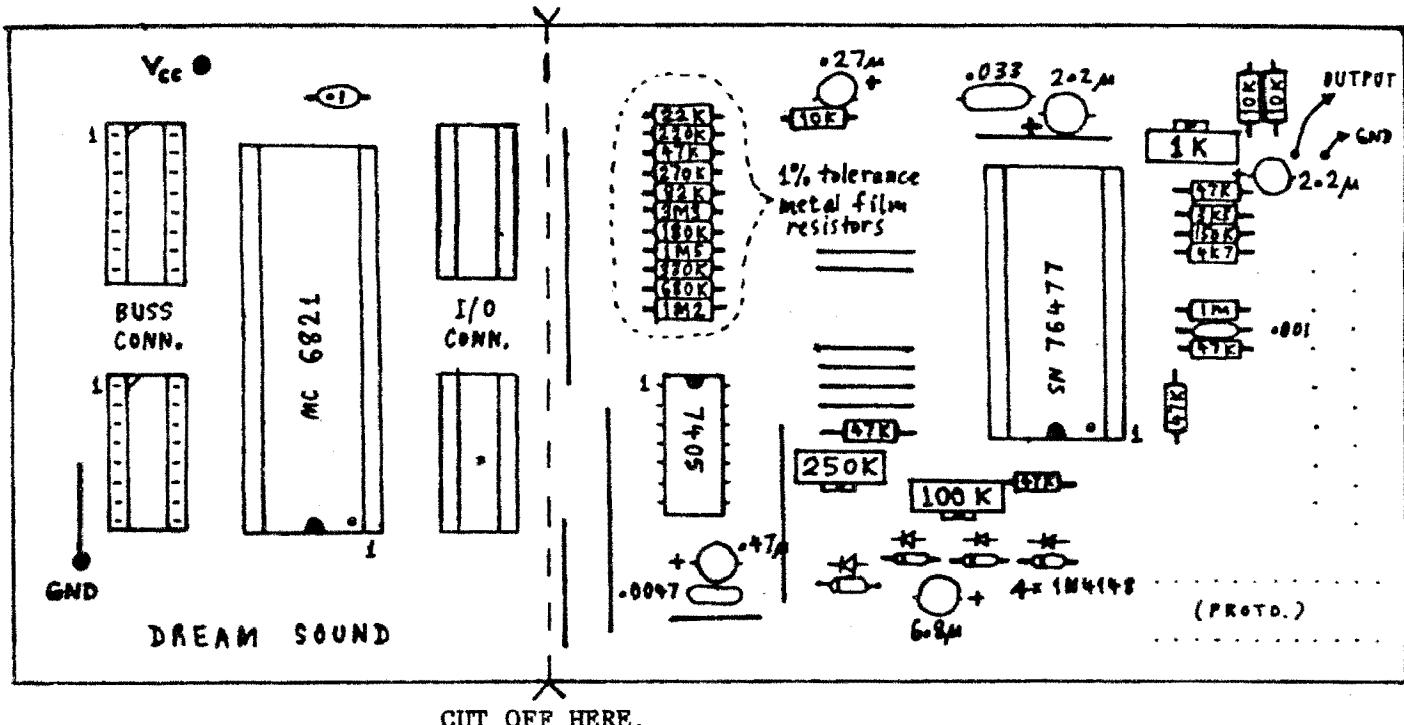
Examining the Pseudo Instruction Register at 0028,9, will give the faulty instruction.

\*\*\*\*\*

# AN ASCII KEY BOARD FOR YOUR DREAM

GRAEME V. SAMWAYS.

You can add a full ASCII keyboard to your DREAM 6800 for the cost of the keyboard, (we used one from Dick Smith, Cat.No.K3601, \$39-95,) and some cable, if you have a J.R. Components Expansion board. If you don't, you will require a full PIA. You could build this up on part of a Sound Effects Generator P.C. board. Make up a P.C. board from the layout given on Page 17 of Dreamer No.8, and cut it off where indicated in the diagram below. All the required PIA lines are present on this piece and are the same as on the J.R. Expansion board.



The PIA from the Sound Effects Generator itself can not be used, as the lines would be loaded down too much, but the board just described could be used to run the S.E.G., if you had them separate, and plugged the S.E.G. into the PIA board when you wanted to use it, as you would with the J.R. board. This extra PIA board can also be used for other devices, such as a printer.

Now that you can interface the keyboard to your DREAM, you will want to know how to wire up the keyboard. Well, I can not tell you! E.A. will not let me, as all their articles are copyright. You will have to find the July 1979 issue of Electronics Australia, which is the one with the third of the DREAM articles in it, so it should not be too difficult to find. (If you haven't worn it out by now, of course.) If you do not have one, you may be able to get a back issue from E.A., or you can order a photo-copy of the article from them at a cost of \$2-00. Details are given in each issue of E.A. on how to do this. The name of the article you want is 'Software Driven Keyboard for D2 Kits', and it is on Pages 92, 93 and 95. Alternatively, a trip to your local library may be helpful.

Once you have the article in your hot little hands, READ IT CAREFULLY, two or three times if necessary, until you understand it. The article gives the connection layout, a program for the D2 kit, and a program explanation. For all you Flow Chart addicts, there is even a Flow Chart.

Here is a program listing for the DREAM. It is almost the same as the D2 program, the differences are the PIA locations, and a wait 3.33ms subroutine. It does not have lower case Alphabetics, either. It is located at 0700 - 07EF, not 0000. To move it, you only have to change location 0749/A to the location before the start of the look up table.

When the routine is finished, if no key was closed, the routine returns with the 'carry clear' in the 6800 Condition Code register. If a key

## AN ASCII KEY BOARD FOR YOUR DREAM (Cont)

was closed the ASCII value is in the A and B Accumulators and the carry bit in the 6800 Condition Code register is set.

The routine is used by calling from the main program, using a **OPMM** instruction. If you just want it to look and see if a key is closed, use 0700. If you want it to WAIT for a key, do not access the main routine directly, run this routine, using 07F0.

|      |        |            |                          |
|------|--------|------------|--------------------------|
| 07F0 | BD0700 | BRA \$0700 | ASC KEY                  |
| 07F3 | 24FB   | BCC 07F0   | If no key, go look again |
| 07F5 | 9730   | STAA 0030  | Variable 0               |
| 07F7 | 39     | RTS        | Return with ASCII value  |

This returns the ASCII value in the A and B Accumulators and in Variable 0.

Next month, we will give you a HANGMAN game from Lindsay Ford, which will let you play using the T.V. Typewriter code on the Hexadecimal keyboard, or use the ASCII keyboard.

We have included the ASCII Conversion Table, and shown the relative keys alongside the look-up table. As you can see from these, the key functions are easy to change by changing the data in the appropriate location on the look-up table. To find the Hexadecimal code for each key, just look at the number in the top row of the column the key is in for the Most Significant Digit, and look at the number in the extreme left hand column of the row the key is in for the Least Significant Digit. All clear? If not, here are some examples. Capital 'D' is 4,4, Capital 'L' is 4,C, Number 6 is 3,6. (Don't forget the 'SHIFTed' part of the look-up table, as well.) You could even write yourself a table for the T.V. Typewriter codes (which are not standard ASCII codes), so that you can play all the old games, using your ASCII keyboard.

### ASCII CONVERSION TABLE

| HEX<br>LSD | MSD<br>BITS | 0   | 1   | 2     | 3   | 4   | 5   | 6   | 7   |
|------------|-------------|-----|-----|-------|-----|-----|-----|-----|-----|
|            |             | 000 | 001 | 010   | 011 | 100 | 101 | 110 | 111 |
| 0          | 0000        | NUL | DLE | SPACE | 0   | @   | P   | -   | p   |
| 1          | 0001        | SOH | DC1 | !     | 1   | A   | Q   | a   | q   |
| 2          | 0010        | STX | DC2 | -     | 2   | B   | R   | b   | r   |
| 3          | 0011        | ETX | DC3 | #     | 3   | C   | S   | c   | s   |
| 4          | 0100        | EOT | DC4 | \$    | 4   | D   | T   | d   | t   |
| 5          | 0101        | ENQ | NAK | %     | 5   | E   | U   | e   | u   |
| 6          | 0110        | ACK | SYN | &     | 6   | F   | V   | f   | v   |
| 7          | 0111        | BEL | ETB | '     | 7   | G   | W   | g   | w   |
| 8          | 1000        | BS  | CAN | (     | 8   | H   | X   | h   | x   |
| 9          | 1001        | HT  | EM  | )     | 9   | I   | Y   | i   | y   |
| A          | 1010        | LF  | SUB | .     | :   | J   | Z   | j   | z   |
| B          | 1011        | VT  | ESC | +     | :   | K   |     | k   | {   |
| C          | 1100        | FF  | FS  | .     | <   | L   | \   | l   | --  |
| D          | 1101        | CR  | GS  | -     | =   | M   | ]   | m   | }   |
| E          | 1110        | SO  | RS  | .     | >   | N   | ^   | n   | ~   |
| F          | 1111        | SI  | US  | /     | ?   | O.  | ←   | o   | DEL |

### THE ASCII SYMBOLS

|     |                         |     |                             |
|-----|-------------------------|-----|-----------------------------|
| NUL | - Null                  | DLE | - Data Link Escape          |
| SOH | - Start of Heading      | DC  | - Device Control            |
| STX | - Start of Text         | NAK | - Negative Acknowledge      |
| ETX | - End of Text           | SYN | - Synchronous Idle          |
| EOT | - End of Transmission   | ETB | - End of Transmission Block |
| ENQ | - Enquiry               | CAN | - Cancel                    |
| ACK | - Acknowledge           | EM  | - End of Medium             |
| BEL | - Bell                  | SUB | - Substitute                |
| BS  | - Backspace             | ESC | - Escape                    |
| HT  | - Horizontal Tabulation | FS  | - File Separator            |
| LF  | - Line Feed             | GS  | - Group Separator           |
| VT  | - Vertical Tabulation   | RS  | - Record Separator          |
| FF  | - Form Feed             | US  | - Unit Separator            |
| CR  | - Carriage Return       | SP  | - Space (Blank)             |
| SO  | - Shift Out             | DEL | - Delete                    |
| SI  | - Shift In              |     |                             |

\*\*\*\*\*

AN ASCII KEY BOARD FOR YOUR DREAM (Cont)

ASCII KEY BOARD ROUTINE

( 0700 - 0800 )

ASC KEY

|      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 0700 | CE | 80 | 20 | 86 | 04 | C6 | FF | 6F | 01 | 6F | 00 | A7 | 01 | 6F | 03 | E7 |
| 0710 | 02 | A7 | 03 | 01 | 01 | 6F | 02 | E1 | 00 | 27 | 16 | BD | C2 | F3 | CE | 80 |
| 0720 | 20 | 86 | 7F | A7 | 02 | 86 | 07 | E1 | 00 | 26 | 08 | 00 | 66 | 02 | 4A | 2A |
| 0730 | F6 | 8C | 39 | 48 | 48 | 48 | E6 | 00 | 48 | 4C | 54 | 25 | FC | C6 | FF | E7 |
| 0740 | 02 | 64 | 02 | E6 | 01 | C4 | 40 | 18 | CE | 07 | 6F | 4C | 08 | 4A | 26 | FC |
| 0750 | A6 | 00 | 06 | FF | CE | 80 | 20 | 6F | 02 | E1 | 00 | 26 | FC | BD | C2 | F3 |
| 0760 | 16 | 00 | 39 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 |

KEY LOOK UP TABLE

|      |    |    |    |    |    |    |    |    |      |   |   |   |   |    |    |     |
|------|----|----|----|----|----|----|----|----|------|---|---|---|---|----|----|-----|
| 0770 | 1B | 32 | 34 | 36 | 38 | 30 | 3A | 08 | ESC  | 2 | 4 | 6 | 8 | 0  | :  | BS  |
| 0778 | 09 | 57 | 52 | 59 | 49 | 50 | 5C | 7F | TAB  | W | R | Y | I | P  | \  | DEL |
| 0780 | 00 | 53 | 46 | 48 | 4B | 3B | 50 | 00 | BELL | S | F | H | K | ;  | J  |     |
| 0788 | 04 | 58 | 56 | 4E | 20 | 2F | 00 | 00 | EOT  | X | V | N | , | /  |    |     |
| 0790 | 5A | 43 | 42 | 4D | 2E | 20 | 00 | 00 | Z    | C | B | M | . | SP | CR |     |
| 0798 | 41 | 44 | 47 | 4A | 4C | 40 | 00 | 00 | A    | D | G | J | L | @  | FF |     |
| 07A0 | 51 | 45 | 54 | 55 | 4F | 5B | 0A | 00 | Q    | E | T | U | O | E  | LF |     |
| 07A8 | 31 | 33 | 35 | 37 | 39 | 2D | 5E | 00 | 1    | 3 | 5 | 7 | 9 | -  | A  |     |

"SHIFT" KEY LOOK UP TABLE

|      |    |    |    |    |    |    |    |    |      |   |    |   |   |    |    |     |
|------|----|----|----|----|----|----|----|----|------|---|----|---|---|----|----|-----|
| 07B0 | 1B | 22 | 24 | 26 | 28 | 30 | 2A | 08 | ESC  | " | \$ | & | ( | 0  | *  | BS  |
| 07B8 | 09 | 57 | 52 | 59 | 49 | 50 | 5C | 7F | TAB  | W | R  | Y | I | P  | \  | DEL |
| 07C0 | 00 | 53 | 46 | 48 | 4B | 2B | 50 | 00 | BELL | S | F  | H | K | +  | J  |     |
| 07C8 | 00 | 58 | 56 | 4E | 30 | 3F | 00 | 00 | EOT  | X | V  | N | < | ?  |    |     |
| 07D0 | 5A | 43 | 42 | 4D | 3E | 20 | 00 | 00 | Z    | C | B  | M | > | SP | CR |     |
| 07D8 | 41 | 44 | 47 | 4A | 4C | 40 | 00 | 00 | A    | D | G  | J | L | @  | FF |     |
| 07E0 | 51 | 45 | 54 | 55 | 4F | 5B | 0A | 00 | Q    | E | T  | U | O | E  | LF |     |
| 07E8 | 21 | 23 | 25 | 27 | 29 | 3D | 7E | 00 | !    | # | Z  | ' | ) | =  | ~  |     |

GET ASC KEY

07F0 BD 07 00 24 FB 97 30 39 00 00 00 00 00 00 00 00

\*\*\*\*\*

DREAMCARDS

We received a note from Lindsay Ford recently asking us to pass on the following message, which we are happy to do. He writes:-

'DREAMCARDS has now had some feedback (always very welcome) from people who have purchased 'Dream Rummy / Strip Jack Naked'. It seems that some of our first batch of cassettes, (those with a black tinted plastic case), were extremely susceptible to demagnetization and suffered badly in transit. After a fair bit of experimentation, I have come up with a far more stable brand of cassette and these will be supplied in future. If any Dreamers are having problems with the earlier batch, they can return the cassettes to me for replacement.

A typographical error has crept into the 'Strip Jack Naked' listing. Location 058F should be '00', not '80'. Thanks to J.Marchington of [REDACTED] for picking this one up."

Regards,

Lindsay.

\*\*\*\*\*

With 4K memories all the rage, it becomes possible to store a small library of programs which can be instantly accessed via a system which shows a 'menu' of what is available along with a keycode for each offering. The whole 4K can be loaded in one two minute cassette dump. By pressing the appropriate key, the desired program is moved from it's library location into the 'usual' DREAM memory working area, (0200 onwards), and run. At the conclusion of the program, control returns to the menu program, the screen again shows the offerings on file and you can make your next choice.

Games and utilities are obvious applications, with frequent changes of program easily made without having to load from a cassette every time. This system also allows programs to be written so that they always begin at 0202, regardless of where they are stored, making development easier and allowing a program to be stored anywhere in your available memory (below 7FFF, anyway) without requiring any re-writing of branch and subroutine instructions.

POINTS TO NOTE:

- 1) The Menu Program resides at 0F90-1000, and the Screen Buffer, (Menu Display) at location 0E90-0F90.
- 2) All programs used with this system should be adjusted to begin at 0202. At 0200 in each program enter '1FA6', and always terminate with 1FA6. (Or 1200)
- 3) When entering the menu program put the Start, End, and Destination addresses of each program, numbered 0 to 4, inclusive, from 0FD4 - OFF1.
- 4) Destination will usually be 0080 or 0200, but may be anything to suit the needs of the program.
- 5) Always enter 1FA6 at 0200 before running (C000, FN, 3,) for the first time.
- 6) Leave enough room above 0202 to hold the largest program in the group before beginning to enter program '0'. E.G. If the largest program takes up from 0202 - 0402, begin to enter your library above 0402.
- 7) The "move" subroutine, (0F90 - 0FA5) is handy in many other applications. To use it, get your program to enter the starting address of the block to be moved into 0030/1 (V0,V1,) the end address +1 of the block to be moved into 0032/3 (V2,V3,) and the starting address of where it is to be moved to into 0034/5 (V4,V5,) then call the routine, using 0F90, FN, 3. (You can use this technique to transfer programs from 0202 onwards into their appropriate storage locations when setting up the menu system.)
- 8) To compose the screen display for use with this system, alter the 'T.V. Typewriter' program, (E.A.July'79) as follows:-  
Insert '12E0' at location 020C, then add,  
02E0 400B 12E8 0277 120E A2F0 F565 0F90 F000  
02F0 0100 0200 0E90

Enter the menu program, enter and run the modified T.V. Typewriter program and compose your screen display. When everything is to your satisfaction, just press "B" and the screen will be dumped into the buffer area of memory.

The disassembled listing is shown on the next page. Space has been left for you to add your own comments as you follow the program through.

\*\*\*\*\*

MENU SYSTEM

( 0F90 - 1000 )

| <u>ADDR</u>                 | <u>INSTR</u> | <u>MNEMONIC</u> | <u>EXPLANATION</u> |
|-----------------------------|--------------|-----------------|--------------------|
| (Machine Code 0F90 - 0FA5 ) |              |                 |                    |

|      |       |            |  |
|------|-------|------------|--|
| 0F90 | 01    | NOP        |  |
| 0F91 | DE 30 | LDX \$0030 |  |
| 0F93 | A6 00 | LDAA X,0   |  |
| 0F95 | 08    | INX        |  |
| 0F96 | 9C 32 | CPX \$0032 |  |
| 0F98 | 27 08 | BEQ 0FA5   |  |
| 0F9A | DF 30 | STX \$0030 |  |
| 0F9C | DE 34 | LDX \$0034 |  |
| 0F9E | A7 00 | STAA X,0   |  |
| 0FA0 | 08    | INX        |  |
| 0FA1 | DF 34 | STX \$0034 |  |
| 0FA3 | 20 EC | BRA 0F91   |  |
| 0FA5 | 39    | RTS        |  |

| <u>ADDR</u>           | <u>INST</u> | <u>MNEMONIC</u> | <u>EXPLANATION</u> |
|-----------------------|-------------|-----------------|--------------------|
| (Chip-8 0FA6 - 0FFF ) |             |                 |                    |

|      |      |                              |  |
|------|------|------------------------------|--|
| 0FA6 | FFFA | I = 0FFA                     |  |
| 0F88 | 2FF4 | DO SUB 0FF4                  |  |
| 0F8A | F00A | V0 = KEY                     |  |
| 0FAC | 6102 | V1 = 02                      |  |
| 0FAE | 8200 | V2 = V0                      |  |
| 0FB0 | 8125 | V1 = V1 - V2                 |  |
| 0FB2 | 3F01 | SKF VF = 01                  |  |
| 0FB4 | 1F8A | GO TO 0F8A                   |  |
| 0FB6 | 8004 | V0 = V0 + V0                 |  |
| 0FB8 | 8004 | V0 = V0 + V0                 |  |
| 0FB8 | BFBC | GO TO 0FBC + V0              |  |
| 0FBC | AFD4 | I = 0FD4                     |  |
| 0FBE | 1FCE | GO TO 0FCE                   |  |
| 0FC0 | AFDA | I = 0FDA                     |  |
| 0FC2 | 1FCE | GO TO 0FCE                   |  |
| 0FC4 | AFE0 | I = 0FE0                     |  |
| 0FC6 | 1FCE | GO TO 0FCE                   |  |
| 0FC8 | AFE6 | I = 0FE6                     |  |
| 0FCA | 1FCE | GO TO 0FCE                   |  |
| 0FCC | AFEC | I = 0FEC                     |  |
| 0FCE | 2FF2 | DO SUB 0FF2                  |  |
| 0FD0 | 1202 | GO TO 0202                   |  |
| 0FD2 | 0000 | NOP                          |  |
| 0FD4 | 0000 | Start Program 0              |  |
| 0FD6 | 0000 | End Program 0                |  |
| 0FD8 | 0000 | Dest. Program 0              |  |
| 0FDA | 1111 | Start Program 1              |  |
| 0FDC | 1111 | End Program 1                |  |
| 0FDE | 1111 | Dest. Program 1              |  |
| 0FE0 | 2222 | Start Program 2              |  |
| 0FE2 | 2222 | End Program 2                |  |
| 0FE4 | 2222 | Dest. Program 2              |  |
| 0FE6 | 3333 | Start Program 3              |  |
| 0FE8 | 3333 | End Program 3                |  |
| 0FEA | 3333 | Dest. Program 3              |  |
| 0FEC | 4444 | Start Program 4              |  |
| 0FEE | 4444 | End Program 4                |  |
| 0FF0 | 4444 | Dest. Program 4              |  |
| 0FF2 | 00E0 | ERASE                        |  |
| 0FF4 | F565 | V0 TO V5 = MI                |  |
| 0FF6 | 0F90 | CALL M/C AT 0F90             |  |
| 0FF8 | 00EE | RETURN                       |  |
| 0FFA | 0E90 | Start 'Menu' display         |  |
| 0FFC | 0F90 | End 'Menu' display           |  |
| 0FFE | 0100 | Screen buffer.(Destination.) |  |

LINDSAY R. FORD,

This is a random number game that is an excellent test of your ability to recognise 'patterns' or 'systems'. The DREAM throws 50 dice and then performs a non-random operation on some of them before they are displayed. At least 3 dice must be affected by this operation or 'ERROR' is displayed, your score is incremented by one, and the throw is repeated. You then have 20 seconds, (or less if you hold down a key,) before the DREAM blanks the display and asks you to key in the answers to three questions;

- 1) "FROM" - ie: What dice have been changed? ( 2's, 3's, etc.)
- 2) "TO" - ie: What number have they been changed to?
- 3) "AT" - Has the operation only been performed on dice on the:-
  - Left of the screen? (Key in 1)
  - Right of the screen? (Key in 2)
  - Centre of the screen? (Key in 3)
  - Outside of the screen? (Key in 4)
  - or, Throughout all the dice? (Key in 5)

After each answer is entered the correct answer will be displayed and your score incremented by 1 for a correct guess or decremented by 1 if you were wrong. You win if your score reaches 20, and lose if it reaches 00. To give yourself longer to ponder the throw, alter the data at 0301. (3C will give you 60 seconds.)

The original idea for this game (and the rather odd name) came from an article in the August '78 issue of E.T.I. (Page 74) in which the game, (as played with real dice,) was described. It had to be greatly simplified for the limited DREAM graphics display, but anyone interested in information on the range of possibilities and odds against them occurring randomly should get a copy of the original article.

N.B. This program contains a preliminary display ( 0100-01C7) to identify it and explain the scoring when it is loaded from tape. As soon as it has been keyed into the DREAM, the program should be dumped onto tape, (any errors can be corrected later) as a C000, FN, 3, instruction will erase this data.

|      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|
| 0080 | 0001 | 06EE | 8ACE | 8CEA | EAAA | EACA | AEE0 | A0E0 |
| 0090 | C0A0 | F8F8 | D8F8 | F8B8 | F8E8 | F8B8 | D8E8 | F8A8 |
| 00A0 | F8A8 | F8A8 | D8A8 | F8A8 | A8A8 | F8E8 | F8B8 | F8E8 |
| 00B0 | D8B8 | F8B8 | F8B8 | F83E | 3E3E | BE3E | 3E3E | 3E3E |
| 00C0 | BE3E | 3E3E | 3E3E | BE3E | BE3E | 0080 | A080 | A080 |
| 00D0 | 0080 | A080 | A080 | 0080 | 2000 | 2000 | 0000 | EFAA |
| 00E0 | HAAA | EH00 | 3B12 | 1212 | 1300 | 3B29 | 3929 | 2900 |
| 00F0 | 00EE | 8ACE | 8C8A | DA8D | 6B02 | 7A38 | F01E | 00EE |
| 0100 | 000F | FFFF | FFFF | E000 | 0008 | 8888 | A822 | 2000 |
| 0110 | 000E | AAAA | AAAA | A000 | 000D | AAA8 | 8AA2 | A000 |
| 0120 | 000B | AAAA | DAAA | A000 | 0008 | 88AA | DAAA | A000 |
| 0130 | 000F | FFFF | FFFF | E000 | 0000 | 0000 | 0000 | 0000 |
| 0140 | 0777 | 771D | DDDC | 02E0 | 0425 | 5211 | 1550 | E2A0 |
| 0150 | 0727 | 721D | 15D8 | 02A0 | 0125 | 6205 | 1590 | E2A0 |
| 0160 | 0725 | 521D | DD5C | 02E0 | 0000 | 0000 | 0000 | 0000 |
| 0170 | EBAB | 8040 | 2AEE | EE01 | AA29 | 2240 | 2AAA | A881 |
| 0180 | EAB9 | 0740 | 2AEA | AA1D | CAA9 | 2240 | 2ACA | AA81 |
| 0190 | ABA9 | 0040 | 3EAE | AE01 | 0000 | 0000 | 0000 | 0000 |
| 01A0 | 955C | 1COA | EA55 | 7077 | 9554 | 540A | AA55 | 5215 |
| 01B0 | 9554 | 940E | AA55 | 5175 | 9554 | 5404 | AA55 | 5245 |
| 01C0 | 9F54 | 1C04 | EE7D | 5077 | **** | **** | **** | **** |

ZOONAYMAN (Cont)

|      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|
| 0200 | 6308 | 6062 | 2350 | 0000 | 00E0 | 6400 | 2380 | 4006 |
| 0210 | 120C | 8500 | 2360 | 0600 | 2360 | 9600 | 1218 | 8700 |
| 0220 | 2378 | 03EE | 4501 | 124A | 4502 | 1266 | 4503 | 1284 |
| 0230 | 4504 | 12A8 | 6801 | 6A02 | 23A4 | 23B4 | 3A3E | 1238 |
| 0240 | 7B06 | 3B1F | 1236 | 23AE | 12D2 | 6B01 | 6A02 | 4501 |
| 0250 | 23A4 | 23B4 | 3A20 | 124E | 7B06 | 3B1F | 124C | 4501 |
| 0260 | 23AE | 3501 | 12D2 | 6B01 | 6A20 | 4502 | 23A4 | 23B4 |
| 0270 | 3A3E | 126A | 7B06 | 3B1F | 1268 | 4502 | 23AE | 3502 |
| 0280 | 12D2 | 124A | 6B07 | 6A08 | 4503 | 23A4 | 23B4 | 3A38 |
| 0290 | 1288 | 7B06 | 3B19 | 1286 | 4503 | 23AE | 3503 | 12D2 |
| 02A0 | 6B19 | 6A08 | 4504 | 23A4 | 23B4 | 3A38 | 12A4 | 7B08 |
| 02B0 | 3B29 | 12A2 | 6B01 | 6A38 | 4504 | 23A4 | 23B4 | 7A04 |
| 02C0 | 3A4C | 12B6 | 7B06 | 3B1F | 12B6 | 4504 | 23AE | 4504 |
| 02D0 | 1284 | 03F2 | 3400 | 12FC | 00E0 | 6A16 | 6B0C | 6005 |
| 02E0 | A083 | DAB5 | 7A08 | F01E | 3A2E | 12E2 | 23C6 | 6E50 |
| 02F0 | FE18 | 4300 | 13DE | 4314 | 13DE | 1208 | 6E00 | 235A |
| 0300 | 4E14 | 130A | 6F0F | EF9F | 12FE | 00E0 | 6000 | 6106 |
| 0310 | 6A28 | 6B02 | A0B7 | 23BC | 20F6 | 3AD0 | 1316 | 23BC |
| 0320 | 23C8 | 6B03 | 6A24 | F80A | F829 | DAB5 | 7A07 | 235A |
| 0330 | 4B09 | 8670 | 4B0F | 8650 | F629 | DAB5 | 23C8 | 9680 |
| 0340 | 23C6 | 5680 | 23C4 | 4300 | 13DE | 4314 | 13DE | 7B06 |
| 0350 | 3B15 | 1324 | 6094 | 2350 | 1206 | 6030 | F015 | F007 |
| 0360 | 3000 | 135E | 6002 | F018 | 7E01 | 00EE | C007 | 4000 |
| 0370 | 136C | 4007 | 1360 | 00EE | 2360 | 8800 | C101 | 4100 |
| 0380 | 138E | 4802 | 1398 | 4803 | 139C | 4806 | 13A0 | 8004 |
| 0390 | 8004 | A08E | F01E | 00EE | A0AA | 00EE | A0AE | 00EE |
| 03A0 | A0B2 | 00EE | 5680 | 00EE | 7401 | 8070 | 137A | 60FC |
| 03B0 | 8402 | 00EE | DAB5 | 2378 | 7A06 | 00EE | DAB6 | 7B06 |
| 03C0 | F11E | 00EE | 73FE | 7301 | A080 | F333 | F265 | 6C10 |
| 03D0 | 6D18 | F129 | DCD5 | 7C04 | F229 | DCD5 | 00EE | 6800 |
| 03E0 | 6E03 | FE18 | 23C8 | 7801 | 3828 | 13E0 | 1200 | BDC3 |
| 03F0 | 4139 | CE80 | 1206 | 3FE7 | 0139 |      |      |      |

ZOONAYMAN - TWO PLAYER SUBROUTINE

( 03FA - 0500 )

This is a little extra for 2K (and up) DREAMs. It allows a second player to key in the three variables used in the dice display/modify operation. If an illegal key is entered, (o, 7, F etc.), or an illegal operation performed, (E.G. If the second player tells the DREAM to change all 5's to 5's) then the score is incremented by 1. The score will also be incremented if less than 3 dice are affected by the operation performed, but this is not under the second player's control.

0206 Insert 13FA into main program.

|      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|
| 03F0 |      |      |      |      | 00E0 | 6A04 | 6B0C |      |
| 0400 | 6405 | A4D4 | 2468 | 3A3C | 1404 | F10A | 4101 | 1208 |
| 0410 | 3102 | 140A | 2470 | 00E0 | 6201 | 2476 | F60A | 2470 |
| 0420 | 00E0 | 8860 | 2482 | 4314 | 13DE | 00E0 | 4901 | 1418 |
| 0430 | 6202 | 2476 | F70A | 2470 | 00E0 | 8870 | 2482 | 9760 |
| 0440 | 24C2 | 4314 | 13DE | 00E0 | 4901 | 1430 | 6203 | 2476 |
| 0450 | F50A | 2470 | 00E0 | 8850 | 24CA | 4314 | 13DE | 00E0 |
| 0460 | 4901 | 144C | 235A | 1220 | DAB5 | 7A08 | F41E | 00EE |
| 0470 | 600C | 235C | 00EE | 6A18 | F229 | 2468 | A4F2 | DAB5 |
| 0480 | 00EE | 6E00 | 4800 | 1498 | 60F9 | 6900 | 6F00 | 8084 |
| 0490 | 4F00 | 00EE | 3E00 | 78FF | 6901 | 6D00 | 6A18 | F829 |
| 04A0 | 2468 | A4F2 | DAB5 | 2470 | 7D01 | 3D0A | 14A4 | 00E0 |
| 04B0 | 6A16 | A083 | 2468 | 3A2E | 14B4 | 23C6 | 6E50 | FE18 |
| 04C0 | 00EE | 6A14 | F629 | DAB5 | 1498 | 4800 | 1498 | 6E01 |
| 04D0 | 7B01 | 1488 | 8E8A | 8A8A | SEE3 | A0E3 | C2R3 | 8E8A |
| 04E0 | 8E08 | 888E | 8A8E | 8A8A | AER8 | EC48 | 4EEE | A8EE |
| 04F0 | C2AE | 7711 | 2200 | 22   |      |      |      |      |

\*\*\*\*\*

P. E. MARSTON.

Here is a simple program, which enables the player to draw anything on the screen.

In addition, I have included the 'Flow Chart' to allow the new-comer to programming to analyse the program and see how CHIP-8 is used to perform this simple task.

The point of your 'chalk' appears in mid-screen, and the corners of the 'easel' are marked. To move your 'chalk', without drawing a line, press key 'C', (Change position.), followed by :-

'4' Left,    '6' Right,    '9' Up,    '1' Down.

To draw, press key 'D', followed by:-

'8' Up Left,    '9' Up,    'A' Up Right,

'4' Left,                          '6' Right,

'0' Down Left,    '1' Down,    '2' Down Right.

Each press draws one dot.

The program is also ideal for designing and evaluating graphics, on screen.

NOTE: We have not followed our usual practice of changing the key functions to suit the 'Digitran' keyboard with this program. You should try to do this yourself, (even if you do not need them changed), by disassembling the program and using the 'Flow Chart' as a guide. (If you do not have a printer, disassemble it by hand, it is only a short program and will not take you long.)

G &amp; G.

|      |      |       |      |       |      |       |      |       |
|------|------|-------|------|-------|------|-------|------|-------|
| 0200 | 6A00 | 6B0F  | 6D1F | 6E3F  | A292 | DAD1  | DAA1 | DED1  |
| 0210 | DEA1 | DDB1  | F00A | 400C  | 124C | 4006  | 7D01 | 400Z9 |
| 0220 | 7B01 | 400Z1 | 7BFF | 4004  | 7DFF | 400Z4 | 7D01 | 400ZA |
| 0230 | 7B01 | 400Z0 | 7DFF | 400Z0 | 7BFF | 400Z1 | 7D01 | 400ZL |
| 0240 | 7BFF | 400Z7 | 7DFF | 400Z7 | 7B01 | 1212  | DDB1 | 6100  |
| 0250 | 6200 | 6C0D  | ECA1 | 1212  | 6C04 | ECA1  | 61FF | 6C06  |
| 0260 | ECA1 | 6100  | 6C0F | ECA1  | 62FF | 6C01  | ECA1 | 6201  |
| 0270 | 8D14 | 8B24  | DDB1 | 6A04  | FA15 | FA07  | 3A00 | 127A  |
| 0280 | 124C | 8000  |      |       |      |       |      |       |

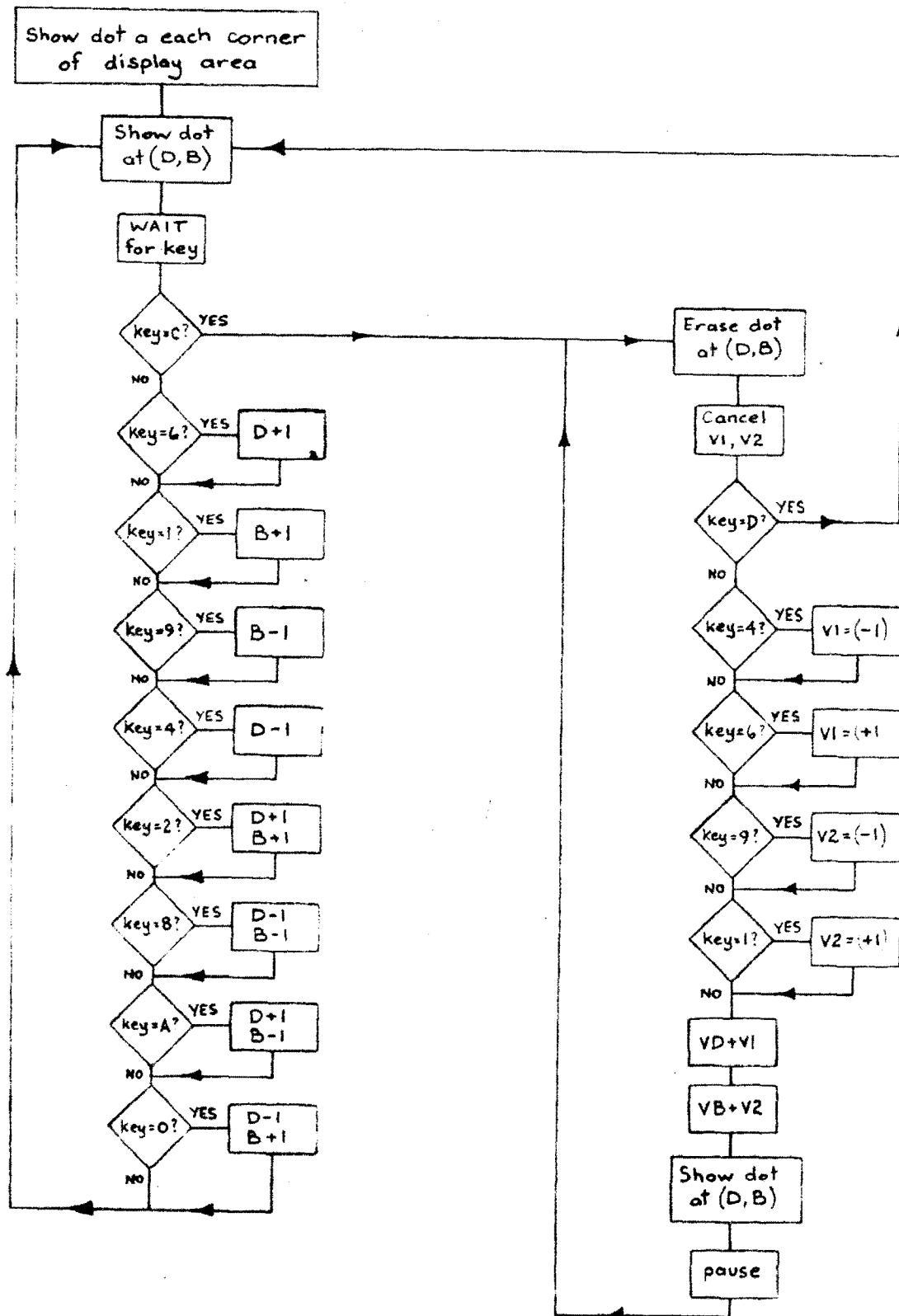
\*\*\*\*\*

WANTED

Here is a selection of things that people have requested appear in the DREAMER. If you would like to try your hand at writing a program, or an article, but can not think of a subject, why not try one of the following?

- |                           |   |
|---------------------------|---|
| - A CHESS program         | - A FLIGHT SIMULATOR game                   |
| - DRAUGHTS                | - Interfacing the DREAM to external devices |
| - An EPROM programmer     | - Morse Code Decoder                        |
| - A LIGHT PEN             | - Radio Amateur orientated programs         |
| - More 'SERIOUS' programs | - A 'WESTERN GUNFIGHT' game                 |
| - More JOYSTICK programs  | -   |

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FLOW CHART.

## ADVERTISING

If you would like some help, can offer some help, have something to sell, or would like to buy something, send it in to us with a fee of \$1-00, and we will print it in two newsletters. THIS OFFER ONLY APPLIES TO PRIVATE ADVERTISERS, and we would ask you to keep them reasonably short, something like the ones below. Commercial enterprises who wish to advertise in the DREAMER are invited to contact us for details of rates, etc.

\*\*\*\*\*

IF YOU ARE HAVING TROUBLE getting your DREAM up and running or it has died on you and you cannot find out why, write with full details of troubles. Send stamped, addressed envelope for reply. If you think it is too hard for you to find the fault, send \$10-00, (to cover return insured postage and packing), and your DREAM, to SID MOORBY, [REDACTED]

\*\*\*\*\*

FRED LEVER, SNR, is happy to discuss problems after hours on [REDACTED] or send S.S.A.E. with description of problems to [REDACTED]  
[REDACTED] If repair is required on DREAM send (P.C.B. only preferred) to above address. With faulty expansions, send BOTH P.C.B.'s as problem may be on main board. A fee of \$33-00 will cover post and normal repairs, exceptional repairs may cost more, but owner will be advised BEFORE proceeding.

If you have a DREAM or an EXPANSION KIT partly built, I will complete it for you, price will be quoted on individual jobs.

\*\*\*\*\*

## **ANNOUNCING THE BIG ONE!**

→ Wondering what to do with all that space in your expansion board memory? ----- Why not fill it with Dream Pontoon? ←

Dream Pontoon is that exciting card game Pontoon 21 translated into Chip 8. It has 4K of powerful logic that not only makes it a damned good player, but also results in a versatile game that can be played for hours without becoming boring.

- IT FEATURES:
- \* Memory mapped card deck for absolute realism
  - \* Fully floating player options (anything you can do your Dream can do better!)
  - \* Probability based betting routines give high skill
  - \* Automatic level of play settings and checksum

This is the biggest and most intelligent programme available for the Dream. To hell with Level II Basic, load this one up and see how smart a Dream can be.

Cassette and Instructions \$17.50

Fully Commented Listing \$7.50 Extra

Dream Rummy is an easy game to learn and great fun to play. High intelligence, memory mapped card deck, manual checksum and level of play settings give it reliability and realism. A bonus game of "Strip Jack Naked" is supplied free with this game - both require 2K, although "Strip Jack Naked" can be cut to 1K.

Cassette and Instructions \$10.00

Commented Listing (Rummy only) \$5.00 Extra

\*DREAMCARDS

8 Highland Court, North Eltham 3095 Vic.  
SOFTWARE THAT THINKS

MULTIPLICATION TABLES

( 0080 - 0400 )

STUART CROFT,

A random selection of numbers are displayed in the form of a multiplication sum. The child's and the computer's scores are shown on the screen after ten sums have been answered. Enter the answer via the keyboard. I.E. If answer is 100, hit keys 1, 0, 0. If answer is 2, hit key 2.

The final score is displayed as a fraction of ten, with comments Good, Fair, or Bad. To start the program, Run C000, FN, 3.

|      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|
| 0080 | ABAA | ABAB | 52BB | AAAA | 2ABA | B9A1 | A9AB | B9B0 |
| 0090 | EAA4 | E4C4 | AEEA | SAAE | AAEA | E444 | 4440 | 4400 |
| 00A0 | EE8A | AAA8 | EEE8 | AAA8 | AAEC | EEAA | EA8A | 8EEE |
| 00B0 | AAAE | ACEA | EE8A | CE8A | 8AEE | 4A4E | 4CEA | 0000 |
| 00C0 | R0R0 | 6301 | 6118 | 6200 | 2204 | 1294 | R0RA | 1002 |
| 00D0 | R0B4 | 10C2 | 4B2B | 6B0B | BBB8 | 7B8B | BB6B | BB6B |
| 00E0 | 0B9B | 8B8B | 0B8B | CBA8 | 9BCB | 6B2B | D80B | 1BFB |
| 00F0 | 6B8B | AB8B | 2BAB | AB9B | 3BFB | 4B6B | 2BFB | 5BCB |
| 0200 | 6900 | 6400 | 6500 | 00E0 | 2340 | 2340 | 2358 | 000F |
| 0210 | 6A0C | 8A05 | 3F01 | 120E | C00F | 6A0C | 8A05 | 3F01 |
| 0220 | 1218 | 2364 | 2370 | 237A | 2386 | 2390 | 23A0 | 0000 |
| 0230 | A3BC | F265 | 4000 | 13C2 | F00A | A3BF | F055 | F00A |
| 0240 | R3C0 | F055 | F00A | A3C1 | F055 | A3D4 | FF55 | A3BC |
| 0250 | F565 | 8035 | 3000 | 13E4 | 8145 | 3100 | 13E4 | 8255 |
| 0260 | 3200 | 13E4 | 2392 | A338 | FE33 | 2300 | A3D4 | FF65 |
| 0270 | 7401 | 22E0 | 6650 | F618 | 7901 | 390A | 1206 | 0000 |
| 0280 | 00E0 | 6602 | 8655 | 3F00 | 1000 | 6605 | 8655 | 3F00 |
| 0290 | 10D0 | 1000 | 6A14 | 6B0A | A338 | F433 | 2300 | 7A07 |
| 02A0 | A2BE | DAB5 | 7A09 | 660A | A338 | F633 | 2300 | 6E00 |
| 02B0 | F615 | F607 | 3600 | 12B2 | 660A | F618 | 1200 | 0810 |
| 02C0 | 2040 | 8000 | 6605 | D125 | 7301 | 4303 | 00EE | F61E |
| 02D0 | 7108 | 1206 | R080 | 6300 | 6100 | 6213 | 2204 | 00EE |
| 02E0 | R090 | 12D6 | 22D4 | 02EA | 12D4 | 0650 | D721 | C640 |
| 02F0 | BDC2 | E539 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 |
| 0300 | F265 | 4000 | 1320 | F029 | 4001 | 7AFF | DAB5 | 4001 |
| 0310 | 7AFF | 7A05 | F129 | 4101 | 7AFF | DAB5 | 4101 | 7AFF |
| 0320 | 7A05 | F229 | 4201 | 7AFF | DAB5 | 00EE | 4100 | 1322 |
| 0330 | 1314 | 00F0 | 00F0 | 0000 | 0000 | 0588 | 5020 | 5000 |
| 0340 | 6A01 | 6B00 | A338 | F433 | 2300 | 00EE | 6A20 | 6B00 |
| 0350 | 610C | F129 | DAB5 | 00EE | 6A26 | 6B00 | A338 | F533 |
| 0360 | 2300 | 00EE | 6A01 | 6B0A | A338 | FC33 | 2300 | 00EE |
| 0370 | 7A07 | 680A | A33B | DAB5 | 00EE | 7A09 | 6B0A | A338 |
| 0380 | FD33 | 2300 | 00EE | 7A07 | 6B0A | A332 | DAB4 | 00EE |
| 0390 | 7A08 | 6B0A | A39A | DAB5 | 00EE | E020 | 4000 | 4000 |
| 03A0 | 6E00 | 4C00 | 13B4 | 4D00 | 13B4 | 8EC4 | 7DFF | 3D00 |
| 03B0 | 13AA | 4E00 | 6E00 | A3BC | FE33 | 00EE | 0004 | 0000 |
| 03C0 | 0402 | 6000 | A3BF | F055 | 3100 | 123E | A3C0 | 6000 |
| 03D0 | F055 | 1244 | 8204 | 0203 | 0100 | 5000 | 0A01 | 200A |
| 03E0 | 0700 | 2A00 | 22E4 | A3D4 | FF65 | 2358 | 7501 | 2358 |
| 03F0 | A3D4 | FF65 | 7501 | 7901 | 490A | 1280 | 1230 | 0000 |

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Mr. K. BOLCH,

Even if you consider yourself an 'expert' at Noughts and Crosses, you will still find it hard to beat the computer. The cells are numbered 1 to 9, so to make your move, just press the key corresponding to the cell you want to move to.

The computer's score is displayed on the left, the number of draws in the middle, and your score on the right.

Remember, it CAN be beaten!

|      |      |      |      |       |      |      |      |      |
|------|------|------|------|-------|------|------|------|------|
| 0080 | 3910 | 1360 | 1096 | 8180  | 6001 | 2288 | 4F01 | 10A0 |
| 0090 | 7401 | 2340 | 1214 | 4400  | 10C2 | A3FB | F065 | 1006 |
| 00A0 | 8180 | 2288 | 1084 | C803  | 7801 | 4804 | 6809 | 4802 |
| 00B0 | 6807 | 00EE | 20A6 | 7801  | 480A | 6806 | 00EE | 6805 |
| 00C0 | 1086 | 232A | 1086 | 4000  | 10BE | 4401 | 1284 | 4402 |
| 00D0 | 1284 | 3403 | 10C2 | 4001  | 1284 | 6100 | A3F6 | F11E |
| 00E0 | F065 | 7101 | 3001 | 10DC  | 6802 | 4102 | 6809 | 4103 |
| 00F0 | 6801 | 4104 | 6807 | C007  | 4000 | 20B4 | 1086 | 1088 |
| 0200 | 6500 | 6600 | 6700 | 00000 | 0000 | 0000 | 22AA | 0001 |
| 0210 | 4000 | 123A | 6310 | 2250  | 4409 | 13DC | F80A | 6909 |
| 0220 | 8985 | 4F00 | 121C | 4800  | 121C | 8180 | 6000 | 2288 |
| 0230 | 4F01 | 13F0 | 6001 | 2342  | 6310 | 2250 | 7401 | 4409 |
| 0240 | 130C | 63FE | 2250 | 3910  | 1360 | 6302 | 2250 | 1080 |
| 0250 | 6900 | 6800 | A300 | F91E  | F165 | 8A00 | 0310 | A3F6 |
| 0260 | FB1E | F065 | 8804 | 8A10  | 0310 | 81A0 | 3B00 | 125E |
| 0270 | 4803 | 13E4 | 48FD | 135A  | 9380 | 00EE | 7902 | 3910 |
| 0280 | 1252 | 00EE | 20A6 | 1086  | A324 | 4000 | A327 | 6000 |
| 0290 | 6D07 | 4101 | 12A6 | 71FF  | 7C06 | 4C12 | 12A0 | 1292 |
| 02A0 | 6C00 | 7D06 | 1292 | DCD3  | 00EE | 00E0 | 6C04 | A323 |
| 02B0 | 6D07 | DCD1 | 7D01 | 3D16  | 12B2 | 6D08 | 22F2 | 6011 |
| 02C0 | 22F2 | 6C1D | 6D00 | 8370  | 22DA | 8350 | 22DA | 8360 |
| 02D0 | 22DA | 6400 | 234A | 00EE  | 0000 | A030 | F333 | F029 |
| 02E0 | DCD5 | 7C04 | F129 | DCD5  | 7C04 | F229 | DCD5 | 7C0A |
| 02F0 | 00EE | 6CF9 | A293 | DCD1  | 7C01 | 3C08 | 12F6 | 00EE |
| 0300 | 0997 | 0963 | 0951 | 0852  | 0375 | 0471 | 0654 | 0321 |
| 0310 | 963A | 4456 | 4456 | 4456  | 4456 | 5454 | 5454 | D73B |
| 0320 | 973A | 3982 | A040 | A0E0  | A0E0 | C80F | 7801 | 6109 |
| 0330 | 8185 | 4F00 | 132A | A3F6  | F81E | F265 | 3000 | 132A |
| 0340 | 60FF | A3F6 | F81E | F055  | 00EE | 6000 | 6100 | A3F6 |
| 0350 | F055 | 7101 | 310A | 1350  | 00EE | 7701 | A3C8 | 13E8 |
| 0360 | A300 | F91E | F165 | 8A00  | 0310 | A3F6 | FB1E | F065 |
| 0370 | 4000 | 137C | 8A10 | 0310  | 81A0 | 136A | 88B0 | 2340 |
| 0380 | 1086 | 6205 | 6018 | 6108  | 0015 | F21E | 7008 | 3038 |
| 0390 | 1388 | 6050 | F015 | F007  | 3000 | 1396 | 00EE | 0000 |
| 03A0 | AEAA | EA4A | 4EA0 | A0A0  | A0E0 | 8AAA | AAFA | DA90 |
| 03B0 | D060 | 9090 | CERA | AEAC  | C4E5 | AAEA | AFAD | 8080 |
| 03C0 | 8060 | 8000 | 0000 | 0000  | AEAA | EA4A | 4EA0 | A0A0 |
| 03D0 | A0E0 | SE8A | 8A8A | EEEE  | 884E | 28EE | 7501 | A3B4 |
| 03E0 | 2382 | 120C | 7601 | A3A0  | 2382 | 22AA | 00EE | 0000 |
| 03F0 | 8180 | 2288 | 121C | 0000  | 0000 | 00FF | 0000 | 0000 |

\*\*\*\*\*

E. WITTE,

This routine copies the 64 X 32 screen of the DREAM to a Baudot Teleprinter. It is fully re-locatable, so to use it in your Machine Code programs, call it using a 7E0200 instruction. (if you locate it at 0200.) To use it in a Chip-8 program, simply use a OMMM instruction. (0200 in this example.) The listing is shown below starting from 0200.

```

0200    CE 00 FF C6 04 D7 20 8D 0E 7F 00 41 08 8C 02 00
0210    26 15 8D 03 7E C3 60 86 FE 8D 3C 86 C4 8D 38 86
0220    D0 8D 34 86 C4 20 30 7F 00 40 A6 00 97 42 96 42
0230    7C 00 40 48 97 42 24 04 86 FA 20 02 86 C8 8D 17
0240    96 40 81 08 27 02 20 E6 7C 00 41 96 41 81 08 27
0250    02 20 B9 8D CA 20 B2 7D 00 20 26 FB 44 24 04 C6
0260    07 20 02 C6 05 F7 80 12 C6 01 D7 20 4D 26 E8 39.
      SO

```

Here is a sample of what it will do:

|                                    |                                       |                    |
|------------------------------------|---------------------------------------|--------------------|
| X    X    XXXXX    XXXX    XXXXX   | XXX    XXX                            | X                  |
| X    X    X    X    X              | X    X    X                           | X    X             |
| X    X    X    X    X              | X    X                                | X    X             |
| XXXXXX XXX    XXXX XXX             | X    XXX                              | X    X             |
| X    X    X    X    X              | X    X                                | XXXXXX             |
| X    X    X    X    X              | X    X    X                           | X    X             |
| X    X    XXXXX X    X    XXXXX    | XXX    XXX                            | X    X             |
| XXXX    XXXXX X    X    XXX        | XXX    XXXXX                          |                    |
| X    X    X    XX XX X    X        | X    X    X                           |                    |
| X    X    X    X    X    X         | X    X    X                           |                    |
| X    X    XXX    X    X    X       | X    X    XXX                         |                    |
| X    X    X    X    X    X         | X    X    X                           |                    |
| X    X    X    X    X    X         | X    X    X                           |                    |
| XXXX    XXXXX X    X    XXX        | XXX    X                              |                    |
| XXXXXX X    X    XXXXX             | XXXX    XXXX    XXXXX                 | X    X    X        |
| X    X    X    X                   | X    X    X    X X                    | X    X    XX XX    |
| X    X    X    X                   | X    X    X    X X                    | X    X    X X X X  |
| X    XXXXX XXX                     | X    X    XXXX    XXX                 | X    X    X X    X |
| X    X    X    X                   | X    X    X    X X                    | XXXXXX X    X      |
| X    X    X    X                   | X    X    X    X X                    | X    X    X X    X |
| X    X    X    XXXXX               | XXXX    X    X    XXXXX X    X X    X | X    X    X        |
| XXX    XXX    X    X    XXXX    X  | X    XXXXX    XXXXX XXXX              |                    |
| X    X    X    X    XX XX X    X X | X    X    X    X X                    |                    |
| X    X    X    X    X    X X       | X    X    X    X X                    |                    |
| X    X    X    X    X    XXXX      | X    X    X    X X                    | XXX    XXXX        |
| X    X    X    X    X    X X       | X    X    X    X X                    | X    X    X X      |
| X    X    X    X    X    X X       | X    XX X    X                        | X    X    X X      |
| XXX    XXX    X    X    X X        | XX X    X                             | XXXXXX X    X    X |

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VIDEOTELETYPEWRITER.

( 0200 - 0400 )

TERRY MACKRELL,  
[REDACTED]

This is a repetitive and eye-catching advertising page. You adjust the page length at 021F, from 06 for one 'line', to 1C for a full 'page'.

Treat the display either as a 64 X 28 matrix, or enter copy from a stored "T.V. TYPEWRITER" page. In either case, enter a 00 byte after every eighth byte of copy for the 'carriage return'. Note that the sum of the carriage return entries consumes a total of four lines of page zero thus permitting only 28 printing lines.

Data is entered from 0236 to 0330.

This program was developed from an idea suggested by a 6800 user friend, Don Smith, ZL3AFP.

|      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|
| 0200 | 6A00 | 6B00 | 6C00 | A236 | FC1E | DAB1 | 2226 | 7A08 |
| 0210 | 3C50 | 7C01 | 3A40 | 1206 | 6A00 | 7B01 | 7C01 | 3B1C |
| 0220 | 1206 | 00E0 | 1200 | 6D02 | FD18 | 6D05 | FD15 | FD07 |
| 0230 | 3D00 | 122E | 00EE | CEEE | F877 | 770A | EER0 | 00AA |
| 0240 | 8AA8 | 4555 | 0A44 | A400 | AEAE | A877 | 550A | 44E0 |
| 0250 | 00AC | 3AA8 | 5555 | 0A44 | 4400 | CREA | A877 | 7704 |
| 0260 | 4440 | 0000 | 0000 | 0000 | 0000 | 0000 | E4EE | 8EEE |
| 0270 | EE3B | 3B38 | 00A4 | 22A8 | 82AA | 2AA2 | A000 | A4EE |
| 0280 | AE22 | EE3B | A2B8 | 00A4 | 82E2 | A2A2 | 2AA2 | A000 |
| 0290 | E4EE | 2EE2 | EE2B | 3B38 | 0000 | 0000 | 0000 | 0000 |
| 02A0 | 0000 | 7757 | 1547 | DDDD | DCDC | 0044 | 5215 | 4555 |
| 02B0 | 5555 | 0000 | 6572 | 1645 | 555D | 5C88 | 0045 | 5255 |
| 02C0 | 4555 | 51D8 | 4800 | 4757 | 7575 | 55D0 | 9588 | 0000 |
| 02D0 | 0000 | 0000 | 0000 | 0000 | 5555 | 55C7 | 7605 | 09C8 |
| 02E0 | 0055 | 5554 | 4555 | 0880 | 4800 | 5554 | 9C87 | 5510 |
| 02F0 | 5008 | 0055 | 5549 | 0555 | 0880 | 0000 | 7229 | 49C5 |
| 0300 | 5605 | 0888 | 0000 | 0000 | 0000 | 0000 | 0000 | 5000 |
| 0310 | DDDD | DDDD | DDDD | 0022 | 2222 | 2222 | 2222 | 2200 |
| 0320 | 5000 | DDDD | DDDD | DDDD | 0022 | 2222 | 2222 | 2222 |
| 0330 | 2200 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 00   |

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LOTTO

( 0200 - 0300 )

D. WOOLNOUGH,  
[REDACTED]

We haven't heard from any big winners from our previous 'Lotto' number selector, so here is another one to try your luck with.

Simply key it in, then RUN C000, FN, 3. A selection of six random numbers will appear on the screen. Press any key to select another set.

GOOD LUCK!

|      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|
| 0200 | 6A08 | 6B04 | 2220 | 7A0E | 2220 | 6A08 | 7B0A | 2220 |
| 0210 | 7A0E | 2220 | 6A08 | 7B0A | 2220 | 7A0E | 2220 | 124A |
| 0220 | 6328 | C23F | 8325 | 4F00 | 1220 | A250 | F333 | F265 |
| 0230 | 3100 | 123A | 3200 | 1246 | 1220 | F129 | DAB5 | 7A07 |
| 0240 | F229 | DAB5 | 00EE | 7A07 | 1240 | F00A | 00E0 | 1200 |

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D. A. TRABUCCO,

To all those who say 'Not another version of Space Invaders?', I say, 'Why Not?' After all, Space Invaders is all the rage, so why not jump on the bandwagon, especially when it is fun. This program will have special appeal to all those DREAM addicts who have neither the time nor the resources to add memory expansion at this time, and thus are not able to play 'Dream Invaders.'

In this game your job is to man the cannon using keys <sup>C</sup> and <sup>R</sup> for Left and Right, and <sup>F</sup> for Fire. You must shoot as many 'Invaders' and 'Commanders' as possible with your 30 bombs, receiving 5 points and 15 points respectively. The game ends when you run out of bombs, the invaders infiltrate your castle, or you get hit by an invader's bomb.

|      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|
| 0080 | 6C00 | A0C0 | F233 | 6A1A | 6B1A | A0C0 | FC1E | F065 |
| 0090 | F029 | DAB5 | 7A04 | 7C01 | 3C03 | 108A | F00A | 00E0 |
| 00A0 | 1200 | CA01 | 03E8 | 7B01 | 00EE |      |      |      |
| 00E0 | 681C | 7901 | 391E | 127A | 13E0 | 6A01 | FA18 | 00EE |
|      |      |      |      |      |      |      |      |      |
| 0200 | 6A0C | 6B18 | A3F9 | DAB3 | 7A10 | 3A3C | 1206 | 6000 |
| 0210 | 6104 | 6C00 | A3F6 | D013 | A0AA | FC1E | 7C02 | F155 |
| 0220 | 7106 | 311E | 1214 | 6104 | 7008 | 3040 | 1214 | 611F |
| 0230 | 6C00 | A0DA | 7C01 | F155 | 3C03 | 1234 | 6200 | 63FF |
| 0240 | 661C | 68FF | 6C04 | 6D00 | 6E00 | 6901 | A3FC | 1268 |
| 0250 | A3FC | D564 | 453A | 1262 | 6104 | E1A1 | 7501 | 4500 |
| 0260 | 1268 | 6108 | E1A1 | 75FF | D564 | 6A3F | 85A2 | 38FF |
| 0270 | 127E | 6108 | E19E | 1298 | 10E0 | 8750 | 1280 | D781 |
| 0280 | 78FF | 4800 | 1296 | D781 | 3F01 | 1298 | 6B1C | 8B82 |
| 0290 | 4800 | 13AC | 135E | 68FF | A0AA | FE1E | F165 | 41FF |
| 02A0 | 12C4 | A3F6 | D013 | 7003 | 6A3F | 80A2 | 403E | 7103 |
| 02B0 | 403F | 7103 | 4000 | 7103 | D013 | 4116 | 13E4 | A0AA |
| 02C0 | FE1E | F155 | 7E02 | 4E30 | 6E00 | A0DA | FD1E | F165 |
| 02D0 | 311F | 12F6 | CA01 | 3A00 | 1326 | 8AC0 | A0AA | FC1E |
| 02E0 | F165 | 31FF | 1300 | 7AFE | 8BC0 | 7BFA | 9AB0 | 132C |
| 02F0 | A0AA | FA1E | 12E0 | A3F2 | D011 | 3F01 | 130A | 1302 |
|      |      |      |      |      |      |      |      |      |
| 0300 | 7102 | 7101 | 411F | 1326 | A3F2 | D011 | 3F01 | 1326 |
| 0310 | 6B1C | 8B12 | 4B1C | 13CE | 20EA | 70FE | 5700 | 1324 |
| 0320 | 9810 | 68FF | 611F | A0DA | FD1E | F155 | 7D02 | 4004 |
| 0330 | 6D00 | 7C06 | 4C34 | 6C04 | A3F3 | 33FF | 134A | CAF  |
| 0340 | 3A00 | 1250 | 633A | 6400 | 1358 | D343 | 73FF | 4300 |
| 0350 | 63FF | 4300 | 63FF | 33FF | D343 | 1250 | 0000 | 6A17 |
| 0360 | 8A85 | 3F01 | 1296 | 6A00 | A0DA | F165 | 70FE | 5700 |
| 0370 | 1376 | 9810 | 1296 | 7A02 | 3A08 | 136A | 6A00 | A0AA |
| 0380 | FA1E | F165 | 41FF | 1392 | A3F6 | D013 | D013 | 4F01 |
| 0390 | 1396 | 7A02 | 137E | D013 | A3FC | D781 | 61FF | A0AA |
| 03A0 | FA1E | F155 | 7205 | 6A02 | 03E8 | 1296 | 6B00 | D781 |
| 03B0 | A3FC | D343 | 20A2 | D343 | 3BFF | 13B4 | A3F3 | D343 |
| 03C0 | 63FF | 720F | 1296 | CE01 | C086 | 007E | C07D | D011 |
| 03D0 | 6BA0 | 0000 | A300 | D564 | 20A2 | D564 | 3BFF | 13D8 |
| 03E0 | 0000 | 0000 | 03C8 | 1080 | F600 | 3AD7 | 21C6 | 407E |
| 03F0 | C2E5 | 40B4 | FC30 | A0E0 | 40AA | FEFE | 1038 | 7C28 |

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KEITH A AYTON,  
VK3KAA,

This program is in Machine Code and must be run 0200, FN, 3, NOT C000, FN, 3.

It sends Morse Code at any nominated speed, to enable people to learn Morse, or as an automatic I.D.

The 'User Message' starts at 0274, up to the limit of memory available. Speed is set at 0270 & 0272, which also sets the 'DIT/DAH' length ratio.

The spacing is always ONE DIT length. To get letter and word spacing, you have to string a series of spaces together. I.E. 30 30 30 for letter space, 30 30 30 30 30 30 for word space.

10 equals DIT

20 equals DAH

30 equals SPACE

00 equals RETURN TO START OF MESSAGE AND REPEAT

ADJUST SPEED by changing 0270 & 0274

|    |    |    |                          |
|----|----|----|--------------------------|
| to | 20 | 5E | for 7 words per minute   |
|    | 19 | 4B | for 10 words per minute  |
|    | 0F | 2D | for 15 words per minute. |

NOTE: The actual program is from 0200 to 0274. The rest is a message from Keith. You can run it with only 1K of memory, but your message will be restricted to what you can squeeze into 0275 to 03FF. (Don't forget to end your message with an 00.)

|      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 0200 | 47 | 80 | 13 | 86 | FF | B7 | 80 | 12 | 86 | 2F | B7 | 80 | 13 | 86 | 00 | B7 |
| 0210 | 80 | 12 | CE | 02 | 74 | A6 | 00 | 08 | 81 | 10 | 27 | 0E | 81 | 20 | 27 | 18 |
| 0220 | 81 | 30 | 27 | 25 | 4D | 26 | D9 | 7E | 02 | 12 | FF | 02 | 6C | FE | 02 | 70 |
| 0230 | FF | 02 | 6E | 86 | FF | 7E | 02 | 51 | FF | 02 | 6C | FE | 02 | 70 | FF | 02 |
| 0240 | 6E | FE | 02 | 72 | 86 | FF | 7E | 02 | 51 | FF | 02 | 6C | FE | 02 | 70 | 86 |
| 0250 | 00 | 01 | B7 | 80 | 12 | 09 | 26 | FD | 86 | 00 | B7 | 80 | 12 | FE | 02 | 70 |
| 0260 | 09 | 26 | FD | FE | 02 | 6C | 7E | 02 | 15 | 00 | 00 | 00 | 03 | 31 | 0F | FF |
| 0270 | 0F | FF | 2D | FF | 20 | 10 | 20 | 10 | 20 | 30 | 30 | 30 | 30 | 30 | 10 | 20 |
| 0280 | 30 | 10 | 20 | 30 | 10 | 20 | 30 | 10 | 20 | 30 | 30 | 20 | 10 | 10 | 10 | 30 |
| 0290 | 20 | 10 | 10 | 10 | 30 | 20 | 10 | 10 | 10 | 30 | 20 | 10 | 10 | 10 | 10 | 30 |
| 02A0 | 30 | 20 | 10 | 20 | 10 | 30 | 20 | 10 | 20 | 10 | 30 | 20 | 10 | 20 | 10 | 30 |
| 02B0 | 20 | 10 | 20 | 10 | 30 | 30 | 30 | 30 | 20 | 10 | 10 | 10 | 20 | 10 | 10 | 30 |
| 02C0 | 20 | 10 | 10 | 30 | 20 | 10 | 10 | 30 | 30 | 30 | 10 | 20 | 30 | 10 | 20 | 30 |
| 02D0 | 10 | 30 | 30 | 10 | 30 | 30 | 10 | 20 | 30 | 30 | 30 | 10 | 10 | 20 | 10 | 30 |
| 02E0 | 10 | 10 | 20 | 10 | 30 | 10 | 10 | 20 | 10 | 30 | 10 | 10 | 20 | 10 | 30 | 30 |
| 02F0 | 30 | 30 | 20 | 20 | 10 | 30 | 20 | 20 | 10 | 30 | 20 | 20 | 10 | 30 | 20 | 20 |
| 0300 | 10 | 30 | 30 | 30 | 30 | 30 | 10 | 10 | 10 | 10 | 30 | 10 | 10 | 10 | 10 | 30 |
| 0310 | 10 | 10 | 10 | 10 | 30 | 10 | 10 | 10 | 10 | 30 | 30 | 30 | 30 | 30 | 10 | 10 |
| 0320 | 30 | 10 | 10 | 30 | 10 | 10 | 30 | 10 | 10 | 30 | 30 | 30 | 30 | 10 | 20 | 20 |
| 0330 | 20 | 30 | 10 | 20 | 20 | 20 | 30 | 10 | 20 | 20 | 20 | 30 | 10 | 20 | 20 | 20 |
| 0340 | 30 | 30 | 30 | 30 | 20 | 10 | 20 | 30 | 20 | 10 | 20 | 30 | 20 | 10 | 20 | 30 |
| 0350 | 20 | 10 | 20 | 30 | 30 | 30 | 30 | 10 | 20 | 10 | 10 | 30 | 10 | 20 | 10 | 10 |
| 0360 | 30 | 10 | 20 | 10 | 10 | 30 | 10 | 20 | 10 | 10 | 30 | 30 | 30 | 20 | 20 | 20 |
| 0370 | 30 | 20 | 20 | 30 | 20 | 20 | 30 | 20 | 20 | 30 | 30 | 30 | 30 | 20 | 10 | 30 |
| 0380 | 20 | 10 | 30 | 20 | 10 | 30 | 20 | 10 | 30 | 30 | 30 | 30 | 20 | 20 | 20 | 30 |
| 0390 | 20 | 20 | 20 | 30 | 20 | 20 | 30 | 20 | 20 | 20 | 30 | 30 | 30 | 30 | 30 | 10 |
| 03A0 | 20 | 20 | 10 | 30 | 10 | 20 | 20 | 10 | 30 | 10 | 20 | 20 | 10 | 30 | 10 | 20 |
| 03B0 | 20 | 10 | 30 | 30 | 30 | 20 | 20 | 20 | 10 | 20 | 30 | 20 | 20 | 10 | 20 | 20 |
| 03C0 | 20 | 20 | 10 | 20 | 30 | 20 | 20 | 10 | 20 | 30 | 30 | 30 | 30 | 10 | 20 | 10 |
| 03D0 | 30 | 10 | 20 | 10 | 30 | 10 | 20 | 10 | 30 | 10 | 20 | 10 | 30 | 10 | 20 | 10 |
| 03E0 | 30 | 30 | 30 | 10 | 10 | 10 | 30 | 30 | 10 | 10 | 10 | 30 | 10 | 10 | 10 | 30 |
| 03F0 | 10 | 10 | 10 | 30 | 20 | 30 | 20 | 20 | 30 | 30 | 20 | 20 | 20 | 20 | 30 | 30 |

MORSE CODE SENDER PROGRAMME. (Cont)

|      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 0400 | 20 | 30 | 30 | 20 | 30 | 30 | 30 | 30 | 10 | 10 | 20 | 20 | 10 | 10 | 20 | 20 | 20 |
| 0410 | 10 | 10 | 20 | 30 | 10 | 10 | 20 | 30 | 30 | 30 | 30 | 10 | 10 | 10 | 20 | 20 | 20 |
| 0420 | 10 | 10 | 10 | 20 | 30 | 10 | 10 | 10 | 20 | 30 | 10 | 10 | 10 | 20 | 30 | 30 | 30 |
| 0430 | 30 | 30 | 10 | 20 | 20 | 30 | 10 | 20 | 20 | 30 | 10 | 20 | 20 | 30 | 30 | 10 | 20 |
| 0440 | 20 | 30 | 30 | 30 | 30 | 20 | 10 | 10 | 20 | 30 | 20 | 10 | 10 | 20 | 30 | 20 | 20 |
| 0450 | 10 | 10 | 20 | 30 | 20 | 10 | 10 | 20 | 30 | 30 | 30 | 20 | 10 | 20 | 20 | 20 | 20 |
| 0460 | 30 | 20 | 10 | 20 | 20 | 30 | 20 | 10 | 20 | 20 | 30 | 20 | 10 | 20 | 20 | 20 | 30 |
| 0470 | 30 | 30 | 30 | 20 | 20 | 10 | 10 | 30 | 20 | 20 | 10 | 10 | 30 | 20 | 20 | 10 | 10 |
| 0480 | 10 | 30 | 20 | 20 | 10 | 10 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 10 | 20 | 20 | 20 |
| 0490 | 20 | 20 | 30 | 10 | 20 | 20 | 20 | 20 | 30 | 10 | 20 | 20 | 20 | 20 | 30 | 10 | 10 |
| 04A0 | 20 | 20 | 20 | 20 | 30 | 30 | 30 | 30 | 10 | 10 | 20 | 20 | 20 | 30 | 10 | 10 | 10 |
| 04B0 | 20 | 20 | 20 | 30 | 10 | 10 | 20 | 20 | 20 | 30 | 10 | 10 | 20 | 20 | 20 | 30 | 30 |
| 04C0 | 10 | 10 | 20 | 20 | 20 | 30 | 30 | 30 | 10 | 10 | 10 | 20 | 20 | 30 | 10 | 10 | 10 |
| 04D0 | 10 | 20 | 20 | 30 | 10 | 10 | 10 | 20 | 20 | 30 | 10 | 10 | 10 | 20 | 20 | 20 | 30 |
| 04E0 | 30 | 30 | 30 | 10 | 10 | 10 | 10 | 20 | 30 | 10 | 10 | 10 | 10 | 20 | 20 | 10 | 10 |
| 04F0 | 10 | 10 | 10 | 20 | 30 | 10 | 10 | 10 | 10 | 20 | 30 | 30 | 30 | 10 | 10 | 10 | 10 |
| 0500 | 10 | 10 | 10 | 30 | 10 | 10 | 10 | 10 | 10 | 30 | 10 | 10 | 10 | 10 | 10 | 10 | 30 |
| 0510 | 10 | 10 | 10 | 10 | 10 | 30 | 30 | 30 | 30 | 20 | 10 | 10 | 10 | 10 | 30 | 20 | 20 |
| 0520 | 10 | 10 | 10 | 10 | 30 | 20 | 10 | 10 | 10 | 10 | 30 | 20 | 10 | 10 | 10 | 10 | 10 |
| 0530 | 30 | 20 | 20 | 10 | 10 | 10 | 30 | 20 | 20 | 10 | 10 | 10 | 30 | 20 | 20 | 10 | 10 |
| 0540 | 10 | 10 | 30 | 20 | 20 | 10 | 10 | 10 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 20 | 20 |
| 0550 | 20 | 20 | 10 | 10 | 30 | 20 | 20 | 20 | 10 | 10 | 30 | 20 | 20 | 20 | 10 | 10 | 10 |
| 0560 | 30 | 20 | 20 | 20 | 10 | 10 | 30 | 30 | 30 | 30 | 20 | 20 | 20 | 20 | 20 | 10 | 10 |
| 0570 | 30 | 20 | 20 | 20 | 20 | 10 | 30 | 20 | 20 | 20 | 20 | 10 | 30 | 20 | 20 | 20 | 20 |
| 0580 | 20 | 10 | 30 | 30 | 30 | 30 | 30 | 20 | 20 | 20 | 20 | 20 | 20 | 30 | 20 | 20 | 20 |
| 0590 | 20 | 20 | 30 | 20 | 20 | 20 | 20 | 20 | 30 | 20 | 20 | 20 | 20 | 20 | 30 | 30 | 30 |
| 05A0 | 30 | 30 | 30 | 30 | 30 | 10 | 20 | 10 | 20 | 10 | 20 | 30 | 10 | 20 | 10 | 20 | 20 |
| 05B0 | 10 | 20 | 30 | 10 | 20 | 10 | 20 | 10 | 20 | 30 | 10 | 20 | 10 | 20 | 10 | 20 | 20 |
| 05C0 | 30 | 30 | 30 | 30 | 10 | 10 | 20 | 20 | 10 | 10 | 30 | 10 | 10 | 20 | 20 | 10 | 10 |
| 05D0 | 10 | 30 | 10 | 10 | 20 | 20 | 10 | 10 | 30 | 10 | 10 | 20 | 20 | 10 | 10 | 10 | 30 |
| 05E0 | 30 | 30 | 30 | 20 | 20 | 10 | 10 | 20 | 20 | 30 | 20 | 20 | 20 | 10 | 10 | 20 | 20 |
| 05F0 | 30 | 20 | 20 | 10 | 10 | 20 | 20 | 30 | 20 | 20 | 10 | 10 | 20 | 20 | 30 | 30 | 30 |
| 0600 | 30 | 30 | 30 | 10 | 20 | 10 | 20 | 10 | 30 | 10 | 20 | 10 | 20 | 10 | 30 | 10 | 10 |
| 0610 | 20 | 10 | 20 | 10 | 30 | 10 | 20 | 10 | 20 | 10 | 30 | 30 | 30 | 30 | 30 | 30 | 10 |
| 0620 | 10 | 10 | 20 | 10 | 20 | 30 | 10 | 10 | 10 | 20 | 10 | 20 | 30 | 10 | 10 | 10 | 10 |
| 0630 | 20 | 10 | 20 | 30 | 10 | 10 | 10 | 20 | 10 | 20 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| 0640 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |

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KNOT - SO - EASY ( 0080 - 0100 )

|      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|
| 0080 | 0001 | 0E10 | 2040 | 4020 | 00E0 | 1804 | 0402 | 0100 |
| 0090 | 0000 | 0306 | 0870 | 3000 | 0000 | 0020 | 1008 | 0004 |
| 00A0 | 2010 | 0C03 | 0000 | 0000 | 0000 | 0080 | 4020 | 1008 |
| 00B0 | 0000 | 0000 | 0102 | 0408 | 0408 | 1060 | 0000 | 0000 |
| 00C0 | 0000 | 0003 | 0C10 | 2040 | 0810 | 6080 | 0000 | 0000 |
| 00D0 | 0808 | 0406 | 0100 | 0000 | 0000 | 0000 | 8040 | 2010 |
| 00E0 | 4040 | 2020 | 1003 | 0700 | 0003 | 0410 | 2040 | 0000 |
| 00F0 | 0000 | 4030 | 0807 | 0000 | 1008 | 0408 | 3000 | 0000 |

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R. CAMERON,  
[REDACTED]

This interesting little program tests your memory to see if you can re-assemble a rope, (without any breaks), in exactly the same way you found it. When the program is run, there will be shown on the left hand side of the screen a continuous string of dots. (The rope.) After a short time, the computer jumbles up the picture, which is in a block of 4 X 4 squares.

The squares can be manipulated in the following manner. The co-ordinates of a square is 1 to 4 across, then 1 to 4 down. When the last digit of a co-ordinate is pressed, the square at the co-ordinate chosen, and the square on the right hand side of the single dot interchange positions. Thus you can move the squares around the block. To confuse things, the squares can be rotated around in a clockwise direction by the use of the (5) key. The computer also rotates the squares when it jumbles them up. To check to see if your picture is correct, press key (6). If it flashes off straight away, you have some more work to do. If a tone is heard, the picture is correct.

For a different picture, change the data from 0080 to 00FF. The starting address of each square is as follows.

|      |      |      |      |
|------|------|------|------|
| 0080 | 0088 | 0090 | 0098 |
| 00A0 | 00A8 | 00B0 | 00B8 |
| 00C0 | 00C8 | 00D0 | 00D8 |
| 00E0 | 00E8 | 00F0 | 00F8 |

|      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|
| 0200 | A080 | 6808 | 00E0 | 6600 | 6500 | D568 | 5584 | F81E |
| 0210 | 3520 | 126A | 3684 | 3620 | 1208 | 6080 | F015 | F007 |
| 0220 | 3000 | 121E | A201 | 6527 | 6608 | D561 | 67FF | 4700 |
| 0230 | 124A | C003 | C801 | 8084 | 7001 | 2290 | 4005 | 1288 |
| 0240 | C103 | 7101 | 229A | 77FF | 1266 | F00A | 03BF | 4000 |
| 0250 | 124A | 2290 | 4005 | 1288 | 4006 | 12A2 | F10A | 030A |
| 0260 | 4100 | 125C | 229A | 8300 | 8410 | 6200 | 73FF | 3300 |
| 0270 | 7201 | 3300 | 126C | 74FF | 3400 | 7240 | 3400 | 1276 |
| 0280 | 02F6 | 2290 | 229A | 122E | 02BA | 0288 | 2290 | 122E |
| 0290 | F029 | 6523 | 6607 | D565 | 00EE | F129 | 6529 | D565 |
| 02A0 | 00EE | 035D | 2290 | 124A | CE01 | 6786 | 27B7 | 032F |
| 02B0 | B003 | 2BCE | 0167 | B003 | 4439 | 00CE | 0127 | 8609 |
| 02C0 | 6900 | 6640 | F602 | C30B | 08F7 | 0203 | 4A2E | F1F6 |
| 02D0 | 02C1 | C808 | F702 | C106 | 40F7 | 0203 | 7A02 | F12E |
| 02E0 | DD06 | 00F7 | 02C1 | 0640 | F702 | C306 | 08F7 | 02F1 |
| 02F0 | 3908 | 0127 | 0182 | 9632 | B702 | F3B7 | 02F5 | 86A7 |
| 0300 | B703 | 2F8D | 238D | 3ACE | 0127 | 9632 | B703 | 2F8D |
| 0310 | 1A86 | 27B7 | 02F3 | 8D29 | CE01 | 8786 | 27B7 | 032F |
| 0320 | 8D09 | CE01 | A78D | 1D39 | FE02 | F2A6 | 00B7 | 0167 |
| 0330 | C608 | 087C | 032F | 5A2E | F97A | 035C | 2EED | 8D16 |
| 0340 | 39FE | 02F2 | 8600 | A700 | C608 | 085A | 2EFC | 7A03 |
| 0350 | 5C2E | F38D | 0139 | 8608 | B703 | 5C39 | 08CE | 0880 |
| 0360 | B003 | 9AA6 | 00B1 | 0100 | 2640 | 08F6 | 0367 | CB08 |
| 0370 | F703 | 677A | 03A7 | 2EEB | C608 | F703 | A770 | 03A8 |
| 0380 | C603 | F103 | A82C | D97F | 03A8 | F603 | A90B | 40F7 |
| 0390 | 03A9 | C100 | 2721 | 2008 | 0101 | 7F03 | 67F6 | 03A8 |
| 03A0 | FB03 | A9F7 | 0367 | 3908 | 0000 | 7F03 | 677F | 03A8 |
| 03B0 | 7F03 | A906 | 08F7 | 03A7 | 3906 | 32BD | C2E1 | 3986 |
| 03C0 | 0791 | 302F | 0139 | 7F00 | 3039 | 8605 | 9131 | 2F01 |
| 03D0 | 397F | 0031 | 3900 |      |      |      |      |      |

(See the bottom of the previous page for 0080 - 0100.)

C. FETHERS.

The 'duck' flies around the screen, changing direction and speed when it hits the edge of the screen.

The player moves the sights of his/her gun to track the duck, using Key '8' Left, 'A' Right, '5' Up, and '1' Down. Press 'F' to Fire.

As more ducks are shot down, the duck tends to fly faster. It also flies off in a hurry when it is shot at, but missed.

After every shot, the number of rounds remaining is displayed briefly. When a duck is hit, it dies, and the number of rounds, and number of dead ducks are displayed.

The player starts with twenty rounds. When all ammunition is exhausted, the total 'bag' is displayed.

To change Key functions, insert the value of the key you wish to use at 02D1 for Left, 02D7 for Right, 02DD for Up, 02E3 for Down, and 0235 for 'Fire'.

|      |                    |                    |      |                    |      |      |                    |      |
|------|--------------------|--------------------|------|--------------------|------|------|--------------------|------|
| 0200 | 6200               | 6114               | 6C1E | 6D1E               | 6A08 | 6B04 | 6500               | 6600 |
| 0210 | 6707               | 2200               | 680F | 6E00               | 1244 | 0000 | 0000               | 0000 |
| 0220 | 4100               | 1280               | 22D0 | 2300               | 00E0 | DAB4 | A2F8               | DCD2 |
| 0230 | 380F               | 121A               | 690F | E99E               | 121A | 0000 | 0000               | 0000 |
| 0240 | 8EF0               | 71FF               | 00E0 | 6900               | SF10 | 2300 | A2F8               | DCD2 |
| 0250 | 3E00               | 12B2               | 23B4 | DAB4               | F818 | 6800 | 22C0               | 6301 |
| 0260 | 121A               | CA3F               | 80A0 | 6F38               | 80F5 | 3F01 | 125A               | 1262 |
| 0270 | 6918               | 89B5               | 3F01 | 6B18               | 00EE | 0000 | 0000               | 0000 |
| 0280 | 00E0               | 6A1C               | 6B0C | A0A0               | F233 | F265 | F129               | DAB5 |
| 0290 | F229               | 6A20               | DAB5 | 1296 <sup>10</sup> | R2AA | DAB7 | F818               | DAB7 |
| 02A0 | 4B18               | 1262               | 7B01 | 2270               | 1298 | 1038 | 3838               | 1010 |
| 02B0 | 1000               | 7201               | 8F20 | 6938               | 2300 | 6803 | 1298               | 0000 |
| 02C0 | C007               | 8400               | 8404 | 8404               | 8444 | 2350 | 00EE               | 0000 |
| 02D0 | 6908 <sup>14</sup> | E9A1               | 7CFF | 690A <sup>14</sup> | E9A1 | 7C01 | 6905 <sup>14</sup> | E9A1 |
| 02E0 | 7DFF               | 6908 <sup>14</sup> | E9A1 | 7D01               | 690F | E99E | 680F               | 00EE |
| 02F0 | 5E24               | 3C18               | 00EE | 3C18               | C0C0 | FFFF | FFFF               | 0000 |
|      | E7                 |                    | 67   |                    |      |      |                    |      |
| 0300 | 0000               | 0000               | 76FF | 3600               | 13B4 | 8040 | B30E               | 0000 |
| 0310 | 7BFF               | 133C               | 7A01 | 7BFF               | 133C | 7A01 | 0000               | 133C |
| 0320 | 7A01               | 7B01               | 133C | 0000               | 7B01 | 133C | 7AFF               | 7B01 |
| 0330 | 133C               | 7AFF               | 0000 | 133C               | 7AFF | 7BFF | 0000               | 0000 |
| 0340 | 0000               | 0000               | 0000 | 0000               | 0000 | 0000 | 0000               | 0000 |
| 0350 | 3A38               | 1358               | 640F | 136E               | 3B00 | 1360 | 6409               | 136E |
| 0360 | 3B1C               | 1368               | 6415 | 136E               | 3A00 | 13B0 | 6403               | 4205 |
| 0370 | 6703               | 420A               | 6701 | 420F               | 6700 | C3FF | 8372               | 7301 |
| 0380 | C003               | 4003               | 1380 | 8404               | 8404 | 8404 | 0000               | 0000 |
| 0390 | 6915               | 8945               | 3F01 | 74E8               | 8444 | 0000 | 0000               | 0000 |
| 03A0 | 0000               | 0000               | 0000 | 0000               | 0000 | 0000 | 0000               | 0000 |
| 03B0 | 8630               | 7580               | A2F0 | 3500               | A2F4 | 00EE | 0000               | 0000 |
| 03C0 | 0000               | 0000               | 0000 | 0000               | A0B0 | F255 | A0A0               | FF33 |
| 03D0 | F265               | 0000               | 0000 | F129               | 23E4 | F229 | 23E4               | A0B0 |
| 03E0 | F265               | 00EE               | 6F1A | D9F5               | 7904 | 00EE |                    |      |
| 0030 | F00A               | 300F               | 10E0 | C0E0               | 1200 |      |                    |      |

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Slide is a two person game. Each player tries to slide a 'puck' over the high-scoring 'spots' without hitting the back wall.

The 'puck' moves up and down randomly. Press key '0' to stop the puck. The puck will move towards the spots after you release the key. The longer you hold the key down, the further the puck travels. (Maximum time is approximately 2.5 seconds.)

You get two points for hitting the first spot, four points for either of the next two spots, and eight points for either of the last two spots. The highest score possible is 216. (Two spots can be hit on one slide.) If you hit the back wall, though, you get zero points for that slide, even if you have hit a spot.

Each player gets three pucks per turn, and six turns in a game.

|      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|
| 0200 | 00E0 | A360 | 6800 | 6900 | 6201 | 230E | 62FF | 230E |
| 0210 | 6A00 | 6B00 | 6406 | 6C00 | 2328 | 6001 | 2328 | A359 |
| 0220 | 6D28 | 6E12 | DDE3 | 6D20 | 6E0E | DDE3 | 6E16 | DDE3 |
| 0230 | 6D38 | 6E0A | DDE3 | 6E1A | DDE3 | 6C00 | 6D03 | 2258 |
| 0240 | 6C01 | 6D3B | 2258 | 74FF | 3400 | 123A | 620F | F218 |
| 0250 | 6118 | F115 | 1366 | 1256 | 6204 | 234C | A357 | 6E03 |
| 0260 | DDE2 | 6503 | 6600 | 6E70 | A35C | 6805 | 6909 | D894 |
| 0270 | 6D01 | 6111 | C218 | 7208 | 234C | D894 | 89D4 | D894 |
| 0280 | 71FF | E0A1 | 1292 | 3100 | 1274 | 4DFF | 1270 | 6DFF |
| 0290 | 1272 | 6202 | F218 | 6210 | 234C | 3E00 | 7EFE | E0A1 |
| 02A0 | 1296 | 6210 | 234C | E0A1 | 1296 | 6204 | 234C | 83E0 |
| 02B0 | 83E4 | 8230 | 234C | 7E02 | D894 | 7801 | D894 | 4F01 |
| 02C0 | 12F8 | 3E70 | 12AE | 6280 | 237A | 2328 | 3C00 | 12D4 |
| 02D0 | 8A64 | 12D6 | 8B64 | 2328 | A35C | D894 | 6220 | F218 |
| 02E0 | 75FF | 3500 | 1264 | A357 | 6E03 | 6D03 | 3C00 | 6D3B |
| 02F0 | DDE2 | 6204 | 234C | 00EE | 6202 | F218 | 483C | 12D8 |
| 0300 | 4825 | 7602 | 482D | 7604 | 4835 | 7608 | 1374 | 613F |
| 0310 | D891 | 71FF | 8824 | 3100 | 1310 | 611F | D891 | 71FF |
| 0320 | 8924 | 3100 | 131C | 00EE | A361 | 6E02 | 6D08 | FA33 |
| 0330 | 4C00 | 1338 | 6D28 | FB33 | F265 | F029 | DDE5 | 7D06 |
| 0340 | F129 | DDE5 | 7D06 | F229 | DDE5 | 00EE | 7202 | 72FF |
| 0350 | 3200 | 134E | 00EE | 01C0 | C0E0 | A0E0 | F0F0 | F0F0 |
| 0360 | 8000 | 0008 | 00D4 | F107 | 3100 | 1366 | 72FF | 3200 |
| 0370 | 124E | 1372 | 3E70 | 12AE | 1206 | F215 | F207 | 3200 |
| 0380 | 137C | 00EE |      |      |      |      |      |      |

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#### DREAM INVADERS MODIFICATION

Mark Armstrong,

[REDACTED], sent us this mod. He writes "For people who tend to 'freeze' the score in round 11 when they play Mike Bauer's 'Dream Invaders', and who want to avoid the 'warmup' rounds and get straight into the action, the following mods to Dream Invaders will make all rounds as difficult as round 11. As far as I know, no-one has ever complained of freezing the score with this great game!"

| ADDR. | FROM | TO | FUNCTION                          |
|-------|------|----|-----------------------------------|
| 0602  | 96   | 86 | ) Speed                           |
| 0603  | A7   | FA | )                                 |
| 060F  | 90   | 80 | ) Drop rate                       |
| 0610  | A7   | FA | )                                 |
| 061C  | D6   | C6 | )                                 |
| 061D  | B5   | 06 | Number of Alien missiles/invaders |

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F. VIG,

Unless forced to make some other play, the program will randomly select any open position as its play. The player (X) has first turn, unless key 'F' is pressed. An incorrect entry will cause a ? to be displayed for two seconds.

P displayed = Player's turn.      W displayed = Player Wins.  
 L displayed = Player Loses.      D displayed = Drawn game.

Keypad layout;

| C | D | E | F |
|---|---|---|---|
| 8 | 9 | A | B |
| 4 | 5 | 6 | 7 |
| 0 | 1 | 2 | 3 |

Digitran keypad;

|   |   |   |   |
|---|---|---|---|
| 0 | 1 | 2 | 3 |
| 4 | 5 | 6 | 7 |
| 8 | 9 | A | B |

Change,  
 023E to 6E00  
 024C to 6E16

|      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|
| 0200 | 6000 | 610D | 2358 | 6000 | 611A | 2358 | 6009 | 6109 |
| 0210 | 2364 | 6014 | 6109 | 2364 | 6300 | 6000 | 6200 | A3DA |
| 0220 | F21E | F055 | 420B | 122C | 7201 | 121E | 6E0B | 6D30 |
| 0230 | A3D2 | DDE8 | F00A | DDE8 | 400F | 12FA | 6A11 | 6E16 |
| 0240 | 4000 | 126E | 4001 | 132C | 4002 | 1328 | 6E00 | 4008 |
| 0250 | 126E | 4009 | 132C | 400A | 1328 | 6E0B | 4004 | 126E |
| 0260 | 4005 | 132C | 4006 | 1328 | 4A11 | 130E | 133C | 6D0A |
| 0270 | A3AA | 4A11 | A3A2 | DDE8 | 4F01 | 1304 | 7101 | A3DA |
| 0280 | F01E | 6202 | 3A11 | 6209 | 8020 | F055 | 6700 | 6900 |
| 0290 | 8090 | B370 | 8680 | A3DA | F61E | F065 | 8500 | 8644 |
| 02A0 | A3DA | F61E | F065 | 8504 | 8644 | A3DA | F61E | F065 |
| 02B0 | 8504 | 3700 | 12C6 | 4506 | 134A | 451B | 1346 | 492A |
| 02C0 | 12E8 | 7906 | 1290 | 4A00 | 12BE | 4311 | 12BE | 6311 |
| 02D0 | 4701 | 12DC | 4702 | 12E2 | 6300 | 12BE | 4512 | 12FA |
| 02E0 | 12D8 | 4504 | 12FA | 12D8 | 4702 | 12F0 | 7701 | 128E |
| 02F0 | 6300 | 4136 | 134E | 3A11 | 122C | 6A00 | 1312 | 6B11 |
|      |      |      |      |      |      |      |      |      |
| 0300 | C007 | 123E | DDE8 | 4A00 | 1334 | 6E0B | 6D30 | A3B2 |
| 0310 | DDE8 | 6C60 | FC15 | FC07 | 3C00 | 1316 | 4311 | 1330 |
| 0320 | 4A00 | 12FE | DDE8 | 122C | 6D24 | 1270 | 6D17 | 1270 |
| 0330 | 8080 | 123E | 4300 | 133C | 8044 | 123E | 3B11 | 12FE |
| 0340 | 7003 | 6B00 | 123E | A3C2 | 1350 | A3BA | 1350 | A3CA |
| 0350 | 6E0B | 6D30 | DDE8 | 1356 | A3A0 | D101 | 7001 | 301E |
| 0360 | 135A | 00EE | A3A1 | D101 | 7101 | 312D | 1366 | 00EE |
| 0370 | 6800 | 6404 | 1294 | 6801 | 6404 | 1294 | 6802 | 6404 |
| 0380 | 1294 | 6800 | 6401 | 1294 | 6804 | 6401 | 1294 | 6808 |
| 0390 | 6401 | 1294 | 6800 | 6405 | 1294 | 6802 | 6403 | 1294 |
| 03A0 | 0180 | 8142 | 2418 | 1824 | 4281 | 3C42 | 8181 | 8181 |
| 03B0 | 423C | 000E | 1102 | 0404 | 0004 | 0011 | 1111 | 1515 |
| 03C0 | 1B11 | 0010 | 1010 | 1010 | 101F | 001E | 1111 | 1111 |
| 03D0 | 111E | 001E | 1111 | 1E10 | 1010 | 0209 |      |      |

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## HOW TO SUBMIT PROGRAMS

To remain in operation, we need a constant supply of new programs, and articles about the DREAM 6800. If you can write an article on modifications you have made to your DREAM, or the use you are making of it, or if you have written any games, or utility programs, we invite you to submit them to us for consideration. ALL CONTRIBUTORS OF PROGRAMS PRINTED WILL RECEIVE VOUCHERS FOR TWO FREE NEWSLETTERS. CONTRIBUTORS OF ARTICLES AND IDEAS PRINTED WILL RECEIVE FROM ONE TO THREE VOUCHERS, BASED ON THE GENERAL INTEREST CONTENT OF THE ARTICLE, AND THE AMOUNT OF WORK THAT HAS GONE INTO IT. Along with the listing for all programs submitted, we will need a tape recording, with at least twenty seconds of High and Low "leader" on it. We need a leader to align our tape heads, and tune the DREAM input port. To do this you first must record 20 Sec High tone, then 20 Sec Low tone. The High tone is normal leader, and can be recorded normally. To get the Low tone, load in the following Machine Code program.

```
0200    8640 Accumulator A = 40
0202    B78012 Store in PIA output port.
0205    20FE Branch back 2 bytes from 0207
0207    0000
```

This will produce a continuous Low tone when run 0200, FN, 3. After 20 seconds press RESET to return to normal. Then load your program. We need the electronic copy so we can test the program and verify the listing BEFORE printing, to eliminate program errors and increase the enjoyment of other users.

We will not be able to enter into correspondence, but will print corrections or improvements where necessary. We will not be selling tapes.

Programs submitted for consideration should be typed, for clarity, and set out in the following format:-

- 1) Program name and memory location.
- 2) Your name and address. (If you do not wish to receive any correspondence from other users, omit your address.)
- 3) The program explanation. (Don't forget key functions)
- 4) The program listing, typed single space. (If in doubt, have a look at the way the programs in this issue have been typed, and copy the format)

Following the guidelines set out above lets us check out the programs submitted quickly and easily. If you do not have access to a typewriter, we will accept a handwritten listing, providing it is LEGIBLE, and accompanied by a tape. However, if we cannot read your writing, and the tape will not load, or has 'bugs' in it, there will be no way we can check the program, and it will not be considered.

That's all there is to it, so send us in your favourites, and don't forget, for each one we use, you get vouchers for two newsletters free of charge. Should you be a prolific programmer, and accumulate some surplus vouchers, or have already paid a subscription to the newsletter, we will redeem the vouchers at a rate of six vouchers for \$15-00.

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[REDACTED]

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