NEWSLETTER Nö 4
DEC `80

DREAMSOFT

2K OF NON-VOLATILE DREAM SOFTWARE
Written to reside on your JR board.

A DREAMSOFT Package offers you:

DREAMTEXT

Creates alphanumeric displays similar to "TV Typewriter" but as the information is displayed it is also stored in memory for subsequent replay. You can program variable delays, bleeps, wait for external key input, reverse video (entire screen or individual parts) erase screen scrolling etc. Uses standard ASCII code. Full 64 character subset displayed on 3 x 5 dot matrix.

With 5K of RAM in your JR board you could have a sequence of about 100 pages continuously repeated.

Ideal for advertising displays, teaching etc.

BLOCK MOVE (and Block Compare)

Copies any block of data to any other area of RAM. Checks each byte as it is moved and if not stored correctly, let's you know the first faulty location.

All your CHIP-8 programs could be stored on one continuous tape and loaded into RAM together, then BLOCK MOVE would be used to copy each one down to 0200 as it is required.

TAPE LOAD & DUMP DISPLAY (and Tape Verify)

Makes tape loading and dumping a breeze. The program prompts you for start of data and end of data then takes care of the rest. Load and Dump addresses are retained on the screen. Avoids fiddling with 0002-5.

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A must for machine code programmers. Essential resident software.

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This program gives you inexpensive hard copy via a disposals Baudot teleprinter. Memory dumps in 4 formats are provided, one of which is a disassembler. Write your own Word Processor. ASCII translation is used so you don't have to worry about Letters and Figures shifts.

SUBROUTINES

Many powerful user-callable subroutines.

ALL FOR $30.00 WHICH INCLUDES A PROGRAMMED 2716 EPROM

PLUS: Instructions for installing on your JR expansion board.
Full commented listing.
Details of accessable subroutines and how to use them.
Notes on interfacing a teleprinter to the existing spare DREAM PIA outputs.

Make cheque or Money Order payable to:-

DREAMSOFT,
P.O. BOX 139,
MITCHAM VIC. 3132

N.S.W. 6800 USERS GROUP

NEWSLETTER No.4 DECEMBER, 1980.

Hello again, here we are, December already, and the festive season is almost upon us. We would like to take this opportunity of wishing you all a Merry Christmas and a Happy and Prosperous New Year.

As promised last month, we have a surprise package for you, written by Michael Bauer. It is called "Alpha Display", and it will let you do some pretty amazing things with your DREAM. Before you do anything else, we want you to key the following program in:-

Firstly, load Alpha Display program, (0080-0100, 0200-0300), then,

```
0300    160E  1B1B  22D7  0C11    1B01  1C1D  160A  1CD7
0310    FF99  8099  800A  170D    FF11  0A19  1922  D7FF
0320    1799  0E99  2099  FF22    990E  990A  991B  99EF
0330    E6CC  CFCF  CFF2  8677    6666  66F4  6666  66F4
0340    6666  66F4  6666  6666    D766  FC66  F8C4  66F4
0350    66F4  66F4  66F2  66F2    66E0  D766  66F8  6666
0360    F866  F466  F466  F266    F266  E0D7  66FC  66F4
0370    66F4  6666  66F4  66F8    66EF  E688  771D  110E
0380    D799  8017  271C  2720    F406  0800  00D7  CCCC
0390    CC1E  1C0E  1B1C  D7CC    CC10  1B00  1E19  F499
03A0    8099  8024  C427  C466    80C4  6680  C466  C480
03B0    6627  2727  2727  CCCC    6624  2424  2424  9999
03C0    9999  9980  9980  99FF    FFFF  C166  6666  6666
03D0    80FF  FFFF  C166  C466    F466  FAEE  E777  0A17
03E0    0DD9  1627  1327  0B0A    1E0E  1B27  9999  8499
03F0    8099  8099  8099  8099    8099  8099  8099  80BB
```

* * * * * * * * * * * * * * *   * * * * * * * * * * * * *

How about that, pretty impressive, isn't it? We are sure that you will be able to find lots of uses, but if you can't, here is a suggestion. Set your DREAM up near the Christmas tree, and have it flashing a message from your family to your friends and relations. Never again will you be stuck for words when your wife says "Doesn't that THING you built do anything useful?"

I know we said that this issue would be a little different, but somehow it just seemed to grow and grow, as we kept finding things to put in it, so that we still ended up with eight games, two utility programs,(in machine language), an article on programming, ideas, solutions to problems, and even an article from Graeme on using CHIPOS. Some of the games are similar, as we made this "Space games month", but we think you will enjoy them all, and we hope that the "Lotto Random Number Selector" will find some 'lucky ones' for you.

We haven't had a lot of feedback this month, but there are a few items we want to talk about.

Firstly, it helps us a lot if you send your order in early in the month, as it gives us an idea of how many copies to have printed. (It will help us even more if you subscribe, so don't forget, 6 issues for $15-00, saves you -50c + postage each month.)

Free newsletters for programs published. We are now using a voucher system. For each program we publish, we will send you TWO vouchers.(If it is a really good program, and set out well, you might even get THREE.) You will then be able to use these vouchers as payment for newsletters when you order them. PLEASE DO NOT send us a program for consideration and say in the letter, "here is a program, use it to pay for the next two newsletters" as we may have already accepted a similar program, and be waiting for a chance to use it. Let us make the decision, believe me, it will be a lot easier all round, and, rest assured, we will use it if we can, as we STILL NEED LOTS MORE PROGRAMS.

Could you also ensure that all cheques, Postal orders etc., are made out to N.S.W. 6800 USERS GROUP, not one of us personally.

If you originally ordered a newsletter in your own name, but now share one with a friend, we don't mind, but we would appreciate it if you could make life easier for us by:-

1) Drop us a line and let us know you now share one with someone else, so we can cross you off our mailing list, and,

2) Have the same person order it each month, don't alternate, as we get confused trying to work out which month you have ordered. (Perhaps you could pay half a six month subscription each.)

Have fun over Christmas playing with the new games, and don't forget our subscription offer, 6 issues for $15-00, the January issue will be going out the first week of the new year. Speaking of the next issue, it is going to be so good, I'm getting excited just sitting here thinking about it. Here's a sneak preview:-

We will have,

-4 new games, Lunar Lander, Nim, Arrow Golf, and Bio Plot, (a Bio-Rythm calculator.)

-A review of the latest creation from Michael Bauer, the creator of the DREAM. It is called DREAM INVADERS, and will be available from the DREAMWARE organisation. STOP PRESS: We have been INVADED. It is here already. See DREAMWARE advertisement in this issue!!! Full review next month.

-A review of the J.R.Components Expansion Board kit, and an article from Garry on how he built his, from the amateur builder's viewpoint.

-An article on how to uprate your old 1 Amp Power Supply to power the expansion board.

-An EDITOR program

-How to use CHIPOS, Part 3.

-Plus the usual IDEAS, SOLUTIONS, ADVERTISING, etc., and anything else we can find that we think you would be interested in.

HAPPY DREAMING,

Garry Nelson and Graeme Samways,

N.S.W. 6800 USERS GROUP,
[redacted]

****

COMPETITION

Don't forget our competition, which closes on the 15th February, 1981. The best games program we receive for publication which uses the Joystick controller, will win a six issue subscription, valued at $15-00.

The rules are simple. The program must be original, your own work and be controlled by the Joystick, so go to it, the winner will be announced in the March issue.

****

ERRATTA

THE SNAKE. We have had a couple of complaints that the 'chime' did not work for a score over 100. We must confess that neither Graeme or I have been able to get a score this high yet, so we don't know whether it works or not. If there is an error in the program, perhaps someone who has sorted it out could drop us a line and let us know.

+ + + + + +

STOP PRESS : See Graeme's article "The Snake by the Tail" for the solution.

TIC-TAC-TOE. Apparantly the printing was a bit light on some newsletters, for which we apologise.The only address which seems to have given any trouble is 034A, which is 3E00, not 3F00.

****

ADVERTISING

Mr G. Cornwell, of [redacted] is "thoroughly obsessed" with the 6802 and its workings and applications, but does not know of any other 6800 users. He would like to correspond with other members of the group, to swap notes, and expand his horizons by talking to other people with similar interests and needs. If you are in a similar situation, why not drop him a line, or, if you live somewhere near, his telephone number is [redacted]

+ + + + + + + + + + +

FRED LEVER, Snr, of [redacted] [redacted] [redacted] has had "heaps of experience" repairing DREAM's and getting them to run. If any members of the group are having difficulty building or debugging their DREAM, he would be happy to talk to them on the phone AFTER WORKING HOURS on Sydney [redacted]

+ + + + + + + + + + +

WANTED : DREAM 6800. I literally destroyed my last DREAM 6802. (At a rough guess I think I internally haemorrhaged 18 of the I.C.'s one way or another.) Case, keyboard, or Power Supply not required. Must be working, will pay any reasonable price. Write to B. SKEHAN, [redacted]

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RADIO AMATEURS

Here is the first listing, unfortunately not as many as we thought. Come on fellers, don't be shy. Send us your particulars and we will add you to the next list, in the March 1981 issue.

John ABBOTT	VK6ZHV	1830	Repeater Ch.4
Mark BEVELANDER	VK3BQE		8p.m.Mon, Fri, Sat.
Nic CHANTLER	VK4ANC	3.545Mhz +QRM	Wed.nights 8.p.m.(NSW time)
Bryan CORKRAN	VK3YBD VK3VLD	3.6 Mhz ±QRM	9.30p.m.Summertime,Mon.
P.D. FRITH	VK7PF	3578Khz	Sunday 2000 local
Terry MACKRELL	ZL2BEM	14,200 +QRM	0800 GMT.
Keith WARD	VK2NOI/YFW	146.000Mhz	8.30 a.m.

(None of that makes much sense to me, so I hope you all understand it. If I have done something wrong, let me know, and I will fix it next time. - Garry.)

****

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 above.) Commercial enterprises who wish to advertise in the newsletter are invited to contact us for details of rates etc.

****

"THE SNAKE" BY THE TAIL

Many people have asked us how to slow down "The Snake" (November issue).

After some intense last minute amusement, I found how to regulate the speed at which it runs.

First you change:

```
0360    from  8F00  to    8E00
0364    from  80F0  to    80E0
```

then change,

```
0374    from  00EE  to    10F0    for LOW speed
                          10F4    for MEDIUM speed
          and leave  as   00EE    for HIGH speed
```

HAPPY HUNTING!!!

ALSO, SNAKES CAN TALK.

The 'chime in "The Snake" is only heard fully for scores over 400, partly for scores between 100 and 400, and not at all for scores less than 100.

If you want to sneak a 'listen', load "The Snake", then change 0200 to 13D2.

Graeme.

****

D.R.E.A.M. EXPANSION KIT

DESIGNED ESPECIALLY FOR THE DREAM 6800 AND 6802!!!!!
The printed circuit board in the kit has provision for:

* 8K RAM * TWO PIA'S * ONE EPROM (2708 or 2716) * ADDRESS BUFFERS *
* SELECT LOGIC * DRIVE TRANSISTORS FOR OFF CARD OPTO-COUPLERS *

4K EXPANSION KIT : $99-00
Consists of ; DREAM sized fibreglass P.C.B.; 4K RAM with sockets ; Address Buffers; Select Logic; Connectors and Instructions. (The 1K on the DREAM board is transferred to this board making 5K in total, expandable to 8K. The EPROM, if used, connects to one of the RAM addresses.) A "fully populated" board draws less than 2 AMPS. The P.C.B. is not sold separately.

3 AMP POWER SUPPLY KIT : $45-00. Now available separately.

Post, Packing and Insurance : $5-00 on all orders. Phone Cash-On-Delivery orders accepted. C.O.D. $2-00 extra. Phone for details of Sydney counter sales. Orders subject to a 7 day Money Back Guarantee. Use separate order coupon enclosed with newsletter so you don't have to mutilate your copy. Available only from:

J. R. COMPONENTS PTY LTD
P.O. Box 128, Eastwood. N.S.W. 2122. Telephone (02) 853385.

****

PLEASE NOTE : I will be building up one of the kits advertised above over the next week or two, and will be writing an article for the January newsletter on how to build the expansion board, from the beginners point of view. (If I can build it, so can you.)

Garry.

****

ALPHA DISPLAY

Memory requirements:
0080 -- 0400 incl. buffer.
0080 -- 0300 program only.

by M.J. Bauer

[redacted]

This program allows the user to create, store and then display repetitively, text messages (up to 256 characters). It has uses for advertising displays, "electronic greeting cards" (to other DREAM owners), party games, etc.

Several control codes allow special effects, e.g. WAIT (0 - 5 sec.), ERASE screen, INVERT video, DRAW cursor block, REPEAT message; as well as UP/DOWN/LEFT/RIGHT cursor movement, and simple editing facilities.
To operate the program, execute from C000, as usual with CHIP-8. Then press key (1) to create a new message. Later, you will use key (0) to replay the message; so it's (1) to 'RECORD', (0) to 'PLAYBACK'. Having entered CREATE mode, you then proceed to enter 2-digit character-codes, just like the 'T.V. Typewriter' routine described in E.A., except you have the following additional CONTROL CODES:-

```
8X = WAIT (.3 to 5 seconds, as per X)
99 = INVERT entire screen.
AA = USER-written function (option)
BB = REPEAT entire message, ad inf.
66 = DRAW cursor block
77 = ERASE entire screen
CX = MOVE LEFT (X dot positions)
DX = MOVE DOWN (X dot pos'ns)
EX = MOVE UP   ( "   "   "  )
FX = MOVE RIGHT   ( "   "  )
```

Note that all recordings should end with a 'BB'. During recording, a long BLEEP from the speaker indicates that there is only room left in the buffer for 15 characters/codes. To save the data buffer for future playback, simply dump to cassette the memory contents from 0300 to 0400.

It is possible to make corrections to a message even after creating and dumping to tape. Just follow the steps below:

1. Load the program and data from tape (if not already in memory);
2. Run the program in playback mode; (FN)(3)(0)
3. Wait until the error shows up, then quickly hit (RESET);
4. Examine the 'buffer pointer', VC (=003C) using memod;
5. Logical 'OR' this value with 0300, giving 03XX = approx address of error;
6. Use MEMOD at 03XX (approx) to patch the mistake(s).

Some interesting special effects can be obtained. To draw people's attention to the screen, for example, alternate a few WAITs and INVERTs, or simply string a few INVERTs together. To highlight a word or phrase, first create a white background by stringing several DRAW-CURSOR codes (66) together, then position the real cursor on top of the window thus created, at the left end, and proceed to write characters in the window. They will come up inverted (black) of course. This general technique may be used to selectively erase words, characters and even windows, to produce a variety of flashing, changing, highlighting and disappearing tricks!

```
ALPHA DISPLAY  Data for characters  (don't enter 'BB's)
        0  1  2  3  4  5  6  7  8  9  A  B  C  D  E  F
0080    F6 CE B7 DA E9 2E F4 92 B7 5A F2 48 B7 FA B6 DE
0090    F6 DE 93 DE 5E DE BB DE C5 46 49 2E F6 DA 56 DA
00A0    BF DA B5 5A 4B DA F1 1E 00 24 2A 22 88 A8 40 00
00B0    0B A0 03 80 15 50 11 10 41 00 1C 70 41 9E 5D 74
00C0    BB BB BB BB BB BB BB BB BB BB BB BB BB BB BB BB
00D0    BB BB BB BB BB BB BB BB BB BB BB BB BB BB BB BB
00E0    BB BB BB BB BB BB BB BB BB BB BB BB BB BB BB BB
00F0    F8 A8 A8 A8 A8 50 F0 F0 F0 F0 F0 F0 F0 F0 F0 F0
```

```
ALPHA DISPLAY  Program segment

0200    F9 0A 6C 00 6A 01 6B 01 49 00 12 2E 72 AE F0 0A
0210    02 A5 81 00 F0 0A 81 01 A3 00 FC 1E 7C 01 80 10
0220    F0 55 3C F0 12 2A 65 80 F5 18 72 AE 12 38 A3 00
0230    FC 1E 7C 01 F0 65 81 00 62 C0 81 22 31 00 12 60
0240    40 16 12 50 40 20 12 54 02 94 DA B5 7A 04 12 08
0250    A0 F0 12 56 A0 F1 DA B5 7A 06 12 08 00 00 00 00
0260    82 00 63 0F 64 F0 82 42 42 60 12 B8 42 70 00 E0
0270    42 80 12 C0 42 90 02 D4 42 A0 12 E8 42 B0 12 E0
0280    80 32 42 C0 8A 05 42 D0 88 04 42 E0 8B 05 42 F0
0290    8A 04 12 08 96 30 81 0F 22 03 7E C1 93 80 10 CE
02A0    00 7E 7E C1 98 96 30 48 48 48 48 97 30 39 7B FF
02B0    A0 F6 DA B7 78 01 00 EE 22 AE 7A 04 12 08 00 00
02C0    39 00 12 08 80 32 02 A5 80 34 F0 15 F0 07 30 00
02D0    12 CC 12 08 CE 01 00 63 00 08 8C 02 00 26 F8 39
02E0    00 E0 69 00 12 02       60 A0 12 EA 7C FE 49 00
        12 FC 60 80 A3 00 FC 1E F0 55 12 E0 69 01 12 08
```

DREAMWARE TECHNICAL INFORMATION

From time to time, I hope to take a little space in the 'NSW 6800 User Group' newsletter to answer some of the more common queries concerning the DREAM project. I will continue, however, to answer individual queries, if time permits, but please send a stamped S.A.E. if you hope to receive a personal reply. In either case, you should write to:-

DREAMWARE Information
P.O. Box 343
Belmont VIC 3216

HOW TO USE CHIPOS. (Supplement)

It has become apparent from the letters we have received that many people are confused by the letters X, Y, N & M, which appear in the CHIPOS instruction set, and this has stopped them attempting to write their own programs. A typical enquiry is "How do you enter DXYN to display something when X, Y & N are not on the keyboard? Does this mean you need an ASCII keyboard?", so I have written this supplement to explain why they are there, and what to do with them.

GENERALISATION OF INSTRUCTIONS

Firstly in the CHIPOS instructions table, generalisations have been used to replace the Hex digits which you have to select yourself.

Going down the table we first encounter MMM after a 0, 1, 2, A, or B. MMM is a generalisation for any location from 0000 to 0FFF in memory. It may be a GOTO location or an index location. i.e., 0200, 0080, 02FE, 0CCC, etc.

So, you work out the location you want and replace each M thus -

```
If you want   039C for a GOTO instruction,
      I.E.    1MMM
              ----
You use       139C
or, if you want the index to point to a location,
Point to      0F02
      I.E.    AMMM
              ----
You use       AF02
```

You can think of M as standing for memory, or memory location.

We next encounter X in 3XKK. X is a generalisation for any HEX VARIABLE, 0 to F. Also in this instruction we encounter KK. This is a generalisation for any HEX CONSTANT, 00 to FF.

Say we want to skip an instruction if Variable C = 32.

```
                                           We need  3 X   KK
                                           We use   3 C   32
or, if we want to skip an instruction if Variable 1 ≠ F6
                                    We need  4 X   KK
                                    We use   4 1   F6
```

We can think of X as a variable as in algebra, and K as being a constant. (Usually denoted C or K.)

We next see Y. This is just a second Hex variable and is only used when X has already been used in an instruction. At any stage X can = Y but this is entirely pointless in most cases, except 8XY4, which when used as 8XX4 doubles the value of X. (i.e., X = X + X) This is an extremely useful result.

Or, DXYN, used as DXXN, you can display now only on the diagonal going from the top left hand corner to the bottom centre, and never in the right hand half of the screen.

You can also use 5XY0 and this when used as 5XX0 will always skip next instruction. This can be done by GOTO instructions.

The final generalisation is the N in the display instructions. I.E. DXYN. This says display N Bytes (8 dots) at the location specified by X across from left (0 to 3F) and Y down from top (0 to 1F) The display pattern is always 8 dots across and N dots down. (If 0 is used for N, i.e. 0 Bytes high, a 16(dec)Byte high pattern is displayed.)More on this later.

Some of you practical mathematicians may wonder how X can equal X + Y. Well, in all computing, whether it be DREAM, Basic, Fortran etc, the equals sign does not mean both sides have the same value, but that the Left Hand side will have the same value (be equal to) the Right Hand side after that particular operation. So we see that it should read, the value of X AFTER the operation will equal the value of X plus the value of Y BEFORE the operation, etc.

Graeme V. Samways.

UFO INVADER

(0200 - 0400)

P. CARSON.

A UFO appears at the top of the screen and moves from left to right. Each move across the screen it drops two positions closer to your base. You are equipped with a laser to shoot and stop the UFO invading base position. You must also avoid UFO rockets which are fired at random. The UFO is out of the range of your laser on the first run across the screen. Each time you hit the UFO its starting position is two positions closer to base, until it moves down to the last quarter of the screen, where it will remain. The horizontal position is selected randomly.

Key C (4) LEFT [023C]   Key E (6) RIGHT [0242]

Key 7 (F) FIRE LASER [0248]

If laser and UFO rockets collide they will destroy each other. At the end of the game, press any key to start again.

```
0200    2346  3E3C  120C  3E00    1210  1202  2218  1202
0210    2214  1206  7EFF  121A    7E01  4E3C  7D02  4E00
0220    7D02  A36A  DED3  3F00    12C6  3106  3501  123C
0230    6106  A373  83E0  8BD0    7B04  D3B3  660~~C~~4  E6A1
0240    6404  660~~E~~6  E6A1  6406    660~~7~~F  E6A1  640D  A36D
0250    DC73  4C04  125A  4404    7CFF  4C34  1262  4406
0260    7C01  DC73  3F00  1312    C50B  3106  128A  A373
0270    D3B3  D3B3  3F00  12FE    D3B3  7B02  D3B3  3B1E
0280    128A  D3B3  6100  D3B1    D3B1  320D  12A4  A370
0290    D083  78FD  D083  3801    12B6  D083  6200  D081
02A0    D081  12B6  340D  12B6    6202  F218  620D  A370
02B0    80C0  6819  D083  6400    A36A  DED3  3D1A  00EE
02C0    7D02  DED3  1324  A370    D083  3106  12D2  A373
02D0    D3B3  A36A  DED3  A363    7DFE  7EFE  DED7  F218
02E0    DED7  FD18  7905  CE3A    3A16  7A02  8DA0  6140
02F0    F115  F107  3100  12F2    6100  6200  00EE  D3B3

0300    A370  D083  6200  A35E    D085  F118  D085  6100
0310    12B6  A36D  DC73  A373    D3B3  77FD  A376  DC76
0320    F118  00E0  6A40  FA18    6A18  A380  F933  F265
0330    6B10  F029  DAB5  7A04    F129  DAB5  7A04  F229
0340    DAB5  FA0A  00E0  6100    6200  6400  671C  6900
0350    6A00  6C1A  6D00  6E00    A36D  DC73  00EE  2214
0360    0014  2281  4200  0000    4281  60F0  6008  1C3E
0370    0808  0820  2020  ~~0841~~    ~~2200~~  ~~4100~~  ~~0000~~  0000
                Rocket
0380
0390    4A10  DC74  4A10  DC76    4A30  DC78  4A40  1324
* * * * * * * * * * * * * * * * * * * * * * * * * * * *
03A0    7A10  6107  F118  22F0    00E0  139C
```

LIFE - LARGER AND FASTER (0080 - 0400)

R.FAINT,
[redacted]

In the first editition of the newsletter, there was a program for a game of "LIFE". I wish to present an expanded version, which, as the title suggests, is played on a larger universe, and runs more quickly. This is due to the fact that the generations are computed by a machine language routine, which will run much faster than an interpretive one. I had previously written a CHIPOS program that took approximately 1 minute per generation on the same sized grid, as opposed to ½ second per generation for this one.

For those readers who may not have heard of the rules for the game of life previously, allow me to recap.

1. A cell is born if 3 cells are adjacent to an empty one.
2. A cell lives if 2 or 3 cells are adjacent, and dies otherwise.
3. All events occur simultaneously.

The starting pattern is fed in by controlling a cursor, which can be moved by the following keys:-

1) Move UP 9
4) Move LEFT 4
6) Move RIGHT 6
9) Move DOWN 1

To draw a dot key 5 moves the cursor in the direction last moved and leaves its previous position live. To kill an incorrect entry, show the cursor at that position, hit key 5, and the offending block will be removed.

When the desired pattern has been entered hit key 3. ??? will be shown. If you want a count of the generations, hit key C. If not, any other. The program will now start generating. If you wish to edit the pattern after some generations hit the E key and you will return to the cursor mode.

```
0080    6900  6A00  6B1B  A094    DAB5  7A04  DAB5  7A04
0090    DAB5  00EE  E020  6040    4080  7901  20AA  6840
00A0    78FF  3800  10A0  10B2    00EE  A0C8  F933  A0C8
00B0    F265  6A00  6B1B  F029    DAB5  7A04  F129  DAB5
00C0    7A04  F229  DAB5  00EE    0000  0000  6A20  6B10
00D0    6D06  A099  DAB1  FC0A    4C05  10E0  8DC0  DAB1
00E0    4D01  7B~~FF~~01 4D04  7AFF    4D06  7A01  4D09  7B~~01~~FF
00F0    4D03  1202  DAB1  10D6    0000  0000  0000  0000

0200    10CC  2080  FC0A  2080    6E0E  EEA1  1200  0227
0210    4C0C  209A  120A  0000    0000  0000  0000  0000
                  +++ MACHINE LANGUAGE +++
0220    0000  0000  0000  00CE    0308  FF02  20CE  00FF
0230    08BD  025C  8C01  F726    F7CE  0108  FF02  20CE
0240    0308  A600  08FF  0222    FE02  20A7  0008  8C01
0250    F826  0139  FF02  20FE    0222  20E6  7F02  24C6
0260    80BD  0272  B602  244C    8108  2601  39B7  0224
0270    20EF  7F02  26BD  028F    C101  26F9  B602  26FF
0280    0222  FE02  20A7  0008    FF02  20FE  0222  397F
0290    0225  C101  2608  BD02    D208  C680  2004  BD02
02A0    D254  BD02  D954  C100    2706  BD02  D258  2009
02B0    08C6  80BD  02D2  C601    09B6  0225  8103  270A
02C0    8102  2701  39E5  0826    0139  B602  261B  B702
02D0    2639  E508  2703  7C02    25E5  0027  037C  0225
02E0    E510  2703  7C02  2539    0000  0000  0000  0000
0300    ------ Used by machine language program ----0400
```

* *

SPACE BATTLE (0200 - 0400)

ARTHUR HAND,
[redacted]

You have three fighter ships with a mission to destroy the enemy fleet of 25 ships. You have unlimited firepower but can only fire one rocket at a time, which is launched randomly from one of your two rocket launchers. Press "F" to launch rockets.

Beware of enemy rockets coming out of hyper - space. You may dodge them by moving your ship. Press "~~0~~"9 to go UP, and "~~C~~"1 to go DOWN, or intercept them with one of your rockets. Be warned! Enemy rockets can space warp from the bottom of the screen to the top, and vice versa.

You score four points for each enemy ship hit. Your score is displayed when either your ships or the enemy ships are all destroyed.

```
0200   A39C  6038  6107  D01F   A3AC  6117  D011  6400
0210   6503  6C00  6D00  6E00   A3B0  6001  610E  D014
0220   6F0F  EF9E  1236  6E01   6205  8310  CF01  3F01
0230   7303  A3AE  D231  0000   0000  A3B0  6A0~~0~~9  EA9E
0240   124A  4100  1260  6BFF   1256  6A0~~C~~1  EA9E  1260
0250   411C  1260  6B01  D014   81B4  D014  4F01  1300
0260   3E01  1278  A3AE  D231   323F  1270  6E00  1278
0270   7201  D231  4F01  132C   4DFF  1284  7D01  12DE
0280   0000  0000  4C01  12A6   0000  6C01  C707  7702
0290   C807  780B  C907  7915   6620  0000  0000  A3AE
02A0   D671  D681  D691  A3AE   D671  D681  D691  0000
02B0   76FF  23BA  87A4  D671   4F01  12E8  0000  88A4
02C0   D681  4F01  12E6  0000   89A4  D691  4F01  12E4
02D0   3600  12DE  D671  D681   D691  6D00  6C00  3E01
02E0   1220  123A  D691  D681   D671  0000  6A05  8A65
02F0   3F01  12FA  A3B0  D014   130C  D231  1348  0000

0300   00B0  D014  A3AE  D671   D681  D691  6C00  6D00
0310   A3B4  D015  238A  D015   3E01  1322  A3AE  D231
0320   6E00  75FF  4500  135C   2390  1218  6A20  8A25
0330   4F01  133E  6E00  7404   3464  1278  135C  A3AE
0340   D231  D671  D681  D691   6E00  6C00  6D00  A3B4
0350   D235  238A  D235  1220   0000  0000  236E  3464
0360   136A  238A  236E  2390   135C  238A  136C  A3D4
0370   F433  F265  661A  6704   F029  D675  7604  F129
0380   D675  7604  F229  D675   00EE  6F32  FF18  00EE
0390   6A32  FA15  FA07  3A00   1394  00EE  2800  5400
03A0   2A00  1500  2A00  1500   2A00  5400  2800  8000
03B0   B0E0  E0B0  50A8  50A8   5000  6A00  CB03  4B01
03C0   00EE  4B02  13D0  4B03   13CC  00EE  6AFF  00EE
03D0   6A01  00EE  0000  0000   0000  0000  0000  0000
```

* *

BOUNCEY BOUNCEY (0200 - 0400)

R. FAINT,
[redacted]

An interesting little program, this one. A "ball" bounces around inside a frame. To make things more interesting we can draw in barriers, tunnels, deadend alleys etc. To control the cursor, use the following keys:-

1) Move UP
4) Move LEFT
6) Move RIGHT
9) Move DOWN

Hitting the (D)raw key causes the cursor to draw a line using the keys above. The (E)scape key allows an exit from the draw mode to reposition the cursor. To make the ball bounce, hit the (B) key. While the ball is bouncing holding the (E) key will bring you back to the cursor so you can move the ball, or draw more barriers.

```
0200   2220  2230  2254  4D0B    1212  4D0D  1216  2268
0210   1204  22D0  1204  22A0    1204  8000  0000  0000
0220   6A20  6B10  6D00  A21A    DAB1  00EE  0000  0000
0230   0000  6000  6100  D011    611E  D011  7001  303F
0240   1234  6101  6000  D011    603E  D011  7101  311E
0250   1244  00EE  EDA1  00EE    7D01  3D10  1254  6D00
0260   1254  0000  0000  0000    DAB1  4D01  1280  4D04
0270   1288  4D06  1290  4D09    1298  DAB1  1380  00EE
0280   7BFF  4B00  7B01  127A    7AFF  4A00  7A01  127A
0290   7A01  4A3E  7AFF  127A    7B01  4B1E  7BFF  127A
02A0   22B8  2254  4D0E  12B0    226A  4F01  DAB1  12A2
02B0   22B8  00EE  0000  0080    600D  F029  6102  6218
02C0   D125  A21A  00EE  0000    0000  0000  0000  0000
02D0   6D00  600E  E0A1  00EE    DAB1  22E8  DAB1  3F01
02E0   12E4  2310  238A  12D2    80D0  80D4  80D4  80D4
02F0   80D4  80D4  B2F6  7A01    7BFF  130C  7AFF  7BFF

0300   130C  7AFF  7B01  130C    7A01  7B01  A21A  00EE
0310   6F03  FF18  6F01  0000    2350  4D00  1328  4D02
0320   1328  6301  64FF  132C    63FF  6401  4100  1338
0330   4200  133C  7D02  133E    8D34  133E  8D44  4DFF
0340   6D03  4D04  6D00  4D05    6D01  00EE  0000  0000
0350   6200  7BFF  2370  7B02    2370  8120  7BFF  6200
0360   7AFF  2370  7A02  2370    7AFF  00EE  0000  0000
0370   DAB1  82F4  DAB1  00EE    0000  0000  0000  0000
0380   6010  70FF  4000  00EE    1382  6008  1382  0000
```

* *

MISSILE ATTACK (0200 - 0300)

P. E. MARSTON

Your spacecraft is under attack, use keys 9 and 1 to evade missiles. To destroy missiles, align your spacecraft with an on-coming missile and fire a shot with key F.

A direct hit will add 25 to your score.(Shown at end of game.) The game ends after you have fired 10 shots, or when your spacecraft is hit.

To make things difficult, you cannot fire unless your spacecraft is stationary, or until your previous shot is out of sight.

To really test your skill, change 0223 to 02.

```
0200    6E00  6600  670A  A2D6    6038  610C  D015  A2DB
0210    6200  C31B  4300  1212    4301  1212  4302  1212
0220    D233  6401  A2D6  6C00    6D0X9 EDA1  6CFF  6D09
0230    EDA1  6C01  D015  81C4    D015  3E01  227C  423A
0240    1260  A2DB  D233  8244    D233  4E01  226A  1224
0250    6E01  A2DE  6837  8910    77FF  D893  6BFF  00EE
0260    4F01  12B2  A2DB  D233    120E  A2DE  D893  88B4
0270    D893  4800  1284  4F01    1292  00EE  6D0F  EDA1
0280    2250  00EE  D893  228A    1224  6E00  4700  12BA
0290    00EE  D893  6508  F518    7619  A2DB  D233  A2E1
02A0    D234  F518  D234  A2E5    D235  F518  D235  228A
02B0    120E  650B  F518  A2D6    D015  A2F0  F633  F265
02C0    6419  6500  F029  D455    7405  F129  D455  7405
02D0    F229  D455  12F8  0F7E    FC7E  0F00  00E0  0000
02E0    8000  5000  5088  0000    0088  0000  0000  0000
02F0    0000  0000  0000  0000    F00A  02FC  7EC0  0001
```

[illegible]

* *

VIDEO LOTTO RANDOM NUMBER SELECTOR (0200 - 0300)

J. PANOS,

[redacted]

Keying "A" will automatically select the random lotto numbers. Keying "D" will allow manual selections to be made using the "F" key.

Keying "C" after the twelth number display will clear the screen and allow continuation of the system of random selections which was previously used, or you may key 0 then A orD, to change the selection system.

P.S. No two identical random numbers will be displayed for each lotto game of six numbers.

```
0200    00E0  6F0A  6EAA  EFA1    1212  6F0D  6EDE  EF9E
0210    1202  6B00  6A01  A2D0    DAB1  7A02  3A3D  1216
0220    7B0E  3B2A  1214  6A00    6B00  A2D1  DAB1  7B02
0230    3B1E  122A  7A3E  3A7C    1228  6300  6409  6502
0240    6800  6900  6A00  6B00    6C00  6D00  3EDE  1258
0250    C7FF  6F0F  EF9E  1250    C7FF  77FF  7301  4329
0260    6301  3700  125A  9830    1258  9930  1258  9A30
0270    1258  9B30  1258  9C30    1258  7D01  4D01  8830
0280    4D02  8930  4D03  8A30    4D04  8B30  4D05  8C30
0290    A2D2  F333  F265  F129    22CA  F229  22CA  6610
02A0    F618  7406  343F  124C    6409  7506  450E  6510
02B0    4510  1240  351C  124C    6F00  C7FF  EFA1  1200
02C0    6F0C  EF9E  12B8  00E0    1212  D455  7406  00EE
02D0    4080  0000  0000  0000    ****  ****  ****  ****
```

* * * * * * * * * * * * * * * * * * * * * * * * * * * *

ETCH - A - SKETCH (0200 - 0300)

K.A.AYTON VK3YHC/NNV
[redacted]

This program enters dots at positions controlled by the user. Lines can be formed with spaces between, or at right angles to each other. Each entry of a dot automatically increments the next dot position right one position. To make a line all you do is keep pushing 5. If a mistake is made simply move dot over original (use key 4) then press 5 to erase. The whole screen may be erased by pushing F.

Key functions are:-

1. UP
4. LEFT
5. ENTER
6. RIGHT
9. DOWN
F. RESTART

```
0200    00E0  6800  6900  A227    D891  F00A  4006  1228
0210    4005  122A  4004  123A    4001  1240  4009  1246
0220    400F  1200  1208  0080    D891  7801  4840  7901
0230    4920  6900  4840  7901    1208  D891  78FF  1208
0240    D891  79FF  1208  D891    7901  1208  0000  0000
```

* * * * * * * * * * * * * * * * * * * * * * * * * * *

SPACE WAR (0080 - 0400)

K.A.AYTON VK3YHC/NNV
[redacted]

This game is played in the same manner as "TANK BATTLE". The "Fire" button has been changed to 5. Push A to restart at the end of the game.

Load Tank Battle, then load the following program on top of it.

HAPPY UFO ZAPPING!!

```
00E0    F00A  300A  10E0  00E0    1200

0292    D346
0296    6005 600F

0364    10E0
03D0    1010  387C  6C6C  7C38    1010  1000  0060  703E
03E0    7060  0006  0E7C  0E06    8280  A870  ****  ****
```

* * * * * * * * * * * * * * * * * * * * * * * * * * * *

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 of inclusion in the newsletter. ALL CONTRIBUTORS OF ARTICLES AND PROGRAMS PRINTED WILL RECEIVE TWO MONTHS NEWSLETTERS FREE OF CHARGE. Along with a listing of the program 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 20sec High tone, then 20sec 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 dealing in tapes, but if you submit a program, and wish to sell tapes, just state this after your program explanation, and detail your charges etc.

Programs submitted for consideration must be typed on A4 in BLACK 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) Details of cassette cost etc. (If applicable)

5) 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, and saves us a great deal of work if they do not have to be retyped before printing.

That's all there is to it, so send us in your favourites, and don't forget, for each one we use, you get two months newsletters free of charge.

****

BACK COPIES OF NEWSLETTERS

Copies of all newsletters from No.1, September 1980, are available at a cost of $4-00 each, from:-

N.S.W. 6800 USERS GROUP,
[redacted]

****

MEMOD MOD (0080 - 0100)

M. MEE,
[redacted]

This program allows you to check the contents of the memory location you have just altered/viewed. It is especially useful when keying in long programs, as you don't have to exit from MEMOD if you suspect your finger slipped. If checking a CHIPOS program, it is also easier to check two bytes simultaneously if you are at all familiar with the instructions. (FN FN view, FN FN etc.)

The program is fully machine code, and is fully relocatable without modification. To start, simply key in the starting address (0080) and GO. Now key in the address from which you wish to modify/view. Two addresses will appear with their contents; the first simply to look at, the second to either view or m^dify. Continue as in MEMOD, i.e.,FN to increment the address or key in new data.

```
0080    BDC2  C4BD  C392  9706    BDC3  9097  07DE  0609
0090    DF06  8601  BDC3  B3DE    06BD  C3C8  8622  BDC3
00A0    E0DE  0608  DF06  BDC3    BDDE  06BD  C3C8  BDC2
00B0    C44D  2B05  BDC3  92A7    0020  D7**  ****  ****
```

* *

BLOCK MOVE (0200 - 0230)

R.SCHMIDT,
[redacted]

This program is in machine code. It enables a block of program to be moved from one memory location to another. It is relocatable without modification.

Use the program as follows:-
Load source start address into 0100 (msb) and 0101 (lsb)
Load source end address into 0102 (msb) and 0103 (lsb)
Load destination start address into 0104 (msb) and 0105 (lsb)
GO from 0200.

```
0200  FE 0104         LDX $0104   POINT X AT DESTINATION
0203  FF 0108         STX $0108   SAVE DEST PTR IN PSEUDO X REG # 2
0206  FE 0100         LDX $0100   POINT X AT SOURCE
0209  A6 00     LOOP  LDAA  0,X   GET BYTE
020B  FF 0106         STX $0106   SAVE SOURCE PTR IN PSEUDO X REG # 1
020E  FE 0108         LDX $0108   GET DEST PTR
0211  A7 00           STAA  0,X   STORE BYTE
0213  08              INX         INC DEST PTR
0214  FF 0108         STX $0108   SAVE DEST PTR
0217  FE 0106         LDX $0106   GET SOURCE PTR
021A  BC 0102         CPX $0102   IS IT FINISHED?
021D  27 03           BEQ  DONE   YES - STOP
021F  08              INX         NO  - INC X AND CONTINUE
0220  20 E7           BRA  LOOP   GET NEXT BYTE
0222  7E C360   DONE  JMP          FINISHED

                      0100  msb  lsb  SOURCE START
                      0102  msb  lsb  SOURCE FINISH
                      0104  msb  lsb  DESTINATION START
                      0106   -    -   PSEUDO INDEX REGISTER # 1
                      0108   -    -   PSEUDO INDEX REGISTER # 2
```

* *

CHIPOS PROGRAMS LONGER THAN 4K

R. FAINT,
[redacted]

Because CHIPOS only has 3 byte memory addresses it would seem the language can only be used to write programs that will fit into 4K or less. While this is true, I would like to present a programming method that allows programs of a length dictated only by system memory to be run.

This is accomplished by a technique known as overlaying. This means a program module is loaded (from memory not normally accessible to CHIPOS) to a location where it can be executed. If this description sounds somewhat vague, maybe an example will help to clarify the situation.

Let's say we have an 8K program (0200 - 2200). The first thing to do is write the program as a set of "modules". At this stage don't actually position the routines at specific memory locations. The most used routines and sub-routines are best placed between 0200 - 0BFF. Let's say when we roughed out the program the longest module is 1K. Now we know how much space to reserve for an overlay area. (In this case 0C00 - 0FFF) All the program modules that aren't going to be in 0200 - 0FFF are written to reside in the area 0C00 - 0FFF. It is a good idea to check each of the modules to make sure they run as desired if at all possible. When satisfied these modules are OK, they can be stored in memory above 1000. Keep track of the start and finish addresses of each routine. What we need now is a method of loading and running them as desired. Two short programs are used. A machine language (M/L) sub-routine that shifts them and a CHIPOS program that supplies information to the M/L program so that it "knows" what is to be loaded.

Firstly some locations used.

```
0002 - 0003    Start address    )Of the module to be loaded.
0004 - 0005    End address + 1. )
```

V0 and V1 will be used to store the information in the above location. If the module is to be used more than once during the program the following is best stored as a sub-routine and called as required.

```
0MMM      A002    Index pointer = 0002
0MMM+2    6010    V0 = Start m.s.b.
0MMM+4    6100    V1 = Start l.s.b.
0MMM+6    F155    Store
0MMM+8    6013    V0 = Finish m.s.b.
0MMM+A    61BC    V1 = Finish l.s.b. + 1
0MMM+C    F155    Store
0MMM+E    00EE    Return (If sub-routine.)
```

Now for the machine language sub-routine. This is completely relocatable and uses 2 bytes for temporary storage. You supply this upon program entry. (In the listing I have shown it as XXXX.) To change the start of the overlay area replace the underlined 0C00 with the new address.

```
CE0C00  FFXXXX  DE02  9C04  2601  39  A600  08  DF02
FEXXXX  A700  08  20E9
```

To call the machine language sub-routine from a CHIPOS program, GO 0 (starting address). To run the overlayed program, either GOTO or GOSUB 0C00.

So, there we have it. NO EXCUSES now when you would like to use the reason "sure it could play (insert your favourite game) except the program would be too long to play with any intelligence."

* * * * *   * * * * *

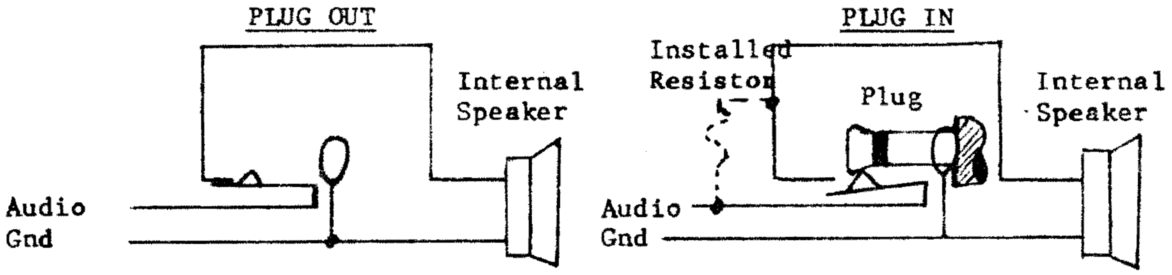
IDEAS

THE SOUND OF THE DUMP

Many people have suggested methods of adding speakers to the cassette player to listen to the tape as it is being dumped into the DREAM.

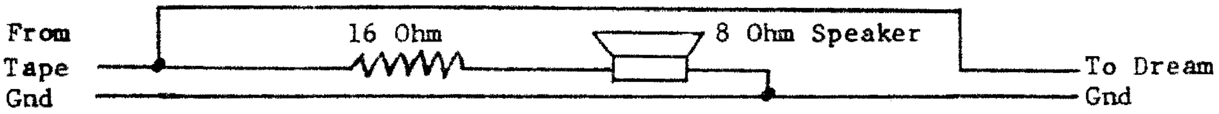
All methods have utilised external speakers etc, but why not use the existing internal speaker? "Well, (you say) every time I put a plug into the external speaker socket it turns off."

This is done so you can use a set of earphones for private listening, and is achieved by a switch in the socket, which is normally closed, and opens when the plug is inserted. What I did was place a resistor (16 ohm) across this switch, so when you have the plug out, you get full volume, and when the plug is in, you get a lower volume. Alternatively, you could short the switch altogether, so you get full volume all the time, but beware, there are three connections to the plug. These are GROUND, (Not wanted), AUDIO, and INTERNAL SPEAKER. They are connected thus:-



You can find the ground by a meter connected to the ring around the front of the plug. The two switched leads will be short circuit (0 ohm) when no plug is in, and 4 ohm or greater when a plug is in. In most cases you will be able to see the internal workings of the socket. If you are not certain, use the resistor, as incorrect wiring here can not cause any damage. Put in the resistor, turn on the tape, and make sure the tape is giving the same volume as before the resistor was put in. If it doesn't, you have the resistor connected at one end to earth. If it gives normal volume, plug in an earphone and make sure the speaker is still operating, but at a lower volume, and that the earplug is also operating.

If you do not want to meddle with your cassette player, you can add an external speaker as such:-



You still cannot hear the tape output from the DREAM to the tape, but you don't need to, you can watch the monitor screen, and when the screen blanks out, the tape is outputting.

Now that you can hear the tape dump why not add a voice leader. I usually use something like this. 'DREAM 6800 program (utility, etc.) Barrier, by G.Samways, Memory location 0100 - 0300, etc.'

This allows you to store the programs one after another on a long tape, (say a C60) because you can easily find them again.(Provided you keep an index of where they are located on the tape.)

Also, on my player, when you are Fast Forwarding or Rewinding, you can hold the play button down so that it will just.pick up the tape signal. While the program is running through, a metallic sound is heard, but when the voice leader is encountered, a squeak is heard, so you can count the programs up or down from a known position.

Graeme V. Samways.

****

SOLUTIONS TO COMMON PROBLEMS

DREAM 6800 DISPLAY FAULT

This fault showed up as filled in areas in the centre of "O"s, "B"s etc, on the bottom of the screen.

An inspection of the DREAM circuit board revealed that Pin 11 of the 4014 Shift Register is left floating. Pin 11 is the unused Serial Input Port. I remembered reading in my CMOS Data Book that CMOS inputs should not be left floating.

The fault was cured by tying Pin 11 of the 4014 to +5 Volts via a 1M Ohm resistor.

See CMOS Data Book AN77, Page 5 - 6, by National Semiconductor.

J.H. Norton,
[redacted]

+ + + + + + + + + + + + +

TAPE I/O PROBLEMS

What a response! I got flooded with phone calls and S.A.E.s for help to get DREAM's going.

Most problems were about the tape interface. "I can get programs out onto tape, but I can't get them back in", was the standard comment. This tallys with the DREAMs I have received for service or repair.

The procedure I have developed as a matter of course is:-

a) Check MODEM frequency and adjust resistor to Pin 6, IC24 for 1200/2400 Hz levels. (Typically 8.2K)

b) If Tape In is sensitive to input level fit resistor to D input of IC21, (Typically 5.6K)then system will work with levels between about 200mV to 6V or so, (a limit of 2V seems advisable) with no change of performance.

c) Adjust 5K trim on IC22 for correct operation.

I have followed this on all repairs, it fixes all ills!!!

Fred Lever Snr,
[redacted]

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My 6802 from Applied Technology had the LED to ground indicator, which worked for about 2 months, but just when you published 'A Bright Idea' it died! The 74LS74 was replaced and the modification made as you suggested but still no go. Inspection of the circuit with a CRO revealed that all was well up to the 74LS74, the output of which was merely a series of narrow spikes when reading in data. It was at this point that I panicked. The thought of pulling the IC out again, with consequently lifted tracks etc was frankly not appealing. Again I referred to the ad in Newsletter No.3 and rang Mr Fred Lever who after a lengthy discussion cleared up the problem. (All thanks to Mr Lever, a very helpful and informed gentleman.) I thought I would point out the problem to save any other member from being trapped like I was.

Apparantly the 74LS74 does not like having negative voltages applied to it and unfortunately in the circuit as it stands the 741 swings ± 5V. The D input will therefore be forced + and - by the comparator. Reducing the input level to the comparator may work, but as Fred pointed out to me a 5.6K resistor in series with the D input to the 74LS74 will solve it. It is necessary to break a couple of tracks and make a jumper lead, but believe me it is worth the effort!

Apparantly this modification is only necessary if you use the 74LS74, the 7474 is more hardy. I hope some readers may benefit from this information.

Simon Leadley,
[redacted]