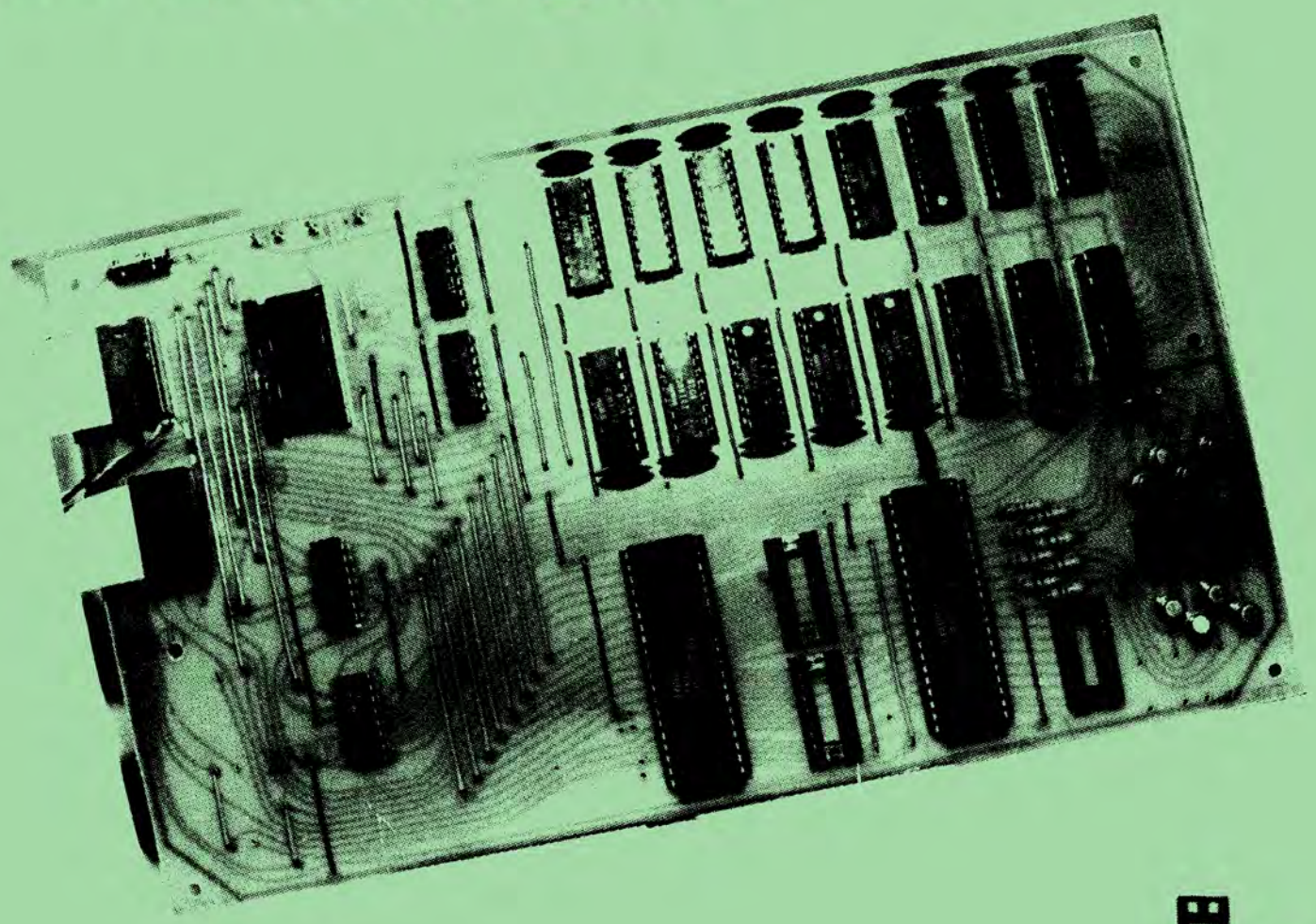
DREAMER Nö 5

JAN. '81

'DREAM 6800'
NSW 6800 USERS GROUP
G. SAMWAYS
G. NELSON



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.

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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.

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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

No.5 JANUARY.1981.

Notice the change? So many of you asked why we hadn't, and Michael Bauer had no objection, so, from here on, the newsletter will be known as "THE DREAMER".

Boy, have we had a busy month getting this lot together, and coping with the Christmas rush. We have hardly had time to play DREAM INVADERS. What a great game! We have got some good ones this month, too, hope you like them.

On to business.

SUBSCRIPTIONS. - Apparantly we confused some people, as they thought it would start and finish any time, so I will run through it again for you. The offer is for the six issues from January to June 1981, inclusive, NONE OTHER, for $15-00 (Australian Residents), $A18-00, (N.Z.Residents,) $A20-00 (Other Overseas Residents). We must have them all ending on the same month, as we use a very simple book-keeping system, and do not have the facilities to keep track of different ending times. We will be making provision for new subscribers to purchase a part subscription between February and June, but they will have to write and ask us for details. PLEASE, send your labels back. We have got to the stage where the newsletters just will not be sent until the labels are received, as we are very limited time-wise, and time spent writing out labels is better spent writing articles and making YOUR newsletter better, where-ever we can.

QUESTIONS - If you would like your questions answered, please PRINT your name and adress on the letter, as we have several letters from people who obviously could use some help, but we can not answer them, as we can not read the scrawl on the bottom of the letter.

VOUCHERS - Please re-read the page on "How to Submit Programs", as we have 1) Changed it a bit to make it easier for you to send us programs, (no excuses now if you do not have a typewriter, send it in, PRINTED, not scribbled,) and 2) Introduced a voucher system as payment for programs published.Yes, you can use the vouchers as part - payment of your next subscription.

WANTED - Starting this month, we will print a list of requests for programs etc, that people have asked for. If you want to try your hand at writing a program, or an article, but can not think of a subject, this should give you some ideas.

SUGGESTIONS - To support the WANTED section, we would ask you to write and let us know what you would like to see. (Even if you have asked before, tell us again, as it takes a while to sink in sometimes.)

PROGRAMMING - Many of you have asked us things like how to move objects around, vary speeds, bounce balls offwalls, change key functions, etc. You should be able to learn a lot of these by following through the instructions in our fully expanded programs, but if you don't, Graeme will deal with all these in "How to Use Chip-8" after he has finished explaining the functions of the instruction set, so, once again, write and tell us what you need to know, and he will deal with the most popular subjects first. In the meantime, so that you can change the key functions to suit your own key board, we will try to give the adresses where the key functions are stored, and tell you how to change them, on as many programs as possible. (Programmers, please note. It will help everyone if you include this information in your explanation of the program.)

NUMBER OF DREAMS - We haven't got a clue, but a lot of you want to know, so how about you drop us a line and tell us,a) How many DREAM owners share your newsletter, (We don't mind,) and b) How many DREAM owners you know of who DO NOT get the newsletter. (Don't you feel sorry for them?) We will attempt to compile a total and let you know in a couple of months time.

A HINT - Hurry up and build your expansion boards. Michael Bauer has almost completed a SOUND EFFECTS GENERATOR for the DREAM, which will be appearing in THE DREAMER, (Hey, I like that,) as soon as it is perfected,

and which will add sound effects to DREAM INVADERS, among other things, but it will need a spare PIA to operate it, so don't say I didn't warn you. (I am notsupposed to tell you about it yet, so don't tell Michael or Graeme I told you - Garry.)

JOYSTICK OPERATING PROGRAM - There is a bug in the program, which will not support the TONE instructions. We have received an amended program from a reader, which M.J.B. has approved, so as soon as we have the space, we will print it.

NEXT MONTH - The February issue of THE DREAMER will contain:-

- Four new programs, Parachute Mission, (By Fred Lever Jnr, Age 13, and it is A BEAUTY.) Simple Rubout, (By Bruce Mitchell), KALAH, (a marble game, guaranteed to make you lose yours), and a Morse Code Practice program.

- A review on the DREAMSOFT EPROM advertised in this issue

- A program to interface a Baudot Printer to your DREAM, and an article on how to wire it up.

- Plus all our usual features.

That's it for now, hope you had a GREAT CHRISTMAS AND NEW YEAR. My kids tell me that I did, I can't remember, and my wife is still not talking to me.

Happy DREAMing,

Garry Nelson and Graeme Samways,

N.S.W. 6800 USERS GROUP

[redacted]

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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.

+ + + + + + + +

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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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.

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WANTED

Here is a selection of things that people have requested appear in the newsletter. 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
- Draughts
- Hangman
- Interfacing the DREAM to external devices.

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SOLUTIONS TO PROBLEMS

Dear Sirs,

Thank you for a very interesting publication. Please send me the six labels, so I can order a six months supply of the newsletter.
REF: Six white bars on screen, change the 4014B, check copper tracks to this I.C. I have had a lot of problems with the DREAM and now have a fully working one. The faults I have found are in the main, board problems, loading, -Check 2708 programming at C311(Hex), it should be 13, I have one with 00 at this point and it had me standing on my head trying to load programs until I found it, changed the I.C., problem solved.
Mr. R. Moroney,Qld.,should check the copper tracks running from C.P.U. through to 2708, 2114's and onward for hairline cracks, as most boards bow slightly by the time they are completed and this is one of the problems I have found, which gives his symptoms. Keep up the good work....

Yours faithfully,
J.A. Cranstone.

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STOP PRESS! STOP PRESS! STOP PRESS!

Just before the last few pages went to the printer, we received word from J.R.COMPONENTS that there were some changes in the Expansion board kits they are selling, so please read this in conjunction with their advertisement, which appears elsewhere in this issue, as it is ALL GOOD NEWS!

Firstly, all the kits now being sold include the sockets for ALL the I.C.'s, not just the RAM chips.

Secondly, a new kit has been added. It is the complete kit, LESS RAM, but it includes everything else, for $59-00. This has been added because so many of you asked for it, as you already had spare RAM chips.

Thirdly, the cost of Packing, Postage and Insurance has been REDUCED from $5-00 to $3-00.

Fourthly, All 3 AMP Power Supply kits sold separately, will be POST FREE if you mention the N.S.W. 6800 USERS GROUP, or use the order form enclosed with this newsletter.

We didn't have time to change the ad, but the order form has been altered to reflect the new prices, so read everything carefully before you send your order, and save yourself some money.

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ERRATTA

HOW ABOUT THAT! NOTHING TO PUT HERE THIS MONTH. WELL DONE GARRY.

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HOW TO USE CHIP - 8 (Part 3)

You may notice that the title has changed, from CHIPOS to CHIP-8. It was pointed out to me that CHIPOS is the program inside your EPROM, and CHIP-8 is the name of the language. This was never clear to me until it was pointed out, so I am sorry if I caused you any confusion.

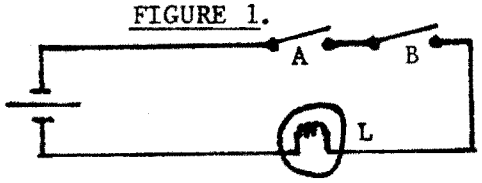
Now, I hope that you have had a look at digital logic gates over the past two months. First of all, I will tell you about Logic Gates.

Digital logic is the general name given to logic which uses only two states. These may be considered either High or Low, True or False, 1 or 0, etc.

To carry out logic operations on these states we have what is called logic gates. The two types we are to be concerned with are AND and OR gates.

The simplest method of visualising these operations is to look at two light wiring diagrams. (Figures 1 and 2.)

FIGURE 1.



In Figure 1 we can see that the circuit is closed and the lamp is on only when both A AND B are closed. Thus we see that the logic operation performed here is an AND operation.

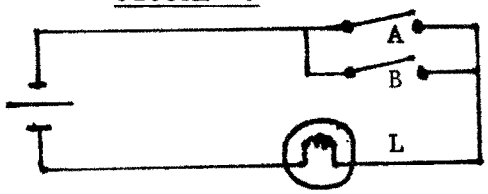
There are four possible combinations of switches A and B. These can be represented in table form.

AND

A	B	LAMP
open	open	off
open	closed	off
closed	open	off
closed	closed	on

This table is called a TRUTH TABLE, as it represents all the possible combinations of inputs (switches) and output states. (lamp on, lamp off)

FIGURE 2.



In Figure 2 we can see that the circuit is closed and the lamp is on if either A OR B is closed. Thus we see that the logic operation performed here is an OR operation.

There are also four possible combinations of switches A and B here. The truth table looks like this:-

OR

A	B	LAMP
open	open	off
open	closed	on
closed	open	on
closed	closed	on

Please make sure that you can follow everything up to now. If you can't, you had better re-read it, then get a battery, a lamp and two switches to demonstrate the circuits to yourself.

Now if we define that a switch, when closed is a 1, and when open it is a 0, and when a lamp is on it represents a 1, and when it is off it represents a 0, the truth tables reduce to:

AND

A	B	L
0	0	0
0	1	0
1	0	0
1	1	1

OR

A	B	L
0	0	0
0	1	1
1	0	1
1	1	1

This is all very well for lights, but what about electronics? In electronics these operations are carried out by different components, i.e., resistors, diodes, transistors, but most commonly at present by I.C.s. To simplify drawing and manipulating logic functions, symbols are used to depict the logic gates. The symbols for the two relevant gates are;

You may have seen these used in E.A., E.T.I., etc. They are used in wiring diagrams but are not very practical for writing. This is why BOOLEAN algebra was devised and is used. (Boolean algebra is algebra for use on digital logic and was derived by G. Boole.)

It enables us to say in shorthand, 'L' will be high only if 'A' AND 'B' are high, in the form L = A . B
also, 'L' will be high if 'A' OR 'B' are high, in the form L = A ! B (Note that ! is not the standard symbol for OR, the + sign is, but this is the form in which they appear in the CHIP-8 instruction table.)

So how does this apply to a variable in the DREAM unless it is a 0 or 1?

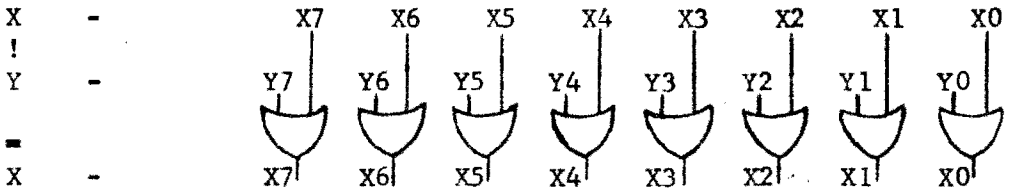
Well, all the numbers involved in the DREAM are Hexadecimal, (base 16) except in special cases. (FX33) This is due to the fact that the DREAM, like all other digital computers, uses Binary, (base 2) i.e. either 0 or 1, (Remember the truth table and gates?) to store and represent numbers. As Hexadecimal is base 16, there are 16 digits, 0,1,2,3,4,5,6,7,8,9,A,B,C,D,E,F. (Base 10, or decimal, has 10 digits, 0,1,2,3,4,5,6,7,8,9.)

These are stored in the DREAM as a Binary code, thus;

HEX	BINARY	HEX	BINARY
0	= 0000	8	= 1000
1	= 0001	9	= 1001
2	= 0010	A	= 1010
3	= 0011	B	= 1011
4	= 0100	C	= 1100
5	= 0101	D	= 1101
6	= 0110	E	= 1110
7	= 0111	F	= 1111

Each variable can range from 00 to FF, i.e. 0000 0000 to 1111 1111, so we can see there must be 8 binary digits in each CHIP-8 variable. Each digit is called a bit, so that each variable contains 8 bits, which is 1 byte.

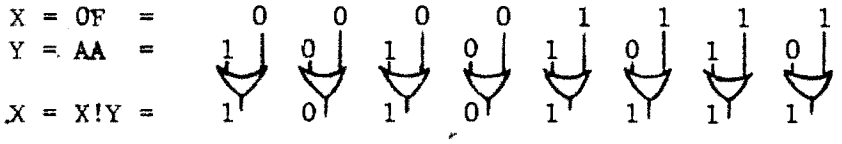
When you call the instruction 8XY1, (i.e., X = X ! Y.) eight logical OR operations are carried out on the bits in the X and Y variables, so that an equivalent circuit diagram would be:-



Where Xk, Yk = value, (0 or 1) of bit k of X or Y respectively.

FOR EXAMPLE

6X0F (X = 0F)
6YAA (Y = AA)
8XY1 (X = X ! Y)



therefore, 0F ! AA = AF

A similar thing happens for the AND function, 8XY2.

FOR EXAMPLE

X = X . Y = 0000 1010
= 0A

The procedure for determining the outcome of AND and OR operations is,

1) Resolve 2 digit Hex numbers into 8 bit Binary equivalents from the previous list.

2) Write these across a page in 8 columns, X over Y.

3) Perform the required logic operation as per the relevant truth table, or follow the general rules,(a) For AND, if both top bits are 1s put a 1, otherwise put a 0. (b) For OR, put a 0 if both top bits are 0s, otherwise put a 1. Repeat this for all 8 bits.

4) Convert the 8 bit Binary result into 2 digit Hexadecimal, using the table.

EXAMPLE A = F0, B = CC

1. Resolve. A = F0 = 1111 0000
& 2. Draw B = CC = 1100 1100
3. Operate AND
A . B = 1100 0000
4. Convert = C 0
Therefore, F0 . CC = C0.

EXAMPLE A = 07, B = 20

1. Resolve A = 07 = 0000 0111
& 2. Draw B = 20 = 0010 0000
3. Operate OR
A ! B = 0010 0111
4. Convert = 2 7
Therefore, 07 ! 20 = 27

You may ask after all this, "What does it all do?" (Hopefully not "What does it all mean?") That is, if you are still awake!

Well, firstly the AND instruction can be used as a filter. Say you have a number, B8, but you only want to add the 8 to another digit.

Q: How do you get rid of the B?

A: Use an AND filter with one number B8 and the other 0F.

Thus,

1. Resolve B8 = 1011 1000
& 2. Draw 0F = 0000 1111
3. Operate AND
4. Convert 0000 1000 = 08

Thus we see that the B, (or any other first digit) is made equal to zero, whilst the 8, (or second digit) is left as it was. Try this with some numbers of your own. In fact, this is done in the random number generator. (CXKK) Here a random number is generated between 00 and FF, but say you only want either a 00 or a 01, what do you do? You specify KK so that only a 00 or 01 result can be derived, then the KK is ANDed with the random number.

E.G. We want 00 or 01 stored in A so we use CA01, so R (Random number) is

either 0 or 1.

1. Resolve Rand.No. = RRRR RRRR
& 2. Draw KK = 01 = 0000 0001
3. Operate AND
4. Convert = 0000 000R , therefore A = 0R.

In this configuration you get a 50% chance of a 0.
If 03 were used, i.e. KK = 0000 0011, you could get 00, 01, 10, or 11.(i.e.,1 of 4)
If 07 you get 1 of 8.
0F 1 of 16.
1F 1 of 32.
3F 1 of 64.

The following short program may help to explain some of the functions. Just enter the 1st number, then the 2nd. They are displayed with the Binary on the right, and under this, A . B, then A ! B are displayed, both with the Binary number on the right.

Variable assigmments are:-

0 - Calculations, storage.	8 -
1 -	9 -
2 -	A - 1st number
3 -	B - 2nd number
4 -	C - A . B
5 -	D - A ! B
6 - X position	E - Filter (= 0F)
7 - Y position	F - Flag

ADDR.	PROG.	EXPLANATION
0200	00E0	Erase screen
0202	6600	6 = 00 (X = 00)
0204	6700	7 = 00 (Y = 00)
0206	6E0F	E = 0F (Set up filter)
0208	F00A	0 = key (Get most significant digit A)
020A	F029	Set index to show 0
020C	2278	Go Sub at 0278 (Go to Display)
020E	FA0A	A = key (Get least significant digit A)
0210	FA29	Set index to show A
0212	2278	Go Sub at 0278 (Go to display)
0214	0280	Go Machine Code Sub at 0280 (Shift 0 left 4 bits)
0216	80A4	0 = 0 + A Combine
0218	8A00	A = 0
021A	A112	I = 0112) Display Binary number
021C	F055	Store 0 at I)
021E	F00A	0 = key (Get most significant digit B
0220	F029	Set index to show 0
0222	6600	6 = 00 (Reset X)
0224	2276	Go Sub 0276 (Go to display)
0226	FB0A	B = key (Get least significant digit B)
0228	FB29	Set index to show B
022A	2278	Go Sub at 0278 (Go to Display)
022C	0280	Go Machine Code Sub at 0280 (Shift 0 left 4 bits)
022E	80B4	0 = 0 + B (Combine)
0230	8B00	B = 0
0232	A142	I = 0142) Display Binary number
0234	F055	Store 0 at I)
0236	8CA0	C = A (Set C)
0238	8CB2	C = C . B (Calculate C = A AND B)
023A	8DA0	D = A (Set D)
023C	8DB1	D = D ! B (Calculate D = A OR B)
023E	80C0	0 = C

HOW TO USE CHIP - 8. (Part 3) CONT

ADDR.	PROG.	EXPLANATION
0240	A172	I = 0172) Display Binary number
0242	F055	Store 0 at I)
0244	0290	Go Machine Code Sub at 0290 (Shift 0 4 bits right)
0246	F029	Set I to display 0
0248	6600	6 = 00 (Reset X)
024A	2276	Go Sub at 0276 (Display)
024C	8CE2	C = C . E (Filter out MSD C)
024E	FC29	Set I to display 0
0250	2278	Go Sub at 0278 (Display LSD C)
0252	6600	6 = 00 (Reset X)
0254	80D0	0 = D
0256	A1A2	I = 01A2) Display Binary number
0258	F055	Store 0 at I)
025A	0290	Go Machine Code Sub at 0290 (Shift 0 4 bits right)
025C	F029	Set I to show 0
025E	2276	Go Sub at 0276 (Display)
0260	8DE2	D = D . E (Filter out MSD D)
0262	FD29	Set I to show D
0264	2278	Go Sub at 0278 (Display LSD D)
0266	F00A	0 = key (wait)
0268	1200	Go to 0200 (Restart)
026A	0000	
026C	0000	
026E	0000	
0270	0000	
0272	0000	
0274	0000	
0276	7706	7 = 7 + 06
0278	D675	Display 5 Bytes at 6 (X), 7 (Y)
027A	7605	6 = 6 + 05
027C	00EE	Return
027E	0000	
0280	B600	)
0282	3048	)
0284	4848	) Machine Code Subroutine. Shift 4 bits left
0286	48B7	)
0288	0030	)
028A	3900	)
028C	0000	
028E	0000	
0290	B600	)
0292	3044	)
0294	4444	) Machine Code Subroutine. Shift 4 bits right
0296	44B7	)
0298	0030	)
029A	3900	)
029C	0000	
029E	0000	
02A0	****	

* *

RADIO AMATEURS

If you would like to contact other DREAMers on the air, send in your particulars in the following format, and we will print an updated list every three months. The next list will appear in the March 1981 issue.

NAME   CALLSIGN   TIME AND FREQUENCY FOR CONTACT

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J.R. COMPONENTS DREAM EXPANSION BOARD

HOW I BUILT MINE

GARRY NELSON,
[redacted]

After unpacking the kit, the first thing I did was sit down with a cold drink close at hand and read right through the instruction manual that came with the kit. I found the instructions to be quite clear and easily understood. The next step was to check all the components against the parts list, all present and correct. Read through the instructions again, just to be sure they were all clear, then get the soldering iron out, and turn to the section on;

CONSTRUCTION

Hold it, switch off the iron. First step is to check the board for breaks in tracks, or shorts. Twenty minutes later, after uncrossing my eyes, I was satisfied that all was in order. The only thing that I found was that in a few places, the tinning solder had covered the holes. No problem though, a quick touch with the soldering iron soon fixed them.

O.K., what's next? The links. I tackled these in the same manner as the DREAM board, I.E., install all the links first, marking them off on he component overlay as I put them in, then turn the board over and solder hem in, after checking that they were all in the right holes.

Some hours later - the next step. Contrary to the instructions in my kit, I decided to use sockets for the 74LS08, 74LS155, and the two 74LS04s. (The later kits include all these sockets.) These were installed, followed by all the other RAM, ROM, and PIA sockets, then the electrolytic capacitor, (watch the polarity), and the ceramic disc capacitors. Finally, the 6 PCB pins were soldered in.

At this stage, I very carefully went over the back of the board with a jewellers eyeglass, looking for solder bridges. Everything was alright. so I carried on to making the connector leads. I found the crimp connectors easy to use, if you follow the instructions given, although I did use a pair of parallel pliers to crimp the two halves together, instead of using a vice. Two jumper leads were made up for the $\overline{CS}$ and $\overline{WE}$ lines. I used telephone cable, soldered to the pins on the expansion board, twisted together, and cut to the correct length to plug into the left hand RAM socket on the main board.

Since the power supply for my DREAM comes from a socket in the side of the case, I simply ran extra leads from the connections on the back of the socket to power the expansion board.

The expansion board was mounted below the DREAM board, using half inch brass spacers from Dick Smith, and all connections made.

Now, the moment of truth. SWITCH ON. No loud noises, no white smoke, measure the + 5v, everything O.K. Switch off again, transfer the 1K from the DREAM board, and key in a test program. (I used the random number generator from E.A., June 1979.)

HEY, IT WORKS. Switch off, fit the rest of the RAM chips, try the test program again, and it's finished.

I found the kit very straightforward and easy to build, if you follow the instructions supplied, which are very good. The board is much simpler than the original DREAM board to build, although you still have to watch your soldering. It took me about nine hours total time, but I would expect a more experienced constructor would do it in much less time than this, as I tend to check things 3 times before I solder them, to ensure they are right the first time.

Well, that's it. I can't stop to tell you any more, because now I have more than 1K, I can finally play "DREAM INVADERS", so I have to go and practise, as the kids, (2 boys, aged 7 & 9,) have been playing while I have been writing this, and they are getting higher scores than me!!! (Has any one got over 1000 yet?) To sum up, I feel that the kit is well worth the money, and Graeme has some great ideas for using it on the drawing board. Watch for them in future issues.

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J.R. COMPONENTS EXPANSION BOARD (CONT)

A TECHNICAL VIEWPOINT

GRAEME V. SAMWAYS.

There are only a few additions I would like to make to Garry's comments on this kit. Firstly, the board is set out neatly and logically, as are the instructions. The only thing I found lacking in the kit were sockets for the PIA output ports, and this has been rectified in the later kits, as they are all fully socketed. I would also recommend that you put in the extra links for the PIAs when you build the board, as we will have applications for these soon. (You should be able to get the PIAs at your usual supplier.) This expansion board has also opened up an enormous range of possibilities for your DREAM. As well as giving you extra RAM so you can run larger and more complex programs and games, the additional PIA's allow almost unlimited scope for expansion. Some of the things we will be looking at in the future are, an ASCII keyboard, an RS232 interface, a Centronics printer interface, an electrosensitive printer interface, a Sound Effects Generator, a Video Tape Recorder controller, a programmable light chaser, a program to store all your games in memory, and load them automatically as you call them, and we may even have two DREAMs playing games against each other, plus anything else that we can think of and can afford. I was particularly pleased to see that all the RAM chips supplied are high quality, prime industrial spec. chips, not 'cheapies'. This no doubt adds to the cost of the kit, but they are well worth it in terms of trouble free running. The quality was verified, when on 'power up', instead of getting random garbage, the address came up as 0000, indicating that all memory locations had reset to zero.

The only dissapointment with the circuit came when I found that my original circuit (published in Newsletter No.1) had been used, with the addition of buffering, as this means that the EPROM will have to occupy one (or two) of the RAM blocks, which restricts you to using seven (or Six) K RAM when the EPROM is in.

****

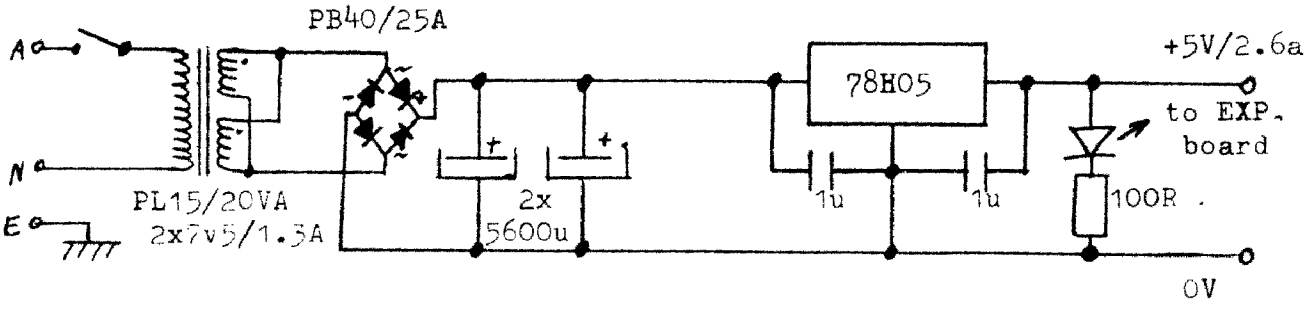
UPRATED POWER SUPPLY.

GRAEME V. SAMWAYS.

The J.R. Expansion Board when added to your DREAM will draw an extra 2 AMPS (approximately) on the + 5v line, but will have little effect on the + 12v and - 5v lines. (If no EPROM or a single supply EPROM is used, no extra loading will be placed on the + 12v and - 5v lines), so these two lines will be alright left as they are.

However, the existing 1A regulator (LM340T-5, 7805, LM309 etc.) will not carry the extra current. The same goes for the bridge and transformer. (These comments do not apply if you originally built a 3 AMP power supply, it will still do the job.)

The simplest method of supplying the extra power is to build a second supply for the expansion board + 5v, and connect the + 12v & - 5v to the existing supplys. This could be done in the form;



Total cost ; approximately $33-00, using individual diodes instead of a bridge

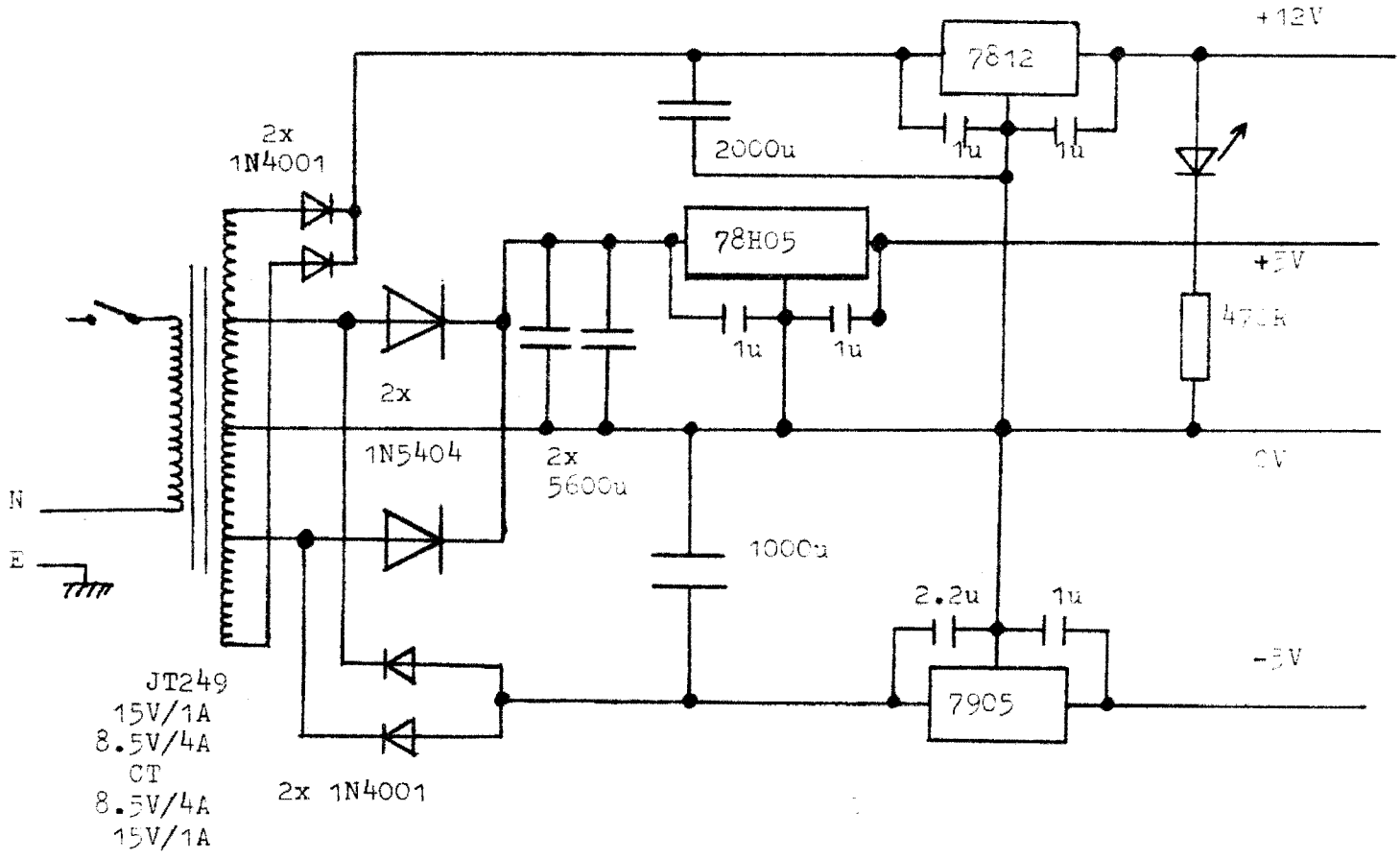
will reduce the cost to about $30-00. (All parts from Dick Smith Enterprises.)

The 78H05 should be mounted on a heat sink or metal case, the bridge can be any rating over 3 A, 40V PIV. (Peak inverse voltage.)

If you have room in your existing case you could replace the original + 5v supply and add the second transformer, or use another transformer from A C E Radio in Sydney. (They advertise in E.A.) This is called the JT249, and is what I use. The circuit for the whole supply using this transformer is shown below. If your existing power supply case is not big enough to fit the extra bits in (Garry's wasn't) you may prefer to do what he did, and rebuild the supply in a Horwood instrument case, ($14-50 from Dick Smith) as this is big enough to sit the T.V. on, and makes a very neat and professional looking job, but the total cost was around $60-00.

After exploring all the alternatives, we decided that the cheapest and easiest way would have been to purchase a 3 AMP Power Supply kit from J.R. COMPONENTS PTY LTD. (See his ad this issue.) We are pleased to be able to announce that after negotiations with J.R., he will supply these kits, (priced at $45-00) POST FREE to anyone who mentions the N.S.W. 6800 USERS GROUP newsletter on their order, or uses the order form enclosed with the newsletter.

This is the circuit mentioned above.



****

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 ; All 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.

****

'DREAM INVADERS'!

This exciting action game, written by Michael J. Bauer, is a must for all owners of a DREAM-6800. Level of difficulty increases as the game progresses, so it suits everyone from beginner to seasoned Space Invaders fans.
(Note: 2K RAM required.)

Cassette plus instructions: $10. (incl. post; allow 2 - 3 weeks delivery.)
Program listing (6800 mach. code) also available: $5 extra.

DREAMWARE

PO Box 343
Belmont VIC. 3216

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

DREAM INVADERS REVIEW

GRAEME V. SAMWAYS

What can you say about DREAM INVADERS? Well, I mean, Space Invaders is Space Invaders, or is it? I must admit that I was a complete novice when it came to playing Space Invaders of any form, and I haven't scored very high, nothing much over 1000 in DREAM INVADERS. (SKITE - Garry.)

Wanting an expert opinion, I took DREAM INVADERS to the local Computer Club, a den of human microprocessors and general Space Invaders addicts. I was slightly upstaged at first by a Compucolor II with Floppies, etc, and many people said "Watch our Space Invaders."

Not to be outdone, I sat there and played DREAM INVADERS gaining interest with every BLEEP and the fast moving action. Several other members had a go. It didn't take them long to realise what speed was necessary to play the game after 3 rounds, and that single aliens come down to invade you when you are not looking, or under cover of a barrage of fire from its allies.The few who did manage to get into and above round 3 soon began to realise that the aliens tactics were not just random, and that their intelligence was beginning to show through.

Following their respective games, many came back for a second attack run, and most of them said that DREAM INVADERS was the best they have ever played, whilst others sulked off in total disgust at not being able to score over 200 or 300, after being able to achieve much higher scores on the slower TRS-80's etc.

This is very high praise, indeed, from a group where almost every type of computer is represented, and almost all Space Invaders games known are played regularly. I can only say that DREAM INVADERS will only lose its attraction when you can repeatedly score 2400, but until then, (probably about the year 2400 AD), DREAM INVADERS will continue to captivate the player and enable him to indulge his addiction to Space Invaders at a minimal cost. See the DREAMWARE ad in this issue for details of how and where to purchase it.

WARNING

If you have children, or others who like Space Invaders, don't buy the program, as you will probably have a neighbourhood 'Invasion' of your own. Of course, you could alwys build a ccin slot onto your DREAM, you would pay for the DREAM in no time.

****

INVADER CONTROL

GRAEME V. SAMWAYS

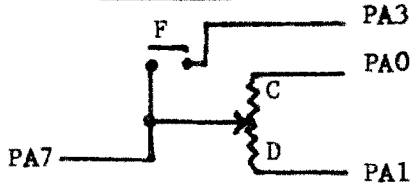
After playing DREAM INVADERS for a while, I decided to build a handset to enhance the operation of the game. (And get higher scores.)

I fiddled around with 3 models. Each has good and bad points, so I will cover them all quickly.

All versions are mounted in the smallest 'zippy box' available, with a push button mounted on the top side for a 'fire' button, as in the joystick. Onto the aluminium front panel I mounted various devices.

The first was a 5K pot. wired as in Figure 1.

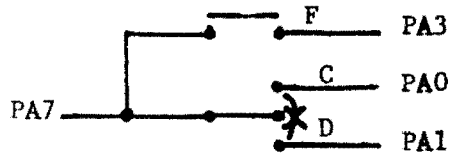
Figure 1



This allows 'fire' on the push button, and left and right movement by moving the pot. left or right. The centre area doesn't give movement in either direction. However, you have to move the pot. back manually. If you are used to T.V. games this version may suit you.

The second version had a centre off, 2 way momentary contact switch, (this was a NIHON-KAIHEIKI S-2018) wired as in Figure 2.

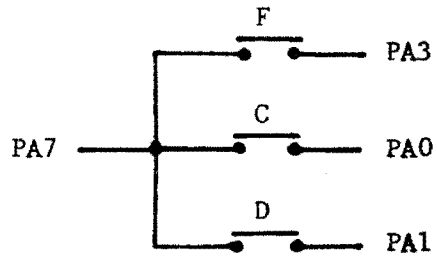
Figure 2

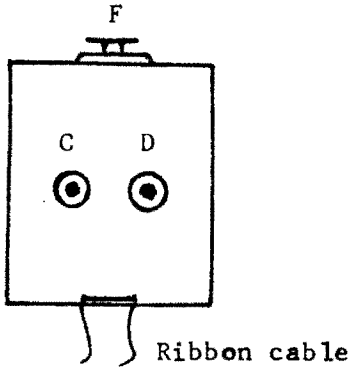


This system is O.K., but the switch is designed for 125V, 5A, and is stiffer than necessary, which leads to 'finger fatigue' after a time. This could be overcome by an extension handle. The switch may also be difficult to find, as it came out of my 'junk box.' Alternatively, a telephone exchange switch, (either old or new,) or something similar could be used.

The third version had two push buttons across it the same as the 'fire' button. It is wired as in Figure 3.

Figure 3





This is the easiest and most effective to use as long as you remember where your fingers are. It is the one I ended up with, so I built one for Garry as well, but I had to confiscate his to get him to finish typeing the newsletter. (He promised to give it back when I do - Garry)

To connect any of the above units to the DREAM I used a 16 pin I.C. socket. (The type with the connectors emerging from the top.) I then soldered the 4 wires VERY CAREFULLY to the outside of the socket. You may have to trim a little bit from the side of the socket. See Figure 4 and Figure 5 for details.

Figure 4

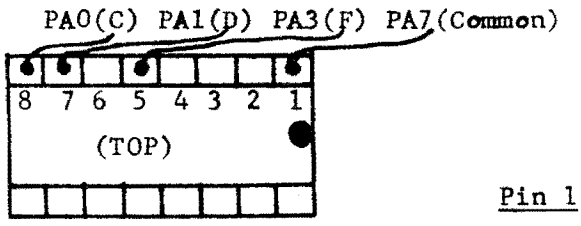
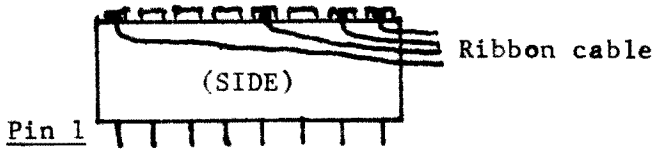
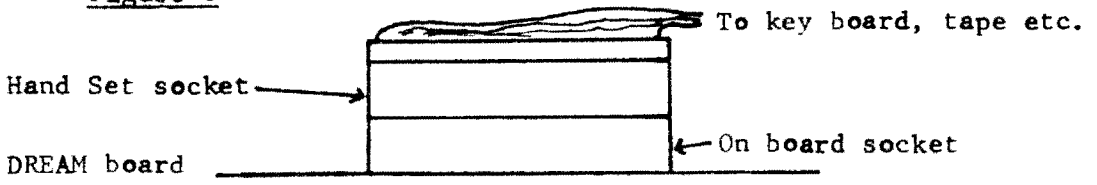


Figure 5



When the socket is completed, remove the key board, tape I/O, speaker etc plug from its socket, plug the hand set socket into the board, then plug the key board etc. plug into the top of the hand set socket, (See Figure 6,) to form a 'piggy back', then, HAPPY ZAPPING.

Figure 6



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ARROW GOLF (0080 - 0400)

JAY D. MANN,
[redacted]

To play nine holes of "golf", you aim the arrow in the direction you wish, using the keys shown in the matrix below. Hold down the 9 key to store up power. On release the arrow travels a distance proportional to the number of beeps. Hitting a barrier bounces the arrow back and scores an extra stroke penalty. You have to get the arrow overlapping the square target to sink the putt. Each hole has extra random barriers. You can use the wrap-around feature to bypass barriers. Your score is given as "Hole A = .."

This game has a few patches that someone might want to clean up, leaving enough room to end with a final message of "Total = .."

↖ 4	↑ 5	↗ 6
← 8	9	A →
↙ C	↓ D	↘ E

To change the key functions, enter the key you wish to use for the direction indicated, at the following locations. (Enter as 0,Key.)
↖023B, ↑023F, ↗0243, ←0233, →0237,
↙0227, ↓022B, ↘022F, Power,02ED & 03D9)

0080	03C4	009E	0005	661A	FF01	0566	1A00	0000
0090	0100	0200	6060	1008	0440	2010	0C0C	0020
00A0	7C20	0008	7C08	0010	3810	1010	3810	0C0C
00B0	1020	4004	0810	6060	0000	AEAA	EAAA	AE8E
00C0	888E	88EE	00E0	00E0	0080	8080	8080	F000
00D0	E0A0	E000	0500	0A00	FF00	0020	0C66	3C00
00E0	0000	0A00	FF00	0038	1866	0000	3000	0000
00F0	E0A0	E000	3300	0000	0000	0000	00C0	C100
				F00A	300F	10F6	00E0	1200
0200	6600	6E01	620A	6100	0000	226C	2274	8020
0210	2248	70FF	3000	1210	8020	225A	70FF	3000
0220	121A	23E0	F00A	400C	2286	400D	2292	400E
0230	229E	4008	22AA	400A	22B6	4004	22C2	4005
0240	22CE	4006	22DA	13D8	A0CE	CA3C	CB1C	6F00
0250	DAB1	4F00	00EE	DAB1	124A	A0C8	CA3F	CB1F
0260	CF00	DAB5	4F00	00EE	DAB5	125C	CA3C	CB1C
0270	22D0	13D0	A0D0	C73C	C83C	6F00	D783	4F00
0280	00EE	D783	1276	DAB5	A0B3	63FF	6401	DAB5
0290	00EE	DAB5	A0A9	6300	6401	DAB5	00EE	DAB5
02A0	A099	6301	6401	DAB5	00EE	DAB5	A09E	63FF
02B0	6400	DAB5	00EE	DAB5	A0A2	6301	6400	DAB5
02C0	00EE	DAB5	A094	63FF	64FF	DAB5	00EE	DAB5
02D0	A0A7	6300	64FF	DAB5	00EE	DAB5	A0AE	6301
02E0	64FF	DAB5	00EE	6500	2340	234C	6009	7501
02F0	E0A1	12E8	7101	0000	0000	2360	75FF	8CA0
0300	8DB0	8A34	8B44	DCD5	6F00	DAB5	3F00	1352
0310	3500	12FC	0000	0000	2360	4F00	1224	6F1F
0320	2342	8614	00E0	236A	6F5F	2342	7E01	4E0A
0330	1338	7202	00E0	1206	8160	00E0	236A	133E
0340	6F05	FF15	FF07	4F00	00EE	1344	6001	F018
0350	00EE	7102	23F0	DAB5	DCD5	8AC0	8BD0	1314
0360	03BA	A0F0	D783	03C4	00EE	A085	F455	6300
0370	6410	A0BA	D345	7308	A0BF	D345	730C	FE29
0380	D345	7308	A0C4	D345	730A	8910	2396	0000
0390	A085	F465	00EE	A08A	F255	A090	F933	F265
03A0	F029	D345	7305	F129	D345	7305	F229	D345
03B0	A08A	F265	00EE	0000	0000	DF80	DE26	DF82
03C0	DE80	3900	DF80	DE82	DF26	DE80	3900	0000
03D0	A0D4	FB55	00EE	0000	4009	12E6	1224	0000
03E0	A0E0	F955	A0D4	FB65	A0E0	F965	A0A7	00EE
03F0	234C	234C	234C	00EE	0000	0000	0000	002E

* *

BIOPLOT (0080 - 0400)

D.A.TRABUCCO
[redacted]

This program calculates and plots biorhythms. Briefly, three sine-waves of differing period commence cycling at your birth. The 'physical' cycle period is 23 days, 'emotional' - 28 days and 'intellectual' - 33 days. The physical curve relates to vitality, endurance and energy. The emotional - sensitivity and cheerfulness and the intellectual - alertness and judgement. If a curve is above the axis on a particular day, then you can be said to be energetic and dynamic in that area (P,E, or I). Below the axis you are in a recuperative period. If any curve happens to pass through the axis on a particular day then you could be prone to accidents (i.e. a "bad" day etc.) If all three pass through the axis then don't bother getting out of bed!

The program is started at C000 and dates entered using the format DD MM YY. e.g. 03 10 80. The birthday must come before 'today', be more than a year apart and within this century. To have a "redraw" of curves, press any key. Each dot on the axis represents one day, the extreme left being "today".

```
0080  0201 0200 0101 0202  0201 0202 0102 0102
0090  0201 0002 0401 0202  0301 0180 00C0 0080
00A0  80FF 6C00 6B00 6A00  A3C6 FC1E 7C01 F065
00B0  8100 41FF 00EE 62C0  8122 41C0 10CE 4016
00C0  10EA 4020 10EE 0374  DAB5 7A04 10A8 8200
00D0  64F0 8242 640F 8042  42C0 8A05 42D0 8B04
00E0  42E0 8B05 42F0 8A04  10A8 A0F6 10F0 A0F7
00F0  DAB5 7A06 10A8 F8A8  A8A8 A850 0000 0800

0200  2368 A2A0 F71E 6000  6100 F20A 4200 1218
0210  700A 7101 5120 1210  F20A 8024 F055 3700
0220  12AE 12A8 6C04 6900  6700 6800 A29F F665
0230  A293 F21E 7701 F065  4701 8015 227C 4202
0240  2282 7201 320D 1234  7301 9360 125A 2282
0250  606D 227C 6F01 227E  1248 F818 00E0 6D01
0260  8040 227C A294 4501  1320 F065 227C 7D01
0270  9D50 1320 4D02 2282  126A 0000 8804 89F4
0280  00EE 8B30 8BC5 3F00  1284 3BFC 00EE 6001
0290  227C 00EE 1F1C 1F1E  1F1E 1F1F 1E1F 1E1F
02A0  0000 0000 0000 A2C4  6C24 6B0C 6700 A2A0
02B0  F71E F065 7701 A0FD  F033 A0FE F165 F029
02C0  DAB5 7A04 F129 DAB5  7A06 4703 12D4 3706
02D0  1202 1224 6A25 7B0C  1202 6300 6DFC 6701
02E0  6A00 6B0F 6C00 8E40  6100 A080 FE1E 7E01
02F0  F065 4000 1310 9C60  6302 8BD4 7C01 7101

0300  4B0F 1318 4A3E 00EE  8A34 A09B F51E DAB2
0310  5010 12F6 8D74 12E8  3701 7704 77FE 12E6
0320  236C 23FA A09B D561  7502 353C 1324 6517
0330  2350 6400 6500 22DA  651C 2350 6409 6502
0340  22DA 6521 2350 6412  6504 22DA F00A 1364
0350  8680 8E90 8655 3F00  1354 7EFF 3EFF 1354
0360  8654 00EE 00E0 1320  6700 10A2 660F 6500
0370  6C19 10A4 9630 810F  2203 7EC1 9380 10CE
0380  0384 7EC1 9800 F6CE  B7DA E92E F492 B75A
0390  F248 B7FA B6DE F6DE  93DE 5EDE BBDE C546
```

(SEE BOTTOM OF "NIM" PAGE FOR 03A0 to 0400)

NIM (0200 - 0400)

M. K. DOWSON.

This game is for two players, A and B. The players take alternate turns to remove the 21 symbols from the screen using keys 1, 2 or 3, to represent the number of symbols they wish to remove at each turn. The player who removes the last symbol wins.

The game restarts automatically with cumulative scores, which can be reset to zero by a restart from C000.

```
0200   A350 6106 6000 F055   F01E 71FF 3100 1204
0210   6A00 6300 6404 6500   6615 A26C D453 7409
0220   7501 76FF 3600 121C   6700 222E 124A 6002
0230   70FF A22F 3001 7002   F055 6C18 6D1A 4001
0240   A26F 4002 A274 DCD5   00EE F10A 4100 124A
0250   68FC 8814 4F01 124A   22A6 4715 1214 4716
0260   1268 4717 1268 122A   00E0 1214 40E0 4070
0270   5070 5050 F050 7050   F000 A26F DCD5 00EE
0280   A274 DCD5 00EE 8E8A   8A8A EEEE 88EE 28EE
0290   E080 E020 E800 FF11   1171 5171 2175 A9A1
02A0   7151 5151 D901 8E10   87E4 6E09 84E5 75FF
02B0   A26C D453 71FF 3100   12AA 2342 4715 22C2
02C0   00EE 222E 7C0A 6D1A   A286 DCD5 7C08 A28B
02D0   DCD5 7C08 A290 DCD5   6C1C 6D04 A296 DCD0
02E0   230E 4002 231E 4001   2326 6C16 6D06 A26F
02F0   DCD5 7C0A A350 232E   6C16 6D16 A274 DCD5

0300   7C0A A353 232E 230E   222E 00E0 00EE 653F
0310   F518 F515 F507 3500   1314 00E0 00EE 7A01
0320   A350 FA33 00EE 7301   A353 F333 00EE F265
0330   F029 DCD5 7C04 F129   DCD5 7C04 F229 DCD5
0340   00EE 6C18 6D1A 4001   227A 4002 2280 00EE
0350   ****
```

* *

BIOPLOT (CONTINUED)

```
03A0   492E F6DA 56DA BFDA   B55A 4BDA F11E 0024
03B0   2A22 88A8 8000 0BA0   0380 1550 1110 0820
03C0   1C70 419E FFFE 0B12   1819 1518 1DDC CF0B
03D0   121B 1D11 2CCC CCDC   1D18 0D0A 222C FF01
03E0   2919 1122 1CDC CCCC   0229 0E16 181D CECC
03F0   DC03 2912 171D 0E15   FF00 6E50 FE18 136C
0400   ****
```

* *

LUNAR LANDER

(0080 - 0400)

STUART CROFT.
[redacted]

This is the well known game of Lunar Lander. The screen readout gives you units of height, fuel remaining, and rate of descent. A small L.E.M. on the right hand side gives you an indication of your progress.

You may burn anything from 0 - 9 units of fuel at each firing, until you land, or run out of fuel. 0 - 3 units of speed is considered a safe landing, but remember, if you burn 3 or less units of fuel, gravity will start to accelerate your descent. If you burn too much fuel, you will start to climb. Key ~~C000, FN, 3~~ F, to restart. HAPPY LANDINGS.....

```
0080  8C50 6DF0 6319 8CD2  6E00 9CE0 1094 7E10
0090  73FE 108A 20F2 6A10  FA18 12AE 6A2F 6B1F
00A0  0000 A0A8 DAB1 00EE  FFFF 23F0 2392 10AE
00B0  6A27 6B13 A0C6 DABD  7A08 A0CB DABC 7A08
00C0  A0D3 DABD 00EE 4124  0000 AA00 4208 4008
00D0  0048 0298 245A E900  9104 00AA 0040 1002
00E0  20F2 237A 20F2 23F0  20F2 20B0 23F0 20B0
00F0  10E2 6A30 A0FA DA36  00EE 3030 78CC FC84

0200  6A00 6B00 A27C DAB5  7A08 A281 DAB5 7B06
0210  A28B DAB5 7AF8 A286  DAB5 7B06 A290 DAB5
0220  7A08 A295 DAB5 6A17  6B0E A250 DAB1 129A
0230  6A1B F265 F029 DAB5  7A04 F129 DAB5 7A04
0240  F229 DAB5 00EE 6A17  6B0D A251 DAB3 00EE
0250  E040 0040 A34E F433  6B00 2230 00EE A34E
0260  F533 6B06 2230 00EE  A34E F633 6B0C 2230
0270  00EE A34E F933 6B0C  2230 00EE EA8A CA8A
0280  8EE8 88E8 88EE CEA4  A4A4 CE6E 8444 24C4
0290  EEAA EECA AAEE 484E  484E 209C 65FA 6300
02A0  644B 664B 6800 2254  225E 2268 20F2 4400
02B0  2360 3400 F70A 20F2  4801 2246 4801 2272
02C0  4800 2268 225E 2254  6C80 94C0 12D6 7CFF
02D0  4C09 12EC 12CA 6C09  97C0 12EA 7CFF 4CFF
02E0  12E8 12D8 84C5 12FA  6C00 12E4 8C40 8C75
02F0  4F01 8C70 4F00 8C40  12E4 6D06 6E00 5EC0

0300  1304 130A 7E01 7DFE  12FE 86D4 6F00 6E7F
0310  2254 8E64 3F01 132A  3F00 131E F000 6900
0320  2246 8965 2272 6801  132E 2268 6800 8B50
0330  8B65 45FF 1344 9B50  1346 4800 75FF 4801
0340  7501 1332 6500 225E  4500 1350 1080 0000
0350  05F0 6319 20F2 4601  10AA 4603 10AA 10E0
0360  0000 236A 23F0 236A  00EE 6A00 6B00 A27C
0370  DAB5 7A08 A281 DAB5  00EE 6B15 6A04 A3C2
0380  DAB5 7A08 A3C7 DAB5  7A08 A3CC DAB5 23A4
0390  00EE 6B15 6A04 A3D2  DAB5 7A08 A3D7 DAB5
03A0  23A4 00EE 6B1B 6A04  A3DC DAB5 7A08 A3E1
03B0  DAB5 7A08 A3E6 DAB5  7A08 A3EB DAB5 0000
03C0  00EE EE8A 8E8C EAE6  A8E4 A2AC A0A0 E0A0
03D0  A000 6E8A 4E2A CAEE  88CE 888E 8E8A 8E8A
03E0  EAEC AAAA AAAC EE4A  4A4A EAE0 80A0 A0E0
03F0  6A10 FA18 FA15 FA07  3A00 13F6 00EE 0000
```

* *

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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PRICE STRUCTURE

The cost of this newsletter is $3-00 per issue. An advance subscription is available at reduced cost. Please write for details of cost and length of time remaining in current subscription period.

BACK ISSUES. 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]

(Please add -10c to all CHEQUES sent from outside N.S.W., to cover Stamp Duty charged by N.S.W. Government. This is only required on cheques and does not apply to Money Orders etc.)

EDITOR (0080 - 0170)

G. J. BIDGOOD

This program is relocatable without change. If you use the same area as I have chosen the program uses some of the display area. PLEASE NOTE THAT THE INSERT AND DELETE INSTRUCTIONS DO NOT ALTER ANY OF THE JUMP INSTRUCTION ADDRESSES, THEREFORE YOU WILL HAVE TO ADJUST THE BRANCH ADDRESSES YOURSELF.

The functions of the program are as follows:-

Key A - ADVANCE. (Step forward 1 address at a time.)
Key B - BACK. (Step backwards 1 address at a time.)
Key C - CHANGE. (Contents of displayed memory location.)
Key D - DELETE. (Contents of displayed memory location.)
Key E - INSERT. (Contents displayed address.)
Key F - LIST. (Program in memory range.)
ANY OTHER KEY WILL HALT PROGRAM LIST.

When program is run, I.E., 0080, FN, 3, enter the program area, (Start and end addresses) followed by Function key and one of the above keys. If the Function key is pressed again, the program returns to start of Editor, thereby allowing you to alter the memory range if desired.

The FN key must also be used to permit you to exit from the Insert and Change modes of operation.

Every time key "A" is pressed the program advances forward 1 step.

Key "B" is again self explanatory, allows you to step backwards through program whenever pressed.

Key "D" deletes the displayed data from your program. Don't forget you may have to change your branch data if affected by this instruction.

The Insert and Change commands ; once entered data is inserted or changed as entered by you. (Similar to memory alter). To exit from this command use FN key.

Program List mode will step through memory range until Hex key or end of range is reached. To change speed of list, use FN key to return to memory range input, enter address 005D, FN, C, (To change memory contents) Increase displayed data to slow down, or decrease to speed up. FN key to exit from Change mode, FN key again to return to input memory range, re-enter memory range and continue as normal. Step 0081 also contains the data for speed of list.

0080	8638	975D	CE01	C886	FFBD	C07D	CE00	027F
0090	002E	8D2A	2B34	A700	BDC3	90A7	0186	08BD
00A0	C3DE	8D14	088D	1108	DF12	8608	BDC3	DE20
00B0	E1DF	06BD	C3B1	DE06	BDC3	C839	8DF3	BDC2
00C0	C416	4D2B	03BD	C392	5D39	DE02	DF12	D612
00D0	D104	22B0	D605	D113	2206	D604	D112	23A4
00E0	8DCF	BDC2	C44D	2B9C	840F	800A	2DF4	275C
00F0	4A27	5D45	2720	4A27	414A	2724	8D55	27FC
0100	D65D	D720	088D	AA8D	4A27	D77D	0020	26F7
0110	9C04	26E8	20CC	8DA4	2BC6	A700	8D40	20F6
0120	DF5E	8D98	2BBA	E600	A700	1708	9C04	26F6
0130	A700	08DF	04DE	5E08	20E6	DF12	A601	A700
0140	089C	0426	F709	DF04	DE12	2082	8D10	2090
0150	0920	8DDF	12BD	C297	DE12	7D00	1839	9C04
0160	2702	0839	08DF	0439	0000	0000	0000	0000
0170	****							

* *