

AM

TELEGRAM

THE FOLLOWING IS AN EXPLANATION OF 'HYDUG', A 2650 MONITOR
WRITTEN BY BRIAN L. YOUNG.

TERMINAL SPEED IS 600 BAUD.

THE COMMANDS ARE A, D, G, I, M, Q, S.

METHOD OF USE.

- A. SAME AS PIPBUG.
- D. HI-SPEED DUMP TO TAPE.
TYPE D(AAAA) (BB) (CR)
WHERE AAAA IS START ADDRESS OF DUMP.
'' BB IS NUMBER OF 256 BYTE BLOCKS TO BE DUMPED.
IE, A DUMP OF 4K WILL REQUIRE 4 BLOCKS TO BE ENTERED.
BY TYPING D400 2(CR) WILL PROVIDE A DUMP FROM 0400 TO 05FF.
(LEADING ZERO'S ARE NOT REQUIRED.)

- G. SAME AS PIPBUG.
- L. HI-SPEED LOAD.
TYPE L(CR) THEN SWITCH THE SENSE PORT OF PROCESSOR TO OUTPUT
OF TAPE RECORDER VIA THE SQUARING OP-AMP.
AFTER COMPLETION OF LOAD, SWITCH SENSE BACK TO NORMAL AND
PRESS RESET.

- M. BLOCK MOVE.
TYPE M(AAAA) (BBBB) (CCCC) (CR).
WHERE AAAA IS START ADDRESS OF MEMORY TO BE MOVED.
'' BBBB IS END ADDRESS OF MEMORY TO BE MOVED.
'' CCCC IS START ADDRESS OF WHERE THE MEMORY IS TO BE
MOVED TO, (NEW ADDRESS).

- Q. QUERY MEMORY.
TYPE Q(AAAA) (BBBB) (CR).
WHERE AAAA IS START ADDRESS.
'' BBBB IS END ADDRESS.
THIS IS A HEX LISTING PROGRAM.

- S. BLOCK SEARCH.
TYPE S(AAAA) (BBBB) (CC) (CR).
WHERE AAAA IS START ADDRESS OF AREA TO BE SEARCHED.
'' BBBB IS END ADDRESS OF THIS SEARCH AREA.
'' CC IS HEX BYTE YOU ARE SEARCHING FOR.

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While the 2650 processor is not considered a first line, modern device it is an extremely versatile base for a modest or not so modest system. Limited to a maximum of 32k of memory, it will operate with as little as 1k which is quite enough for a page full of alpha-numerics for an ATV transmission.

By the way the DSE 2650 kit is no longer available, however Applied Technology can supply 2650 based systems at quite reasonable rates. It is also possible to 'roll your own'. The original 2650 mini-system PCBs and parts are available from Dick Smith, McGraths and All Electronic Components. To contact any of these companies see the list of addresses at the end of this column.

So much for hardware. What about software? Well, in view of the popularity bestowed upon the 2650 by virtue of the many Electronics Australia articles and the DSE kit the 2650 has retained and expanded its popularity as a somewhat old but never the less powerful processor.

There are several local Melbourne amateurs — mostly ATVers — who have 2650 systems going. No doubt Melbourne VHF FM users will have heard the chit-chat on

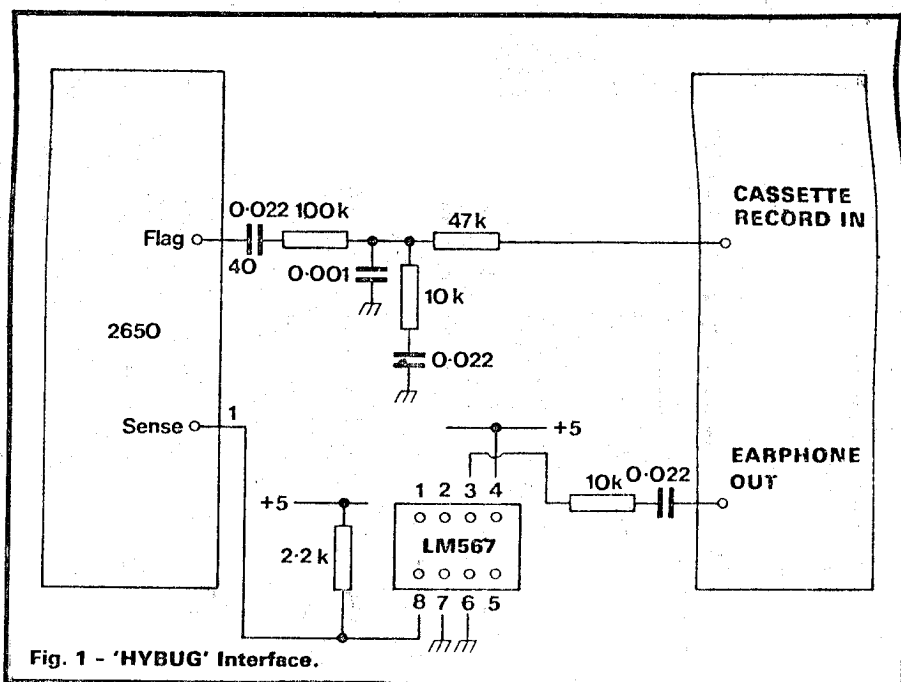


Fig. 1 - 'HYBUG' Interface.

HYBUG' Command List

Commands available are: A, D, G, L, M, Q, S. Their functions are as follows —

A. Same as PIPBUG.

D. High Speed Dump To Tape.

Type D (AAAA) (BB) (CR).

where AAAA is start address of dump.

where BB is number of 256 byte blocks to be dumped.

Example: A dump of 1k will require 4 blocks to be entered. Typing 2 (CR) will provide a dump from 0440 to 05FF. (Leading zeros are not required).

G. Same as PIPBUG.

L. High speed load.

Type L (CR) then switch the sense port of the processor to output of tape recorder via the squaring Op Amp. After completion of load switch sense back to normal and press reset.

M. Block move.

Type M (AAAA) (BBBB) (CCCC) (CR)

Where AAAA is start address of memory to be moved.

Where BBBB is end address of memory to be moved.

Where CCCC is start address of destination of memory to be moved (new address).

Q. Query memory

Type Q (AAAA) (BBBB) (CR).

Where AAAA is start address.

Where BBBB is end address.

This is a hex listing program.

S. Block Search.

Type S(AAAA) (BBBB) (CC) (CR).

Where AAAA is start address of area to be searched.

Where BBBB is end address of search area.

Where CC is hex byte you are searching for.

various frequencies. These groups accumulate software as a normal result of developing systems and talking to other 2650 users. Consequently there is quite a lot of user produced software available from this source.

There is also a 2650 Users Group that has quite a pile of material available. There is a \$40 joining fee which is good value from what I hear. The address is c/o Applied Technology.

Brian Young VK3BBB and Bruce Reilly VK3ZSR — both QTHR — operate a 2650 enthusiast's group on a strictly non-profit basis. Contact Brian or Bruce for further information.

The most exciting recent development regarding the 2650 is the appearance of MICROBYTE, a new and vigorous supplier of 2650 software at modest prices. It is run by Ian Binnie and Martin Hood who write the software and manuals respectively. I have just received a very nice looking cassette tape handling system and 6k Basic from this firm and I am very impressed with both the product and the service. I advise anyone interested in the 2650 to get themselves on the Microbyte mailing list by writing to their Canberra address or their Melbourne agent — David Thomas VK3ZGC c/o Cottage Computers.

Programs for ATV graphics are very much in my mind and I will be presenting 2650 software for this area especially, as I get the time to write them. Readers are invited to send me 2650 software for publication, particularly if ATV graphics are involved. Full credit will be given to the originator, of course.

One VK3 amateur, Brian Young VK3BBB, deserves some credit for producing a very clever 1k monitor program which he terms 'HYBUG'. This replaces the regular Signetics monitor 'PIPBUG'. Brian's monitor has additional utility routines for a high speed load,

block move, memory list and block search.

Its chief claim to fame is the fast load and dump. With the simple interface shown in Fig. 1 this routine will 'bang off' 1k of memory to tape in nine seconds. This is great for recording ATV announcements. If your tape deck is of reasonable quality and your processor is a 2650A model you can halve this to approximately 4.5 seconds per k by switching in a 2 MHz clock. But don't forget to adjust your terminal speed by a factor of two as well!

For those 2650 system owners with a DG-640 software controlled VDU, both 1 MHz and 2MHz clocks are available from IC40 (74LS92) pins 12 or the junction of 14 and B respectively.

A source listing of Brian Young's 'HYBUG' monitor is reproduced here with a list of available commands. This is reproduced with the help and permission of its author, thanks Brian.

At this stage you could be excused for thinking that you've transferred to 'Printout', however such is not the case. I plan to keep the subject of computers 'alive' in the pages of ATV but promise not to let the ATV section become another 'Printout'.

Quite enough about computers for one issue. Here is some genuine ATV.

The following listing is a copy of HYBUG, a 2650 monitor program written by Brian Young. Terminal speed is 300 baud.
 To operate at other baud rates make the following changes.

for 800 baud
 12A8 28 C8 C8 C8 C8 C8 C8
 12B0 A8 F8 7E 17
 for 1200 baud
 change 12B8 from A8 to 58

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0000 07 3F 20 CF 44 00 5B 7B 04 77 CC 04 09 04 1B CC
0010 04 0B 04 80 CC 04 0C 1B 09 01 60 01 6E 04 3F 3F
0020 02 B4 75 FF 3F 00 8A 04 3E 3F 02 B4 3B 2D 20 CC
0030 04 27 0C 04 13 14 41 1C 00 AB F4 4D 1C 01 60 E4
0040 53 1C 01 DA E4 4C 1C 03 10 E4 47 1C 01 3A E4 44
0050 1C 05 6A E4 51 1C 00 F4 1F 00 1D 07 FF CF 04 27
0060 E7 14 18 19 3F 02 86 E4 7F 98 0E E7 FF 18 71 0F
0070 64 13 3F 02 B4 A7 01 1B 67 E4 0D 93 18 05 01 03
0080 1A 02 85 02 0D 04 2A CF 04 29 04 0D 3F 02 B4 04
0090 0A 3F 02 B4 17 05 02 F4 0A 18 64 CF 24 13 3F 02
00A0 B4 1F 00 60 0D 04 0D CE 04 0E 17 3F 02 DB 3B 74
00B0 3F 02 69 0D 04 0E 3F 02 69 3F 03 F2 0D 84 0D 3F
00C0 02 67 3F 03 F2 3F 00 5B 0C 04 2A E4 02 1E 00 22
00D0 18 11 CC 04 11 3F 02 DB CE B4 0D CC 04 11 E4 04
00E0 7C 00 22 06 01 8E 04 0E 05 00 77 08 8D 04 0D 75
00F0 08 1F 00 AE 3F 02 DB 3F 00 A4 3B F9 CD 04 0F CE
0100 04 10 3F 00 8A 0D 04 0D 3F 02 69 0D 04 0E 3B F9
0110 04 20 3F 02 B4 0D 84 0D 3B EF 08 F0 E8 E2 98 07
0120 08 E4 E8 D9 1C 00 00 09 DD 06 01 8A DF 78 02 85
0130 01 3B C5 46 07 18 4B 18 57 00 3F 02 DB 3F 00 A4
  
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0140 0C 04 07 92 0D 04 01 0E 04 02 0F 04 03 77 10 0D
0150 04 04 0E 04 05 0F 04 06 0C 04 00 75 FF 1F 04 09
0160 3F 02 DB 3F 00 A4 3B F9 AE 04 0E 77 0A AD 04 0D
0170 75 08 1A 04 19 04 5A 02 9B 1D CD 04 0F 86 01 CE
0180 04 10 3B DD CE 04 12 CD 04 11 E9 E2 1A 08 19 24
0190 EA D7 19 20 18 62 0A E3 18 16 07 00 05 FF 0D A4
01A0 0D CD E4 11 FB 78 5A 02 9B 22 05 01 3B 1F FA 6C
01B0 0B CE 1B 68 0A C5 0B CB 02 C1 86 01 78 0F 0F C4
01C0 0D CF 24 11 5B 78 05 FF FA 72 1F 02 1D 0C 04 0D
01D0 81 CB FB CC 04 11 81 CB FB 17 3F 02 DB 3F 00 A4
01E0 3B F9 CD 04 00 CE 04 01 3B F1 CE 04 02 3B 12 E8
01F0 FA 98 7A 09 8D 3F 02 49 09 8B 3E FA 3F 00 8A 18
0200 6C 0D 04 0D 0E 04 0E 86 01 77 08 85 00 75 08 3B
0210 CD 0C 84 0D E9 CD 98 04 FA CC 18 01 17 20 FB 7E
0220 F8 7C 9B 00 3F 02 86 3B 1D D3 D3 D3 D3 CF 04 12
0230 3F 02 86 3B 11 6F 04 12 03 C1 3E 01 17 01 2C 04
0240 2C D0 CC 04 2C 17 07 10 EF 42 59 14 E7 01 9A 78
0250 0C 04 07 64 40 92 1F 00 1D 30 31 32 33 34 35 36
0260 37 38 39 41 42 43 44 45 46 CD 04 12 3B 4F 51 51
0270 51 51 45 0F 0D 62 59 3F 02 B4 0D 04 12 45 0F 0D
0280 62 59 3F 02 B4 17 77 10 04 80 B0 05 00 06 08 12
0290 1A 74 20 B0 3B 17 3B 10 12 41 80 31 61 C1 FA 76
02A0 3B 06 45 7F 01 75 18 17 20 C0 C0 C0 C0 FB 7E 04
02B0 60 F8 7E 17 77 10 76 40 C2 05 08 3B 6B 3B 67 74
02C0 40 3B 65 52 1A 04 74 40 1B 02 76 40 F9 73 3B 58
02D0 76 40 75 10 17 0C 04 2A 18 07 17 20 C1 C2 CC 04
02E0 2A 0F 04 27 EF 04 29 14 0F 24 13 CF 04 27 E4 20
02F0 18 68 3F 02 46 04 0F B2 B2 B2 B2 42 D1 D1 D1 D1
0300 45 F0 46 F0 61 C1 03 62 C2 04 01 CC 04 2A 1B 51
0310 20 CC 04 01 75 08 05 00 06 FF 20 86 00 18 02 FA
0320 00 B4 80 18 7C 07 21 FB 7E B4 80 18 6E 5A 67 3B
0330 35 58 15 3E 22 CC 04 00 3B 1D C2 3B 1A CE E4 00
0340 81 C1 DA 77 1B 54 21 50 84 50 3F 02 B4 3F 00 8A
0350 1B 44 B5 01 14 1B 02 04 01 E4 80 18 7C 07 21 FB
0360 7E 80 B4 80 18 6C 64 01 1B 78 3B 87 CD 04 00 CE
0370 04 03 3F 02 DB CE 04 02 75 68 20 C1 0E 04 05 CC
0380 04 01 3B 3E F9 7C 04 01 3B 3B 0F 04 02 18 27 A7
0390 01 CF 04 02 3B 31 0C 04 00 3E 27 02 3B 24 14 0E
03A0 E4 00 C3 81 C1 03 3B 1F DA 75 0F 04 00 87 01 CF
03B0 04 00 3E 12 1B 50 01 64 01 3B 0C DB 7E D6 7C 1F
03C0 00 00 07 07 1B 03 C0 07 04 80 64 01 FB 7E B5 01
03D0 18 04 07 18 1B 05 07 31 14 CF 04 04 76 40 FB 7E
03E0 74 40 0F 04 04 A7 16 FB 7E 80 07 0E 58 5E 17 00
03F0 00 00 07 03 1B 02 07 3C 04 20 3F 02 B4 FB 79 17
  
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