

# SYDTRUG NEWS

SYDNEY TRS-80 USERS GROUP NEWSLETTER

P.O. BOX 43 ERSKINEVILLE 2043

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## In this Issue

Again I thank all contributors to this months issue, Geza Dujmovich has got some important points to note in his Presidential Notes, so don't miss reading the column. Leonard Yates continues with another article on transferring a tape based game to run under Disk Basic, and another on creating a self booting disk with Newdos/80 on the Model III. Those of us with modems are well catered for this month with a review, Mike Cooper's Comm Line and an article from Geoff Radcliffe (designer of the Avtek Multi Modem). If you are using Newdos/80 and considering switching to LDOS (wise move), don't miss the Prophet & Oracle. Last but certainly not least we have Keith Black's Gamers Corner.

Most interests are being catered to, except the cassette users and those of you using your machine for business purposes. So how about someone using cassette writing an article or at least jotting down some notes on what you would like to see, the same goes for those of you using them for your business.

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## Meeting News

Well, as I write this at the second meeting at Sefton it appears that this venue is a great success. A big roll-up and many helping hands for the beginners present.

As always the first and second monthly meetings will be held at the rear of Pattersons Florists, Botany Rd, BOTANY (entrance from Chegwyn St) while the third meeting (on the fourth Saturday of the month), will be held at 1st Sefton Scout Hall, 2 Waldron Rd, SEFTON. All meetings commence at 1 PM on the following dates :-

December 8th	Botany	January 12th	Monthly General Meeting
December 15th	Botany	January 19th	Special Interest Meeting
December 22nd	Sefton	January 26th	South West Meeting

Have a Merry Christmas and drive carefully,  
Gary Bryce, Editor

## SYDTRUG Bulletin Board

CLUB-80 Bulletin Board operates for members, seven days a week twenty four (24) hours a day on (02) 332-2494. The data format used is as follows :- 8 data bits, 1 stop bit, No parity, Full duplex, CCITT V21 modem standard 300 bps (set your modem to ORIGINATE mode). Limited access is granted for visitors.

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## Presidential Notes

by Geza Dujmovich

### ANNUAL MEMBERSHIP RENEWAL

As I mentioned in last months column the Club is switching over to a system where all our yearly memberships are due on the one date. The details of the actual procedure, having been thrashed out at the last committee meeting can now be spelled out. As announced at the Monthly General Meeting in November we decided that the best way we could implement the decision is as follows:

- (1) All memberships become payable on the 1st. of July of the year.
- (2) New members who join as from Saturday 10th. of November will pay a 'Joining fee' of \$10 as well as the yearly fees due (\$20 normally but adjusted at a pro-rata rate for the changeover period between now and next July see 'Pro-rata' below). This will hopefully reduce the number of tardy members who are currently taking up to three months to submit their renewal dues (as members one month or more overdue will be deemed to be new members).
- (3) New members who join as from the above date will not have to pay a 'joining fee' for the Bulletin Board. (this is replaced by the 'Club' joining fee above) however, they like the rest of us will still have to pay the \$10 yearly BBS membership.
- (4) Existing club members (those of us with 'A' series membership numbers) who wish to join the BBS will still have to pay the \$10 BBS joining fee plus the membership fee. This makes everyone equal, in that the total paid by a member for Club and BBS membership is \$40 for new and existing members.
- (5) A pro-rata adjustment of \$5 membership per quarter will be made for club membership for those who:
  - a) join between now and July. i.e. \$15 membership from the present, \$10 from January and \$5 from April, (and all being due again in July).
  - b) have their present membership extending over July '85 (like myself). They will have \$5 per quarter deducted from their fees then due.
- (6) The BBS pro-rata rate will apply same as for the membership above except that the pro-rata rate will only be \$5 per half year (not quarter).

I sincerely hope that this reads as straight forward as I have intended. The once a year renewal should certainly make things a lot more logical and more orderly as far as running the membership renewals is concerned.

### REVIEW BOOKS

For the last few months due to the good work of Jim Whittaker we have had TRS-80 related books sent to us for review purposes by the publishers PRENTICE-HALL. Via their helpful Leslie King we have received the following books for review:

The Illustrated Multiplan Book -by Russell A. Stultz.

Dbase II -by A.L. Peabody and Richard Seabrook.

Learning Logo on the TRS-80 Co-Co -by Tony Adams etc.

Super Scripsit Micro Word Processing for the TRS-80 -by C & M Lehman & Connie J. McMullan

TRS-80 Programming Learning/Teaching -by Bell.

All the above books except the Co-Co LOGO book are now out with our intrepid reveiwing team and we hope to see the fruits of their labour in the newsletter soon (the sooner the better fellows please). These books are all club property and when they come back from the reveiwers will be in the club library cupboard and be available to be borrowed for reasonable periods by members. I would also like to invite any member who owns a COCO or knows anybody with one who would be interested in reading and then writing a review on the COCO LOGO book please get in touch with me or any member of the committee and we will get the book to you.

### MONTHLY INCOME & EXPENDITURE

I intend from time to time to write in detail about the main points of the committees various decisions and will try to include (as now) a brief balance sheet for the Month as prepared by our 'paragon of preciseness' (the Treasurer) Denis Pagett.

Total Income to 6/11/'84                      \$918

includes amounts from New Membership, New BBS membership and renewal club and BBS memberships.

Total Expenditure \$926.36

which includes Newsletter printing costs, Rent on club premises, Diskettes for Club use (Newsletter, BBS, Membership Data Bases, Club software storage etc.), 'Phone bill, Postage, etc. etc....

As you can see our source of income is membership fees and our expenditures are manifold. We certainly hope that the new annual influx of fees in July will make it all easier to manage, although we will probably have to put a lot more thought into future budgeting etc. to see us through with all our expenditures until the following July.

## AVTEK MULTIMODEM OFFER

The details of the generous offer made to the club by Avtek electronics and as mentioned in last months column by Jim are as follows. The club will be allowed to purchase Multi Modem 2's (this is the fully built up and Telecom approved version with 'phone etc. included) at a discount in lots of 4. To be paid for by a Club cheque and resold to Club members at not less than \$330. Therefore if you would like to take advantage of this, find three other club members with similar intentions and front one of us in the committee with your \$330 each and we will arrange for you to get your modems which with this offer will be \$20 cheaper than what you could do elsewhere.

## CLUB SECRETARY REQUIRED

You may notice that Jim Whittakers usual Secretarial Column is missing from this issue. This unfortunately is due to the fact that Jim has resigned the position of Secretary. The pressure of home and tech. commitments has meant that we are now looking for a willing person to be Secretary and do much of the (excellent) work that Jim has done up 'till now. Please, if you think you could possibly contribute and are willing to attend committee meetings etc, come forward and we will be glad to have you. Seriously we are in urgent need of somebody capable to fill Jims shoes and although the workload would be (and is) shared by the rest of the committee members it would be good to have someone handling the full job again.

## VISIT TO RCS RADIO

One of the more pleasant things a couple of us attended during the month (no it wasn't the Computer fair at the Showground THAT was a major disappointment - Not a mention of TANDY or it's Machines yet again) was a visit to RCS Radio, owned and run by one of our members, Bob Barnes. Upon Bobs' invitation to visit his plant and see how Cct. boards were made amongst other things, we ventured out and were awed by a lot of what we saw.

The first thing that greets you in the reception area are four (yes 4) Model I's all doing their own thing keeping data on various EA and ETI cct boards, Accounting, Prices etc. all dedicated to (and performing well) to a single task — Bob doesn't believe in swapping disks he just adds on another whole system if need be.

There are numerous other Model I's and III's doing various jobs around the office, obviously better the devil you know ....

Anyway the whole visit was very enlightening and we could not believe the amount of cct. boards we saw. Truly they must be as they say "the only company which manufactures and sells every printed cct. board and scotch-cal front panel ever published by EA and ETI etc."

We hope to announce soon the availability of the 'in-monitor' amplifier project cct. board (as designed by Gary and published a few issues ago) from RCS and via the club.

Thanks for the interesting info and support of the club Bob (you want to be Secretary by any chance ??)

## NEWSLETTER ARTICLES

One of the pleasures of writing a regular column for the Newsletter (and there are others not the least of which is helping others by sharing your knowledge) is seeing ones name in print at the head of the page (boosts the already over inflated ego).

Seriously if for no other reason there must be a lot of you out there who have the expertise on various computer related pursuits to make up an article and thereby ACTIVELY CONTRIBUTE TO THE CLUB. I'm sick of seeing the same old mob contributing issue after issue and it would be good to see someone new with something new appear in the pages and brighten our outlook.

This month we have a couple new contributors (about time Geoff) and we are looking forward to have more from you and others in the future.

In closing this month you'll notice there are no further related quotes from the famed Edsel Murphys laws as they apply to the fundamental rules of the universe, due to the application of law No.123-b which states "the location of that safe place 'where important documents not to be misplaced' are put -- WILL be forgotten."

I wish all of you a MERRY CHRISTMAS and a Very HAPPY NEW YEAR - Good Computing during the holidays. (we hope to see the results next year)

See you at the meetings ..... Geza

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## **Run "RESCUE AT RIGEL" under Disk BASIC**

*by Leonard Yates.*

This article is the second in a series of modifications to cassette-based programs to allow them to run under Disk BASIC. RESCUE AT RIGEL is from the same stable as TEMPLE OF APESHAL. Many copies of the cassette version were sold in Australia and although not as cumbersome to load as TEMPLE, it does have some incompatibilities with Disk BASIC. The following modifications are not enhancements; they simply allow the game to be saved to disk and to be played under a 48K Disk BASIC environment.

There are two separate modules on the tape: The RESCUE module (i.e., the actual game in BASIC) and the DATA module (for the graphics).

**Step 1:** Under Disk BASIC, CLOAD the RESCUE module. For the TRS-80 Model III, make sure you have the cassette baud rate set to L. (or POKE2H4211,0 from BASIC). Make the following changes:

Add line 6, 'POKE 2H40B1,2HC0 : POKE2H40B2,2HFA'

From line 10, delete the expression 'ON ERROR GOTO 11'

Delete line 11 entirely

In line 16 change 'KA=31485' to 'KA=2HFAFD'

Delete line 1100 entirely

Change line 1610 to '1610 OPEN"1",1,"RESCUE/DAT" : K=0 : FOR I=1 TO 5 : A\$="" : INPUT#1,A\$ :GOSUB1950'

Delete line 1660 entirely

Change line 1960 to '1960 MC!=USR0(KA+K)'

**Step 2:** Save the modified RESCUE module as "RESCUE/BAS:dn1".

**Step 3:** Type in, save then run the following program. In response to 'Filespec...?', reply 'RESCUE/DAT:dn1'

```
1 'Data transfer routine for RESCUE AT RIGEL
2 'by Leonard J. Yates, 25 October 1984
10 CLS : CLEAR 1000 : ON ERROR GOTO 160
100 PRINT"Data transfer routine for RESCUE AT RIGEL"
110 PRINT"Place cassette in player, cue and press 'PLAY'"
120 LINE INPUT"Filespec for disk file (incl. drive no.): ";FS$
130 OPEN"O",1,FS$ : FOR I=1 TO 5 : PRINT@256,"Reading data #";I
140 INPUT#-1,A$ : IF LEN(A$)O249 PRINT@256,"Data read error "
150 PRINT@256,"Printing data #";I : PRINT#1,A$ : NEXT I
160 CLOSE 1: PRINT"Data transfer complete" : PRINT : PRINT
```

**Step 4:** On the disk, you should now have two files: RESCUE/BAS and RESCUE/DAT. To run the program, type RUN"RESCUE/BAS" under Disk BASIC. Unlike the cassette version, there is no need to set memory size and the game will load and run in a matter of seconds.

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## **AVTEK Multi Modem - Review**

*by Neville Thomas*

*Reprinted from Adelaide Micro User News*

The "Multi-Modem" was designed by David Griffiths and Geoff Radcliffe and is available exclusively for Avtek Electronics Pty. Ltd. Enquiries in writing should be made to Avtek Electronics Pty. Ltd., c/- Post Office Lane Cove 2066 (phone 02-427-6688). Cost of a complete kit, including case, front panel and all parts is \$249 (July price including free post and packing).

Until recently, modem equipment has either been complex and unwieldy to construct and align or has been capable of using only a limited number of data formats. The most complicated and troublesome parts of a modem are usually the filters used to separate and condition the transmitted and received audio tones.

This new direct connect modem changes all that. It is based on a new integrated circuit from Advanced Micro Devices, the Am7910 "World Chip". All the major functions of the modem are performed by this chip, with 10 other commonly available ICs providing interfaces to the computer and data transmission line. Nine different data transmission standards are supported, including the CCITT V.21 and V.23 300bps and 1200bps formats and the Bell 103 and 202 standards.

A data bit received from the modem is translated into the Electronic Industries Association (EIA) standard known as RS-232C. This standard defines a 0 as a voltage level between +5V and +15V and a 1 as a level between -5V and -15V. Voltages between -5V and +5V are undefined.

The circuit of the modem can be divided into four main sections. These are:

- \* The line interface which provides relay switching to loop the communications line, detection of ringing signals and most importantly, DC isolation between the modem and the communications line;
- \* An analogue section which handles modulation and demodulation of the audio tones. This is carried out by the Am7910 and an op amp;
- \* A computer interface which converts data and control signals to and from the modem into RS232C levels for connection to a standard serial interface as provided on most computers. Once again, this task is carried out by the Am7910.
- \* A power supply, which provides +/-5V for the analogue and control logic circuits and a nominal +/-9V for the RS232C interface section.

Construction of the modem is straight forward. Avtek Electronics supply a complete kit of parts, including front panel, pre-punched cabinet and a double-sided printed circuit board with plated-through holes. Please take careful note - the Am7910 is an NMOS component and should be handled with care as it is sensitive to static electricity. Replacement chips cost about \$70 each. I have been fortunate enough to be able to have a chat with the service technician at AVTEK who advised they have sold over 500 kits so far. Only three Am7910's were duds from a known bad batch and were replaced without further ado. Two others were U/S as a result of poor construction practices. Note all ICs are provided with sockets in the kit. If a kit does not work on completion, AVTEK will look at it for you and if the kit has obviously been well constructed (NOT soldered with your average roof guttering soldering iron) and the World chip proves to be U/S, AVTEK will replace same for you F.O.C.

Any repairs should not entail more than 14 days down-time for the modem according to AVTEK. AVTEK describe the Multi-modem (in kit form) as being ideal for private line use and Amateur Radio operators for Packet Radio. The modem is also available fully built and tested and it can be LEGALLY plugged into any 'phone socket to replace your standard 'phone. It comes complete with telephone hardwired into the modem. This version cost \$349 in November.

The implication is clear - the kit is not legal for connection to your telephone outlet. The kit version does however use the necessary to keep Telecom engineers happy and nasty bites out of the 'phone lines. Be warned however of soldering where angels fear to tread. The Telecommunications Act prohibits the connection of any equipment to the public telephone lines except for Telecom approved devices and equipment leased from Telecom. The kit form modem uses a Telecom-approved line isolation transformer and follows relevant guidelines separating the power and line connections and matching the impedance of typical telephone lines. However it is NOT A TELECOM APPROVED DEVICE.

Readers wishing to secure Telecom approval for the unit once built should contact the Regulatory Branch, Data Division, Telecom Australia Headquarters, 199 William Street, Melbourne, for an application form and details of the documents which must be submitted with the application. A fee is payable for type approval testing.

I found the modem particularly easy to assemble and instructions/description provided (with updating as they have been making improvements) clear and easy to follow.

I was not happy with the delay in receiving the kit. It took 16 days to arrive registered surface mail after posting my mail order. Packing left something to be desired - the transformers (power and line isolation) were not secured and protected well enough and as they moved around inside the package, they left scratches on the PCB. I had to check very carefully for open circuits and felt this spoiled what was clearly a very pretty PCB produced by Digital Graphics.

AVTEK (for obvious reasons), make no attempt to describe how the modem is connected to a telephone line although the circuit is easy to follow and the appropriate connection points are clearly labelled.

Teething troubles on final assembly proved a little difficult to track down. The initial test involved switching in the analogue loop back facility whereby the modem will receive on the same frequency as it is transmitting. With the CPU in the line communications mode, the modem will echo back the transmitted data in full duplex operation. The test failed as the handshaking lines (DTR & RTS) were not set. I found the modem would operate with only three lines (TXD, RXD & SIG GND) connected to the RS232C interface leaving the handshaking floating. I could not specify the correct handshaking parameters under LDOS as setting CTS & RTS together produced a confliction. Later I reasoned that if I specified DTR once the communications software had initialised and then requested to send (RTS), then I would be able to produce the clear to send (CTS) response from the Am7910 which would then enable the TXD/RXD. Note DTR = Data Terminal Ready. (Your end is the data terminal, the host is the Data Set.) Pin 2 connects to pin 2 and 3 connects to 3 at each end of the cable between RS232 and the modem. The RS232 board supplied by Tandy must be switched to the communications mode otherwise these connections are effectively reversed. (This is done by use of the onboard slide switch.)

The LDOS command: SET \*CL TO RS232R/DVR (DTR,RTS), cured the problem with handshaking however I found I was still unable to access the (AMUG) bulletin board. Surprisingly, I could access Outback RCPM in Darwin and the Computer Ventures BB. The kit offers a good deal of control over signal levels and after checking for cross-talk, distortion and frequency, I found that the master crystal was 700Hz high. Dividing down from 2.4576 MHz, the pass band frequencies under CCITT V.21 would only be out by about 30 Hz. I reasoned that with narrow pass bands and insufficient overlap of pass bands between the AMUG and my modem, the difficulties I had observed could be accounted for. A 20 pF cap, inserted in parallel with the Xtal pulled the frequency back into the operating "window". Although the crystal frequency was high, the adjustment did not fix the problem. The fault was cured by specifying the exact same parameters selected under hardware configuration, ie: SET \*CL TO RS232R/DVR (W=8,B=300,S=1,P=N,DTR,RTS).

It remains a mystery why these parameters need to be specified for the AMUG BB to the exclusion of all others! More important however is that the modem didn't appear to be at fault; I have put it down to a software bug which I can live with.

The total complement of control/data lines utilised on the RS232 interface includes:

Pin no.	Description
1	Frame protective ground
2	TXD - Transmit Data to data set
3	RXD - Receive Data from data set
4	RTS - Request To Send (from data terminal)
5	CTS - Clear to send (to data terminal)
6	DSR - Data Set Ready (from data set)
7	GND - Signal Ground
8	DCD - Data Carrier Detect (to data terminal)
11	BRTS - Back channel (RTS)
12	BDCD - " " (DCD)
13	BCTS - " " (CTS)
14	BTXD - " " (TXD)

- 16 BRXD - " " (RXD)
- 20 DTR - Data Terminal Ready (from data terminal)
- 22 RI - Ring Indicator (to data terminal)

The presence of back channels facilitates access to Viewdata systems such as Prestel with split 1200/75 baud rates. This could be a very desirable feature when Viewdata systems become more widely established in Aust. Furthermore, it will allow you to play the part of a Viewdata host computer and enable you to communicate with owners of dedicated Viewdata modems. This could be of interest to people who have friends/relations/business contacts back in "the Olde Dart" where Prestel is commonplace. Communicating at 1200 baud would represent a considerable saving in time and expense with modem owners who are otherwise locked out of systems other than Prestel.

The Tandy RS232 board of course does not support back channel operation. Simple hardware links overcome this problem if you wish to implement these limited forms of full duplex operation.

The "Multi-Modem" in conjunction with the appropriate software is able to automatically answer the telephone and originate calls. (This might be a handy feature if you would like to have the computer call the BB at regular intervals during periods of high activity). It is an ideal device for prospective owners of bulletin boards and private systems such as small businesses might like to set up with branch offices.

In summary, I can thoroughly recommend this modem to any computer hobbyist who is interested in learning more about computer interfacing to communication systems, any hardware hackers who don't mind the challenge of kit construction or micro users who are keen to access BBS's overseas and are currently stumped by incompatible modes.

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## Model III Self-Booting Disk using NEWDOS/80

*by Leonard Yates*

(with a little help from Gary Bryce).

Back in the August 1984 issue of SYDTRUG NEWS, Gary presented an article on creating self-booting disks using NEWDOS/80. The Model I mods worked well but, as he said at the end of the item, had not been verified on the Model III. Well, to get a Model III data disk to self-boot, you'll have to proceed as follows (I'll make this complete so you don't have to refer to the original article):

1. FORMAT a data disk and copy the /CMD file to be made self-booting to it. If it's the only file on the disk (apart from BOOT/SYS and DIR/SYS), chances are it will have only one extent (as revealed by DIR dnl A). If it has more than one extent, it's probably more than 32 granules long (Super Utility 3.2 is the longest program I've been able to self-boot).
2. Using the DFS option of SUPERZAP, note the DRS of relative sector 0 of the /CMD file on the data disk. Next, using the DD option of SUPERZAP, and responding with the drive number and DRS noted above, record the TRS and TRK (in HEX) of the /CMD file on the data disk.
3. Using the DFS option again, zap FRS 1 of BOOT/SYS (of the data disk) as follows:  
Byte 05 - TRS of /CMD file (will be 05H if it's the only USR file on the disk, and hence won't need to be changed).  
Byte 3E - change from C8H to C9H.

Note: If the /CMD file is the only USR file on the data disk, TRS will be 05H and TRK will be 00H. BOOT/SYS is normally set up to load SYS0/SYS which always occupies from sector 05 of track 0; for a non-system (data) disk, the first USR file will occupy this space. Note also that on NEWDOS/80 system and data disks for the Model III, sector 1 of BOOT/SYS is a duplicate of sector 0 (required for booting on the Model IID. These changes are made to sector 1 only. Further, if your /CMD program is the only USR file on the data disk, the only zap needed is to byte 3E of FRS 1 of BOOT/SYS.

4. Mount the self-booting data disk on drive 0 and press RESET. The disk will BOOT and the /CMD file will load and execute.
-

## The Comm Line

by Michael Cooper

Hi there communicators. This issue as well as the usual BBS News and Tutorial, I will describe how you can use LDOS for Host work.

### **CLUB-80 BBS News**

At the time of writing (16th. Nov) the system has received 2330 Calls. Many of the callers are interstate and spend some time acquainting themselves with the facilities provided. Most request an Information Kit on our group, which is duly forwarded.

Membership of CLUB-80 now stands at 67, with a new rush of members over the last two months. This is very encouraging, as the service is now starting to realise it's potential. Due to the specialised nature of the TRS-80 machines, and the restrictions on access by all and sundry, the BBS still has plenty of free time available.

Early mornings (before 8:00) are a good bet, and during the day until 4:00 pm too. After that the demand rises rapidly. If you can stay up until midnight, that seems to be the popular time to download some goodies from the Library.

That brings me to newcomers who wish to take or leave files in the CLUB-80 Library. Please note that you must use the "Christensen Protocol" to transfer them. If you use MODEM80, then the options are R or S. Files are sent in numbered blocks, with a checksum. Any blocks detected in error are retransmitted up to 10 times. The program does most of the work, but if you are not sure how to do it correctly, please ask me or someone with the experience. The software will give a diagnostic error message if anything goes wrong. Consistent block errors point to a bad phone line. Some MODEMS seem better than others, if you want an opinion, just ask me at the meetings (ED. Note: or read the article on modems in this issue).

We still have not succeeded in interfacing the new 80 Track drive as drive #1 in the Model 3. Hopefully Gary Bryce and I will be able to solve the mystery as to why it doesn't all work correctly. As a temporary holding action I have moved some of the files to other drives, but they will only fill up even faster as a result (ED. Note: I have managed to get the drive working, and as of the Saturday the 17th all appears OK).

I am attempting to complete a new terminal driver program that will allow any screen width from 40 to 80 columns. As usual though, I have so many other tasks requiring immediate attention that a delay has occurred. The job is about half done, as once I complete the driver I then have to reconfigure the system I/O to suit.

### **SYSTEM STRUCTURE**

CLUB-80 BBS is designed to operate within an LDOS environment. This is to simplify the implementation of the HOST software. One of the features of LDOS that make it a superior operating system is the device independence. This allows you total flexibility in the way you can set up the system I/O. In the case of CLUB-80 I needed to include a communications link to the operating system, but still protect the integrity of the applications programs and files.

The Standard Devices in LDOS are :

\*KI = Keyboard

\*DO = Video Display

\*PR = Printer

\*SI = System Input (Unassigned)

\*SO = System Output (Unassigned)

\*JL = Job-log (Unassigned)

LDOS comes supplied with a Serial Device Driver for use with the RS-232 Port. The Model 3 version of this driver ( RS232T/DVR ) is very sophisticated, with an input buffer of 128 bytes and interrupt handling of incoming characters. To set the driver for use with a MODEM you must specify the Baud Rate and Byte configuration.

SET \*CL TO RS232T (B=300,W=8,S=1,P=N,DTR,RTS)

This will create a new device called \*CL (Comm Line) that uses RS232T as its driver program. The parameters passed in the parentheses set Baud Rate = 300, Word length = 8 Bits, Stop Bit = 1, No Parity Bit, sets DTR and RTS to logical "TRUE". Now by connecting a MODEM to the RS-232 Serial port you have a pathway for data to and from the Telephone.



The remaining task is to connect the \*CL device into LDOS. This can be achieved in several ways, but in this case we want to use the system in remote mode, so we connect \*CL to the \*KI (Keyboard) device for input, and to \*DO (Display) device for output. In LDOS this is done by:

LINK #CL #KI <ENTER>      LINK #CL #DO <ENTER>

This permits any request for keyboard input via \*KI (Keyboard) to be serviced either by the keyboard of the HOST machine or via MODEM through \*CL. Any character output to \*DO (Display) will also be sent to \*CL and thus to the MODEM, this provides the ECHO.

As an added bonus, the LDOS Type-ahead Keyboard Driver allows double buffering of all input via \*CL. Data from the MODEM is fetched by the interrupt handler as soon as it arrives, and buffered until the next scan of the typeahead routine. The data is then buffered for use by the \*KI driver when needed. To complete this operation, the whole of high memory and the DCB's are saved in the CONFIG file for loading at Boot. All is now prepared so the computer can be used remotely via the phone. All the programs it will run can be written in BASIC and do whatever you want.

The CLUB-80 software is written in L<sup>B</sup>ASIC and the programs run in "EXEC" mode (Level 7) to afford maximum protection from tampering. As an added protection a FILTER program is used on the \*KI (Keyboard) device to check that the system hasn't somehow dropped into DOS READY or BASIC READY. If the FILTER finds this condition true, the system is rebooted to disconnect the current caller before they can play around.

Well it seems that the tutorial on using the Mail Room will have to wait until next issue. I will also try and describe the Supervisor used in CLUB-80 to run the system. Until then, happy Telecomputing.

## Gamers Corner

by Keith Black 516-3673

This month STAR TREK 3.5 by Lance Micklus. You are the commander of the star ship Enterprise. Omega VI is an unexplored area of the galaxy. It is known to have several class M (earth type) planets, several large stars and black holes, a pulsar, and star bases. It has recently been invaded by Klingon warships. Other than that, little is known about Omega VI.

**You are to explore the entire Omega VI region and collect as much data about it as you can in your ships computer. You must locate all the class M planets, orbit them and beam down landing parties to collect more data.**

You must destroy all Klingon warships, and do all this and return to star fleet HQ by star date 2500. There are 192 quadrants, the galaxy is three dimensional (8 x 8 x 3). Each quadrant is made up of 64 sectors are two dimensional (8 x 8). Star fleet is at quadrant 7,7,2, docking at this base concludes the game.

There are 20 Klingon warships, 5 class M planets. Four quadrants contain either black holes or class O stars, Entering these will destroy the Enterprise. There is one pulsar, and because it gives off so much radiation, all the quadrants surrounding it cannot be scanned by long range sensors.

```

THE MAIN MENU: 0 Status.                1 Damage Control.          2 Science Computer
                3 Ship Computer          4 LR Sensors               5 SR Sensors
                6 Impulse Engines        7 Warp Drive              8 Phasers
                9 Photon Torpedoes       10 Alert                  11 Repair

```

The game is not an easy one to play but you will enjoy it as you get use to the commands, the screen will be packed with data and should be easy to understand.

TOP SCORES:	Apple Panic.	39,570	Brian Osborne.
	Arex.	167,310	" "
	Cosmic Fighter.	146,000	" "
	Galaxy Invasion.	148,910	" "
	Hamburger Sam.	48,200	" "
	Meteor Mission 2.	47,090	" "
	Outhouse.	172,422	" "
	Scarfman.	181,360	" "

**Well that's it for another Month, more scores please and ANY REVIEWS please. Good Gaming**

## The Prophet and Oracle Speak.

*by Rowan Evans & Larry Lewis*

At last we have some questions to answer on LDOS!! The first one comes from a Newdos 80 user, who wants to know "How to configure LDOS, and what all the /DVR and /FLT files do", and the second from a TRSDOS 6.x user who wants to access the system status flags from within a BASIC program.

### **Configuring LDOS.**

The first thing that should be done to configure LDOS for the system you use is to list the options that your system needs - e.g. Double Density, Printer Driver, etc. The easiest way to do this is to list your current Newdos configuration, or if you don't use Newdos, your hardware and its requirements.

#### **1. Using an existing Newdos system configuration list.**

I have listed the Newdos configuration options below and their LDOS counterparts. Items marked + cannot be SYSGENed under LDOS. Items marked \* can be done if a driver or filter is written.

- + AA = Password enable - LDOS passwords are always enabled, with the option of a "Global" password to allow access to ANY file (password is "RS0LT0FF").
- AB = Run only - this is possible under LDOS by forcing a non-breakable AUTO with the SYSTEM option BREAK=N.
- AC = Debounce routine On/Off - LDOS does its debounce through the KI/DVR, so by disabling it, debounce is disabled.
- AD = "JKL" screen print On/Off - This is also a function of the KI/DVR.
- AE = "123" invokes debug - press <BREAK> instead once debug is activated.
- AF = "DFG" invokes minIDOS - install LDOS' MINIDOS/FLT then by pressing <CLEAR> and then another key, several minidos functions are available -

- <CLEAR> + "C" - Clock on/off.
- <CLEAR> + "D" - Enter Debug.
- <CLEAR> + "F" - Free space on all active drives.
- <CLEAR> + "K" - Kill a file.
- <CLEAR> + "P" - Send a character to the printer.
- <CLEAR> + "Q" - Directory of selected disk drive.
- <CLEAR> + "R" - Repeat last DOS command.
- <CLEAR> + "T" - Send form feed to printer.

- AG = Break key status - use LDOS' command SYSTEM (BREAK=ON/OFF).
- AH = Not defined in Newdos 80 version 2.
- AI = Lower case modification installed in computer - LDOS senses this automatically at power up/reset.
- AJ = Keyboard intercept routine active (debounce on/off, repeat on/off and 'JKL', '123' and 'DFG' are activated solely by interrupts) - the LDOS \*KI driver is used to activate these functions, either SET \*KI KI/DVR or RESET \*KI.
- AK = Not defined in Newdos 80 version 2.
- AL = Number of drives on the system - use LDOS' command SYSTEM (DRIVE=n,ENABLE/DISABLE) to set the correct number and address of the drives in the system.
- \* AM = number of retries for disk I/O - only possible to alter if you write a driver routine for a specific drive there are several example disk drivers published in various magazines.
- + AN = default drive for the directory command - LDOS doesn't allow this, instead typing just DIR will give the directories for ALL currently mounted (and enabled) disk drives in the system.
- + AO = first drive to write a default file to (ie where the user has not specified the drive number in the command) - LDOS allows this via the SYSTEM (DRIVE=n,WP) command to software write protect any drive that you don't want to write a file to.
- AP = DOS high memory value to be inserted at bootup - use the LDOS command MEMORY (HIGH=X'nnnn') then do a SYSTEM (SYSGEN).
- AQ = CLEAR key enable/disable - no equivalent function in LDOS apart from the \*KI driver.
- + AR = password enable/disable for full disk backup - LDOS does not allow the enabling and disabling of passwords like Newdos 80, however the LDOS BACKUP can be subverted to allow the full disk backup of a disk with an unknown password.

- \* AS = BASIC converts quoted strings to upper case - no equivalent function in LDOS.
- + AT = do files will only accept string input requests from the /JCL file, single key inputs will be requested from the keyboard - LDOS /JCL files do not allow this, however the LDOS JCL does allow for //KEYIN and //INPUT to get keyboard input during execution of a do file.
- \* AU = repeat key function on/off - no equivalent function in LDOS.
- \* AV = wait for specified number of milliseconds before repeating the last key held down - no equivalent function in LDOS.
- AW = write with verify disk I/O retries - no equivalent function in LDOS.
- \* AX = number specified is that of the highest printable ASCII character to be sent to the printer - this can be done through an LDOS filter.
- AY = ask operator for time and date on/off - LDOS allows the time and date questions to be bypassed (under version 5.1.x) by using the commands SYSTEM (DATE=ON/OFF) and SYSTEM (TIME=ON/OFF).
- AZ = force the operator to re-input time and date after reset on/off - no equivalent function in LDOS.
- BA = reset disables VDU display on/off - this can be done by doing a ROUTE #DO NIL and then a SYSTEM (SYSGEN).
- \* BB = 50/60 Hz clock notification - see TIME50 in the LDOS Quarterly Vol 2 Number 5 page 22 to fix the Mod III real time clock. NOTE - this notification does NOTHING under Newdos 80 - refer to the manual!!!
- BC = operator pause/cancel chaining on/off - no equivalent function in LDOS.
- + BD = operator override of AUTO command on/off - done in LDOS when the AUTO command is set up by issuing the command - AUTO #command.
- \* BE = enable/disable dos 'R' repeat command - can be done by patch to MINIDOS/FLT if desired.
- BF = lower case driver activate - not needed.
- BG = set keyboard to lower case - done by pressing (SHIFT) + 0 and then doing SYSTEM (SYSGEN).
- BH = enable/disable cursor blinking - use the command SYSTEM (BLINK=ON/OFF) or SYSTEM (BLINK=LARGE/SMALL).
- BI = set the cursor to specified character - use the command SYSTEM (BLINK=(ASCII value)).
- BJ = system speed up control - use the LDOS command SYSTEM (FAST/SLOW) which not only changes the timing loops like Newdos, but also will change the CPU speed if the speed mod is addressed through port 254 and is switched on using 1 and off using 0.
- BK = enable/disable command WRDIRP and the W and C functions of DIRCHECK - no equivalent function in LDOS as the disk format from Mod I to III to 4 are IDENTICAL in double density.
- BM = enable/disable separate verify pass during format - no equivalent function in LDOS.
- + BN = write single density disk data address mark for either Model I TRSDOS or Model III Newdos 80 - use the LDOS utility REPAIR (ALIEN).

2. Having chosen the required configuration alternatives, install them into LDOS by issuing the necessary commands.
3. When you are certain that all your chosen functions are operational, type SYSTEM (SYSGEN) to get LDOS to create a configuration file and write it to drive 0. Please note that EVERYTHING in high memory (including SYSRESed /SYS files) will be included in this file, so ensure that you have sufficient room on the floppy to save the file.
4. Once the configuration file is written, power down and then back up again to get a cold start of the system. I have found that some configurations will appear OK if a warm start test is done, but not if a cold start test is done - particularly if the disk is a SOLEd double density boot disk.

A typical configuration for a system with 3 drives is -

```

PDUBL - for double density.
SET #KI KI (TYPE,JKL) - type-ahead, JKL, etc.
SYSTEM (BLINK=143) - blinking block cursor.
SYSTEM (DRIVE=3,DISABLE) - drives 0, 1 & 2 only.
SYSTEM (DRIVE=2,STEP=1) - drive 2 is 12 m/s step.
SYSTEM (TYPE) - activate type-ahead.
FILTER #KI MINIDOS - activate MiniDOS.
FILTER #PR PR (ADDLF) - add linefeeds to printer.
ZSHELL - Misosys command processor. etc.
```

Then type -

SYSTEM (SYSGEN).

I guess after using up all this space, I'll hang the Mod 4 question over to next month - sorry Gary!

Rowan Evans.

---

## Print Head Positioning on the ITOH 8510

by Alan Hatfield

reprinted from Canberra Micro-80 Newsletter

Several newsletters ago there was a report on an Itoh 8510 workshop at which the problem of print head positioning was raised. Briefly, on the 8510 (and possibly on other printers ??), it is possible to tab the print head forwards across the page to print characters or addressable dots using the ESC,F,nnnn sequence to locate the head before printing. However it has proved impossible to do the same backwards across the page without getting a linefeed to the next line each time. Several people have been concerned about this problem as both forward and backward positioning on the same line is needed if a simple and flexible algorithm for plotting graphs and curves is to be developed.

The impossibility of getting same line reverse head positioning has recently been confirmed by Ray Barrington of Bega. To overcome the problem he has suggested a relatively simple algorithm to forward and reverse feed each time to stay on a given line. This approach is virtually the same as that developed by several other 8510 owners. It is not very elegant but it does the job and seems to be the only means available to do the job. Apart from lack of elegance, it also means that the feed motor on the printer platen is almost constantly in motion. However few people are going to be doing so much plotting that this will be a real problem.

A small program demonstrating the approach is reproduced below. It prints five sequential numbers backwards on the same line. While it is specific in purpose, the actual print algorithm (lines 220-270) should be able to be generalised to any situation.

For all that, if it is possible to plot by right movements only (as for plotting say a sine curve) then a simpler algorithm could then be used with consequent reduced activity by the platen feed motor.

Any further suggestions to overcome this problem would be appreciated.

```
100 ' * * * name ..... PLOT/BAS
110 ' * * * purpose ... Demo of Itoh 8510 head positioning
120 ' * * * date ..... 31/12/83
130 '
140 ' aim of demo program is to print sequential numbers
150 '     backwards on the same horizontal line.
160 ' Numbers to be printed ev
170 '
180 ' *** Set initial values
190 DEFINTI-N : DEFSTRX-Z : XL=CHR$(27)
200 ' *** Main program
210 FOR I=1 TO 5 : GOSUB 230 : NEXTI : END
220 ' *** S/R to print a sequential number
230 GOSUB 290: ' Position print head
240 LPRINT I: ' Print number in calculated position
250 LPRINT XL+"r": ' Reverse linefeed
260 LPRINT XL+"f": ' Forward line feed
270 RETURN
280 ' *** S/R to position print head
290 NZ=10000+100*(6-I): ' (Algorithm to calculate
300 ZL="F"+RIGHT$(STR$(NZ),4): ' ( position of head
310 RETURN
```

---

## Using your Modem at 1200 BAUD.

by Geoff Radcliffe

Bored with communicating at 300 baud? Want to shift up a gear and work that data link four times as fast? Well here is the answer. This article assumes you are using an AVTEK MULTI-MODEM and Modem80 as a communications program.

Normal 300 baud full duplex operations work on the principle of one set of frequencies for send and another set of frequencies for receive. Unfortunately when you increase the speed to 1200 baud the bandwidth of a normal telephone line is insufficient to allow full duplex operation when using FSK (frequency shift keying). This mode of operation is known as SIMPLEX. (Full duplex operation at 1200 baud is possible if PSK (phase shift keying) is used, this is known as V22. Unfortunately there are no single chip devices available to do this at the moment).

To communicate at 1200 baud both the send and receive modems should be set to CCITT 1200, or if you experience difficulties due to poor telephone lines CCITT 1200 EQ. (NOTE: the Equalised mode only makes a difference to the RECEIVE modem).

The RTS (Request to Send) line is used to switch the modem from send to receive.

To SEND the RTS line must be ON (+ve).

To RECEIVE RTS line must be OFF (-ve).

Obviously if one end has RTS ON the other end must have RTS OFF. Control of RTS may be accomplished in two ways;

The software method requires that you have two versions of your communications program (or some way of controlling RTS).

A SEND version with RTS ON

A RECEIVE version with RTS OFF

In Modem80 at 9121H the byte controlling RTS is 6DH = RTS OFF, 6CH = RTS ON. (refer to page 30 of Modem80 documentation). Diagram A shows the required connections.

The hardware method for all you non-software types uses the circuit in diagram B.

The SPDT switch grounds RTS for RECEIVE (the modem assumes ground to be -ve), and puts RTS ON for SEND (the resistor to DSR is not required for an unmodified AVTEK modem as RTS is pulled ON internally via R2).

An important point to remember is that 1200 baud is the MAXIMUM speed at which the modem can communicate but data can be sent slower if required. i.e. you can run your terminal at any speed up to 1200 baud.

Whats this! still not satisfied? You want to go further into the unknown and wish to know about this 1200/75 'backward' channel stuff?. Be warned now it gets tricky. Even though there is not enough bandwidth on a telephone line to provide full duplex operation at 1200 baud there is just enough room to provide a slow speed 'backward' channel. This mode of operation is called HALF DUPLEX.

The MAXIMUM speed of the 'backward' channel is 75 baud - don't try to send any faster it wont work!. Now we come to the difficult part. As RTS is the send/receive switch for 1200 baud, BRTS is the send/receive switch for the 75 baud 'backward' channel. It is important to note that RTS and BRTS should NOT be ON AT THE SAME TIME as you cannot send both 1200 and 75 at the same time from one modem.

Unfortunately the handshaking and data lines for the 'backward' channel appear on different pins to the normal channel. So to use the 'backward' channel you will have to construct some hardware as described in diagram C.

In the AVTEK Multi-modem you will have to strap pins 11 and 19 (due to an error in the original PC board) on the DB25 connector at the rear. Also R2 a 10k ohm resistor will have to be removed (this resistor normally hold RTS ON and was originally included to allow a very simple connection to the Modem using only 3 lines. i.e. Receive data Send data and Ground ). Note once R2 has been removed you will always need to have control of RTS. The rotary switch in diagram C provides you with the following selections:

- 1) Send 1200/Receive 75
- 2) Send 75/Receive 1200
- 3) Normal for either 1200 Simplex or 300 Full duplex operation.

Note that an open circuit to RTS or BRTS is equivalent to OFF. A new version of your communications program will now be required to use the 'backward' channel. In fact you will again require two versions of the program, a Send version for use with the S1200/R75 switch position at the terminal which is going to send data and a Receive version for use with the S75/R1200 switch position at the terminal which is receiving the data.

Obviously the data will be sent at 1200 baud and the handshaking or slow speed communications will be at 75 baud. The locations of the baud rate bytes as given in the Modem80 documentation are: the byte at 9120H is normally 55H indicating 300 baud send/receive. To change to send 1200/receive 75 the byte should be changed to 71H. For send 75/receive 1200 change to 17H. From this it can be seen that the first part of the byte is the send and the second part is the receive speed.

The above changes will only work for the Terminal or Echo modes of Modem80, the ""R" and "S" commands will not work. Also you cannot change the speed. NOTE that when using the 'back channel' the RTS line from the terminal should be ON.

For Xmodem the baud bytes are at 6100H and 6102H  
FOR Host the baud byte is at 5229H.

The programs should now be saved with new names as described in the Modem80 documentation. To make it much easier for you there will be a program on the SYDTRUG BBS called MODEM12/ZAP which will automatically put these patches and more into your MODEL I/III copy of MODEM80/CMD.

In fact ALL the commands will work plus you will have control over RTS and DTR and will require just the one program for send and receive as well as full Christensen Protocol operation when in 1200/75 or 75/1200 modes.

Remember there are many more ways to play with 1200 baud (in software), the examples given are just one way. Well that's about all there is to it, if you are not hopelessly confused now you soon will be. But you will find its all worth it.

## CHANGING MODES ON THE AVTEK MODEM

When changing modes (speed) on the AVTEK Multi-modem DTR should be OFF to ensure reliable mode changes. In other words you should either turn DTR OFF in software or turn the modem off when changing modes.

I doubt you will ever experience problems when switching between similar speeds as in 300 Originate/Answer but you may have problems going from 300 to 1200 if the above recommendation is not adhered to.

## HINTS ON 1200 BAUD COMMUNICATIONS.

If you are not operating your Model I TRS80 with a high speed clock you will experience a loss of characters on the start of lines as displayed on the screen (they will be ok in memory). This is due to the time it takes to update the screen. To prevent loss of characters to the screen, use the command in Modem80 to turn off screen scrolling.

In Modem80 when communicating at 1200/75 the end receiving at 75 baud should be in the "Echo" mode and the end sending at 75 baud and receiving at 1200 baud should be in the "Terminal" mode. Both ends should be operating in the FULL DUPLEX mode.

The 75 LOOPBACK position on the AVTEK Multi-modem is only used for testing the 'backwards' channel and is not used in normal communications modes. The 'backwards' channel in the BELL 1200 mode is unsuitable for use as it is only capable of signalling at 5 bauds and is generally used only as a supervisory channel where the receive end looks for an ON or OFF state.

Remember in 1200 SIMPLEX only one end can send at a time. Also DO NOT assert RTS and BRTS at the same time on the same modem. If an AMD7911 chip is installed in the AVTEK Multi-modem the 'backwards' channel may run at speeds up to 150 baud.

Diagram .A

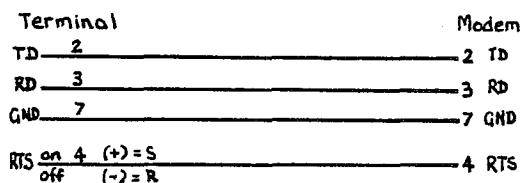


Diagram .B

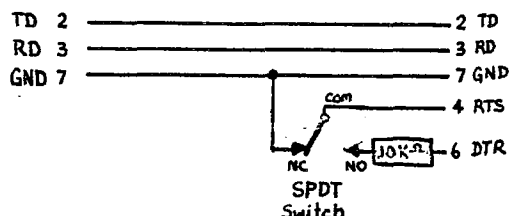
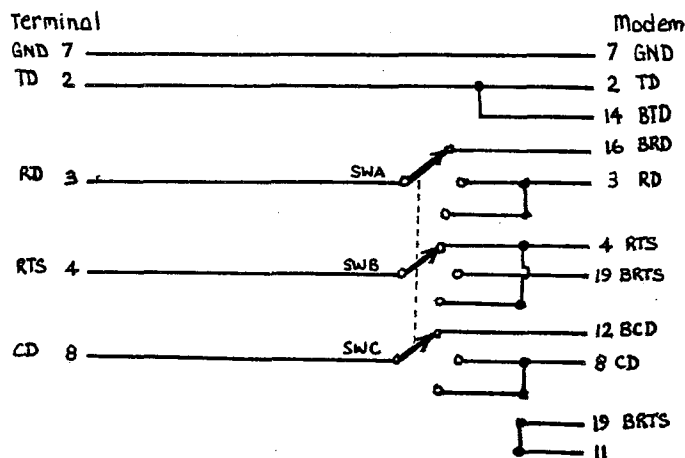


Diagram .C



**SWITCH POSITIONS** as shown in Send 1200 / RECEIVE 75  
 (Diagram .C.) center Send 75 / Receive 1200  
 down NORMAL 1200 simplex or 300 full

NOTE R2 must be removed in the Modem off the RTS lead, this resistor is only there so you don't have to have any more than 3 leads going to the Modem when using 300 FULL DUPLEX. It must be removed so that the OPEN CIRCUIT on RTS acts as an off.

## CONSTRUCTION HINTS.

The circuit of diagram C may be constructed in a 'jiffy' box with a RS232C connector on each end (one male one female) with the switch mounted on the lid of the box. This box is then inserted between the Modem and the RS232C cable. --- Good communicating Geoff.

ED. NOTE:- During the recent violent Electrical storms the club modem was one of quite a number around Sydney which was "Zapped" by the effects of Lightning. Geza Dujmovich has repaired the unit. The 'A' & 'B' relays had their contacts welded together and all IC's, including the AMD7910 modem chip, were blown.

The moral of this story is, "DISCONNECT YOUR MODEM FROM THE TELEPHONE LINE DURING ELECTRICAL STORMS", if you don't want it to end up in the same condition as our unit.

A point which was raised by Geoff Radcliffe while Geza was repairing the modem, was the possible instability of the voltage regulators in the power supply of the unit. The +ve and -ve three terminal regulators used in the modem can often be subject to oscillation. If your unit is suffering from this trouble all that is required to correct it is to replace the two 0.1uF capacitors (C14 and C16) on the output of the regulators with 1uF Tantalum capacitors.

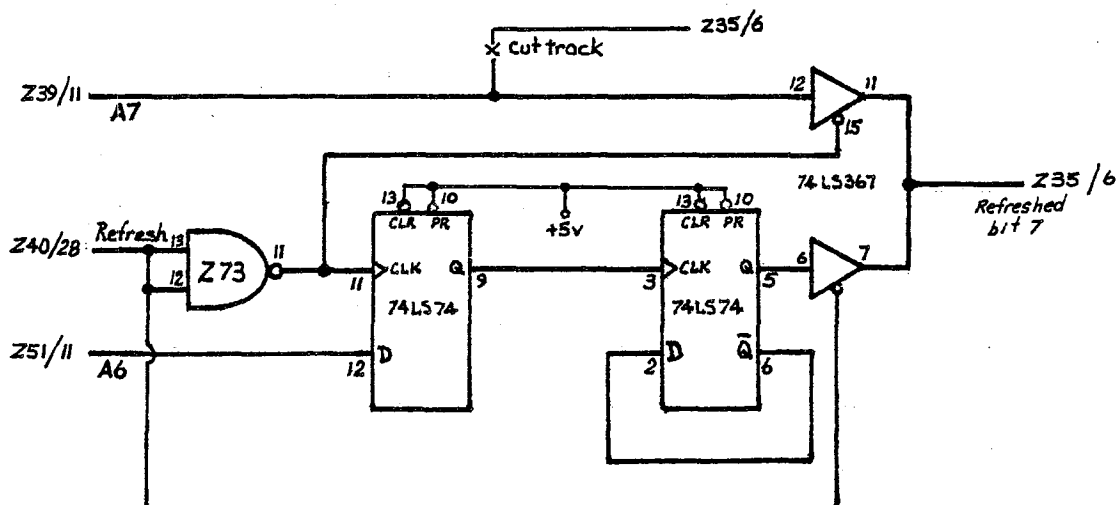
## Random I/O

with Dave Kennedy

While Errol Rosser went jaunting off to Adelaide recently, I was attempting to fit a bank of T.I. dynamic RAMS to a Model I. The only problem I was to discover (after buying the chips - admittedly at an excellent price) was that these chips require a full 256 cycle Refresh (unlike most others which only need a 128 cycle Refresh). Now the Z80 only provides a 7 bit refresh count (128 cycle) from the Refresh register, this appeared to make my RAMS useless to me until I came up with the circuit below, which will give a full 256 cycle count, by gating bit 6 back onto the address bus as bit 7 at the end of every second 128 bit cycle.

The connections marked on the circuit apply to the 64K DRAM modification by Errol Rosser which appeared in the May 1984 issue of SYDTRUG NEWS.

(See next page for circuit diagram.)



## Errata

Last months article on a memory upgrade suffered a couple of omissions. After step 11 it should have read :-

A Resistor (4.7Kohms) should be soldered between pin 15 of each bank piggybacked on Z20 to pin 16 of Z21 (+5v). The decoder chip should be a 74LS156 (not LS155 as marked).



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