

# SYDTRUG NEWS

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## A HIGH QUALITY CHARACTER SET by Michael Cooper

474 Bourke St, SURRY HILLS N.S.W. 2010

Most high quality video terminals use a three line descender in their character sets to improve the readability and help to avoid some smear. The main obstacle to a three line descender in the TRS-80 or SYSTEM-80 is the video output section because the hardware blanks this row from the display. However, a hobbyist from Melbourne has worked out how to modify the video output to allow for a three line descender. For only \$12-90, Don McKenzie will supply a 2716 EPROM with the character set burnt in and instructions on how to fit it. I sent away my cheque, and four days later my GENDON 3 chip arrived. The instructions consist of 2 pages, the first one dealing with the addition of the extra memory chip to enable bit 6 of video RAM, the second covers the modifications to the video output section for either the Model 1 or SYSTEM 80.

Those of you who may have installed the early lowercase conversions for the TRS-80 display will be well aware of the limitations in the lowercase set. The character generator chip used, whilst perfectly adequate for the standard uppercase display, revealed a number of faults in the remainder of the character set. Firstly, there was the weird assortment of symbols occupying ASCII codes 0 to 31, then there was the infamous raised "a", and lastly there was the lack of descenders on the lowercase characters "g,j,p,q,y". To overcome these limitations a number of conversion kits appeared on the market, all containing a replacement character generator. These kits were little more than a switch, one \$2.50 memory chip and the character generator. Tandy themselves changed to a new type of character generator, which had single line descenders. This was available as a spare part for something like \$40. This same chip was available in the U.S. from outside suppliers for \$15, however all supplies of this generator soon dried up leaving the Tandy supplied chip as the only direct pin to pin replacement. Soon hobbyists began to program their own EPROM's to contain a suitable character set. These used a two line descender for the "g,j,p,q,y", but because of the design of the video output stage in the Model 1 it was necessary to move the character set dot matrix up by one row. This is the current state of the art, with both Tandy and Dick Smith using this principle.

To achieve a three line descender, Don has needed to redesign the video output to allow for a change from a five by eight dot matrix to a six by twelve. This is accomplished by isolating Z10 pin 14 and cutting the trace from Z27 pin 11 to Z26 pin 12. Z26 pin 12 is then bridged to Z26 pin 13, and the isolated Z10 pin 14 and Z12 pin 11 are connected to the new character generator EPROM. Well, that all looked simple enough in theory, but how would I do in practice. The first problem was removing the original character generator chip, which Tandy had thoughtfully soldered to the board. Out came the old solder sucker, and soon I had a bunch of 18 empty holes on the main logic board. I then mounted a 24 pin socket on a small piece of matrix board and soldered a wire to each pin except 16, 17, 18, 20 & 21. Pins 18 & 20 were both bridged to pin 12 (GND), and pin 21 was bridged to pin 24 (+5V). I then attached the matrix board to the main logic board, just below the two filter capacitors, using some double sided tape. The rest was easy, soldering each wire to one of the empty holes left by the old character generator chip, with the exception of pin 5 which goes to Z12 pin 11 and pin 15 which goes to Z10 pin 14. The whole job took about an hour to complete.

The end result has left me with a pleasant and much cleaner video display at an all up price of \$16. The shape of the character set is better because of the greater matrix used, my only reservation being the underline character which Don has substituted with a small graphic block. This looks great in Level 2, but some users may prefer the original character as it is used to display input field lengths in some software. I am going to approach Don to see if this can be changed. If you are handy with a soldering iron and wish to improve the quality of your character set then I feel the GENDON 3 modification is the best available, despite the cheap price. Interested members can write to Don McKenzie at 29 Ellesmere Crescent, Tullamarine 3043 or phone him after hours on (03) 338 6286

"SYDTRUG" USERS GROUP IS SITUATED AT:-  
1120 Botany Rd Botany N.S.W. 2019  
Of course, I burnt Michael a special GENDON 3 DASH  
VERSION.