

VZ-200 TERMINAL

With the addition of a low cost V.21 modem this project will get your Dick Smith VZ-200 talking to the world! Designed and developed by the DSE Research and Development team at North Ryde, the ETI-695 must be the cheapest way to get a 300 baud glass terminal going yet.

THE VZ-200 was very good 'value for money' when it was released by Dick Smith Electronics a few years ago. The last batch sold was heavily discounted and no doubt many were snapped up by ETI readers, especially RTTY enthusiasts after the ETI-756 RTTY adaptor appeared in Nov/Dec '84. This project extends the VZ's capability to operate as a 300 baud serial terminal. Although the VZ-200 is no longer available the unit will also work with the latest VZ-300 computer which has an improved keyboard.

Construction

The pc board is designed to fit into a VZ expansion case which adds a professional finish to the project and is recommended. The case needs a bit of surgery to mount the DB-25S connector, so mark out the cut at the back of the 'top' half of the box (the

larger piece). The connector sits flush with the lip of the half-case. Drill the two mounting holes for the DB-25S and screw it in with the 12 mm x 4BA screws and nuts.

Check over the pc board before commencing construction, look for broken tracks, bridges and undrilled holes. The prototype pc board has been tinned and had a couple of holes covered by the solder. These are best handled by heating the spot with a soldering iron and a bit of solder wick, if you try and force the component leads through such blocked holes you run the risk of lifting the copper away from the board and breaking bits off.

Start off by soldering in the ten wire links. One of them is near a mounting hole and should be bent around the hole to leave it uncovered, the other nine links should be straight and tight.

The 44-way edge connector can go in

next. It mounts from the component side of the board (of course). The solder tails should be pushed through the board so that the bottom of the plastic part of the connector is flush with the copper side of the pc board. This is necessary to fit the finished pc board correctly into the case, so make sure the connector is aligned before soldering.

Some of the resistors mount on their ends. Be careful not to bend the leads too close to the resistor body to avoid breaking the leads off.

Solder in the capacitors before the diodes, since the two electrolytic caps are a

PARTS LIST — ETI-695

NOTE — A complete kit of parts can be obtained from your Dick Smith store.

Resistors..... all 1/4 W, 5%

R1, 2, 3, 4, 10	4K7
R5, 12	1k
R6	33k
R7, 11	10k
R8, 9	3k3
R13	2k7

Capacitors

C1, 2	100n ceramic
C3, 4	10n polyester (greencap)
C5, 6	100μ 16 V RB electrolytic

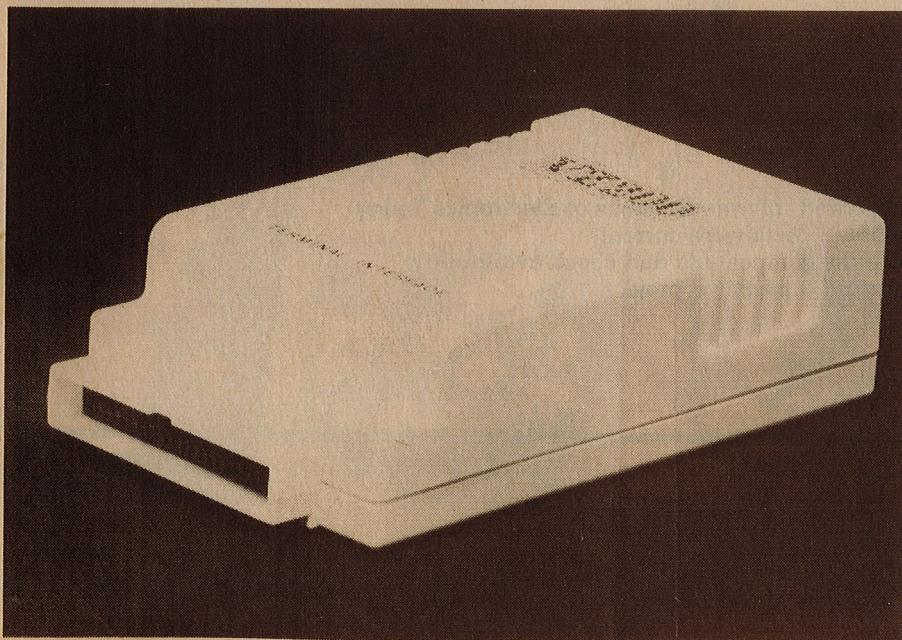
Semiconductors

IC1	74LS138
IC2	2516 "VZRS" EPROM V1.5 or later
IC3	74LS74
IC4	74LS33
IC5	'555 timer
Q1	BC548
Q2	BC557
Q3	BD139 or BC639
D1, 2	1N60 Ge diodes
D3	1N914
D4, 5	1N4002

Miscellaneous

Printed circuit board "VZRS232"; VZ expansion case; 44-way female edge connector right angle pcb mounting; DB25S chassis socket; 2 x 12 mm 4BA screws and nuts; 24 pin DIP IC socket; tinned copper wire, hookup wire, solder, etc.

Price estimate: \$49.95



wee bit close to diodes D4 and D5, which mount on their ends.

The two smaller transistors Q1 and Q2 can go in next, followed by Q3 which should be bent over if it is a BD139, as in the photograph. Solder the IC socket and the four ICs being careful to avoid solder bridges between the pins.

The three wires to the DB-25S connector were brought to the copper side of the pc board on the prototype; you may wire from the component side if you prefer before soldering.

Place the bottom half of the case down and push the 44-way connector through the slot in the end with the copper side of the pc board uppermost. Align the two pc board holes with the mounting pillars and fit the top half of the case. Finish with the case screws and the project is ready to test.

Testing

Make sure your VZ-200 is operating properly before connecting the project. The interface plugs into the memory expansion port which is the largest on the back of the computer. Power should be switched off while inserting or removing the unit.

Testing is best done with a 300 baud terminal (or another computer emulating one) otherwise you will have to call a friend or bulletin board with a modem. To actually communicate you have to enter the terminal

SOFTWARE OPERATION

The VZ terminal interface is totally software based. This text is to serve as a functional description of the operation of this software.

The software resides in an EPROM on the interface board and maintains a data area in RAM at 8000 hex. In this data area are the flags and values used by the terminal software. At power-up these values are set to pre-defined values of 8 data bits, 1 stop bit and no parity. The unit is 300 baud only.

After the power-up sequence has been completed, the software goes into a loop waiting for keyboard input from the user. At this time the user can select one of seven menu options, these are:

- 0) go to the terminal;
- 1) select full/half duplex;
- 2) toggle printer output on/off;
- 3) set number of data bits (7 or 8);
- 4) set number of stop bits (1 or 2);
- 5) set parity (odd, even or none);
- 6) set lf to cr option

If the user has selected one of the options 1-6, the appropriate action is taken and displayed on the screen. If option 0 is selected the software goes into terminal mode.

If the user selected option 0, the system begins looking for either keyboard input or incoming serial data. If a key has been pressed on the keyboard, then the software gets the value of that key, determines if it is a 'return to main menu' key (shift-x); if this is so it returns to the main menu, otherwise it sends the character to a routine that decodes it into bits and sends it serially to the interface hardware. It also adds start, stop and, optionally, parity bits. If the duplex option is set to half, it will echo to the screen as well.

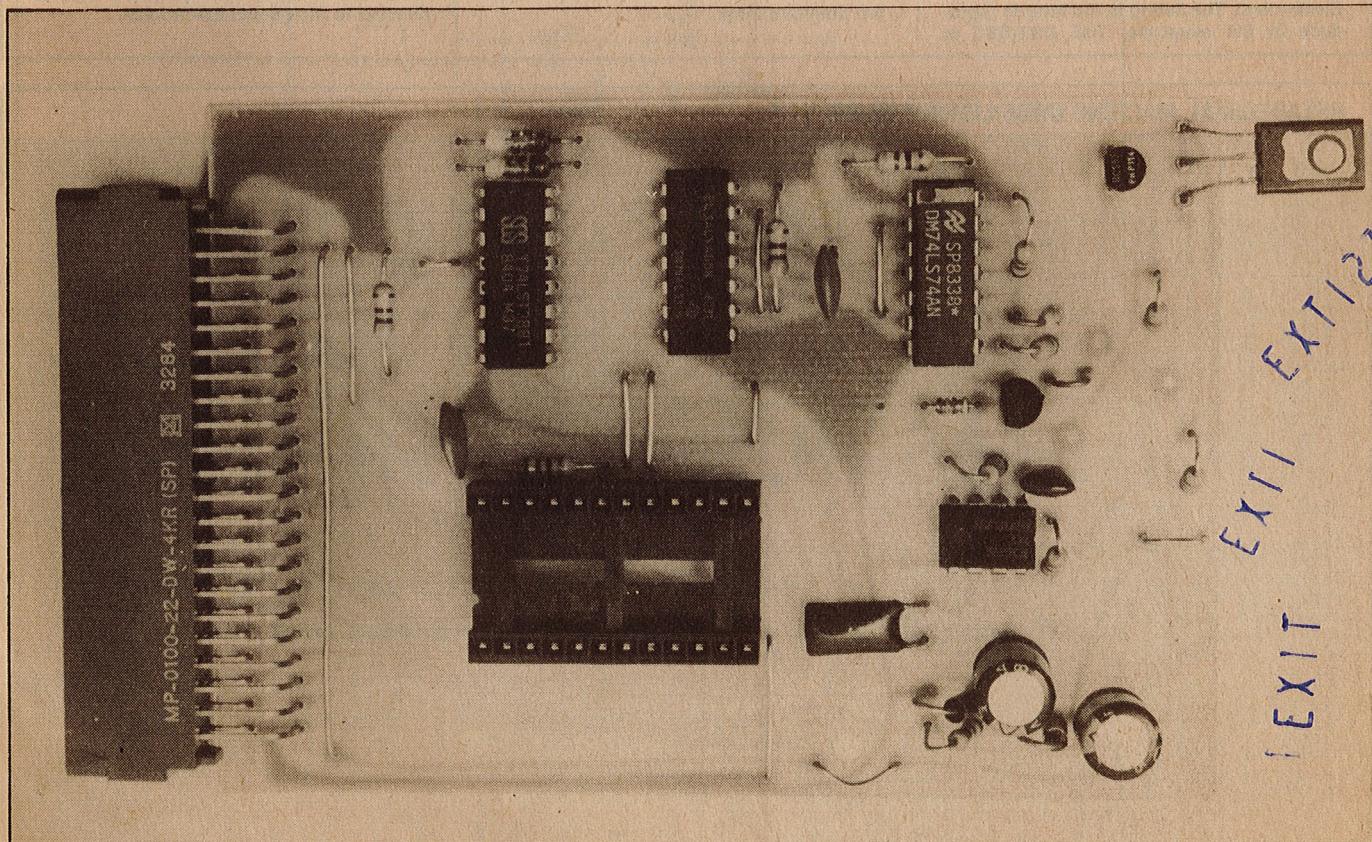
If incoming serial data is found (by detecting a transition from a stop to a start bit), the software goes into a loop, reading bit seven of a port and encoding the incoming serial data bits into a byte, taking due consideration to the state of the start bit, stop bit(s) and optionally the parity bit. After a valid character is assembled it is sent to the screen and optionally to the printer.

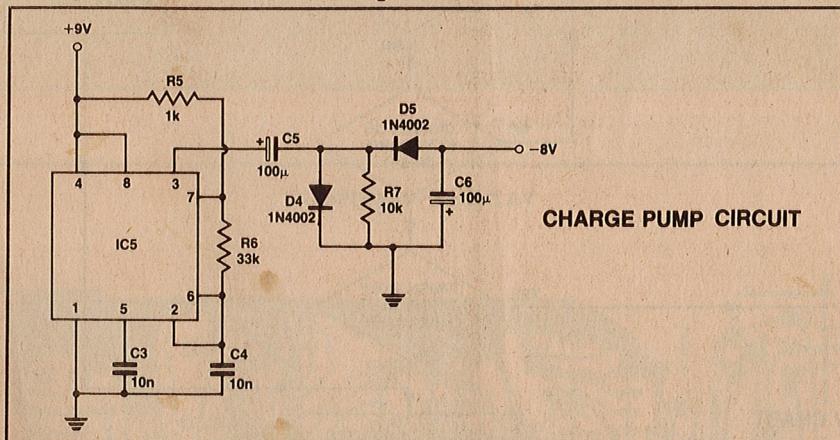
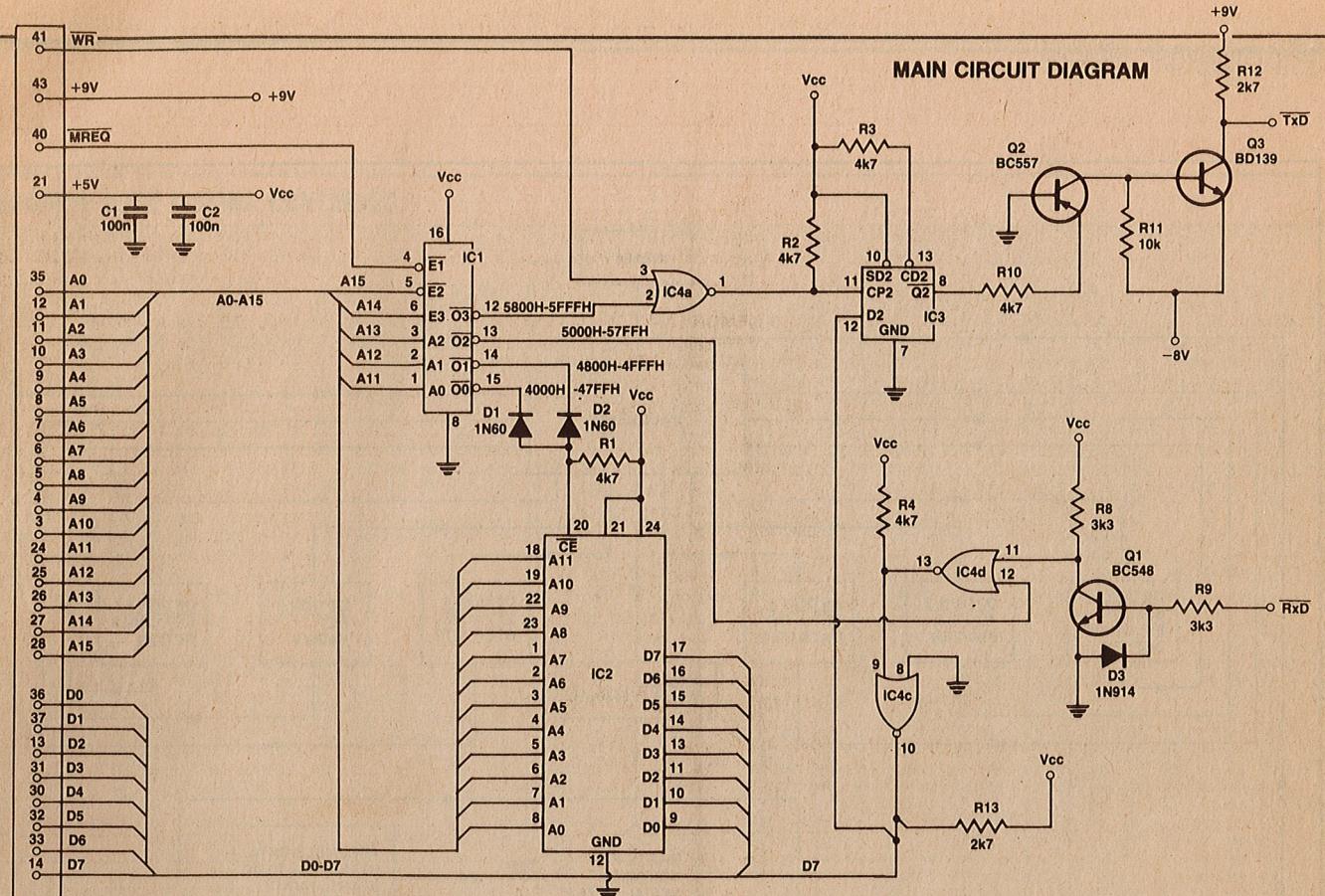
The terminal operation continues until it detects a shift-x key, at which time it returns to the main menu.

mode from the menu by typing 0.

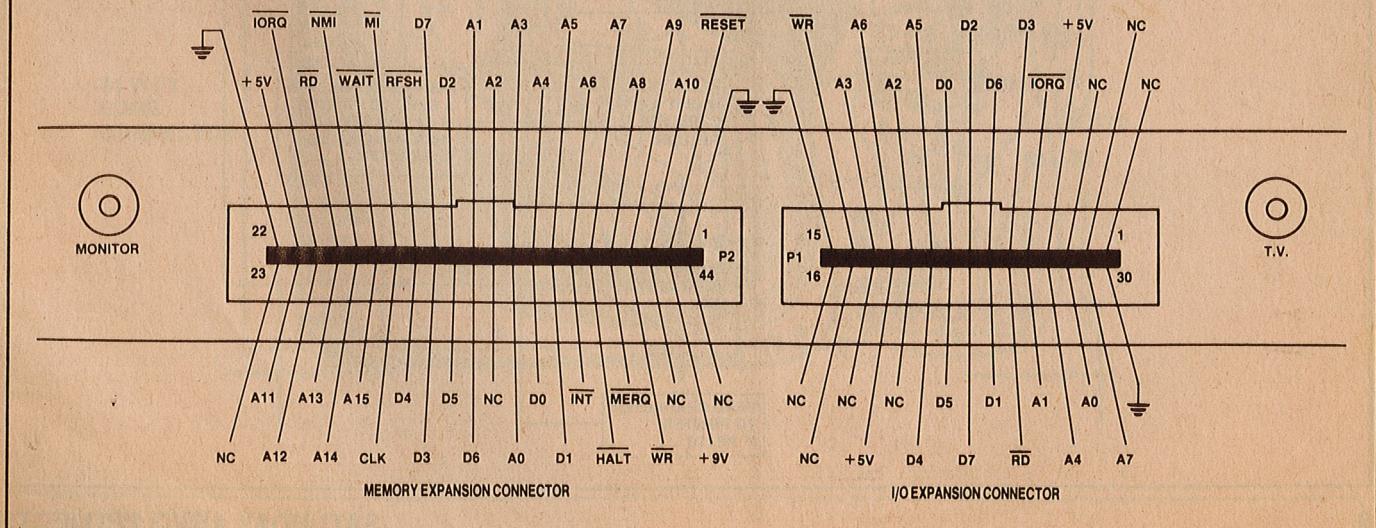
Providing the character length, parity and stop bits are identical you should have no trouble using the ETI-695 as a simple terminal.

We had some problems using the printer echo command with an Admate DP-80 printer using version 1.5 of the VZRS EPROM. This may be fixed in later versions, after our publication deadline.





VZ-200 REAR PANEL LAYOUT



Project 695

