Drive a compact car? Build this . . .

Remote display for the Car Computer

Been wondering where on earth you were going to mount the Car Computer in the crowded instrument console of your late-model compact? Well, here's an easier answer: Dick Smith Electronics has developed a neat little remote display/control option, which houses all main functions in a box only 110 x 70 x 50mm.

by JAMIESON ROWE

Coming at a time of steadily rising petrol prices and heightened awareness of the effect of poor driving habits on fuel consumption, EA's Car Computer project has created a tremendous amount of interest. Judging from the many enquiries from our customers regarding DSE's kit for the project, there are obviously many motorists keen to use it to monitor the performance of both their car and themselves.

The only problem is space. Considering the complex functions it performs, EA has squeezed the Car Computer into a remarkably compact case – it measures only 205 × 158 × 65mm. But this is still rather big when you are talking about mounting it somewhere in, or on, the instrument console of a compact modern car.

Quite a few customers have told us that they'd love to build up the Car Computer and try it out, but they just couldn't fit it into their car's console in a position where it could be used conveniently.

As soon as this problem became apparent, the technical people in our kit department started looking at the Car Computer to see if they could find a solution. After a bit of head scratching, they came up with an idea that I think is pretty neat. It's a remote display/control option, housed in the same tiny 110 × 70 × 50mm box used to house the June 1979 Car Clock kit (H-3194).

This box is so small that you should be able to fit it easily into almost any instrument console! Even sitting on the top, it's so tiny that it won't cause any problems.

Inside the box is a second set of four LED displays, which is wired in parallel with the one in the main unit so that it duplicates the Computer's readout. Or if you wish, the display LEDs in the main unit may be left out, so that the remote display works alone. If the main unit must be mounted under the seat or somewhere else out of sight, this would be a sensible move as it will give a brighter readout on the remote display.

Also in the remote box are five pushbutton switches, which are again wired in parallel with five of the buttons on the front panel of the main Computer.

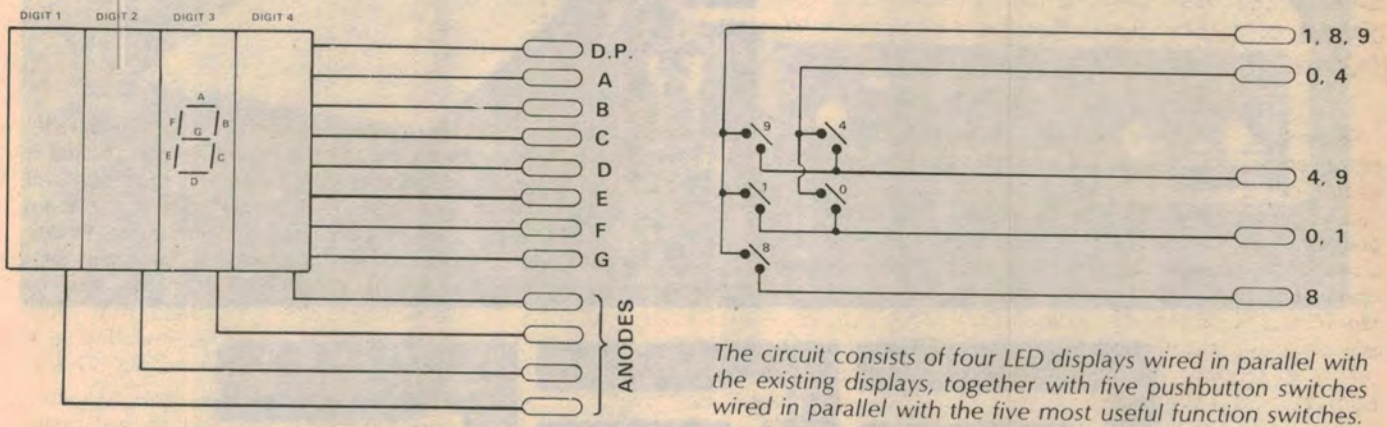
Although there are 12 buttons on the main unit, two of these are used only for initial calibration and another three are used only at the start or finish of trips. This leaves only seven, and of these five tend to be used more than the other two during typical driving. These are Hour.Min or Time (0), Litres or Fuel (1), l/100km or Consumption (4), Remaining (8) and Average (9).

It is these five buttons that are currently extended to the remote box. However you don't have to stick with these five if you don't wish. You can use the five buttons in the remote box to perform any of the functions, just by altering the connections. And if you really must have more than five buttons on the remote box, there's room to add at least four more alongside those already there. In short, there's quite a lot of room for individual variations.

Assembling the remote box is very straightforward, as all the parts are supported by two small PC boards which also perform most of the wiring. The larger of the two boards mounts the four 7-segment LED displays, while the smaller board mounts the five

The remote display option is housed in a small plastic case measuring 110 × 70 × 50mm. Unit is compact enough to mount on virtually any dashboard!

Five functions are duplicated on the remote display unit: hour.min, litres, l/100km, REM and AV (average).



The circuit consists of four LED displays wired in parallel with the existing displays, together with five pushbutton switches wired in parallel with the five most useful function switches.

pushbuttons. Or more strictly, it forms part of the pushbuttons, as these use conductive plastic pads to link electrodes etched on the PCB itself.

As you can see from the overlay diagram for the display PCB (Fig. 2), the only things to mount on the board apart from the displays themselves are four wire links. These go underneath the displays, and therefore must be fitted to the board before mounting the LEDs.

It's even simpler with the switch PCB, as you can see from its overlay diagram (Fig. 3). There's no actual wiring at all if you elect to use the buttons for the same five functions as we have nominated. You'll only have to cut tracks and add additional wiring if you want to change their functions.

Connecting the remote unit up to the main Car Computer is also very straightforward. All you need is a length of 17-conductor ribbon cable. One end of the cable is wired to the connection points on the two remote unit PCBs, while the other end is wired to the corresponding points on the front panel PCB of the main unit. The correct connection points are shown on the accompanying overlay diagram (Fig. 1).

Using "rainbow" ribbon cable for this job helps you make the connections without errors. After making the connections at one end, jot down the colour coding you have used on a piece of paper. Then just follow the same coding at the other end, and Bob's your uncle! (as the saying goes – I've never been sure why this is relevant, even though I do have an uncle named Bob).

By the way, if you don't like the idea of the remote unit permanently connected to the Car Computer, you can cut the cable and use a suitable plug and socket combination. Although they're not cheap, a DB-25 plug and socket would be very suitable. These are sold through Dick Smith outlets as P-2690 for the plug and P-2691 for the socket, with a matching backshell for the plug available as P-2682. You could mount the socket

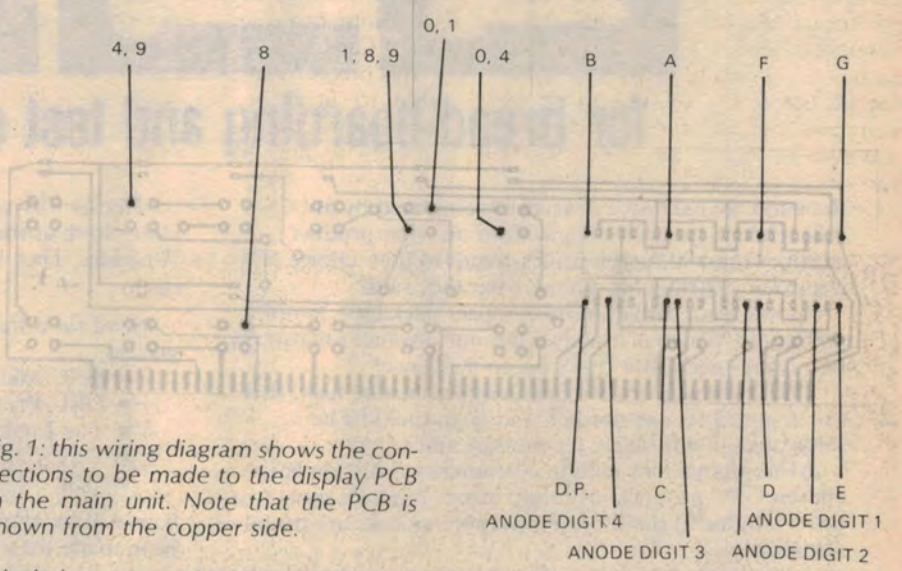


Fig. 1: this wiring diagram shows the connections to be made to the display PCB in the main unit. Note that the PCB is shown from the copper side.

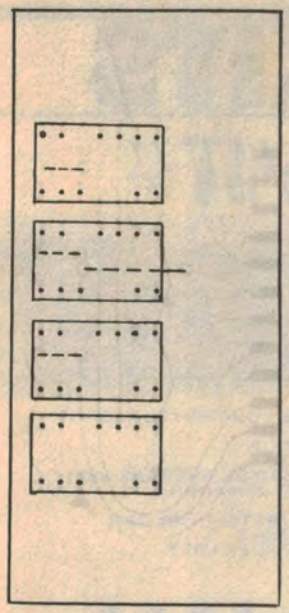
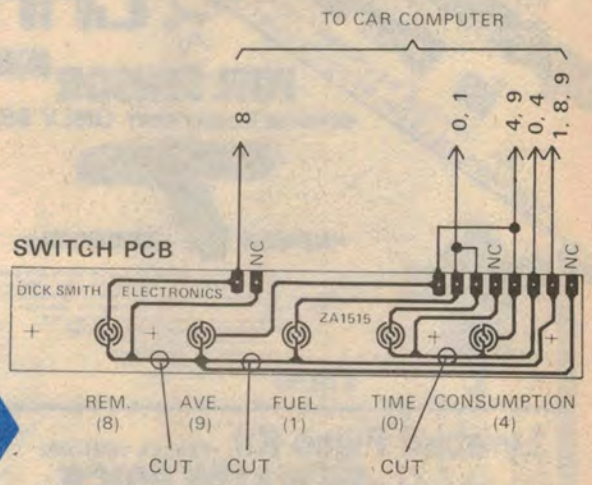
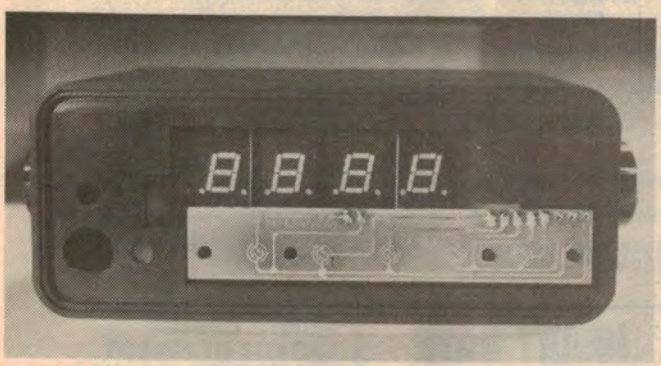


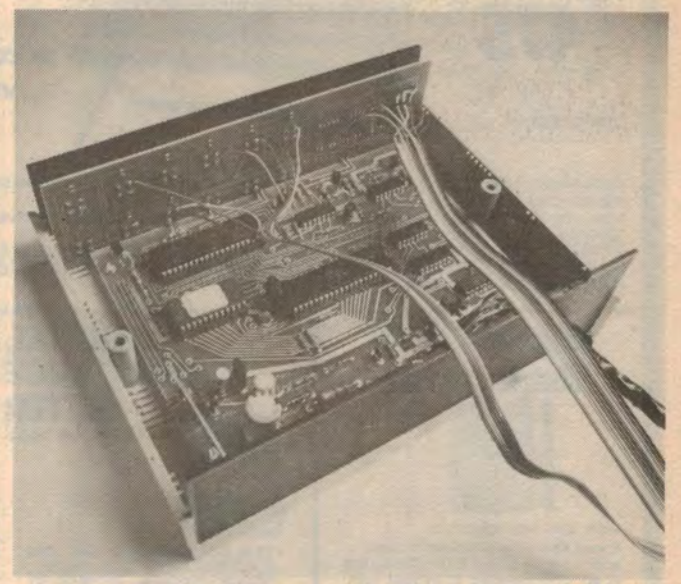
Fig. 2: parts overlay for the display PCB. When you attach the rainbow cable, write down the colours in the space provided. This will help you when you assemble the connector and also when you solder the wires to the back of the display PCB inside the Car Computer.

Fig. 3: wiring details for the switch PCB. Note that the copper pattern can be cut in three places if you elect to use different switches. Do NOT cut the tracks if you elect to use the same switches (ie 0, 1, 4, 8 and 9).





This view shows the prototype with the front panel removed to reveal the LED displays and the switch PCB.



Right: connections to the display PCB in the main unit are run using 17-conductor rainbow cable. Cable entry is via a slot filed in the top of the rear panel.

on the back panel of the main unit, with the cable from the remote unit terminated in the plug.

Just remember that if you use a plug and socket, you'll be doubling the chances of making a mistake with the connections. So you'll need to be twice as careful!

Extra switches

Note that if you want to add some extra buttons to the remote unit, you'll need some conventional miniature pushbutton switches. The low cost S-1102 buttons available from all Dick Smith outlets would be ideal. To mount them in the front panel you'll have to make matching 7mm diameter mounting holes, lining these up neatly with the existing buttons.

Whether or not you decide to leave the displays out of the main unit is entirely up to you. It'll probably depend on where you're planning to mount the main unit in your car, and the likelihood of you changing to a larger vehicle where you may not need the remote unit. Even if you leave them out, you can always add them in later on if you wish.

That's about it. Like all good ideas, the remote display/control option is really very simple and straightforward. It's also pretty low in cost, too, at only $19.95. But the most important thing is that it should allow many more people to obtain the advantages of a Car Computer in their car – no matter how small!