

80 CHANNELS FOR THE ICOM IC22S

Most of you will have seen or heard the new Icom IC22S rig which is the latest version of the popular IC22.

Whereas earlier IC22's used crystals, two for each channel required, the IC22S uses a Phase Locked Loop Synthesizer. Unlike other synthesized rigs, the IC22S uses a conventional 22 position switch wired up to a diode matrix inside the unit. Up to eight diodes are used for each channel that you require, in a combination unique to that channel.

An IC22S was purchased and fitted to the car and many contacts were made on the various channels fitted, namely seven repeater and three simplex. Other operators were then heard QSYing to various "private" channels and other channels which were not programmed into the IC22S.

The thought occurred that this could be done on the IC22S by using an external programming unit to select the required channel in addition to those already programmed into the rig.

Thus facilities similar to other switch programmable rigs could be obtained. In the case of the IC22S, all 25 kHz channels in the WIA band plan can be "dialled up".

After examination of the IC22S circuit, and a couple of hours of thought and doodling, it was apparent that three switches, to dial up the frequency required, would have to be decoded with logic circuits to set up the required diode pattern in the rig.

To select any 25 kHz channel from 146 to 148 MHz, it is apparent that 80 combinations of the 8 diodes in the IC22S must be manipulated by the logic circuit. Since the rig already uses CMOS chips in

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the synthesizer, it was decided to also use CMOS in the external programmer unit.

No attempt will be made to explain exactly how the circuit works, step by step, as this is beyond the scope of this article.

In use, to use the programmer, position 22 on the IC22S channel switch is selected, which makes available the eight diode positions in the matrix to the 9 pin socket at the rear of the IC22S. The +9V supply via channel 22 position is also wired to the socket. Earth is obtained through the ground return of the car. The programmer may be left plugged in at all times since it is only activated when the channel switch is set to position 22. Current drain is about 5 mA.

The three switches on the programmer are used to select the required channel. Frequency is read directly from the switch positions.



IC22S with Home Brew Channel Synthesiser.

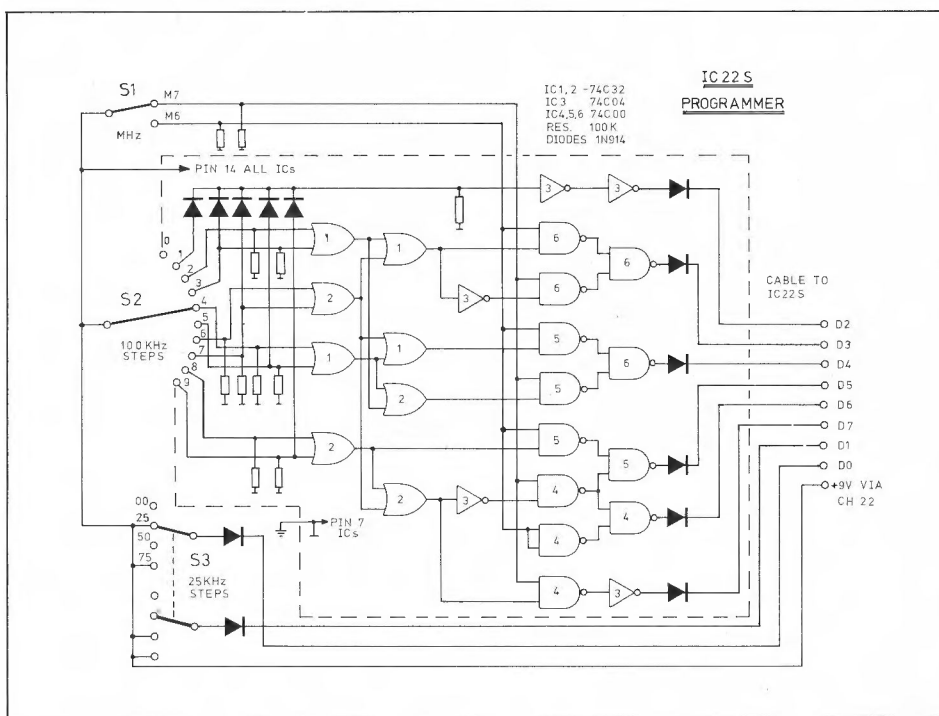
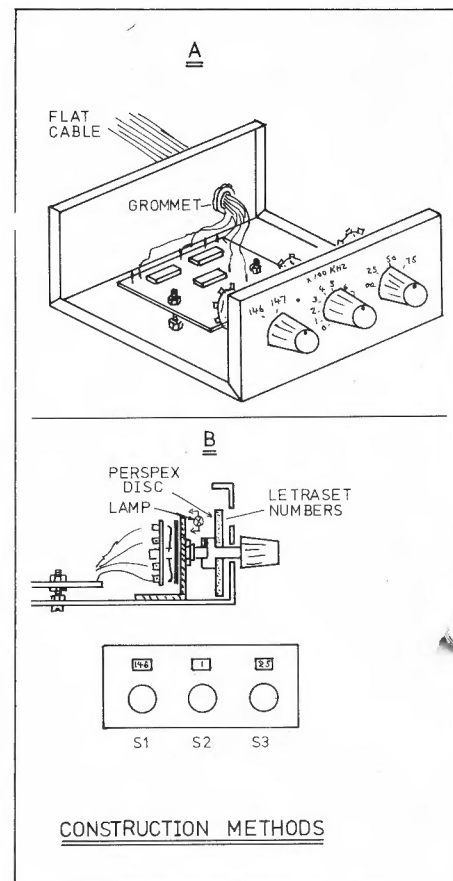
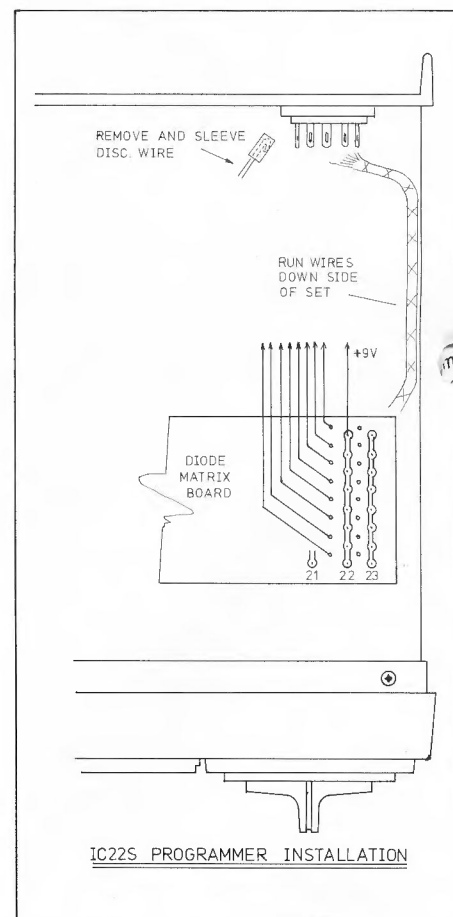
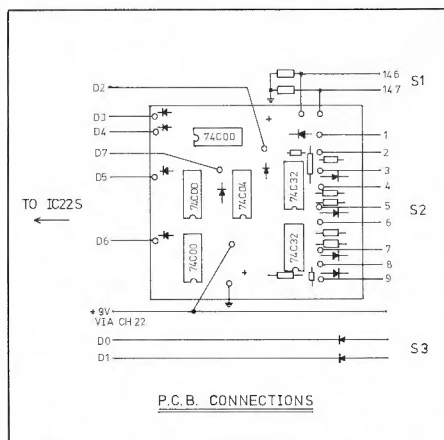


FIG. 1: Above.

Fig. 2: Right.

The whole logic circuit is built up on a double sided printed board approximately 3 in. x 2.5 in. and is mounted in a small aluminium case with the three switches on the front panel. This box can then be mounted in any convenient position in the car. A suggested position would be under the IC22S attached to the cradle support bracket.

A digital readout of the frequency selected could also be made but this was rejected on the grounds of cost and the doubtful advantage to be gained.



All of the CMOS chips are readily available and cost about 40c each. The switches are standard Oak types, or similar, and are, in fact, the most expensive parts in this project. Thumbwheel switches could be used but are expensive and difficult to manipulate whilst mobile.

Total cost of the unit should be less than \$15, according to the state of the "junk-box".

After constructing this unit, it was found that a similar unit is available in the US (N.B.: 15 kHz steps though) and retails for US\$75. Its' easy to see the advantages of home brewing!

Construction is simply a matter of soldering the appropriate bits into the board, connecting the switches, mounting in a box and plugging into the IC22S. Ten way flat ribbon wire can be used to connect to the IC22S. **NORMAL HANDLING PRECAUTIONS WITH CMOS SHOULD BE TAKEN AS A SAFEGUARD**, although no damage to any chips was made when constructing the prototype.

The IC22S is modified slightly by removing and taping the discriminator wire from the accessory socket and wiring the eight diode positions to the socket along with the +9V rail from position 22 on the

channel switch. This point is also made from the diode matrix. That's it. These mods can be easily removed later if you wish.

Actual coverage of the unit, as presented, is all 25 kHz steps from 146.000 to 147.975 MHz inclusive.

PLEASE NOTE:

THIS UNIT CAN ONLY BE USED ON THE IC22S AND NOT ON THE EARLIER VERSIONS OF THE IC22. Sorry.

If sufficient people are interested, a printed circuit board will be made available, at cost. Probably about \$5, depending on quantity made. ■