

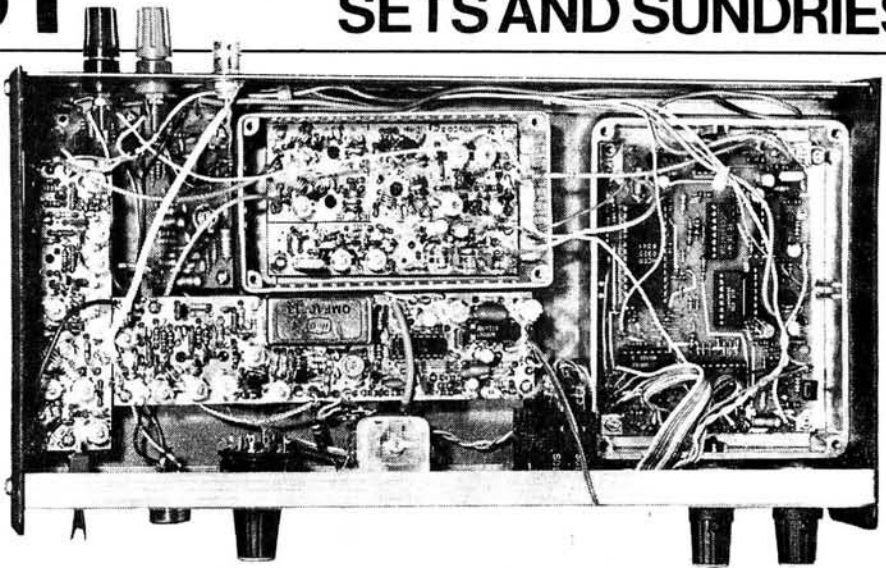
## WOOD & DOUGLAS 430MHz Synthesiser Kit

I approached the idea of this review with a mixture of uncertainty—not understanding the “nitty-gritty” of synthesiser design—and enthusiasm. It seemed an interesting way to expand my u.h.f. horizons. I was pleased to note that the kit was collected from the “normal” pile of kits, not from a special drawer marked “review kits only”, so clearly Wood & Douglas had faith in their packing efficiency.

The construction notes warn that it is quite an advanced project, not to be undertaken lightly, and if the constructor is in doubt, to send it back and buy a ready-built module. It is good to see a warning like this, and it made me read the instructions thoroughly before proceeding. This proved essential as there were one or two modifications that needed to be noted sooner rather than later.

The kit contains the synthesiser, v.c.o., receiver, shortened transmitter strip, modulator, and solid-state relay for the supply switching. I decided to build the synthesiser first. There were two packs of components, one containing most of the components, the other the i.c.s and sockets. These should always be used in projects of this nature, and it is nice to see them provided. Indeed W & D warn that they will only service units fitted with i.c. sockets. The printed circuit boards were of excellent quality, drilled, with no omissions. The main i.c. used is the 0320 by Hughes Microelectronics and featured in the Don Lancaster *CMOS Cookbook*. This is a versatile device and well exploited by Wood & Douglas in this kit.

It is worthwhile sorting out the components, rather than picking them out at random, it being very easy to confuse say 100Ω with 1kΩ when in a hurry. The instructions give clear directions on the order of construction and if followed no problems should be encountered. A useful component check list was included which noted any changes, but my kit had ended up with four 10μF electrolytic capacitors and one tantalum capacitor, rather than the other way round. A quick look at the circuit diagram showed that the tantalum was best suited to the filter, and the others weren't critical, so that was how they were used. I didn't bother to check the transistor pin-outs, being



The completed 430MHz synthesiser rig

content to trust the overlay diagram, which didn't let me down.

I feel that perhaps a rather obvious general warning ought to be included about ensuring components don't touch tracks on the component side of the double-sided p.c.b. I found C5 and C11 a bit close and bent them away. There are four through-board links to be made, as well as one link wire by IC7, and this could have been a bit more clear on the diagram as there are two holes available. It is the hole nearest to IC7 that is used.

The construction section is followed by seven paragraphs of setting-up procedure, the first three of which were accomplished easily. The fourth however proved a problem as it needed the v.c.o. which I had not built yet!

No problems were experienced—or so I thought—in building the v.c.o. My only minor gripe was that L9 had been changed so the drawing was incorrect, but still easily understood. The setting up went superbly until I tried to peak up the 5MHz (approx.) output. Nothing was appearing and after many frustrating hours a phone call to Wood & Douglas revealed that I had put the BF981 in upside down. Take care with this four-legged device; it worked when I put it in the right way round so it must be quite robust, but check its orientation—twice—not like me. Tuning up then proceeded very smoothly, and no problems were encountered linking it to the synthesiser board, and the system locked up nicely.

The receiver was reviewed in *PW* (Oct '80) so it won't be repeated here. Suffice it to say that the circuit has to be slightly modified for external oscillator drive, and this proved to be very easy. It tuned up with no problem at all, and was extremely sensitive.

Though the transmitter was also reviewed in *PW* at the same time it was not in fact used with this kit, because Wood & Douglas provide a “shortened transmitter strip”, taking the 20nW, 144MHz signal from the v.c.o., tripling it and amplifying up to 500mW. The only omission in the kit occurred here, one resistor, so almost full marks to the packing department—certainly many times better than some kits I have built.

At the risk of being repetitive, this, along with the solid-state relay and the modulator, worked first time. The p.a. is tuned up with the output coaxial lead in one position, followed by the output filter, with the coaxial lead in its final resting place. The other end of the lead then connects to the receiver where there is an effective diode switch to avoid the use of relays. When all was connected the TX was delivering approximately 800mW.

The unit was built into a Centurion DX4 case, and with the v.c.o. and synthesiser in individual die-cast boxes it was a tight fit, but looked extremely smart. Wood & Douglas recommend the use of a case with as few separate sections as possible to avoid problems with parts of the case not making a good earth connection. There were a few microphonic hiccups but these were soon ironed out, and the casing was, indeed, the cause.

Feeding into a dipole I was amazed to find six repeaters suddenly available to me. The spectrum analyser revealed a nice clean signal, and audio reports were extremely favourable. The 70 PAC2 kit costs £128 inc. VAT plus 75p post from **Wood & Douglas, Unit 13, Youngs Industrial Estate, Paices Hill, Aldermaston, Reading RG7 4PQ. Tel: 07356 5324.** GALBW