

HUFF & PUFF IN PRACTICE

CHARLES FLETCHER, G3DXZ, was interested in the June *TT* item on PA0KSB's improved huff and puff stabiliser, and decided to give one a try. He writes: "As a constructor over many years of L/C VFOs, like most other constructors I have been troubled by the variability in stability of virtually identical oscillators. PA0KSB's circuit looked like a miracle solution. So I built a purposely poor stability oscillator using ceramic plate capacitors in order to test the huff and puff stabiliser. I achieved the following results: over an hour's run of a 5MHz VFO with the stabiliser the measured drift was less than 2Hz. The drift without the stabiliser was 750Hz.

"Once an original design has been published, it is relatively easy to make minor improvements and/or simplifications. Fig 1 shows my slightly simpler version, together with measured circuit parameters, of this super design. I feel that this form of stabiliser should become a routine addition to L/C oscillator designs which need high stability. I can't think why this outstanding contribution by PA0KSB did not appeal to me when the first version appeared in 1973!"

Several readers have pointed out that the "corrected" diagram of PA0KSB's circuit ("Technical Correspondence" *RadCom* August 1996, p80), still repeats some errors. The PIN numbers for IC1 should be the same as for IC2 and not as shown. PIN3 of IC4 should be connected to +5V and not to ground. Readers still having problems can send me (QTHR) a large SASE for further information.

Without in any way taking credit from PA0KSB, I recall that in the late 1960s I wrote up in *Electronics Weekly* a stabiliser intended for use with existing communications receivers developed (and explained to me) by Keith Thrower of Racal (called the Racalator) which used a rather similar approach. As by then the new generation of communication receivers were beginning to use frequency synthesisers, I suspect that the Racalator did not become widely used.

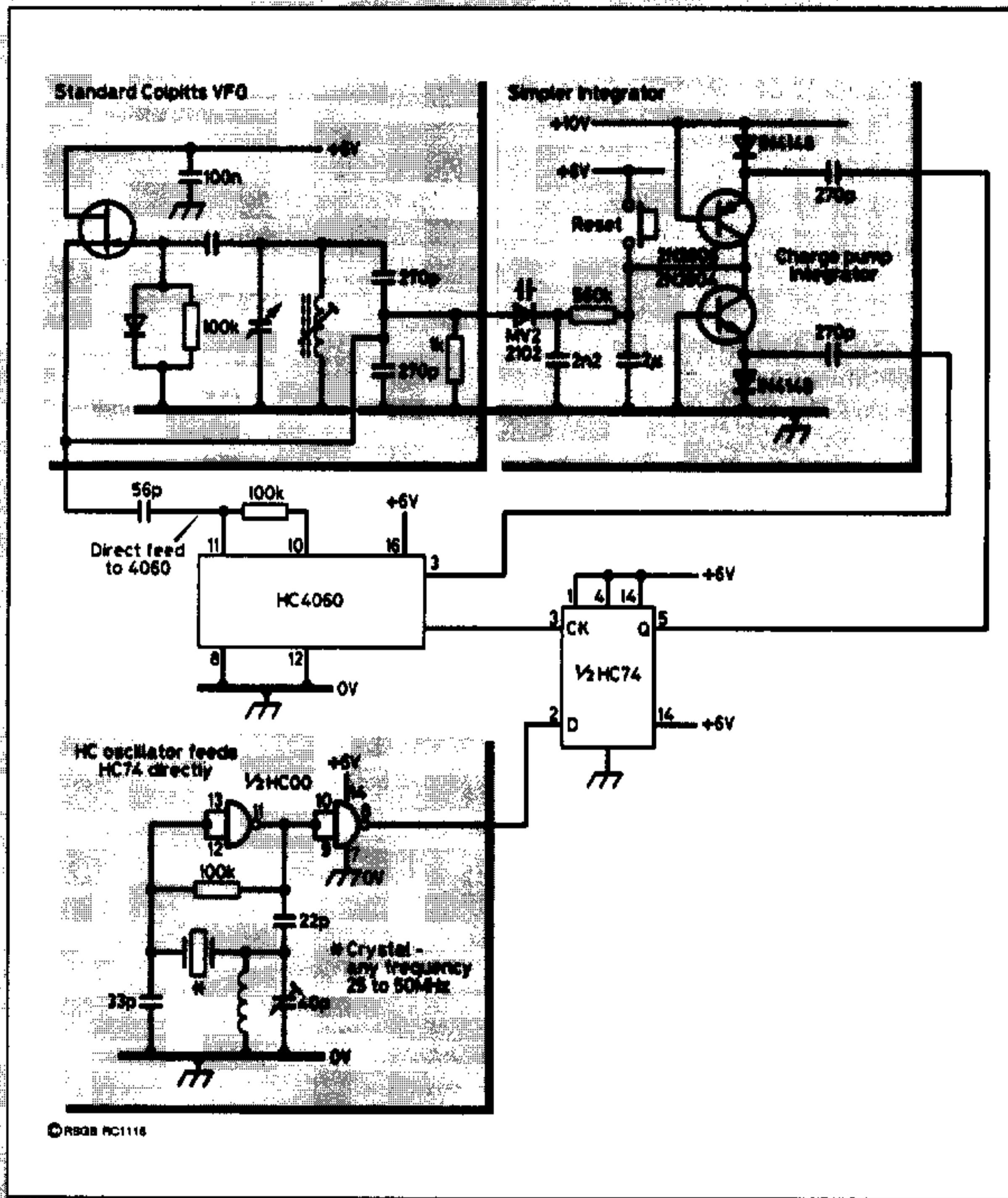


Fig 1: G3DXZ's simplified 'Huff and Puff' VFO stabiliser. Notes: (1) Using a 1MHz oscillator and 4000 outputs Q11 and Q15 gives a reference frequency of about 300Hz at 0. (2) The integrator slow rate is about 0.5V/sec. (3) Various pulse oscillator frequency 2.5Hz to 10kHz at 6V bias. (4) Integrator pump noise about 2mV p-p which is equivalent to 1.5Hz p-p ripple on VFO. These figures make good design centre values for experimentation.