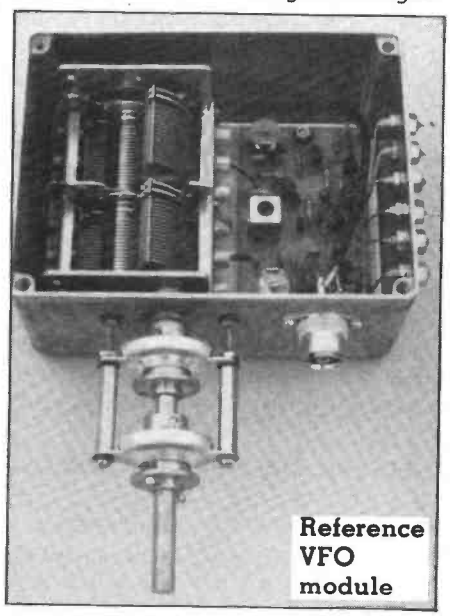
C48,64 — 67	27p ceramic plate
C49	22p ceramic plate
C51	56p ceramic plate
C54 — 63	2p2 ceramic plate
C68,74,76,79,84,86,87,99	1n ceramic plate
C73,81,96	10uF radial electrolytic
C89,90	220n monolithic ceramic
C97	100p ceramic plate
C100	390p ceramic plate
VC1,3	90p film dielectric trimmer
VC2	400 to 560pF max dual gang air spaced, 6:1 drive.
D1	5v6 400mW zener diode
D2 — 11	BA379 PIN diode
D12 — 21	1N4148
D22	BB204B varicap diode
Q1,2,14 — 23,28,29	2SK55
Q3	VN2222L
Q4 — 13,32	BC308,309
Q24	J310
Q25	3SK45
Q26	VN66AF
Q27	2N2369A, BSX20
Q30,31,33	BC238
IC1	741 (8 pin DIL)
IC2	78L08
IC3	7808
IC4	78L05
IC5	74LS14
IC6	74LS74
IC7	74LS00
IC8	NE531 or RS 305-872
DBM	SBL-1
L1	TOKO YRCS18576AQ
2 — 11	Wound on Amidon T37-6 cores
2	23t 0.25mm en Cu wire (30cm)
3	20t 0.25mm en Cu wire (25cm)
4	14t 0.40mm en Cu wire (19cm)
5	13t 0.40mm en Cu wire (18cm)
6	11t 0.40mm en Cu wire (15cm)
7	9t 0.40mm en Cu wire (13cm)
8,9	7t 0.40mm en Cu wire (11cm)
10,11	6t 0.40mm en Cu wire (10cm)
L12,13,14	TOKO KANK3334R
L15,16,17	TOKO KANK3335R
L18,19,20,21	TOKO S18 301SN-0800 Ferrite core
T1	6 turns tapped at 2 turns from earthy end. 0.25mm en Cu wire on Fair-rite balun core type 28-43002402
T2	3 turns bifilar wound 0.25mm en Cu wire on core as T1
T3	6 turns centre tapped 0.25mm en Cu wire on ferrite bead
T4	5 turns primary, 1 turn sec. 0.25mm en Cu wire on ferrite bead
T5	8 turns tapped at 2 turns from earthy end. Core as T1

sources, the result is a synthesised LO signal which approaches that of a free running LC oscillator in spectral purity.

In the Omega design, the digital edge triggered phase comparator — a (circuit arrangement) initially developed by NASA; remember the expression "We have lock..." — operates in the 1 to 2MHz region with an analogue 1 to 2MHz VFO as the primary frequency reference source. The VFO frequency is the effective channel spacing of the system. The result is an error signal with frequency content in the 100s of kHz region rather than the 100s of Hz of most direct digital designs.



Reference VFO module

The low noise DC switched inductor VCO system — which provides the output of the module — also mixes with the output of a low noise DC switched crystal oscillator bank in a double balanced mixer unit. The result is a difference signal between the VCO and the crystal oscillator in use. This is continuously compared with the output of the analogue reference VFO in the phase comparator to produce the error voltage for the VCO. Note how the output from the crystal oscillator transistor in use is filtered through the crystal itself thus effecting a noise improvement on the standard crystal oscillator circuit. The net result is that the VFO frequency adds to the crystal frequency to produce the LO output with a noise spectrum only 4 to 5dB worse than either of these components. Furthermore, the effective system frequency stability is effectively that of the analogue reference VFO on any of its bands.