SEA AIR AND LAND COMMUNICATIONS LTD

120 ST ASAPH STREET, PO BOX 22-621, CHRISTCHURCH, NEW ZEALAND
Phone: +64 3 379-2298 Fax: +64 3 365-1580 Email: sales@salcom.co.nz

11-78 Circuit Description: Q7 VCO oscillates at the output frequency determined by L2, C68 and D5 capacity. L2 is trimmed to adjust the oscillator to a frequency close to the output frequency and output from the synthesizer keeps the frequency phase locked to the reference frequency of 6.25kHz or 12.5kHz. The synthesizer derives a voltage from it's phase comparator and adjusts the capacity of D5 via the VCO loop to keep the oscillator phase locked to the reference frequency. Reference frequency is derived by the synthesizer dividing down the 9.6MHz crystal oscillator. Output from the VCO is transferred via C71 to a buffer/amplifier stage which splits the signal, part is fed to the synthesizer to be divided down for the phase comparator and part goes to Q9 RF amplifier. The signal is further amplified by Q10, Q12, Q13 to provide a 4 Watt maximum output. For a 4 Watt output and supply voltage of +13.8V, Q13 will typically draw 850mA with an applied voltage of 11.5 Volts.
A 3 section filter L14, L15, L16 and associated capacitors filters the output harmonics to less than -36dBm.
RV3 adjusts Q13 quiescent current to 150mA.
IC9B, Q3 provides Output Power Adjustment via the Setup Program which controls IC9B via R10 and IC4 pins 14-19. Q3 is also controlled by an 'out of lock' signal from IC9B & IC3F and an over temperature signal from IC3D. Q14 provides instant control over Q13 bias current from PTT or Out-of-lock.
POCSAG modulation is applied to input DATAIN1, pin 13 on S2, is buffered by IC2C, passes via IC4 to IC9A and is applied as dual-point modulation to D3 (Low Speed), and to D6 (High Speed). Deviation + and - is set via the Setup Program and IC4 pins 24-31 and its associated resistor network control that level. RV2 adjusts the proportion of HS and LS modulation to keep the demodulated waveform as close to a square wave as possible.

Over temperature cutout: When the unit transmits at full power in a hot environment, a protective cutout may operate. R76 NTC resistor will operate IC3D and IC9B via D8, reducing the transmitter voltage from Q3. This will reduce the output power to a safe level, and will reset when the unit temperature has fallen to below 60 deg. This cutout is designed to avoid permanent damage to the transmitter.