	Receive freq.	Oscillator freq.	Switch
K0	137.500MHz	126.800MHz	all OFF
K1	137.300MHz	126.600MHz	SW1 ON
K2	137.400MHz	126.700MHz	SW2 ON
K3	137.500MHz	126.800MHz	SW3 ON
K4	137.620MHz	126.920MHz	SW4 ON

Table 3 : Switch settings for synthesiser.

When this procedure is complete you can listen for received signals and set the correct squelch level. The synthesiser PLL must be set up before the alternative tuning method is used.

Connect a 137 - 138MHz turnstile antenna [17] to the receiver's input and set the frequency for the NOAA or METEOR satellites by using either switch SW1-DIP4 or buttons TL1/TL2. These satellites should soon appear, consult the current orbit timetable to verify the times. The switch SW1-DIP4 serves as simple memory to store pre-set frequencies after switching on of the receiver. When all the switches are set to the position OFF, the PLL tunes the oscillator frequency to 126.80MHz, thus the received frequency is 137.500MHz (satellite NOAA15). Set the required frequency for the receivers oscillator by switching some of the four switches of the selector switch SW1-DIP4x to the position ON. Table 3 shows the setting of the 4 switches, however all 16 combinations in binary code can been used.

To commission of the low-frequency part of the receiver all that is required is to set the gain of the amplifier for the loudspeaker and sound card using an oscilloscope, or by just listening to the audio output. Set the amplification of IC2 to the required value by adjusting R28 (3R3=74dB, 10R=70dB, 33R=54dB, 105R=44dB, 820R=34dB) with C59 100uF. Set the tone decoder IC7 by adjusting R25 so that the LED diode D1 lights up whenever a tone of 2400Hz is detected in the received signal. The optimum input sensitivity of the decoder has been chosen during development. Should you have any reason to change it, choose different ratio of resistors R22 and R23. The output from pin 8 is connected using a jumper on JP3 to the input SQOUT of microcomputer. SQOUT can also be connected to the collector of transistor T3, which has a logical value depending on the setting of the squelch and on magnitude of input signal.

8.1 The Receivers control function

With a jumper on JP3 position 2-3 (TON), after switching on the receiver will perform a first test for the absence of low logical level on SQOUT. The test is then repeated and if a 2400Hz signal above the set threshold level is detected on any channel, the processor stops tuning. When the signal disappears i.e. when the satellite sinks behind horizon, the test re-starts and re-tunes until another signal is captured. Tuning can be interrupted by pressing the push button UP (TL1) or DOWN (TL2), the receiver is set to the frequency according to the selector switch SW1-DIP4. It is then possible to tune manually from 137 - 141MHz in steps of 10.0kHz. Simultaneous pressing and holding of both push buttons restarts scanning again. The LCD display will show the current received frequency in MHz. With a jumper on JP3 position 1-2 (SQL), the squelch output is connected to the input of processor SQOUT. The scan function still operates but is now controlled by the level of the squelch, and not the presence of a 2400Hz tone.

9.

How to connect a LF output of the receiver to your personal computer

After demodulation the receiver's low-frequency output is an amplitude modulated tone of 2400 Hz, which can be