RAT WIRELESS HAND CONTROL

Theory of Operation

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The unit uses the ERA900TS radio transmitter module from LPRS to generate low power radio signals in the 900MHz band.

There is a Microchip microcontroller which sends configuration commands and packet data to the radio module. The microcontroller periodically reads the state of three buttons and a rocker pot and sends the state of these devices as a short packet to the transmitter.

The packets are only sent whilst there is a change in value of one of the controls, i.e. a button being pressed or the rocker pot being moved. If there is no change in value, the unit will send out five packets and then enter a sleep mode. In the sleep mode, the unit will momentarily wake up and test for any changes, if there are no changes it goes back to sleep, otherwise it will start sending packets to reflect the chage in data.

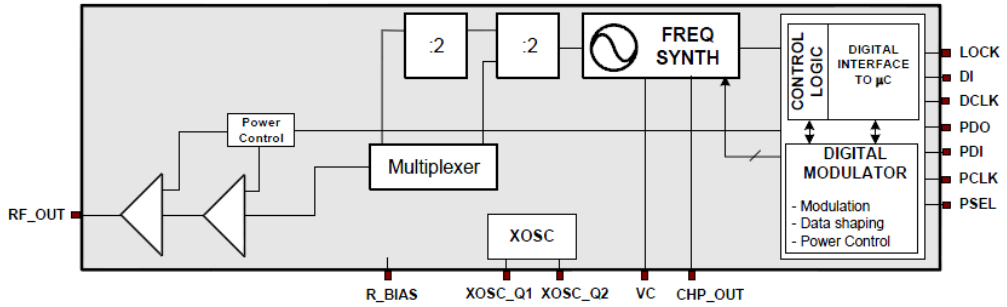
The unit has a HEX rotary switch which can have set to one of sixteen positions – 0 to 9 and A to F. Positions 0 to D are used to select the transmit frequency from one of 14, 25 KHz spaced, channels in the range 902.3625 MHz to 902.6875 MHz. Position F is used to “factory reset” the radio module back to required settings. Position E is currently unused.

There is a battery voltage sensor, when the battery voltage drops to below 7.2 volts, the LED will start flashing whenever the scroll control operated or one of the buttons is pressed.

The unit is fitted with a RP SMA (Reverse Polarity SMA) connector which the supplied antenna is connected to.

RF SECTION:

The ERA900TS module uses a TI CC1070 integrated circuit to generate the modulated RF signal. The module also incorporates a PIC18F25K20 microcontroller.



BLOCK DIAGRAM OF RF IC USED IN ERA900TS MODULE:
(Provided courtesy of TI)

Frequencies used:

PIC18F25K20:
8 MHz internal Oscillator

CC1070:
14.7456 MHz Crystal
VCO 1804.725 MHz to 1805.375 MHz (internally divided by 2)