

Nokia RC58 2m Modification

Introduction

These instructions are for the conversion of a Nokia RC58 radio to work on the 2m amateur band by use of the ON5NXO ham firmware. The Nokia RC58 is based on a design by Mobira and was first seen in the UK as a TACS transportable cellular phone, hence the handset.

Modifications

The conversion is very simple to do and consists of replacing the system eproms with one containing the ON5NXO ham firmware. The firmware is blown into a 27C512 eprom and fitted to the left hand socket on the logic board. The logic board is the one which has the handset socket fitted to it and can be accessed by removing the two 3mm allen screws in the side cover.

Once the firmware is fitted and the radio is switched on then it should power up in a operational mode, but will be very deaf, don't worry it just needs the RX front end tuning. The tuning is carried out by entering setup mode and adjusting the front end tuning for each 1Mhz wide tuning range.

/E Variant Modification

There is another modification required if the radio you have is a /E variant. This is because in the /E the reference oscillator which is usually 12.8000Mhz has been changed to 12.800515Mhz to account for the UK JRC band channel offset of 6.25Khz. If you try to use one of these sets you will find it seems very deaf because the narrow IF filtering will be very effective at cutting down the 6.25Khz off frequency 2m channel.

The reference oscillator must be changed to work at 12.8000Mhz again, to do this you must first remove the synthesizer board by first removing the side cover which is held on with four 3mm allen screws.

Once the side cover is removed, carefully remove the synthesizer board which is the unit in the middle with the two coax cables coming from it, this will entail removing 8 screws two of which are hidden under the VCO modules. When the Synthesizer board is removed you will need to remove the reference oscillator module from the board, take your time as this is an expensive item to replace. The oscillator is removed by de-soldering it's 3 pins and 2 screening can lugs from the PCB, once fully de-soldered gently prise oscillator module from the PCB.

When you have the reference oscillator module removed, turn it over so that the trimmer hole is in the bottom right hand corner. There is a small brown, surface mount capacitor close to the edge of the board opposite the screening can lug. This capacitor needs to be replaced for a 100pF device or have a 56pF capacitor soldered in parallel with it.

Once done re-fit the oscillator module and re-assemble the synthesizer. When completed adjust the reference oscillator frequency by keying in a 2m frequency i.e. 145500 ENT and transmitting, adjust the trimmer in the oscillator module so that the output is on frequency.

Tuning the RF Front End

Key in an operating frequency in the middle of one of the 1Mhz wide bands i.e. 145500 ENT, then key 9 #, you will see the bottom line of the display shows ' rfc xxx xx', the middle digits are the tuning point and the right 2 digits signal strength. Using the +/- buttons on the side of the handset adjust the tuning point value until you peak the received signal with the 2 right hand digits, you should be able to get a receive sensitivity of at least 0.5uV. You can exit setup by pressing ENT at any time.

You can repeat the above process of each or any one of the 1Mhz wide tuning bands between 100Mhz and 200Mhz.

Squelch Setting

When you first turn the radio on with the ON5NXO firmware fitted the squelch should be open, you will need to press and hold the 1 key on the keypad to increase the squelch setting at some point the squelch will close, but DO NOT stop at this point, keep going until the squelch reading rolls over from 99 to 00 at this point the squelch should open again. Now continue to increase the setting until the squelch closes again at this point the squelch is correctly set.

This concludes the modification of the RC58 for operation on the 2m band, please now refer to the operating instruction for the day to day operation of this radio.