

# RADIO SOCIETY

of Great Britain

## EMERGING TECHNOLOGY CO-ORDINATION COMMITTEE

The repeater frequencies in general use within the UK in the 430 to 440MHz (70cms) band are listed below.

TABLE 1: CHANNELS WITH 1.6MHz TRANSMIT – RECEIVE SPACING

Channel Number	Base Transmit	Base Receive
<b>RB0</b>	<b>433.000 MHz</b>	<b>434.600 MHz</b>
<b>RB1</b>	<b>433.025 MHz</b>	<b>434.625 MHz</b>
<b>RB2</b>	<b>433.050 MHz</b>	<b>434.650 MHz</b>
<b>RB3</b>	<b>433.075 MHz</b>	<b>434.675 MHz</b>
<b>RB4</b>	<b>433.100 MHz</b>	<b>434.700 MHz</b>
<b>RB5</b>	<b>433.125 MHz</b>	<b>434.725 MHz</b>
<b>RB6</b>	<b>433.150 MHz</b>	<b>434.750 MHz</b>
<b>RB7</b>	<b>433.175 MHz</b>	<b>434.775 MHz</b>
<b>RB8</b>	<b>433.200 MHz</b>	<b>434.800 MHz</b>
<b>RB9</b>	<b>433.225 MHz</b>	<b>434.825 MHz</b>
<b>RB10</b>	<b>433.250 MHz</b>	<b>434.850 MHz</b>
<b>RB11</b>	<b>433.275 MHz</b>	<b>434.875 MHz</b>
<b>RB12</b>	<b>433.300 MHz</b>	<b>434.900 MHz</b>
<b>RB13</b>	<b>433.325 MHz</b>	<b>434.925 MHz</b>
<b>RB14</b>	<b>433.350 MHz</b>	<b>434.950 MHz</b>
<b>RB15</b>	<b>433.375 MHz</b>	<b>434.975 MHz</b>

TABLE2: CHANNELS WITH 7.6MHz TRANSMIT – RECEIVE SPACING

	Base Transmit	Base Receive
<b>RU66 (25kHz spec)</b>	<b>430.8250 MHz</b>	<b>438.4250 MHz</b>
<b>RU67 (25kHz spec)</b>	<b>430.8375 MHz</b>	<b>438.4375 MHz</b>
<b>RU68 (25kHz spec)</b>	<b>430.8500 MHz</b>	<b>438.4500 MHz</b>
<b>RU69 (25kHz spec)</b>	<b>430.8625 MHz</b>	<b>438.4625 MHz</b>
<b>RU71 (25kHz spec)</b>	<b>430.8875 MHz</b>	<b>438.4875 MHz</b>
<b>RU72 (25kHz spec)</b>	<b>430.9000 MHz</b>	<b>438.5000 MHz</b>
<b>RU73 (25kHz spec)</b>	<b>430.9125 MHz</b>	<b>438.5125 MHz</b>
<b>RU74 (25kHz spec)</b>	<b>430.9250 MHz</b>	<b>438.5250 MHz</b>
<b>RU75 (25kHz spec)</b>	<b>430.9375 MHz</b>	<b>438.5375 MHz</b>
<b>RU76 (25kHz spec)</b>	<b>430.9500 MHz</b>	<b>438.5500 MHz</b>
<b>RU77 (25kHz spec)</b>	<b>430.9625 MHz</b>	<b>438.5625 MHz</b>
<b>RU78 (25kHz spec)</b>	<b>430.9750 MHz</b>	<b>438.5750 MHz</b>

RELATED ISSUES

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From this table it can be seen that devices in the SRD band from 433.050MHz to 434.790MHz present greatest risk to the repeater receive frequencies in Table 1: RB0 to RB8 (434.600MHz to 434.800MHz).

Obviously Amateur operators listening to repeater outputs from RB2 to RB15 (433.050MHz to 433.275MHz) may also be aware of interference from SRD's. However, as signals from repeaters are generally at reasonably high levels then these sources of interference are less likely to disrupt communications although they can still cause considerable annoyance.

Amateur UHF repeaters are frequently sited in urban environments which are most suited to the propagation characteristics at these higher frequencies. Inevitably the use of SRD's is much more prevalent and is increasing almost exponentially in these more densely populated areas with the result that some repeater frequencies are now almost unusable.

It has been noted that many SRD's 'out of the box' are set to operate on default frequencies which coincide with the repeater input frequencies quoted above. One of the most popular defaults encountered appears to be 434.650MHz (RB2).

## POSSIBLE MITIGATION TECHNIQUES

CTCSS: the use of tone squelch systems on both transmit and receive legs of Amateur repeaters can provide some protection against SRD signals. Obviously the interference is still present but CTCSS on the repeater receiver prevents it 'opening' and thus relaying the interfering signal. CTCSS on the repeater output allows mobile stations to protect their receivers from direct SRD reception. If the interfering signal is strong it will of course still present a problem to those legitimate amateur signals which are lower in signal strength

RECEIVER BANDWIDTH: UHF repeaters in the Amateur Service normally use 25KHz channel spacing. It has been found in some circumstances that the use of narrower filters in the base station receivers can reduce interference from slightly off channel interfering sources. Although assisting in reducing annoying noises, these narrower filters can cause clipping to wanted signals which can have peak deviations up to 5KHz.

CHANNEL SELECTION: AS mentioned above the highest levels of interference are encountered in urban locations. Repeaters sited in those areas should be, where feasible, allocated frequencies less likely to be affected. A few 'wide spaced' repeater channels are available (see Table2 above) with inputs in the 438MHz area and may provide a solution in those instances where clearance can be achieved with the Primary User of the band. Clearances are difficult in many areas and these frequencies should be reserved for special cases.

## LIAISON WITH SRD USERS

In some instances the users of SRD's have been co-operative in moving frequency when the shared use of the band has been highlighted to them with the consequent Health & Safety risks especially if the devices being controlled include machinery such as travelling cranes.