FreeWave Technologies, Inc.

Q-Series User Manual Addendum

This document addresses new features available for the user and listed in the MainMenu on the 228-235 and 277-284 MHz Q-Series radio transceivers. Please, note that both models of the Q-Series transceiver have the same firmware, but different hardware.

These features include "RemoteLED" Settings of '2', "SubNet ID" functionality on master radios and Hop Frequency operation.

1) RemoteLED Setting 2 (Menu 3, Option C):

RemoteLED Setting 2 is a new feature which totally disables the LEDs on the radio. This function is useful as a power saving option. If the RemoteLED option on the radio is set to 2, then when the radio is put into the Setup mode, it will turn the LED's back On as normal.

2) SubNetID Functionality:

If SubNetID function on the Q-Series radio is used in a Point-to-Multipoint system, then Xmit SubNetID on the Master radio MUST be specified (should be different from 'F', which is a default setting).

This feature allows separation of Point-to-Multipoint networks utilizing the same NetworkID while enabling roaming (Slave radios can easily connect and disconnect to different networks without changing their NetworkID).

In most cases, the SubNetID on the Point-to-Multipoint Master should be set to Xmit = 0 and Rcv = 0.

3) Hop Frequency operation:

There are a few requirements of the Q-Series radios that must be adhered to:

a) The Hop Frequency Offset parameter on the radio MUST be set at 12 for the 228-235 MHz and to 208 for the 277-284 MHz model.

b) All frequency channels, which radio can be tuned to, are separated from each other by 250 kHz. The first and the last frequency channels for two models of the Q-Series transceivers are listed below:

Transceiver model	Lowest channel center frequency, MHz	Highest channel center frequency, MHz
228-235 MHz model	228.000	235.000
277-284 MHz model	277.000	284.000

c) The total number of frequency channels for both models is, therefore, 29.

d) The overall frequency band of operation of the transceiver is divided into 16 Frequency Zones. Each Frequency Zone includes 2 frequency channels. For

example, Frequency Zone 1 for 228-235 MHz model contains channels with the center frequencies 228.000 MHz and 228.250 MHz. The Frequency Zone 2 for the same transceiver contains channels at 228.500 MHz and 228.750 MHz.

Enabling specific Frequency Zone will allow radio transceiver to operate at the frequency channels defined by this Frequency Zone. For example, disabling Frequency Zones 2 and 3 will keep 228-235 MHz transceiver from operating in the frequency band of 228.500 … 229.250 MHz.

Even though the total number of Frequency Zones available for user is 16, only first 14 Zones can be activated. The last two Zones MUST be disabled (set to 0) for both transceiver models.

To access the Hop Frequency setup page, navigate through HyperTerminal by selecting (3) Edit Radio Transmission Characteristics, from the Main Menu. See Figure 1.

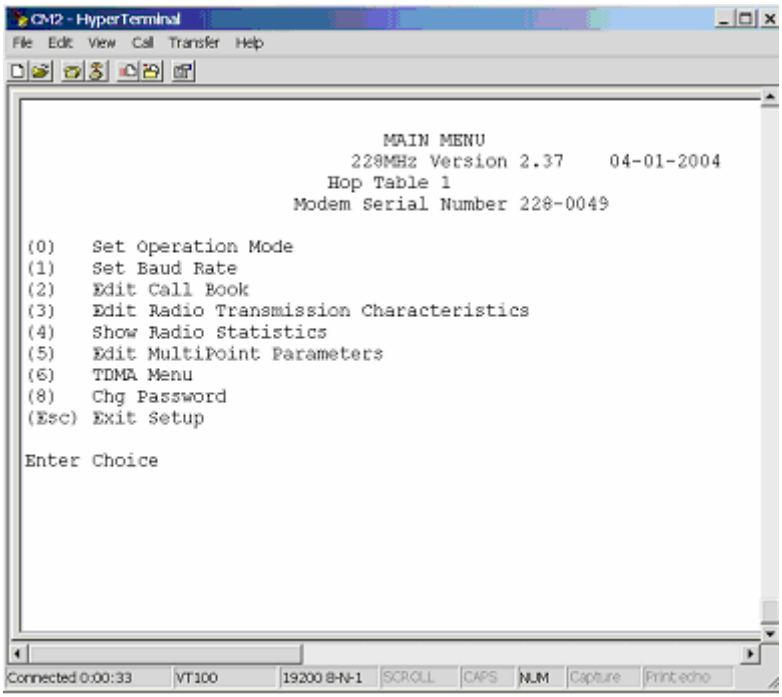
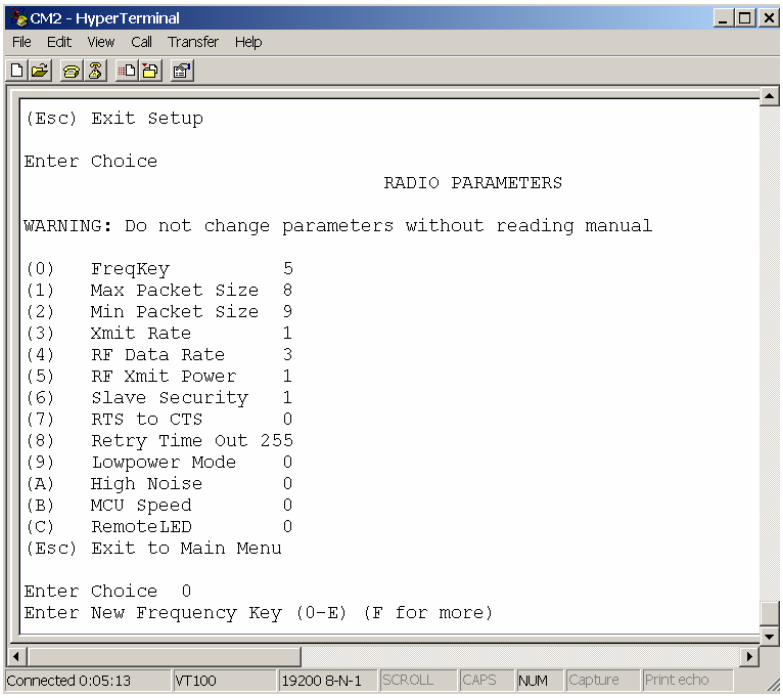


Figure 1

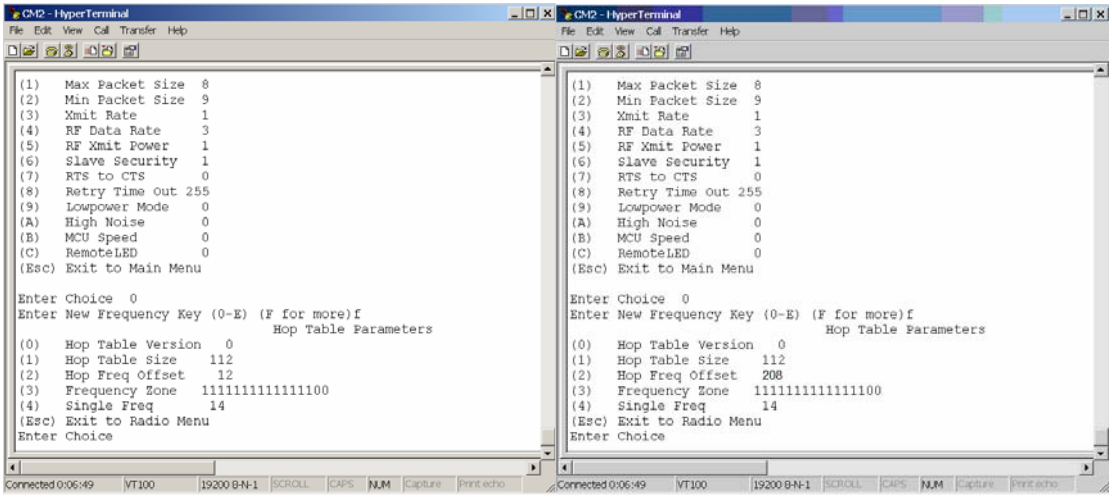
Then select (0) FreqKey. See Figure 2.



228-235 MHz and 277-284 MHz models

Figure 2

Followed by selecting (F for more). See Figure 3.

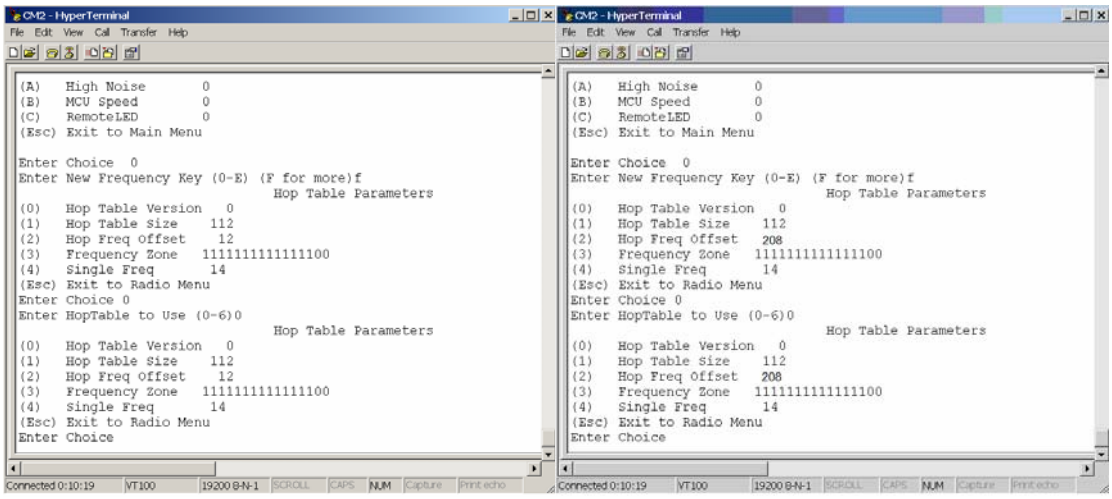


228-235 MHz model **277-284 MHz model**

Figure 3

(0) Hop Table Version

The Q-Series radio transceivers need to use Hop Table Version 0. See Figure 4 (other Hop Table Versions selections are TBD). See Table 1.



228-235 MHz model **277-284 MHz model**

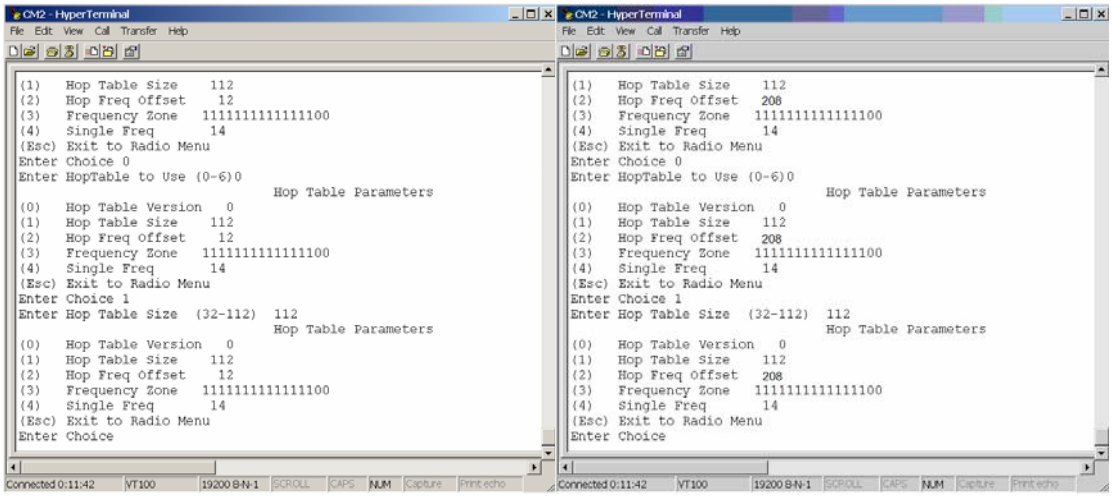
Figure 4

Selection	Name	Band
0	Standard	228-235 MHz or 277-284 MHz depending on transceiver's model, FreqZone parameter determine deactivated sections of the band
1…6	TBD	

Table 1

(1) Hop Table Size

Within a specified band you may select the number of frequencies to be used, ranging from 32 to 112. See Figure 5.



228-235 MHz model **277-284 MHz model**

Figure 5

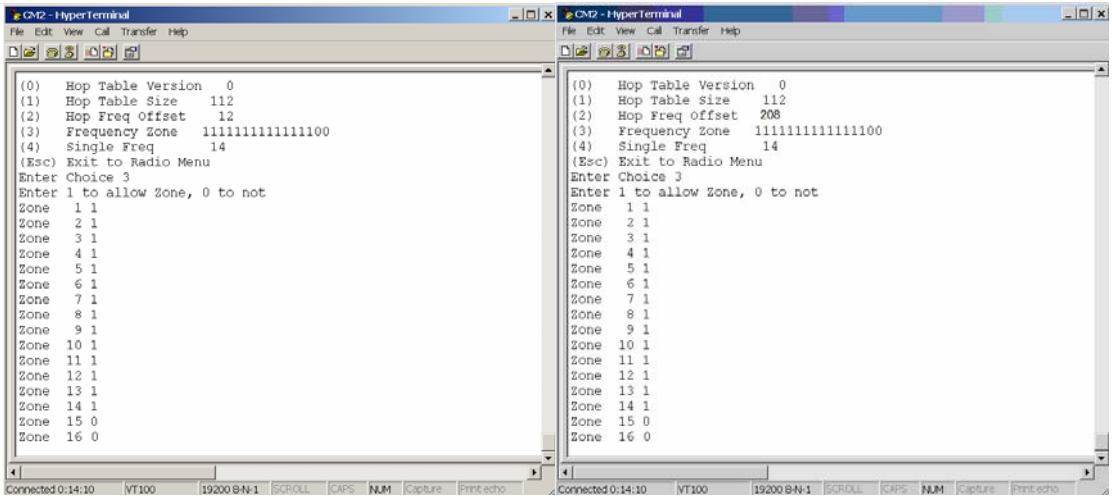
(2) Hop Table Offset

For the 228-235 MHz transceiver this parameter is restricted to 12. For the 277-284 MHz transceiver this parameter should be 208.

(3) Frequency Zone

Frequency Zones are selectable by enabling each one individually. Select 3 then type 1 after each Frequency Zone needing to be enabled. See Figure 6.

NOTE: For Q-Series radios, Frequency Zones 15 and 16 MUST be 0.

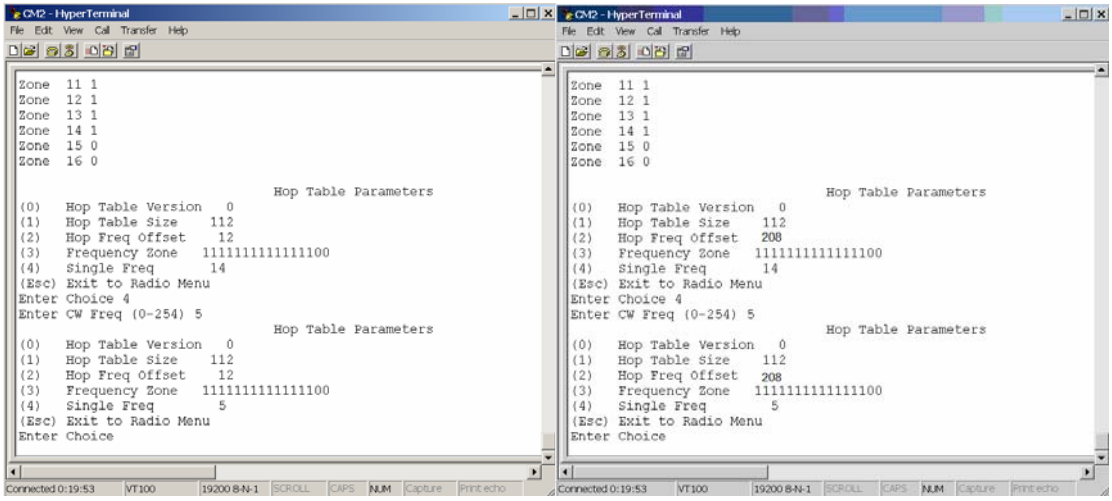


228-235 MHz model **277-284 MHz model**

Figure 6

(4) Single Frequency

The Q-Series radio transceivers (both models) can be used in a single frequency mode. See Figure 7.



228-235 MHz model **277-284 MHz model**

Figure 7

To enter Single Frequency Mode, FreqKey MUST be set to 15 in Radio Parameters menu.

NOTE: On the Q-Series transceiver the Single Frequency selection is restricted to settings of 0 through 28.

See Table 2 for Single Frequency Channel and Zone listings.

Frequency Zone = 2 Frequency Channels			
Frequency Channel spacing = 250KHz			
	228-235 MHz model	277-284 MHz model	Freq. Zone
	Hop Frequency Offset = 12	Hop Frequency Offset = 208	
Channel	Center Frequency	Center Frequency	
0	228.000 MHz	277.000 MHz	1
1	228.250 MHz	277.250 MHz	
2	228.500 MHz	277.500 MHz	2
3	228.750 MHz	277.750 MHz	
4	229.000 MHz	278.000 MHz	3
5	229.250 MHz	278.250 MHz	
6	229.500 MHz	278.500 MHz	4
7	229.750 MHz	278.750 MHz	
8	230.000 MHz	279.000 MHz	5
9	230.250 MHz	279.250 MHz	
10	230.500 MHz	279.500 MHz	6
11	230.750 MHz	279.750 MHz	
12	231.000 MHz	280.000 MHz	7
13	231.250 MHz	280.250 MHz	
14	231.500 MHz	280.500 MHz	8
15	231.750 MHz	280.750 MHz	
16	232.000 MHz	281.000 MHz	9
17	232.250 MHz	281.250 MHz	
18	232.500 MHz	281.500 MHz	10
19	232.750 MHz	281.750 MHz	
20	233.000 MHz	282.000 MHz	11
21	233.250 MHz	282.250 MHz	
22	233.500 MHz	282.500 MHz	12
23	233.750 MHz	282.750 MHz	
24	234.000 MHz	283.000 MHz	13
25	234.250 MHz	283.250 MHz	
26	234.500 MHz	283.500 MHz	14
27	234.750 MHz	283.750 MHz	
28	235.000 MHz	284.000 MHz	15
29	235.250 MHz	284.250 MHz	
30	235.500 MHz	284.500 MHz	16
31	235.750 MHz	284.750 MHz	

Table 2

NOTE: Zones 15 and 16 or Channels 28, 29, 30, and 31 are disabled for operation in Q-Series radio transceivers. (MUST be set to 0 in Frequency Zone)

Power Setting vs. Output Power for 228-235 MHz and 277-284 MHz Q-Series radio transceivers.

RFXmit Power settings	228-235 MHz model		277-284 MHz model	
	Output power, W	Output power, dBm	Output power, W	Output power, dBm
10	2	33	2	33
9	1.7	32.3	1.8	32.7
8	1.45	31.6	1.6	32.2
7	1.2	30.7	1.3	31.3
6	0.89	29.5	1.1	30.6
5	0.66	28.2	0.76	28.8
4	0.44	26.4	0.6	27.8
3	0.25	24.1	0.3	24.8
2	0.12	20.7	0.14	21.5
1	0.03	14.6	0.04	15.8
0	0	0	0	0

Table 3