BAOFENG DM-5R

CodePlug Programming Guide

PREFACE

Thank you very much for choosing our BAOFENG Dual Band Digital DMR and Analog two way radio. This radio adopts the latest advances in technology, providing reliable communication in today's demanding communication environment.

This radio offers both DMR digital and analog communication, introduces innovative DMR digital processing system to achieve SMS, high-audio quality and digital encryption. It offers great stability, and reliability, together with long distance communication as well as fashionable design and compact exterior lines. This radio has Text Messaging, Recording, Voice Message, Digital Encryption, Emergency Alarm, Analog DTMF; CTCSS/CDCSS encode/decode functions.

PROGRAMMING NOTES

When programming the radio, start by reading the factory software data, and then rewrite this data with your frequency etc., to a new saved code plug, otherwise errors may occur.

You can use the programming cable with a PC to program the frequency, channel type, power etc. you programming must comply with your FCC (or other country) license certification.

European Users should note that operation of this unit in Transmit mode requires the operator to have a valid Amateur Radio License from their respective Countries Amateur Radio Licensing Authority for the Frequencies and Transmitter Power levels that this Radio transmits on. Failure to comply may be unlawful and liable for prosecution. At this subject, refer to the "EU" specification guide 2014/53/EU.

PROGRAMMING GUIDE

The programming software and code plug programming guide are available for download from BAOFENG website:

https://www.baofengradio.com

When programming this radio for the first time, it is recommended you first READ the radio with the software and then save this file for future reference as it contains the default programming and settings. In addition, after you READ this radio with software, first make you programming and frequency changes, and then write the edited file to your radio.

You will need the programming cable to connect your radio to your computer for programming.

To perform firmware upgrade, Press CALL and MONI key then turn on the power and volume switches to enter firmware upgrade mode.

1. Programming the DM-5R

Before programming your radio, read the current information from the radio to your PC to create an initial CPS template and at the same time backup the factory data for future use.

When reading or writing data from or to the DM-5R, the software offers various possibilities:
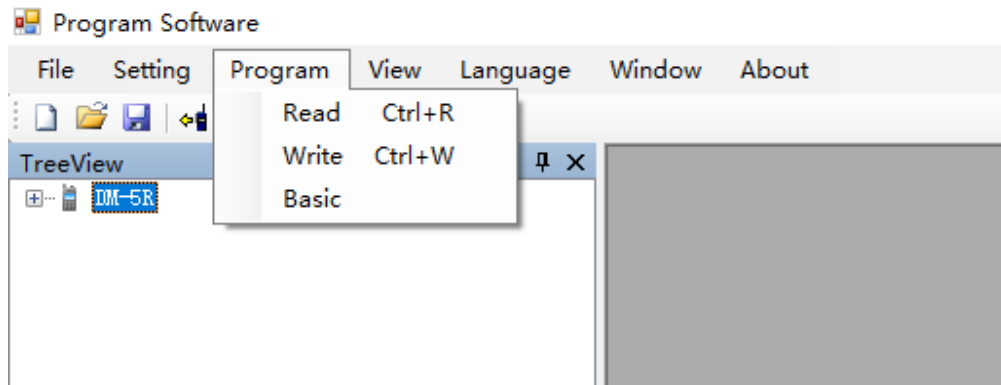

Picture 1: Read data

1.1 Read data

To read in all frequency settings as well as further settings from your DM-5R radio, use this option.

1.2 Write data

Whenever you have made your changes and additions to the settings of your DM-5R radio use this option to write your settings to the radio.

2. General setting

The DM-5R radio supports quite a bunch of general settings. To get there use 'Edit' -> 'General Setting'
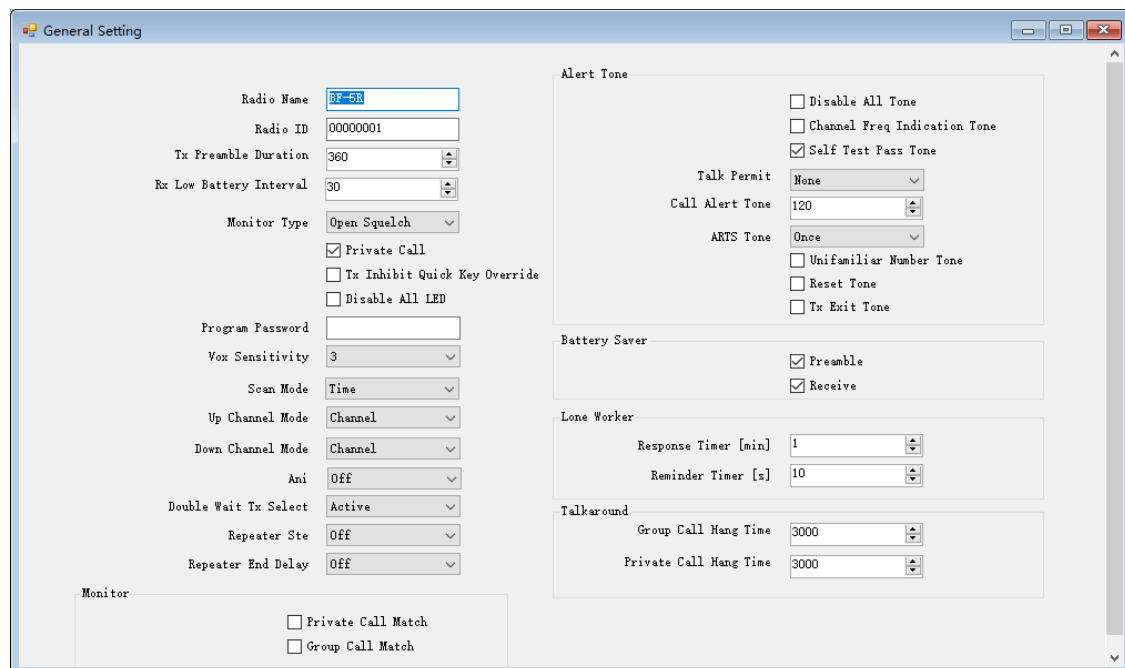
Picture 2: General Setting

The following topics described those parameters used more often.

2.1 Alert Tone

The four parameters refer to tone prompts given in certain cases.
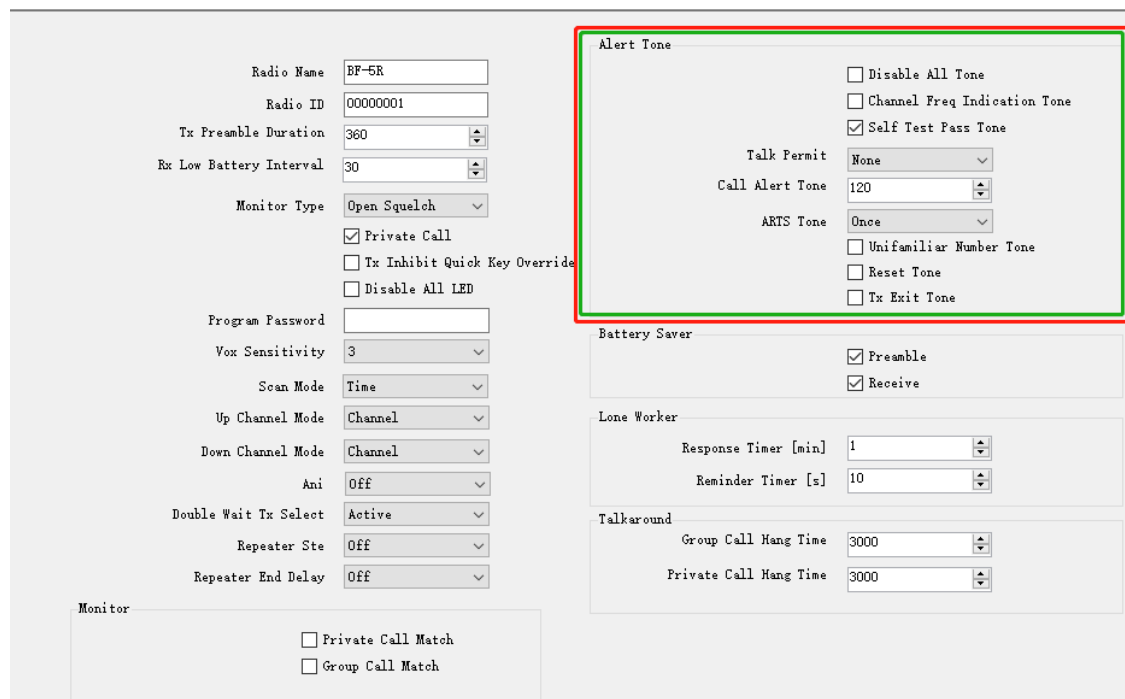
Picture 3: Alert Tone

If you check 'Disable All Tone', you will not hear any prompts, even if you check 'Channel Free Indication Tone' or 'Talk Permit Tone'. Both options would no longer be supported.

Channel Free Indication Tone: Indicates if the current channel is not transmitting and receiving, indicating a free channel.

Talk Permit: This alert tone sounds after the Push-to-Talk (PTT) button is pressed and the radio is able to transmit on the channel. This is to prompt the user to begin speaking.

2.2 Lone Worker

Lone Worker: This functionality is for establishing a convenient rescue. 2 operators have both started their separate work. If one of them does not perform any action during the set time (including pressing the PTT button, turn the knob) or pressing the button light), the other one will receive an alarm tone within a certain time
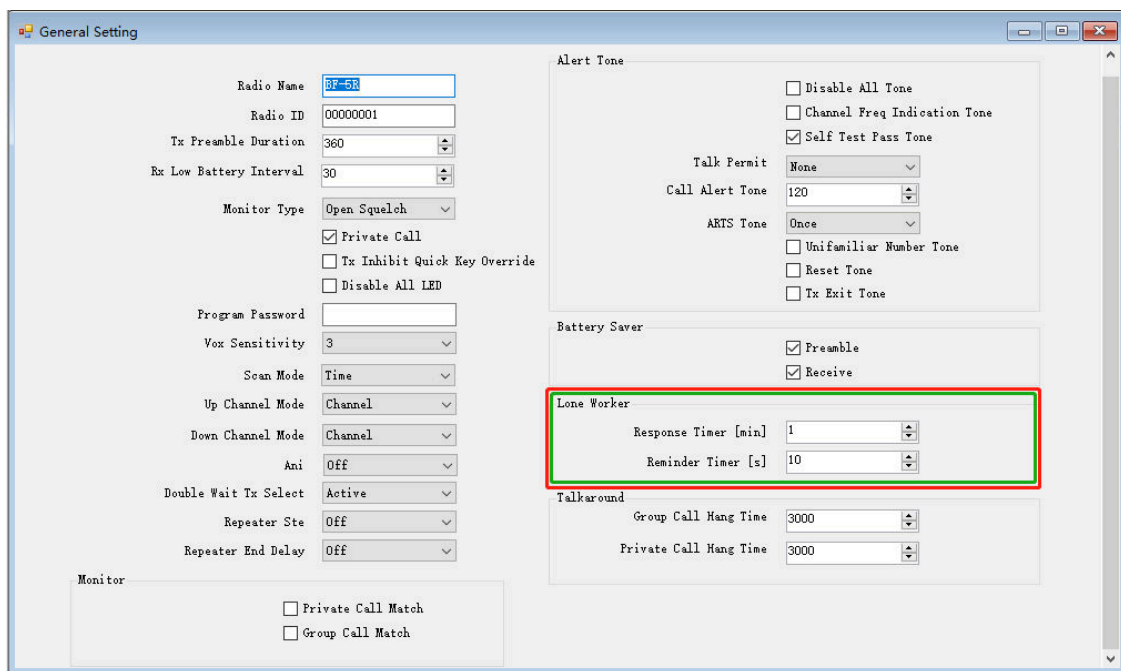
Picture 4: Lone Worker

With the corresponding settings, this function may be adjusted to the personal needs.

2.3 Talkaround

When the Talkaround function is activated, the transmission and reception frequencies are exchanged with each other. You would only activate that function if you can no longer reach the repeater you had been working on, but knowing that the other station is in direct reach.
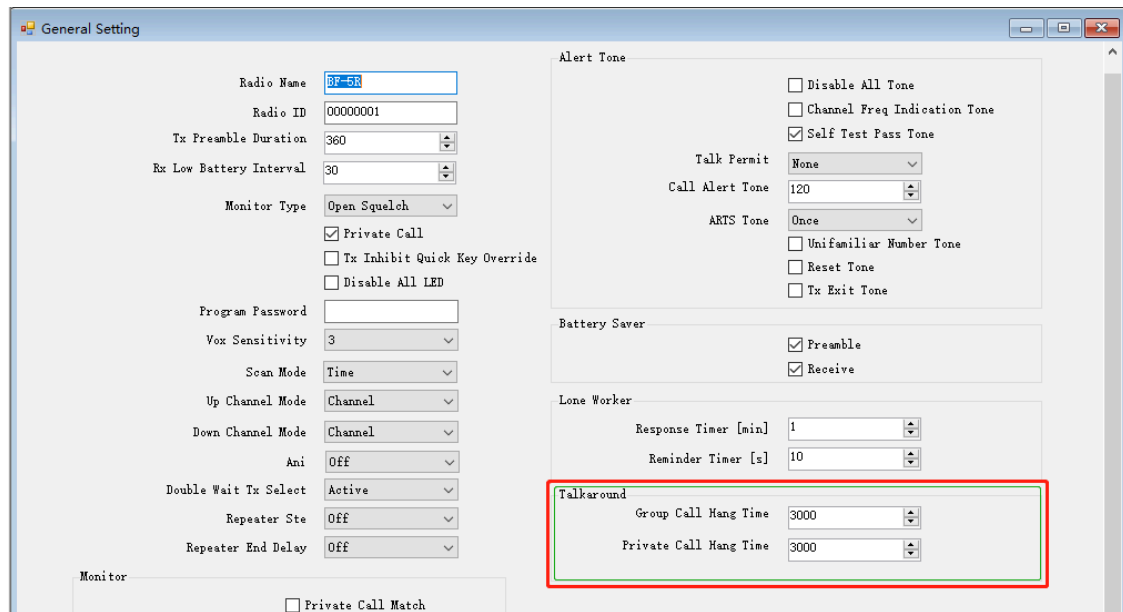
Picture 5: Assign Talkaround

3. Basic settings

There are a few settings that do require special attention.

- If you set PC programming password, you must remember this password. If you forget it, there will be no way to retrieve it.

Picture 6: Program Password

4. Menu Item

Often not all those menus that are available are really required by the user. Thus in order to ease operation, you may disable certain menus to your personal requirements. Using 'Edit' -> 'Menu' you navigate to the corresponding configuration page within the CPS.

Picture 7: Menu Item

Those menu functions checked will later be displayed in the various menus of the DM-5R radio. Those not checked will not be displayed and not become accessible on the radio.

5. Button Definitions

There are various buttons definitions possible:
- Radio Buttons
- One Touch Access
- Number Key Quick Contact Access

5.1 Radio Buttons

The radio buttons may even have two different functions assigned. One of the functions is been activated on a 'Short Press' of the corresponding keys whereas the other one requires a 'Long Press'. The 'Long Press Duration(ms)' defines the time period required to keep the key pressed in order to activate this 'Long Press' function.
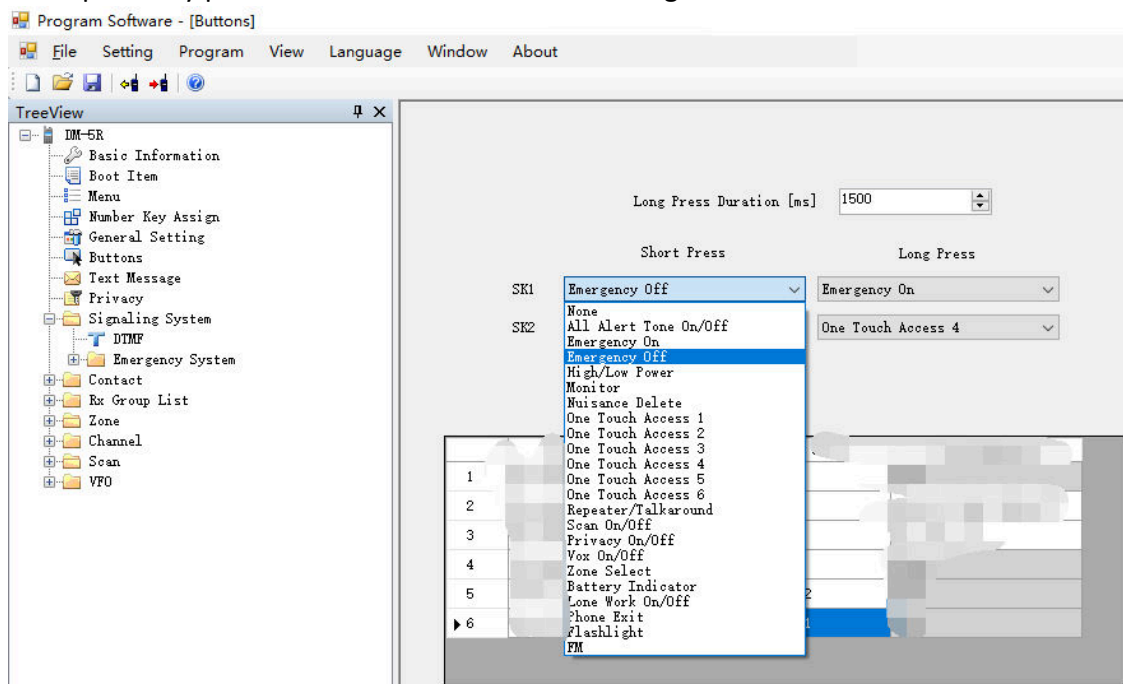
Picture 8: Radio Buttons

Each of the keys has a function activated on 'Short Press' and another one activated on 'Long Press', resulting in a total of 10 different functions being directly accessible.

Those are your options:

- Unassigned (default)
- All Alert Tones On/Off
- Emergency On
- Emergency Off
- High/Low Power
- Monitor
- Nuisance Delete
- One Touch Access 1…6
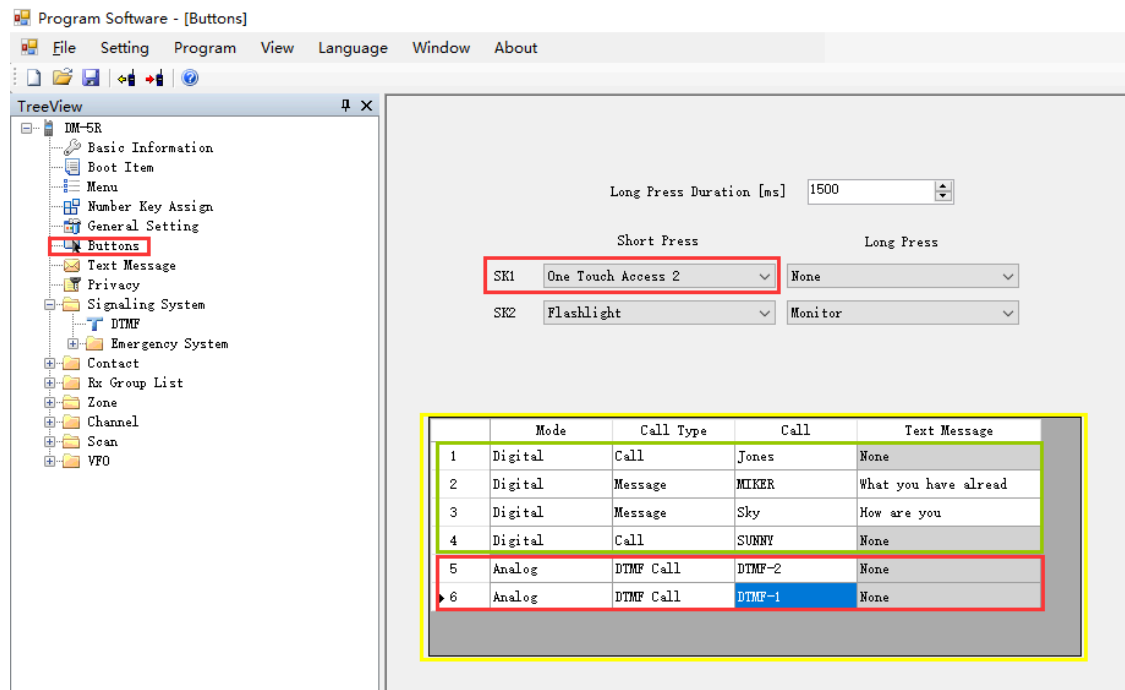- Repeater/ Talkaround

- VOX On/Off
- Zone Select
- Battery Indicator
- Lone Work On/Off
- Phone Exit
- Flashlight
- FM
- Privacy On/Off
- Scan On/Off

Remark:
Those functions related to recording of transmissions are currently not available.

5.2 One touch access

There is a total of six 'One Touch Access' options. Each of them with its own 'Mode', 'Call', 'Call Type' and 'Message/Encode'


Picture 9: One Touch Access

- **Mode**: select either 'Digital' or 'Analog'
- **Call**: If you select analog mode, this option is ignored. If you select digital mode, it will define the 'Digital Contact' to be used.

- **Call type**: In "Analog' mode, there will be four types of DTMF for you to choose from: 'DTMF-1','DTMF-2','DTMF-3' and 'DTMF-4'. In 'Digital' mode, you can choose between 'Call' and 'Text Message'.
- **Message/Encode**: If 'DTMF-1' has been selected as 'Call Type', this option defaults to encode '1'. If 'Text Message' has been selected as 'Call Type', you will be able to choose one of the preset SMS within the menu 'Text Message' you have defined already.

## 5.3 Number key quick contact access

The numerical keypad of your DM-5R has 10 numerical keys, numbered 0..9. Each of those keys can be connected to one of the defined digital contacts. In order to access one of those assigned digital contacts, press and hold the corresponding numerical key.
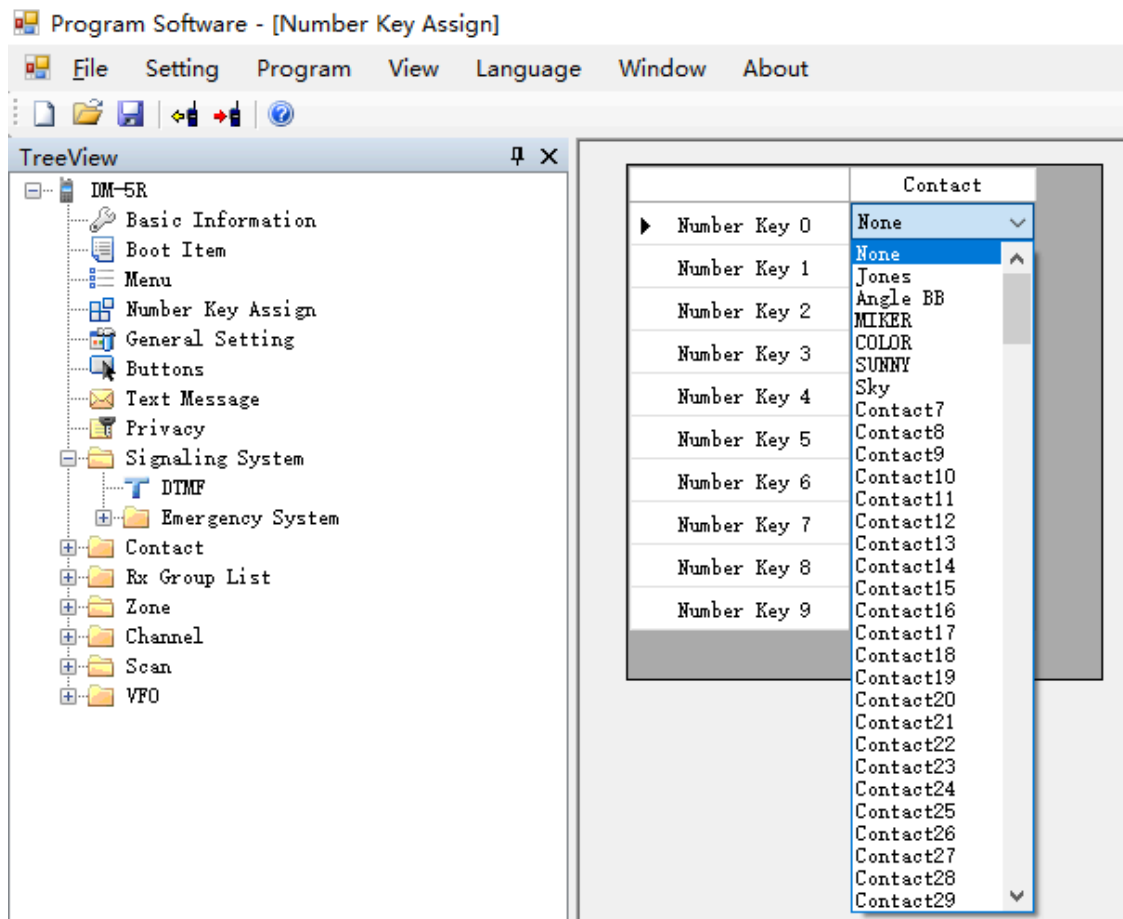
Picture 10: Number Key Quick Contact Access

6. Text Message

You can edit the quick text messages that you use frequently. After you save them to your DM-5R radio, they all will be available in your 'Quick Text'-folder. You can easily send them to the people you need to send without additional editing. Select 'Edit' -> 'Text Message' to get to the appropriate configuration page.
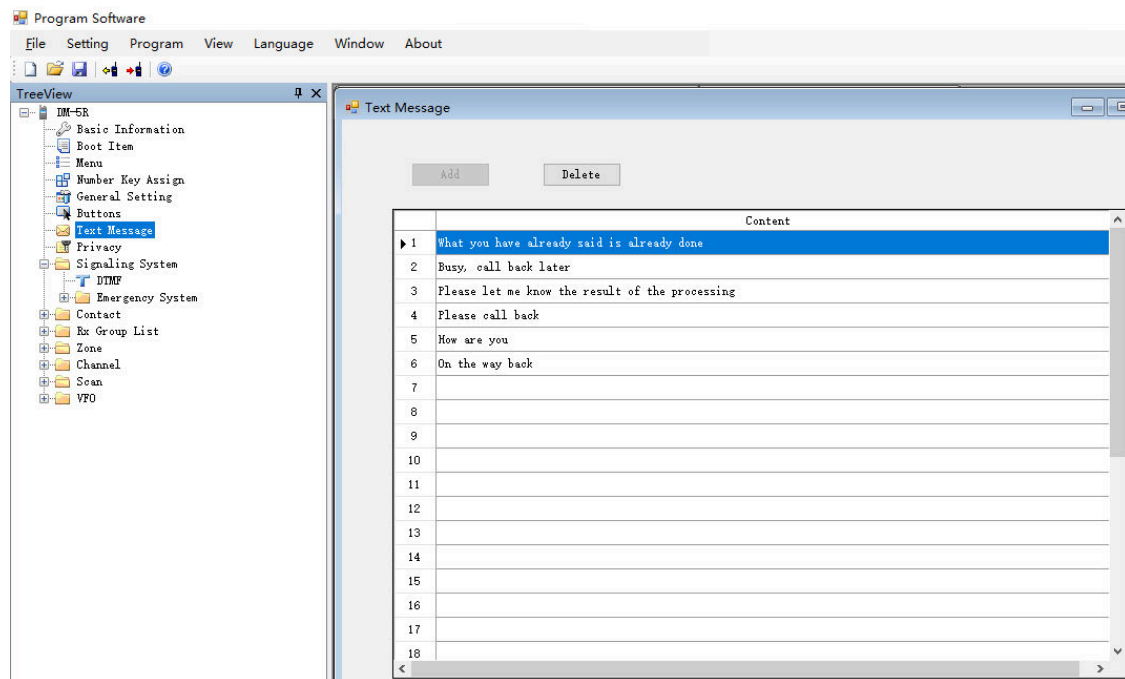

Picture 11: Text Message

7. Privacy Setting

Digital encryption is also supported by your DM-5R radio. You can set the corresponding digital encryption password. The person you are talking to can only hear your voice by setting the same encryption password as you, avoiding other people hearing your call. Select 'Edit' -> 'Privacy Setting' to get to the appropriate configuration page.

Hint:
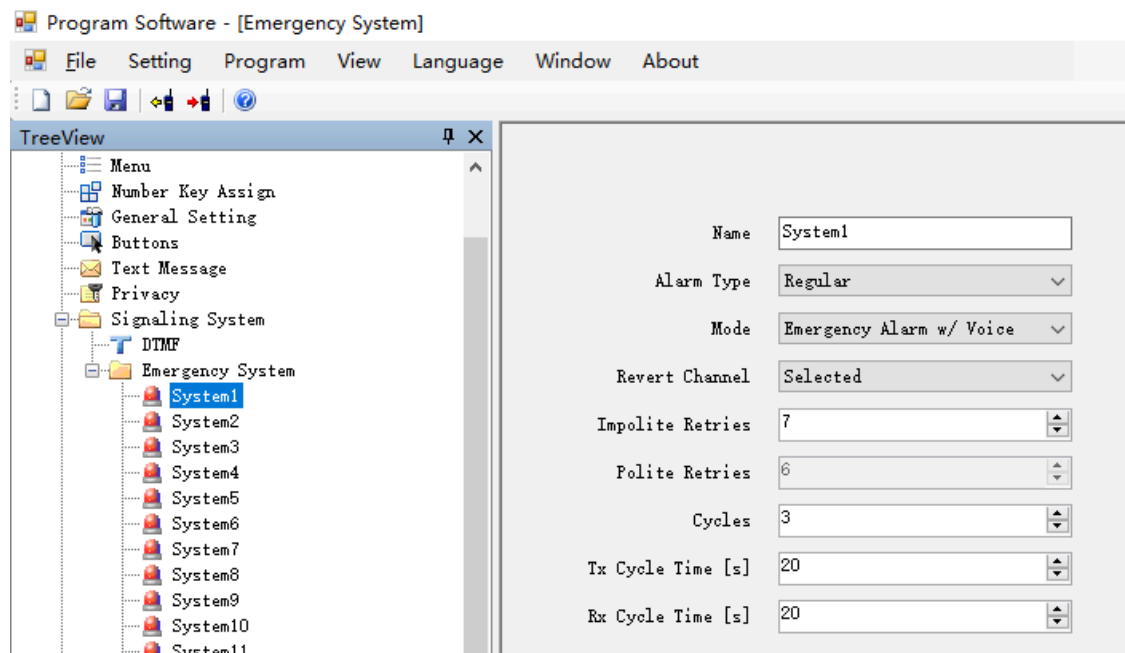*Encryption might not be allowed in your network.*
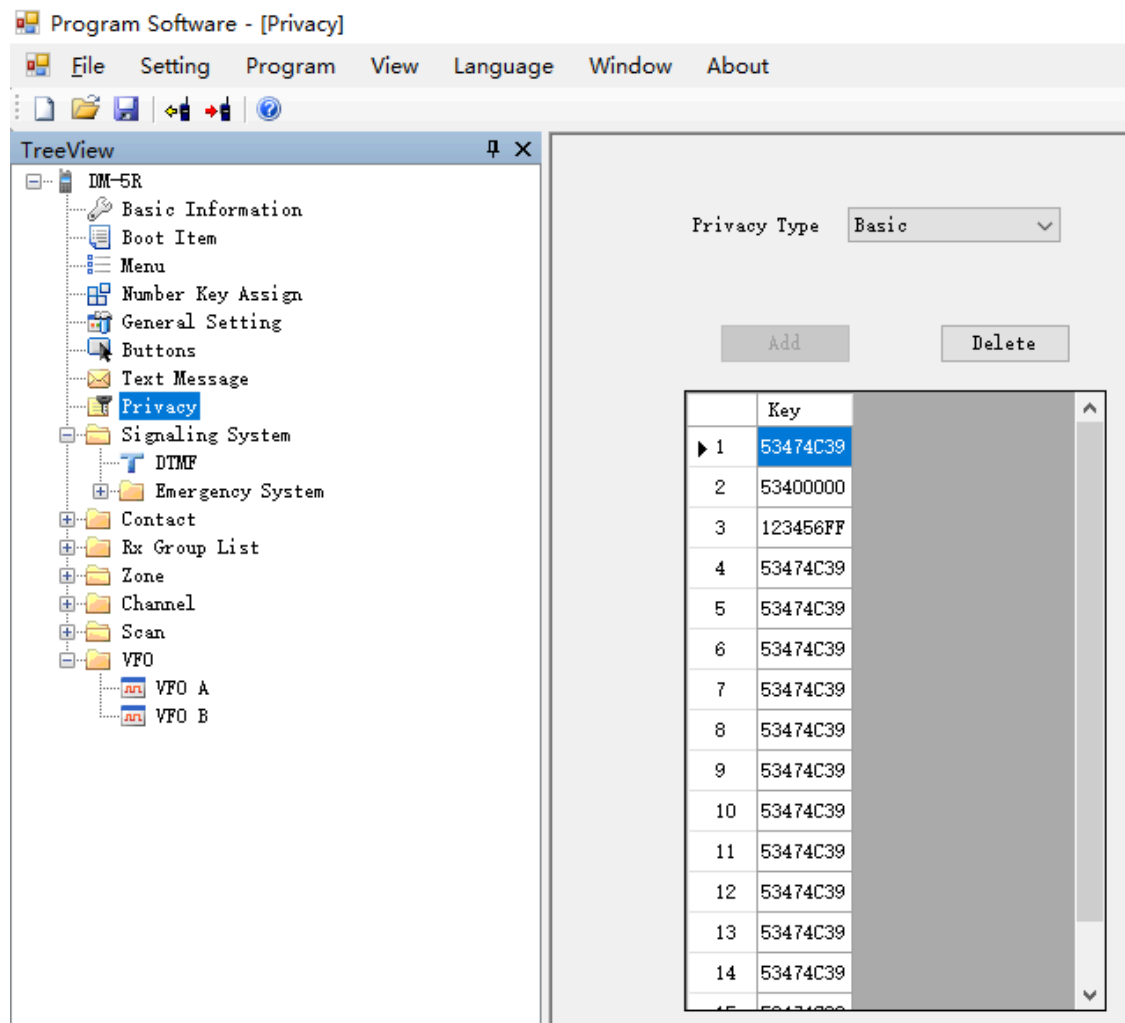
Picture 12: Privacy Setting

Note: Configure the encryption key for the machine. The key is 32 or 64 bit characters, including 0-9, A-F.

8. Emergency System

The availability of a digital emergency system depends on the digital network used. Select 'Edit' -> 'Digital Emergency System' and selected the system to edit.

Picture 13: Digital Emergency System

Name This entry displays the name of the system. The user can enter up to 8 characters. Valid characters include letters, numbers, spaces, and special characters.

Alarm Type An alarm is a non-voice signal that triggers an alert indication on another radio. This feature specifies the behavior of the initiating radio's alarm when the emergency button is pressed.

Mode Defines the radio's behavior when the radio's emergency button is pressed.

Impolite Retries An impolite transmission is a transmission that occurs even when there is activity on the current channel. The radio tries a number of impolite transmissions to get an acknowledgement and then goes on to try a number of polite transmissions. This feature sets the number of attempts to transmit an emergency alarm impolitely.

Polite Retries A polite transmission is a transmission that occurs only when there is no activity on the current channel. The radio tries a number of impolite transmissions to get an acknowledgement before trying a number of polite transmissions. This feature sets the number of attempts to transmit an emergency alarm politely.
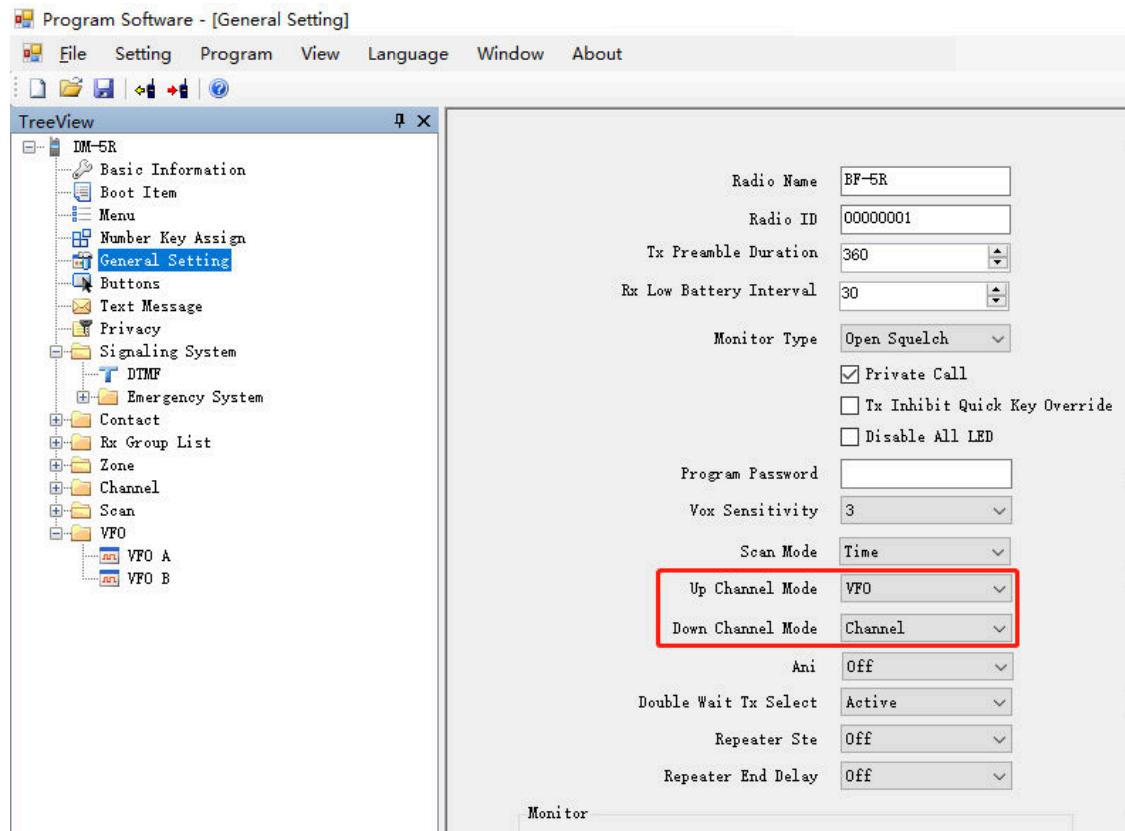
9. VFO Mode

The VFO mode is the similar to the normal channel mode in terms of the various parameters. Select

'Edit' -> 'VFO' to get to the appropriate configuration page.
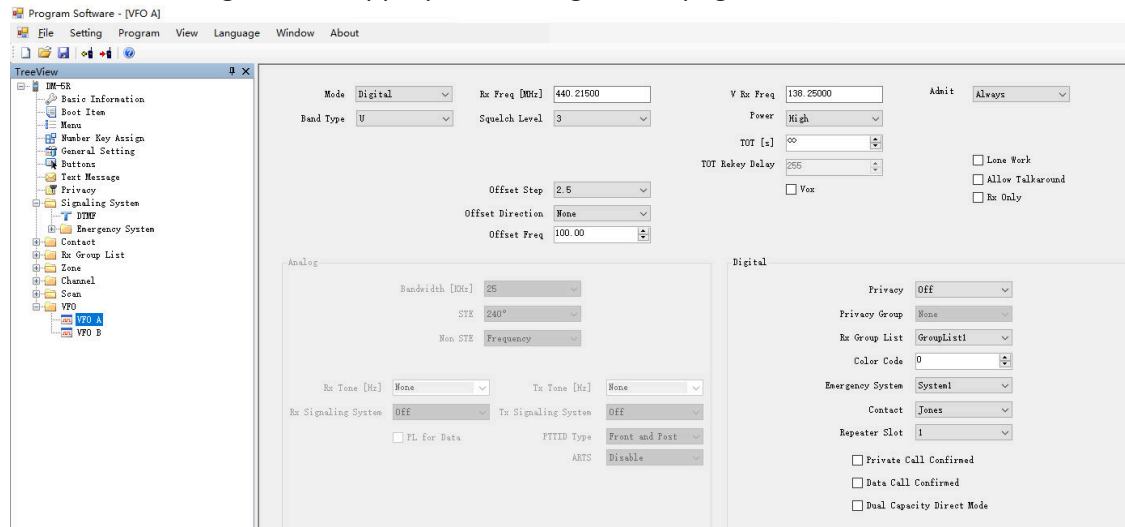
Picture 14: VFO Mode

The displayed mode can be set in the overall general settings.

Picture 15: General Setting - VFO

10. Prepare for DMR operation

10.1 Request a valid DMR RADIO ID

To operate on the DMR network, you must register for a DMR identification number. This can be done at https://www.radioid.net/or https://register.ham-digital.org/, depending on where you live.

Normally new DMR IDs are issued within 24 hours.

Your DMR ID can now be entered into the CPS.

- Click on 'Edit' ->'General settings"
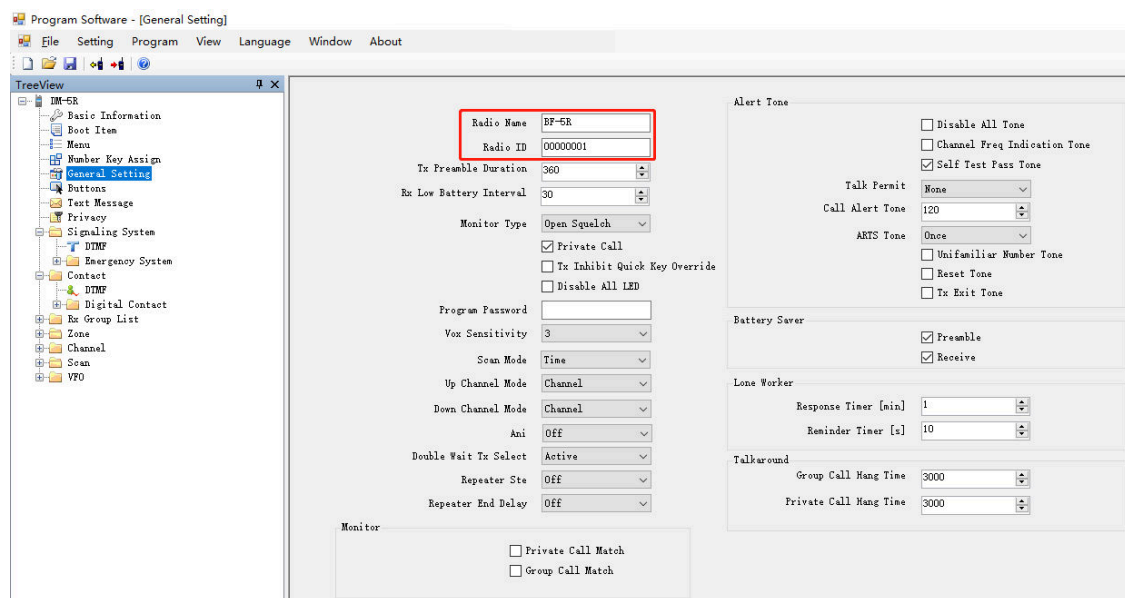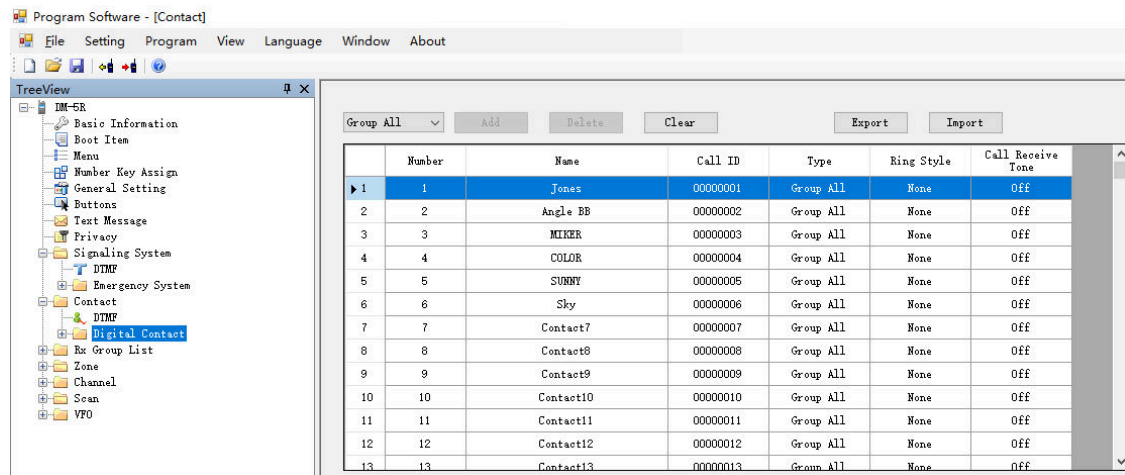

Picture 16: store your call sign and your DMR Radio ID

> **Note:**
> Never ever operate the radio using an ID that is not issued to yourself. Within amateur radio networks this may result in losing your license.

10.2 Digital Contacts (besides those of the DMR database)

Store up to 256 contacts.

Select 'Edit' -> 'Digital Contact' in order to work on those digital contacts.

Picture 17: Digital Contacts

| No	entry within the list of digital contacts (up to 10k entries)
Contact Name	Name to be displayed for this digital contact
Call Type	You may select between: • Group Call • Private Call • All Call
Call ID	ID for a digital call member or talk group. This ID is used to identify and communicate with a target radio (DMR ID) or group of radios (TG) depending on the call type
Call Receive Tone	An alert tone sounds on the receiving radio prior to unmooring during a 'Group Call', 'Private Call' or 'All Call'. This feature is set on a per-call basis.

10.3 RX Group List

You will require a so called 'RX Group List' for your Channel settings. Creating such a group allows you to put your configured 'Contacts' into logical groups so they can be contacted.

- Up to 250 individual RX Groups can be created and named to identify each group.
- Each group can contain as few or as many contacts as convenient.
- Groups should be named according to their group members (Digital Contacts).
- Only contacts set as group calls can be added to a group

To work on such groups use 'Edit' -> 'RX Group List'. A typical group may look like shown in the next picture
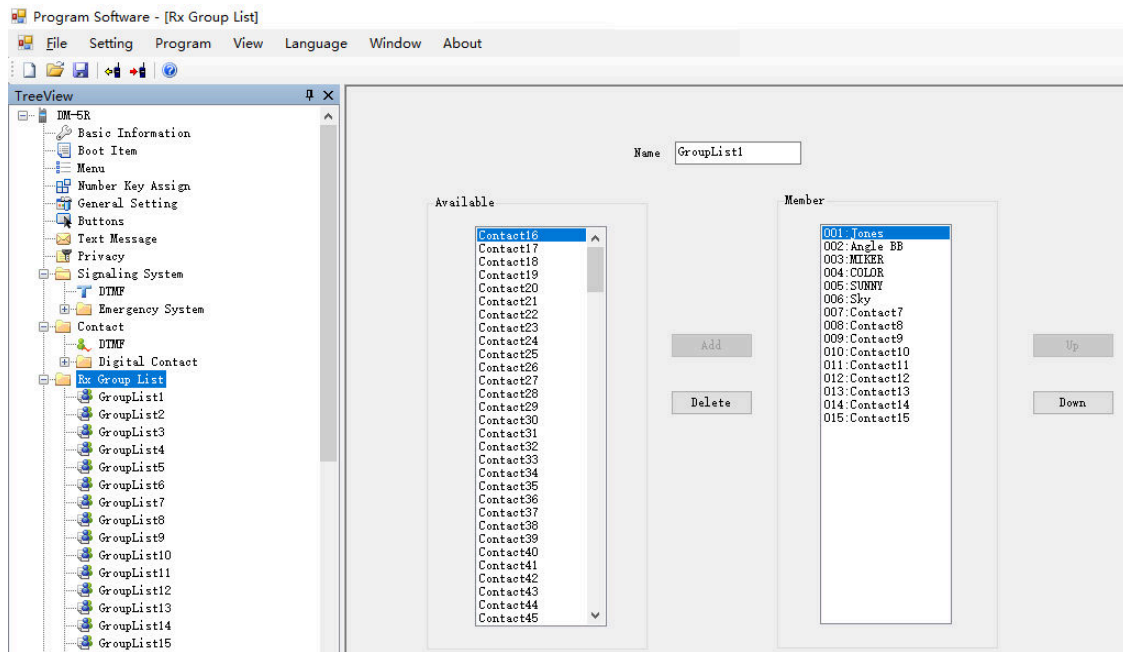
Picture 18: Typical Digital RX group

11. Channel settings

The DM-5R offers up to 1024 channels for UHF and VHF. To start double click on the first line No.1 to open the Channel Information window for that channel:

Picture 19: Channel Information

Let's have a very short explanation of all those fields:

Channel name	The name of the channel (should be unique)
Rx Freq[MHz]	the VHF or UHF frequency
Tx Freq[MHz]	the VHF or UHF frequency
Channel Mode	Select 'Analog' and 'Digital'
Scan List	Select which Scan List(s) will be scanned
Squelch	Squelch level selection, only for analog mode
Admit criteria	Selects PTT transmit criteria – typically same Color Code
Lone work	Check if the 'alone" emergency function should be allowed
TOT	the radio can continuously transmit before a transmission is automatically terminated
VOX	Voice Operated Transmit)
Power	Select one of four levels 1W/5W
Digital	
Privacy	Select 'off', 'basic' or 'enhanced' to use for encryption.
Rx Group List	If programmed, select the RX Group List
Color code	Select which Color Code (CC) is related to this channel
Emergency	Select emergency system
Contact	Talk Group (TG) to be assigned to this channel
Repeater Slot	Select which slot (1 or 2) applies to this 'Channel'
Analog	
Band Width	Select the bandwidth for transmission
Rx Tone	Select Off or CTCSS or DCS and tone frequency
Tx Tone	Select Off or CTCSS or DCS and tone frequency
RX signaling System	Select off, DTMF
TX signaling system	Select off, DTMF

Once completely filled in, click OK to save this Channel.

11.1 Spread Sheet Option

For large amounts of channel data, this may be a desired method as it allows cut and paste of large amounts of data. This is especially desired when adding multiple repeaters with similar configurations.
The current channel configuration can be exported to a csv file, enhanced and finally imported back to the CPS.

Picture 20: Channel List Import

> **Hint:**
> *Always save data files for recovery purposes.*

12. Zones to bundle channels

Creating a 'Zone' allows you to put your previously configured 'channels' into logical groups so they can be accessed.

- Up to 250 individual zones can be created and named to identify each channel group.
- Each zone can contain as few or as many channels as convenient.
- Zones can be named to identify repeaters, functions, etc.
- The channels in each zone can be sorted or rearranged in any order.
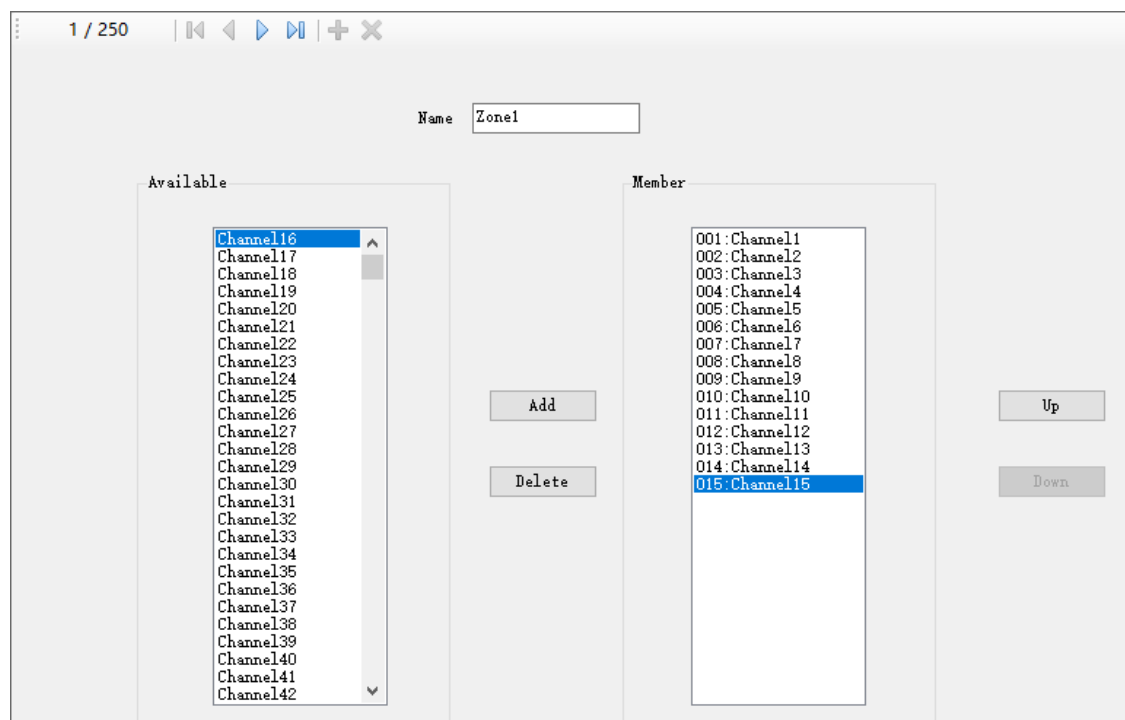
Picture 20: Zone Information

13. Scan List

A 'Scan List' is a group of channels to be monitored when the 'Scan'-function is been activated using one of the programmable function keys. The DM-5R has the capability of storing multiple scan lists per channel.

1. Select Scan List from the left column
2. Double click on the first open line
3. Enter a name for the new Scan List
4. Highlight the channel name you want to appear in the list and press 'Add>>'.

Up to 32 channels can be loaded into an individual list. You also have the ability to sort or rearrange the channels in this list. The scan list will later be assigned to a channel of your choice during the setup of a channel (see section on channels).

Picture 21: Scan List

Name	Name given to group of scanned channels
Available	Will list the channels available to scan
Member	List of channels to be scanned
TX designated channel	This feature defines the conventional channel/trunking personality on which the radio will transmit if the user presses the Push-to-Talk (PTT) button while the radio is scanning.
Priority Channel select	Select the priority channel or 'off'
Signaling Hold time	Sets the amount of time that the radio waits on an analog scan list channel when a carrier signal of sufficient amplitude is detected on the channel. This pause allows the radio to decode the analog system signaling data. If the decoded information is incorrect, the radio reverts to scan.
Priority Sample time	Sets the duration that the radio waits, when in a call, before scanning the priority channels. If the call is taking place on a Priority 1 Channel, no scanning will take place. When scanning priority channels, the radio briefly mutes the current

	transmission. Increasing this interval improves the audio quality of the current transmission as fewer checks are done, but this also increases the chance of the radio missing out priority channel activity.
Priority Channel 1	Sets which channel is priority 1
Priority Channel 2	Sets which channel is priority 2

> *Note:*
> *You can add the same channel to multiple scan lists.*

14. Write data to radio

After you have completed all the above steps, you can write the data to the DM-5R radio.