

# **ARC250 for BC2xxD/BC7xxD User Manual**

*Version 1.10*



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## **1: INTRODUCTION:**

ARC250 is a windows software package for easy programming and controlling the Uniden BC250/785/296/796 digital scanners.

System requirements:

Windows 95/98/ME/XP/Win2000/NT

minimum display resolution settings: VGA 800x600

SMALL Fonts

Free serial port com1-com16

ARC250 is available in 2 versions:

### **ARC250basic:**

- Enhanced editor for memory channels, trunk id's and search range data
- Virtual Control screen, control your scanner from a PC. The PC displays a near 100% copy of the scanner display.

### **ARC250pro:**

ARC250PRO includes all options of ARC250basic plus:

- Search range extender: add 200 custom programmable search ranges
- History log: software shows all the latest activity, the last 100 hits (frequencies/trunk id's/detected subtones) are stored
- Logging to disk: log all data to disk using the CSV file format
- Audio recording: automatically record WAV files. The filename of each wav file contains: frequency / trunk id / start / end time and date
- The color and fonts are user programmable

This manual covers both the BASIC and PRO version. The sections for PRO version are clearly marked.

### **ARC250 Quick Start Reference:**

- Install the software (1.1)
- Enter the registration information (1.2)
- Connect the scanner to the PC (1.3)
- Setup the scanner model and rs232 serial communication port number and baudrate using auto detect (1.4)

**IMPORTANT: YOU MUST ENTER A VALID REGISTRATION CODE TO MAKE FULL USE OF THE SOFTWARE. THE REGISTRATION CODE IS SEND TO YOU BY E\_MAIL (IF YOU PURCHASED ONLINE) OR IS IN THE CD BOX. DO NOT LOSE THIS INFORMATION; YOU NEED IT FOR FREE UPDATES!**

**USB DEVICES ARE NOT SUPPORTED, USE AT YOUR OWN RISK**

## **1.1 Software installation:**

The ARC250 is available as Internet download or on CD-ROM.

Important: we advise our customers to uninstall previous versions before installing new versions. The uninstall process will not remove any data files created with the software.

Win2000/XP users: You must be logged on as administrator to install and use ARC250.

Internet download:

The downloaded file contains all the necessary files for installation. Run the exe file and the installer will automatically start.

CD ROM:

Insert the CDROM; the CDROM has an auto start option that will automatically start the installation process. If the installation process does not start, simply run setup.exe

During the installation process you can set the installation directory. We suggest using the default directory. You cannot install the software on a network drive.

### **Software un installation:**

ARC250 will automatically add an uninstall option. Use the Windows Control panel for uninstalling the software. Backup your work before using the uninstall option.

## **1.2 Registration:**

After installation of the software, the program runs in DEMO mode. You must enter a valid registration code to activate the software. For your convenience the software will work for a limited period of time including uploading to the scanner (BASIC version only). After the demo time has expired you cannot upload data to the scanner until you enter a valid registration code.

Internet download: customers that purchased using the Internet download option, received a registration code by e-mail. It is VERY IMPORTANT that you store the registration code in a safe place. If you loose the registration information you must buy a new registration code.

CDROM: in the jewel case of the CDROM you find the registration information. Store the case of the CDROM in a safe place.

### Enter registration:

Start the software by selecting START \_ PROGRAMS \_ ARC250 \_ ARC250 for Uniden BC250/785. After the start screen, select HELP \_ REGISTER in the menu.

Enter the name and key information: the name is case sensitive!  
No spaces are allowed. The key only contains numbers. The name may contain '0' (=zero) or capital O.

### **1.3 Connect you scanner:**

The scanner must be connected to a free serial port. This is normally a 9-pin connector at the back of your PC. Refer to your PC and scanner manual for information.

BC250/296D: the BC250/296D comes with a serial cable; connect to a free serial port

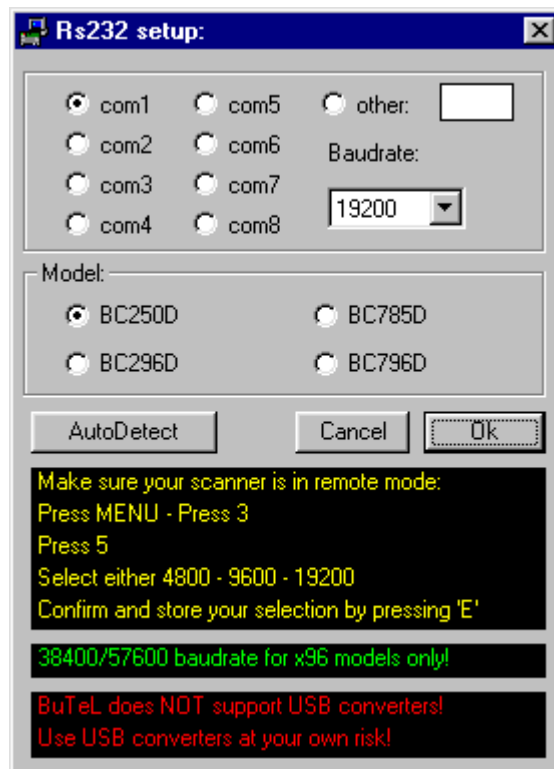
BC785/796D: the BC785/796D does not come with a serial cable; you need to purchase a standard straight thru RS232 cable for connecting the scanner to you PC.

ARC250 does not support USB devices, use USB devices at your own risk.

## **1.4: Getting started: RS232 communication setup**

After installation of the software you must check and set the software settings for correct scanner model and RS232 communication.

Start the software and select: BC250 \_ RS232 communication setup from the menu (or BC785 \_ RS232 communication setup).



First select the right scanner model you are using: BC250, BC296, BC785 or BC796D. 38400 and 57600 baudrate is only available for 296/796 models.

The software has an auto detect option and may automatically change the model settings. You cannot run the software in BC250 mode if a BC785 scanner is connected.

If you know the settings for the serial communications port and baud-rate you can manually set them. Select OK and the software will store your settings. The software remembers these settings.

If you do not know the correct settings you can use the software auto-detect option:

- Connect your scanner to a free serial comport (normally this is a 9 pin connector) using a serial cable or the cable that was supplied with the scanner (BC250 ONLY) (ARC250 does NOT include any cables for connecting your scanner, refer to scanner manual for information about the serial cables)

- Switch on your scanner, verify the scanner is enabled for RS232 serial communication: select MENU \_ 3 \_ 5 \_ ENTER; this will set the scanner to 19200 baud-rate. (or 38400/57600 for 296/796 models)
- In the software press the auto-detect button, the software will scan all available serial ports and detect the scanner model and baud-rate. This autodetect process may take several minutes.
- If the software successfully detects the scanner, a message is shown, if the software does not detect the scanner check your cable and the scanner settings. Refer to section 8.2 for troubleshooting tips from our customer support department.
- The 19200/38400/57600 baud-rate setting is the preferred setting. Only use lower baud-rates in case of erratic communications. Choosing a lower baud-rate than 19200 will decrease overall performance of the software.

USB devices: The Uniden digital scanners use the RS232 serial port standards. They do not support USB connections.

BuTel does not provide any support for USB <> serial converters, use at your own risk. Any questions about a USB converter must be send to the supplier of that device not to BuTel.

After setting up the serial communication you can check the connection. From the main menu select: BC250 \_ Virtual Control (or BC785 \_ Virtual Control). After a few seconds the Virtual control panel should show the contents of the scanner display. Below is an example:

(SCREENSHOT WAS TAKEN FROM PRO VERSION in BC250 mode):



### **1.5: USB information**

Uniden scanners use a standard Rs232 port for computer programming and control. Uniden scanners do not have a USB port available. Therefor ARC250 is developed to support standard serial comports.

For laptop PC's that do not have a serial port we advise to use a PCMCIA serial port extender card.

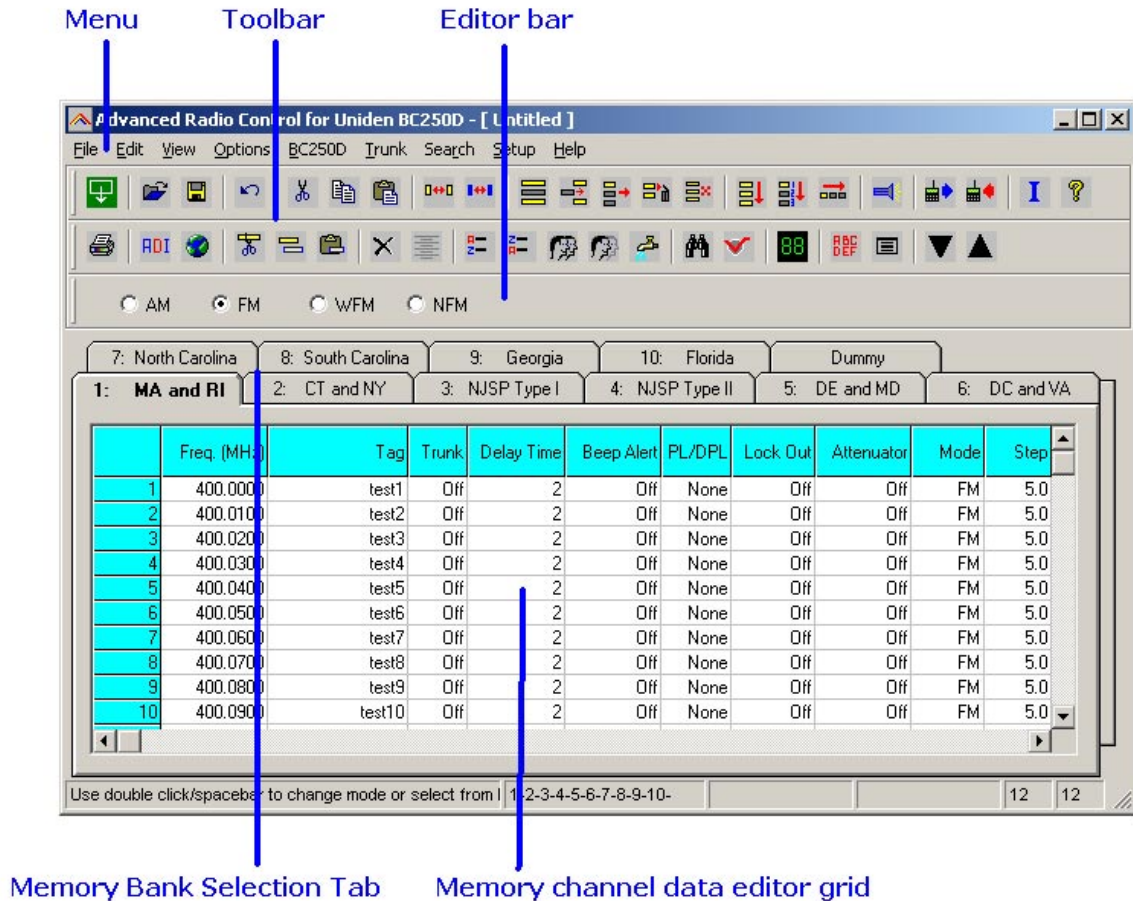
Several manufacturers also sell serial<>USB converters. These converters create a virtual software rs232 port and can work very unreliable. Because USB is not the standard computer interface port for Uniden scanners, BuTel does not support communication problems when a USB converter device is used.

For support in case of communication problem customer should contact the supplier/manufacturer of the usb device.

## 2: Using the memory channel editor:

ARC250 includes the most versatile memory editor available on the market. Unlike other software packages you can use ARC250 without a scanner connected.

This section describes most options available in the memory editor; in order to use the full power of the editor it is important that you read this section carefully. The editor does not require that a scanner is connected.



The memory editor has a clear layout:

The top section has a standard Windows MENU bar and a Toolbar. Most options found in the menu also have a 'shortcut' in the toolbar. If the mouse is moved over a toolbar button a help text is shown giving a brief description of that button.

The editor bar changes as you move the mouse in the editor grid, if you click on a column the editor bar will show the right edit options. You can edit data both in the editor bar or directly in the editor grid.

Using the memory bank selection tab you can set the active memory bank that you want to edit.

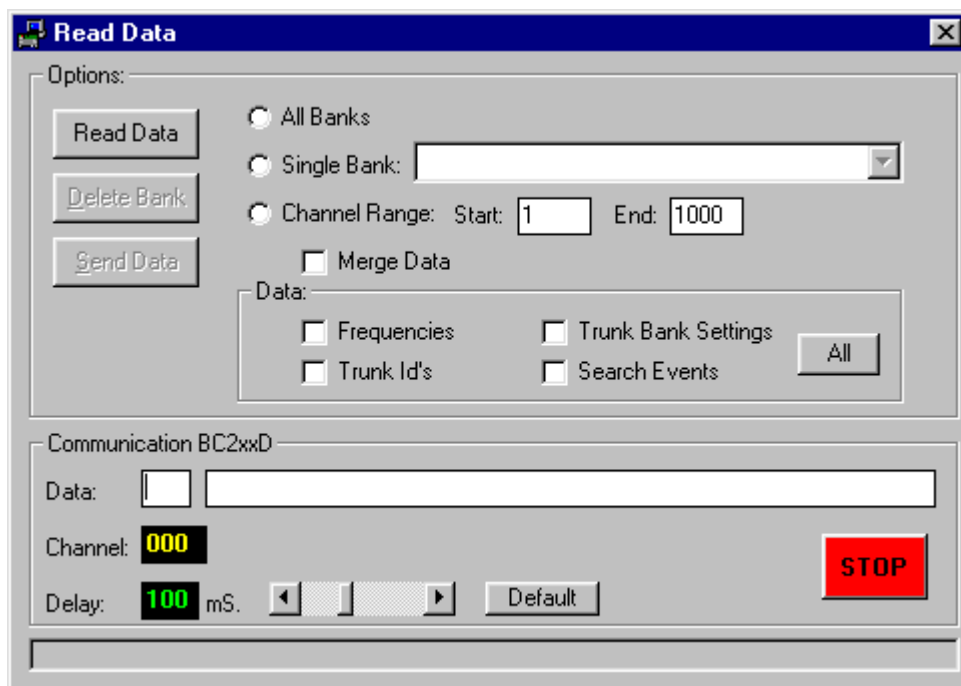
## **2.1 Reading data from the scanner:**

After setting up the communication you can start to use the memory editor. Because there is probably already some data in your scanner it is a good start to first read the data from your scanner.

From the main menu select: BC250 \_ Read Data from Scanner (or BC785 \_ Read Data from Scanner).

*Tip: you can also use the toolbar button or press F5.*

A new window is shown:



First select whether you want to read data from all banks or a single bank. Next select what data you want to read. For your convenience you do not need to read all data from the scanner.

Example: if you want to change frequencies in bank 5, you only need to read the frequency data from bank 5.

Data options:

Frequencies: the frequency data that is stored in your memory channels.

Trunk Id's: the talkgroups and talkgroup tags that are stored in the trunk scan lists.

Trunk settings: the trunk parameters that are used to setup a trunk system.

Search Data: the data that is stored in the 10 user programmable search ranges (also referred to as chain search).

All button: the All button will automatically select all the above options.

After you made your selection, press 'Read Data'. The software will start to read data from the scanner. Once reading data is complete the window is closed and data is transferred to the memory editor grid.

DELAY: This parameters defines the delay the software uses during serial communication. You can adjust this delay to improve communication speed but using delays other then the default value may give communication errors. In case of communication problems always use the default delay of 100mS. See also chapter 8 for more information about communication speed and solving communication problems.

## **2.2: Hints and Tips**

Once data is transferred to the memory channel grid you can use many options to edit your data. ARC250 is the most versatile editor available on the market.

Using the menu or toolbar you can easily move/copy/sort data. All options also have a toolbar button available. Moving the mouse pointer over a toolbar button will show a small popup help text.

General information about using the memory channel editor grid:

You can edit data directly in the grid or you can use the editor bar. The editor bar will automatically change if you click on a column. In the grid there is no cursor shows.

In the frequency and tag columns you can directly type data, to edit existing data use the editor bar above the grid.

Most columns support double click for easy data toggle. The space bar has the same effect as using the mouse double click.

Keyboard shortcuts:

In some columns you can also use keyboard shortcuts:

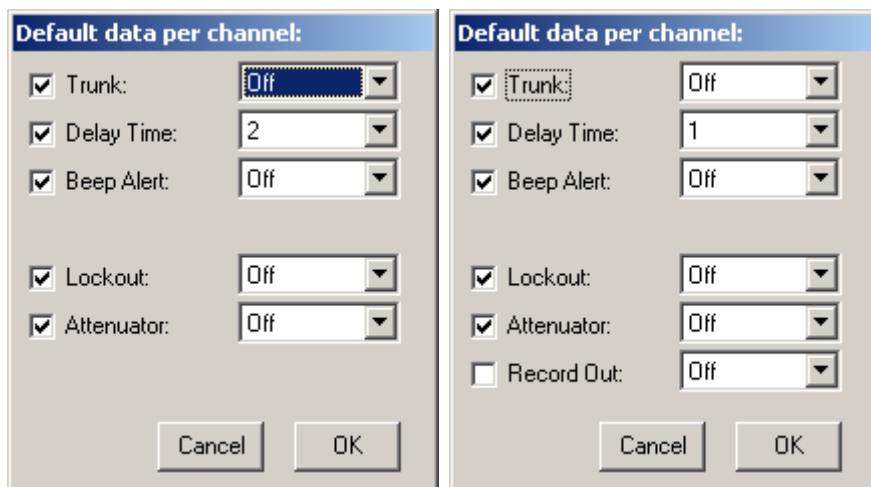
Mode: A=AM, F=FM, N=NFM, W=WFM

On/Off columns: 0 = OFF, 1=ON, F=OFF, N=ON.

### **2.3 Programming conventional frequencies:**

You can enter frequencies directly in the grid. In the grid there is no cursor shown. You can use BACKSPACE to make corrections in the grid. If you click on a cell the current data is copied to the editor bar, in the editor bar a cursor is shown (frequency and tag column only).

When you enter a frequency and you press ENTER the other cells of that line are automatically programmed depending on your custom settings (default channel data). You can customize the default data: select SETUP \_ SETUP DEFAULT DATA. A new window is shown:



In this window you set the default data that is put in the grid if you press enter. All parameters that have the check box selected will be put in the grid. By using this option the software will take care of programming default data.

Mode and step column: depending on the bandplan settings (section 6.2) the software will automatically program data in the mode and step column.

Tip: programming your personal preferences in the default data and setup a custom bandplan will save you time while programming new frequencies.

When you press <enter> the software will automatically go to the next cell.

### **2.4 Programming Trunk frequencies:**

In ARC250 there is no difference between programming conventional and trunk frequencies. A frequency is defined as a trunk frequency by setting the trunk parameter to ON in the trunk column.

**IMPORTANT:** before you start programming trunk frequencies, make sure that the correct trunk system type is selected. The software uses the information from the trunk type settings to auto-correct data in the memory bank.

Additional information about trunk frequencies:

Trunk frequencies only use Fm or Nfm mode.

For an Edacs system it is very important that frequencies are programmed in the right order. If you try to sort an Edacs system a warning is shown.

To setup your scanner for receiving trunk systems:

- Use internet/frequency lists to obtain the correct information about trunk system settings, trunk frequencies and trunk id's.
- First setup the trunk system type (Select TRUNK \_ SYSTEM SETTINGS)
- Second program the frequencies in the memory editor grid and make sure the trunk parameter for these channels are set to ON
- Now you can use trunk search mode to discover trunk id's (refer to scanner manual) or you can program known id's in your scanner by selecting TRUNK \_ TRUNK ID's. For your convenience you can program a tag for every trunk id's. The trunk id's are divided in 10 groups; you can scan these groups just like normal banks.
- ARC250PRO will log new trunk id's when you use the trunk search mode option.

## **2.5 Sort channels**

Memory channels can be sorted. You can either sort ascending or descending. You can only sort within a single bank. In general scanners will scan faster when channels in a bank are sorted.

Sorting entire bank: make sure that only one channel line in the grid has the focus, now you can use the sort ascending/descending options.

Sort a range of channels: highlight the range of channels you want to sort, and then select the sort option. Only the selected range of channels will be sorted.

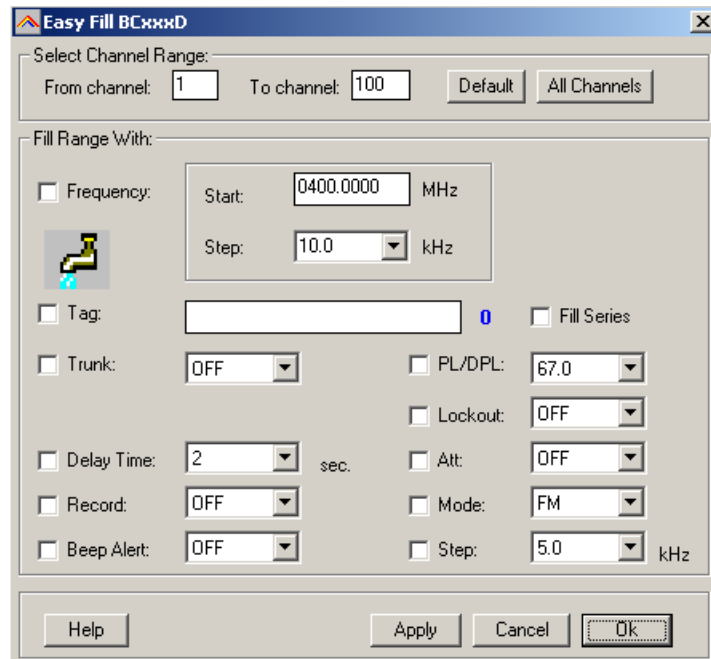
## **2.6 EasyFill**



EasyFill is a simple but powerful option that lets you program data in a range of channels with only a few mouse clicks.

Additionally you can use EasyFill for quickly program a range of frequencies in a memory bank so you can use a memory as a search bank.

Select EasyFill from the Options menu or use the EasyFill toolbar button to display the EasyFill window:



In the top frame the channel range is selected. DEFAULT will set the start and end channel of the selected bank. ALL CHANNELS will set all 1000 channels.

In the 'Fill Range With' frame you select the data you want to program in that range. If you want to set the mode for all selected channels to WFM select the MODE check box then select WFM and select APPLY, this will program WFM in all selected channels. You can select more the one check box.

If the Frequency check box is selected you can set a start frequency and a step. The software will automatically calculate the frequencies for the selected channel range.

Example: Frequency is set to 88.000 MHz, step is set to 50 kHz and channel range is 1-100. If you select APPLY the software will program 88.000 in channel 1, 88.050 in channel 2, 88.100 in channel 3 etc.

Fill series: for the TAG option you can also set the fill series option. Fill series will search for a number in the tag and use that number to 'calculate' the tags in the selected channel range.

Example: in the tag box the tag is set to 'Police 1'. The channel range is set to 1-100.

If fill series is selected, the software will automatically program 'Police 1' in channel 1, 'Police 2' in channel 2, 'Police 3' in channel 3 etc. See also section 2.9.

The number of characters of the tag box is shown in blue.

## **2.7 Using the clipboard**

In the memory editor grid you can use the standard Windows clipboard options. In the toolbar shortcuts are available for cut, copy and paste options. You can also use the keyboard shortcuts CTRL C, CTRL X and CTRL V. Use these options to paste data from other applications like Excel.

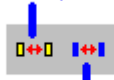


An additional clipboard option is available that will automatically select entire lines (Cut line, copy line and paste line). To use these extra options, click any cell of a memory channel then select cut/copy/paste line. To paste in a different memory channel, select any cell in that memory channel, then select paste line, ARC250 will automatically align the pasted text.

Important: while pasting data make sure the data is valid for the column you want to paste data. Example: you cannot paste WFM in the step column.

## **2.8 Copy/Move/Swap Memory channels / Banks**

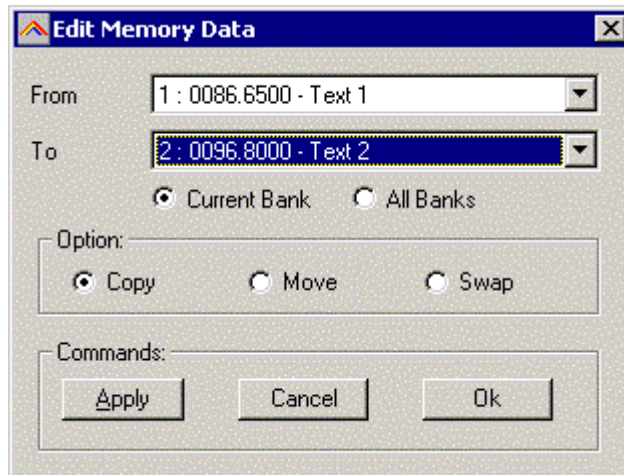
Copy/Move/Swap Memory Channels



Copy/Move/Swap Banks

Memory channels or entire memory banks can be easily copied, moved or swapped.

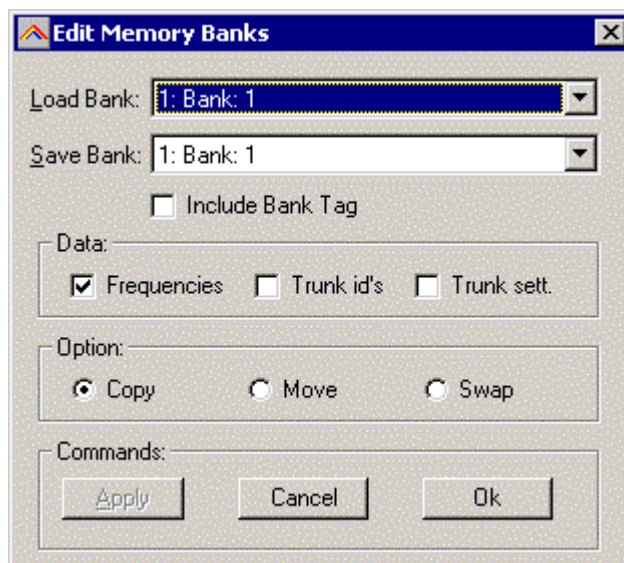
### **2.8.1 Copy/Move/Swap Memory Channels:**



The 'from' and 'to' list boxes will automatically display the channel number, frequency and tag. Channels that are empty (no frequency programmed) are indicated as Empty.

Current Bank: copy/move/swap channels in the active bank  
All Banks: copy/move/swap channels in all Banks

### **2.8.2 Copy/Move/Swap Memory Banks:**



Use this window to copy/move/swap entire memory banks. You can select the data that you want to copy/move/swap (frequencies, trunk id's and trunk settings). To avoid problems with trunk id's you must double-check the trunk settings while trunk id's are copied/moved/swapped.

The 'Include Bank Tag' options will also copy/move/swap the bankname.

## **2.9 Fill Down / Fill Series**

The Fill down and fill series options are used to copy the same data into a range of channels. Fill series will auto calculate ascending numbers in text tags (see examples below)

This example will show fill down:

Channel 10 contains Trunk=OFF, Delay Time = 4 seconds and Record =ON

	Freq. (MHz)	Tag	Trunk	Delay Time	Record
10	0400.0000		Off	4	On
11	0400.0500				
12	0400.1000				
13	0400.1500				
14	0400.2000				
15	0400.2500				
16	0400.3000				
17	0400.3500				
18	0400.4000				
19	0400.4500				
20	0400.5000				

We want to copy this data to channels 11-20; first you must highlight the channel range:

	Freq. (MHz)	Tag	Trunk	Delay Time	Record
10	0400.0000		Off	4	On
11	0400.0500				
12	0400.1000				
13	0400.1500				
14	0400.2000				
15	0400.2500				
16	0400.3000				
17	0400.3500				
18	0400.4000				
19	0400.4500				
20	0400.5000				

Now select the FILL DOWN option:

	Freq. (MHz)	Tag	Trunk	Delay Time	Record
10	0400.0000		Off	4	On
11	0400.0500		Off	4	On
12	0400.1000		Off	4	On
13	0400.1500		Off	4	On
14	0400.2000		Off	4	On
15	0400.2500		Off	4	On
16	0400.3000		Off	4	On
17	0400.3500		Off	4	On
18	0400.4000		Off	4	On
19	0400.4500		Off	4	On
20	0400.5000		Off	4	On

The software will automatically fill the selected range, using the data at the top of the selected range.

**Fill Series:**

Fill series only works in the tag column. It will look for number information in the tag and auto increase the number in ascending channels.

Example: Channel 10 contains the tag 'UHF Channel 431':

	Freq. (MHz)	Tag
10	0400.0000	UHF channel 431
11	0400.0500	
12	0400.1000	
13	0400.1500	
14	0400.2000	
15	0400.2500	
16	0400.3000	
17	0400.3500	
18	0400.4000	
19	0400.4500	
20	0400.5000	

Highlight the channels where you want to copy the data to:

	Freq. (MHz)	Tag
10	0400.0000	UHF channel 431
11	0400.0500	
12	0400.1000	
13	0400.1500	
14	0400.2000	
15	0400.2500	
16	0400.3000	
17	0400.3500	
18	0400.4000	
19	0400.4500	
20	0400.5000	

Now select the FILL SERIES option and ARC250 auto calculates the new tags:

	Freq. (MHz)	Tag
10	0400.0000	UHF channel 431
11	0400.0500	UHF channel 432
12	0400.1000	UHF channel 433
13	0400.1500	UHF channel 434
14	0400.2000	UHF channel 435
15	0400.2500	UHF channel 436
16	0400.3000	UHF channel 437
17	0400.3500	UHF channel 438
18	0400.4000	UHF channel 439
19	0400.4500	UHF channel 440
20	0400.5000	UHF channel 441

## **2.10 Other Options:**

### PL/DPL Column / PL/DPL tone lockout:

If you want to ignore a subtone (lockout a subtone) use the 'L' key to toggle lock out on/off.

A '-' will indicate a subtone is locked out.

Tips: You can scroll the list with subtones by using the - and + keys. Shift \_ spacebar will scroll down.

### DUMMY BANK:

The dummy bank is a virtual bank. You can use this bank for temporary storage of data.

The data in the dummy bank is not send to your scanner nor stored in a file.

You can also consider the dummy bank as a large clipboard.

You can use the cut/copy/paste options to move data between the dummy and memory banks.

### The EASY TAG dropdown list:

If this option is selected the memory editor will show a dropdown box while the Tag column is active.

All tags that are programmed are available in the dropdown combo. This makes it easy to select a tag that was already programmed.

To use the easy tag list:

- Select the tag from the list
- The tag is copied into the tag edit box
- Place the mouse in the tag edit box and press enter
- This will copy the selected tag into the selected cells of the grid

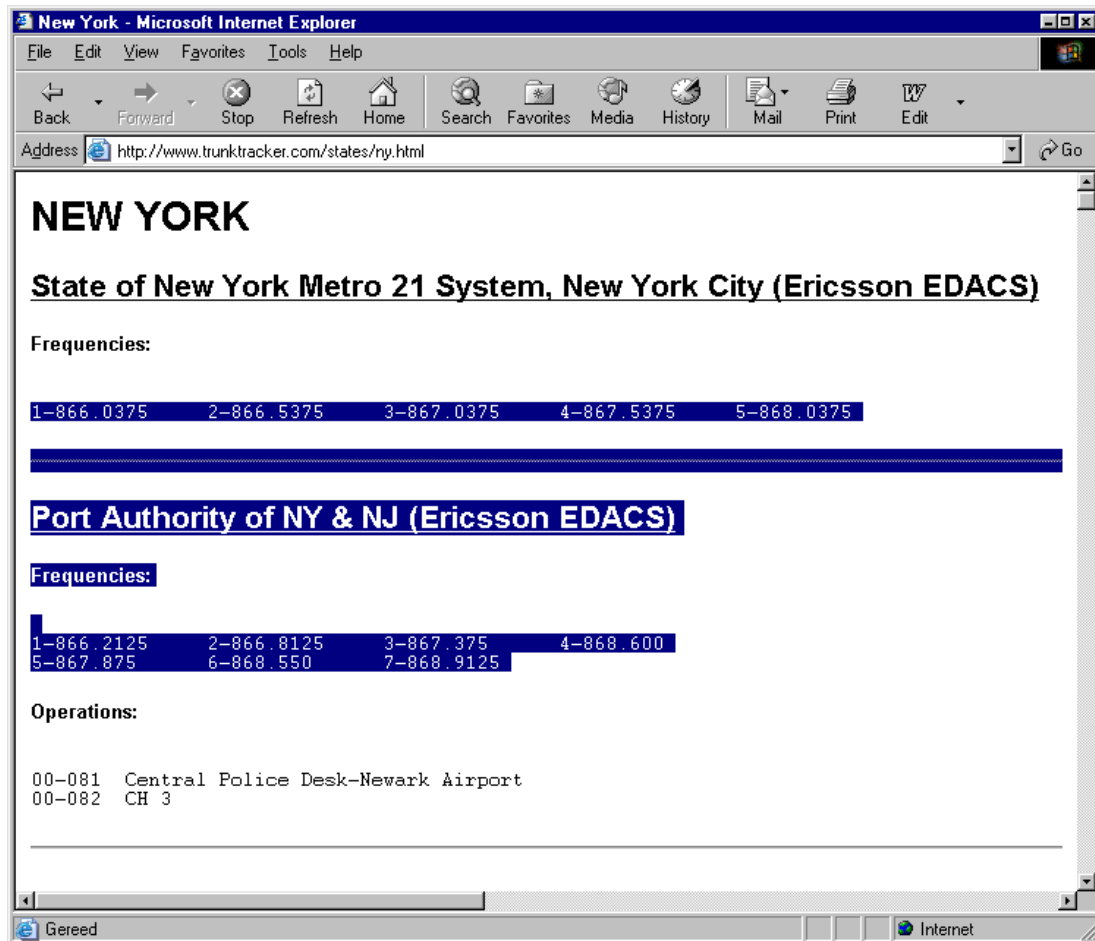
### DIRECT TUNE:

When direct tune is selected, the software will tune you scanner to the memory channel that you click on in the editor grid.

## **2.11 Using Webcatcher for importing frequencies from internet website:**

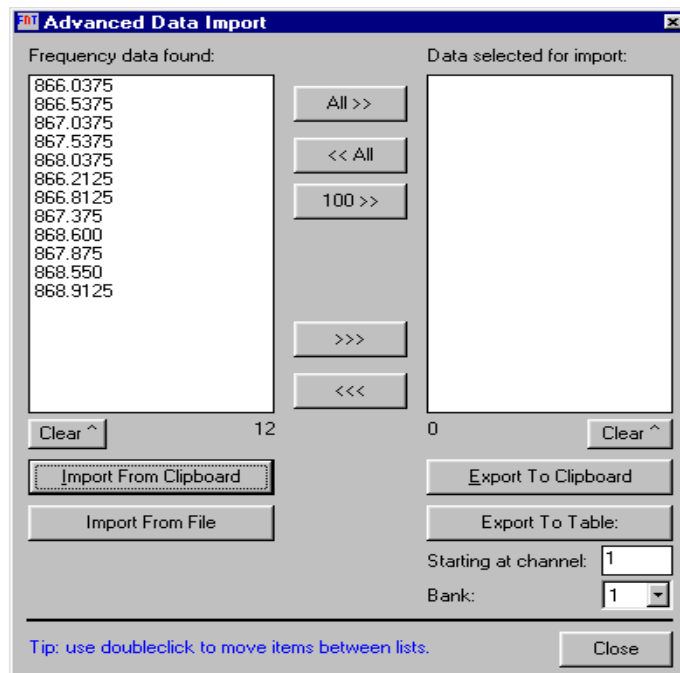
ARC250 can very easily import frequencies from any website.

- Start the ARC250 software
- Open you internet browser and open a website displaying frequencies you want to import (example: <http://www.trunktracker.com>)
- In your browser highlight the area you want to import:

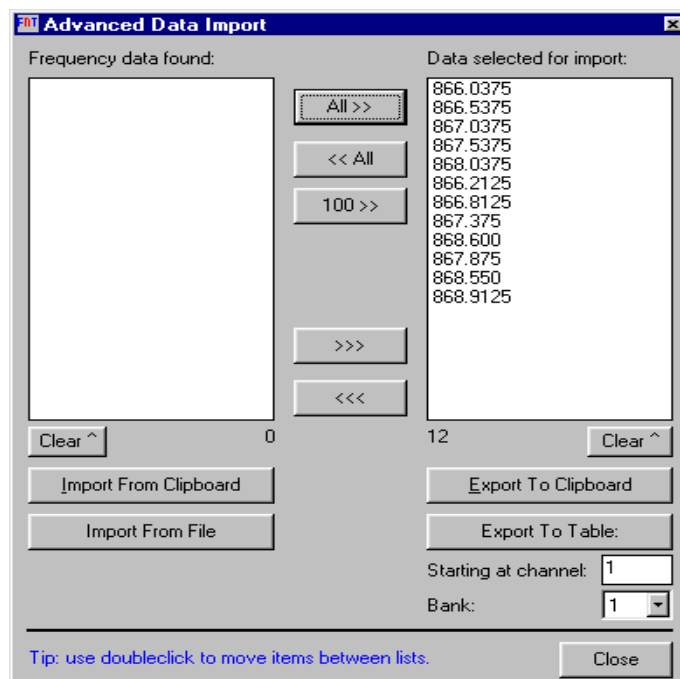


- Now you must press CTRL - C in your browser (or select EDIT \_ COPY from the menu)
- Now go to ARC250 and select FILE \_ ADVANCED DATA IMPORT
- A new window is shown (see below)
- Now press the "IMPORT FROM CLIPBOARD" button.
- The software will now show the frequencies it found in the highlighted part of the website.

- ARC automatically removes duplicate frequencies:



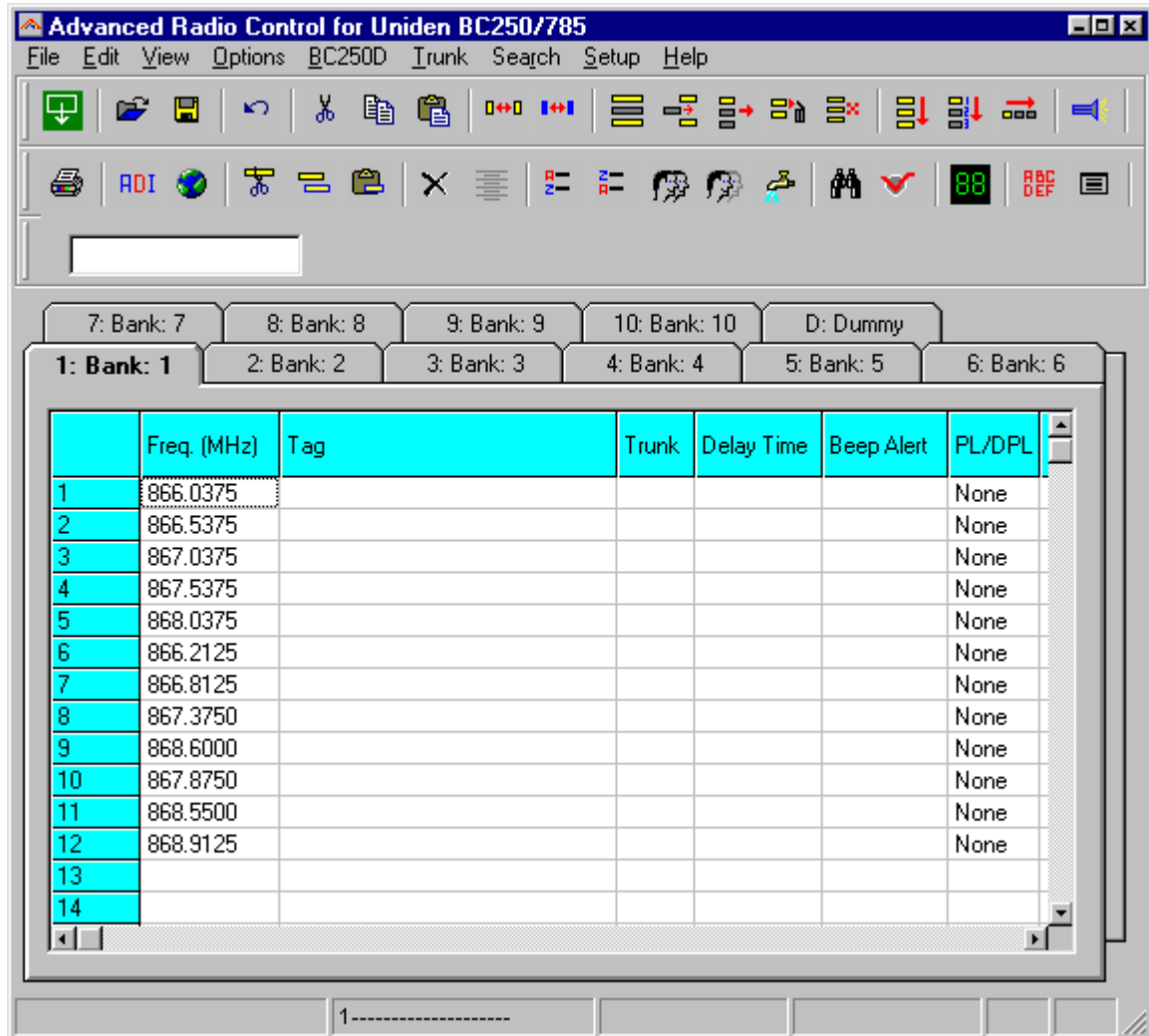
- For import into the memory table you must transfer the frequencies to the right list.
- Finally you select in what bank and at what channel you like to import the data.



- Press "EXPORT TO TABLE" button and frequencies are ready for upload!

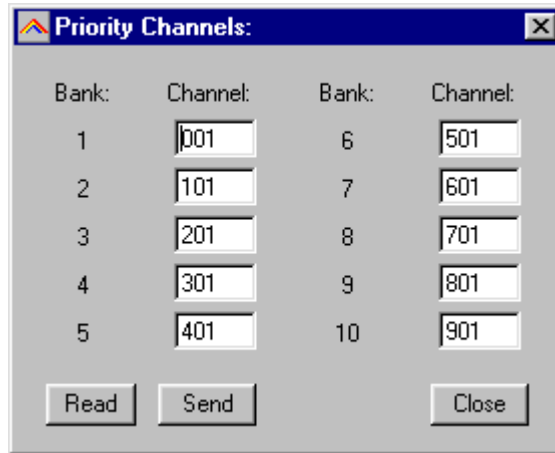
- Webcatcher works with ANY website, the website shown above is only an example.

Here is the result of WebCatcher:



## **2.12 Priority Channels:**

You can set the priority channels, select Bc250 \_ Priority Channels:



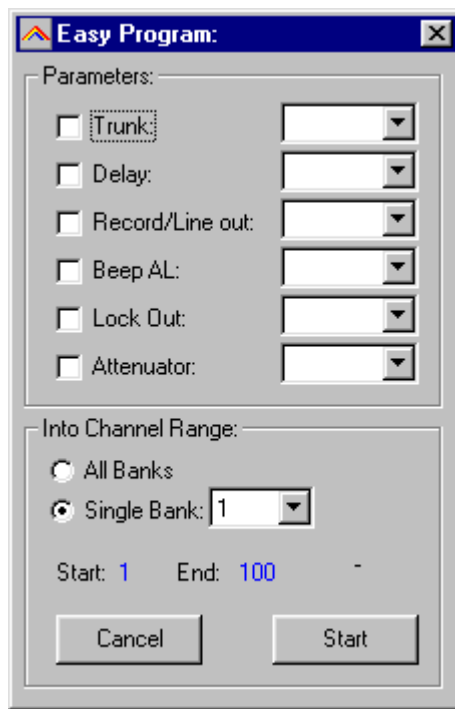
Bank:	Channel:	Bank:	Channel:
1	001	6	501
2	101	7	601
3	201	8	701
4	301	9	801
5	401	10	901

Buttons: Read, Send, Close

Priority channels are stored in your mem file. You can directly read and send the priority channels, priority channels are also read/send when you use the read/send data window.

## **2.13 Easy Program:**

Easy program will directly program your scanner. Select the data you want to program and the channel range (single bank or all channels) and ARC250 will directly program your scanner.



Parameters:

- Trunk: [dropdown]
- Delay: [dropdown]
- Record/Line out: [dropdown]
- Beep AL: [dropdown]
- Lock Out: [dropdown]
- Attenuator: [dropdown]

Into Channel Range:

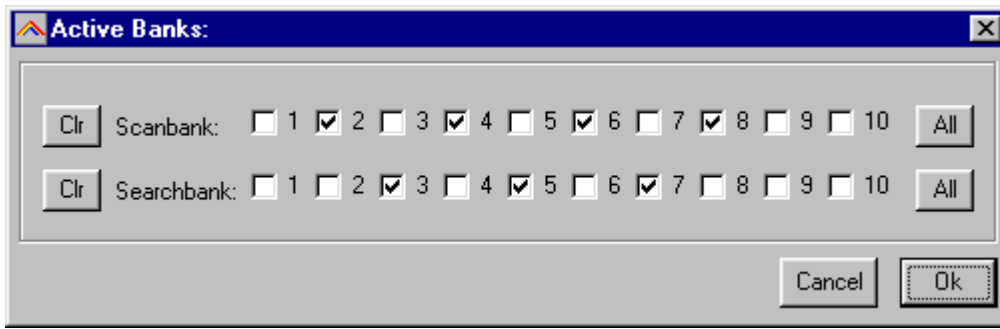
- All Banks
- Single Bank: 1 [dropdown]

Start: 1    End: 100    -

Buttons: Cancel, Start

## **2.14 Set Active Banks:**

You can set the active banks for scan and search mode. Active bank settings are stored in a mem file.



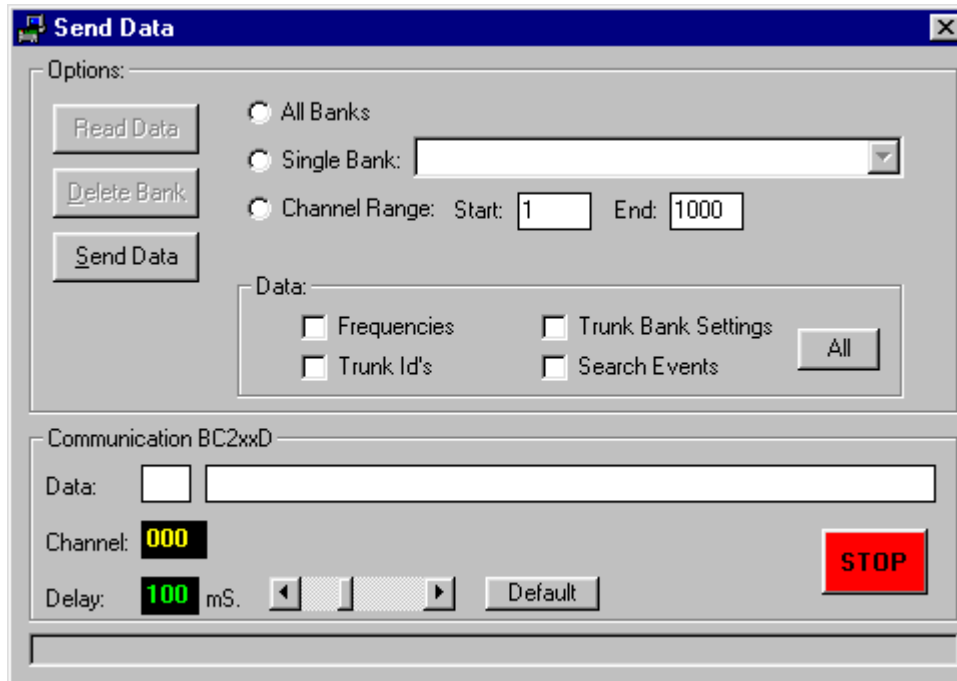
The active bank settings are send to the scanner when you upload data using the 'Send Data' window.

## **2.15: Uploading data into the scanner:**

From the main menu select: BC250 \_ Send Data from Scanner (or BC785 \_ Send Data from Scanner).

*Tip: you can also use the toolbar button or press F6.*

A new window is shown:



First select whether you want to send data to all banks or a single bank. Next select what data you want to upload. For your convenience you do not need to send all data from the scanner.

Example: if you want to change frequencies in bank 5, you only need to send the frequency data from bank 5.

Data options:

Frequencies: the frequency data that is stored in your memory channels.

Trunk Id's: the trunk id's and tags that are stored in the trunk scan lists.

Trunk settings: the trunk parameters that identify a specific trunk system.

Search Data: the data that is stored in the 10 user programmable search ranges (also referred to as chain search).

All button: the All button will automatically select all the above options.

After you made your selection, press 'Send Data'. The software will start to upload data to the scanner.

## **2.16 Import/Export data:**

ARC250 can import data from various sources:

- import data from mem files ( select FILE \_ IMPORT )
- import using the clipboard: you can easily copy/paste data from Excel or other database software that supports the clipboard
- import frequencies from text/html/csv files. Use the webcatcher option to import from these files.

ARC250 can export data:

- CSV format: Select FILE \_ Export CSV data , then select the data you want to export and ARC250 will create a CSV file
- ARc250 fully supports the clipboard so you can copy/paste data from ARc250 into many other applications.

### **3 TRUNK SYSTEM SETTINGS:**

From the menu select TRUNK \_ SYSTEM SETTINGS.

A new window is shown; in this window you will find tabs where you can set the trunk bank settings.

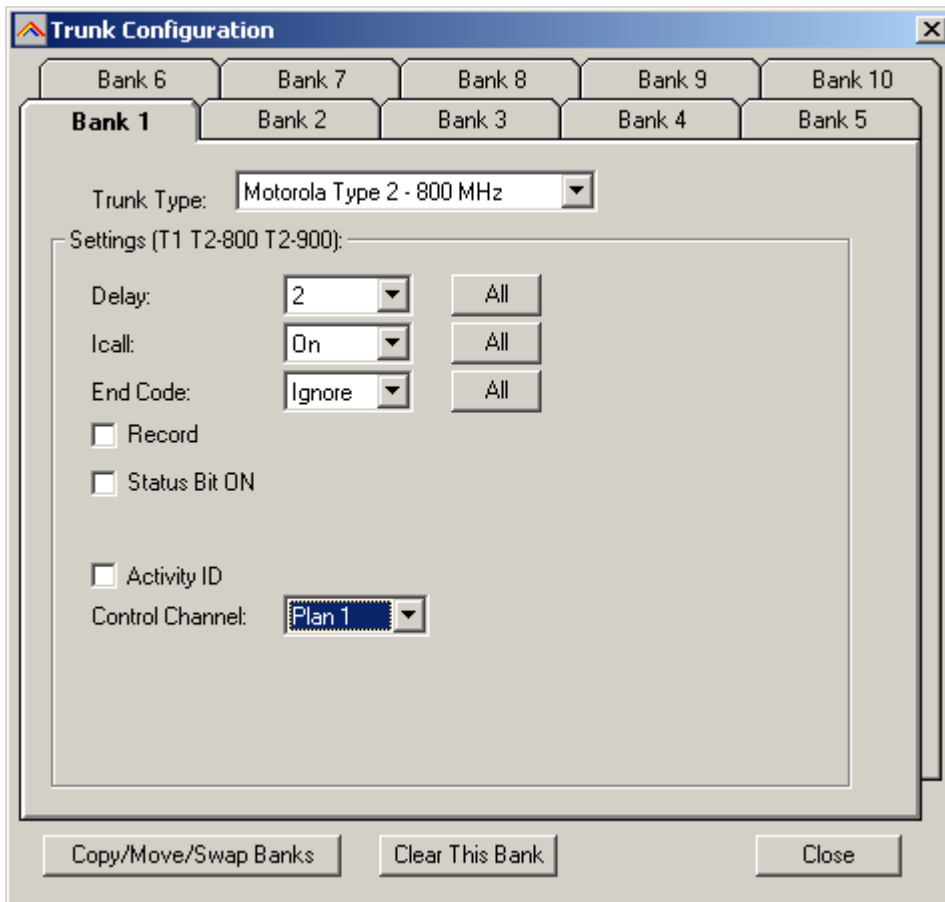
Depending on the selected trunk type the trunk settings for that system are shown. For information about these parameters please refer to the scanner Operating Manual.

General:

The RECORD option is only available for the BC785/796 scanner.  
The BC250/296 only supports a delay of 2 seconds (delay on/off).

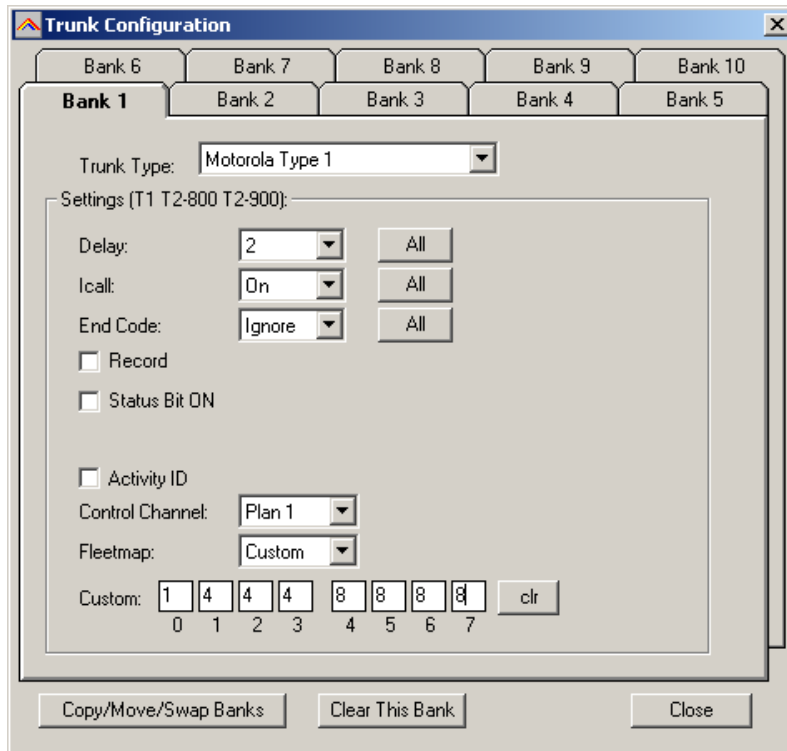
**IMPORTANT:** before you program trunk id's you must first setup the correct trunk type to avoid problems during data upload.

#### **3.1 MOTOROLA TYPE 2 – 800 MHZ:**



For control channel only mode, you must select a plan.

### **3.2 MOTOROLA TYPE1:**



*For a TYPE 1 system it is very important that the trunk system is setup correctly before any trunk id's are uploaded to your scanner. Depending on the fleetmap settings the scanner may not accept some trunk id's.*

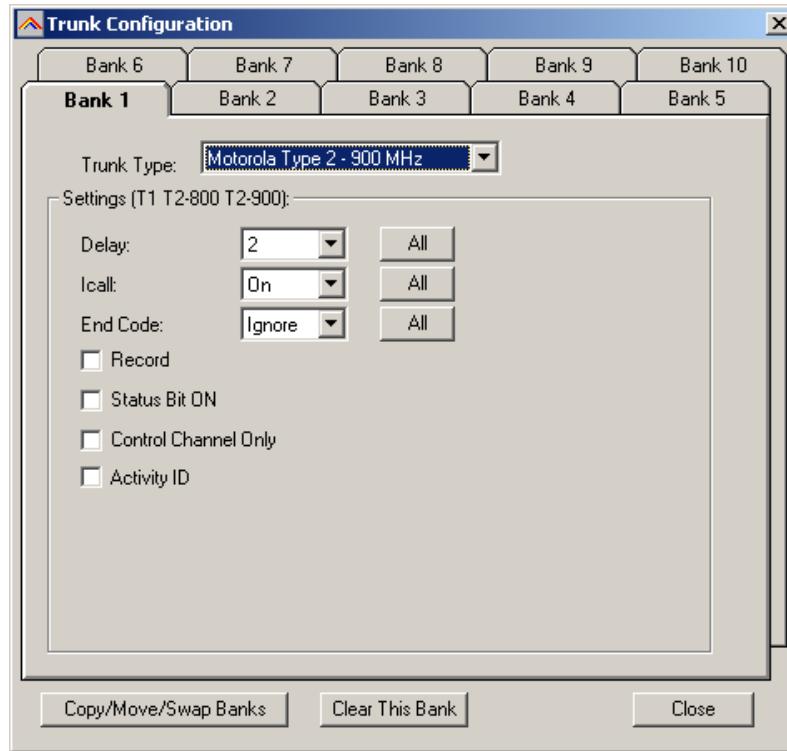
BC250/296D: ARC250 will always use a custom fleetmap even if you selected a predefined fleetmap. The correct settings for the custom plan are automatically programmed. So a predefined fleetmap will be programmed as a custom fleetmap due to limitations in the remote controls for BC250/296D. The software automatically fills in the size codes.

Some size codes require more then one block. If you enter size code 12 in block 0 the software will automatically set block 1 to size 12. You can only program size 12 id's in block 0,2,4 and 6.

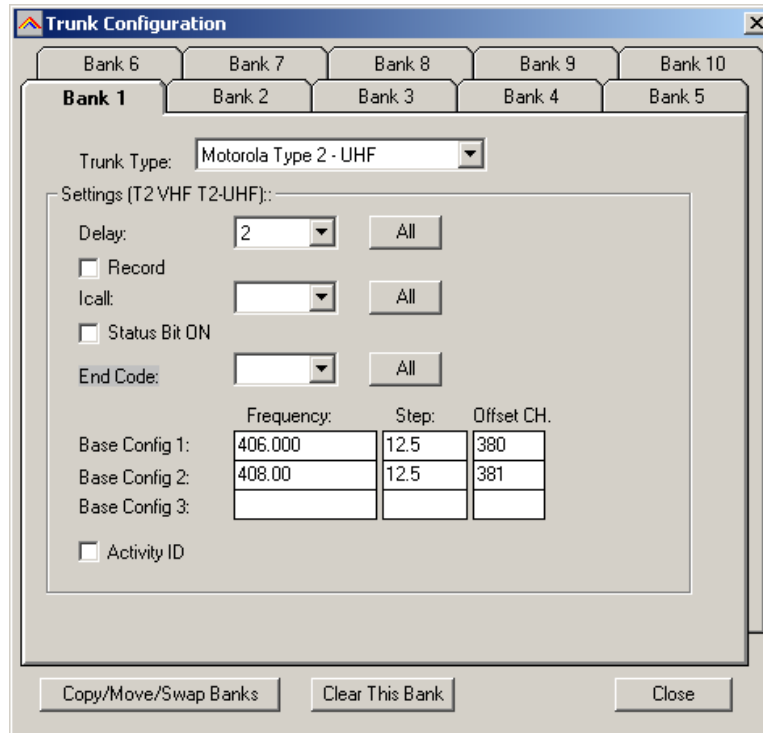
Size Code	Required blocks	Blocks
12	2	0,2,4,6
13	4	0,4
14	8	0

For information about fleetmap programming refer to the scanner manual. For a type 1 the fleetmap must be correct else the wrong trunk id's are shown.

### **3.3 MOTOROLA TYPE 2 – 900 MHZ:**

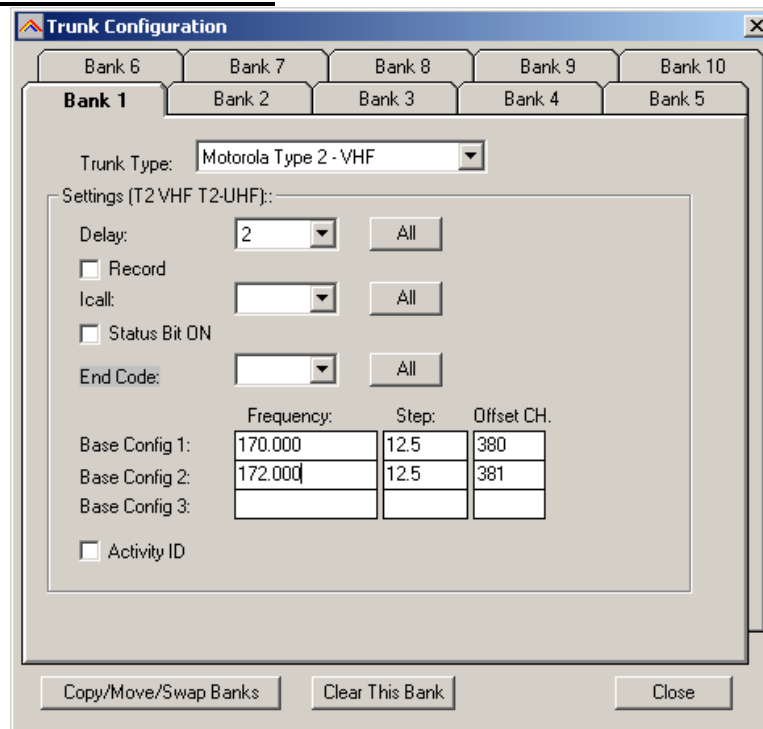


### **3.4 MOTOROLA TYPE 2 – UHF:**



You must program at least one base configuration for a type 2 UHF system. See next page for more information about frequency/step/offset.

### **3.5 MOTOROLA TYPE 2 – VHF**



You must program at least one base configuration for a type 2 VHF system. See next page for more information about frequency/step/offset.

**Explanation of base/step/offset parameters:**

For a type 2 VHF or type 2 UHF you must program base/step/offset parameters.

For properly tracking a type 2 VHF/UHF system, the scanner needs channel number information. The tracking process is controlled by sending channel numbers instead of frequencies. Once the scanner knows one combination of frequency and channel number it will track the system because it can calculate all other frequencies using the step setting and the channel number it receives from the traffic channel.

You must know at least one frequency used in the trunk systems AND the channel number assigned to that frequency.  
The step is normally predefined for the frequency range.

Example:

If the system you want to program uses a frequency 425.250 (step 25 kHz) and the channel number assigned to that frequency is 402 then you must program:

Base: 425.250

Step: 25

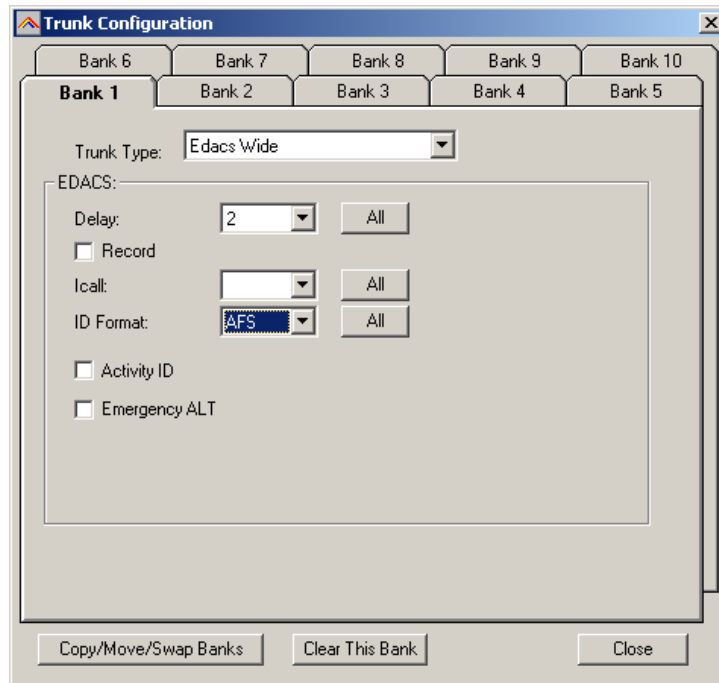
Offset: 402

Because you know the step and channel number you can also use different settings, in the table below all given examples of base/step/offset will have the same effect:

	Example 1	Example 2	Example 3	Example 4
Frequency	425.250	425.200	420.000	430.200
Step	25	25	25	25
Offset	402	400	380	600

The offset channel has a range of 380-600.

### **3.6 EDACS WIDE/NARROW:**

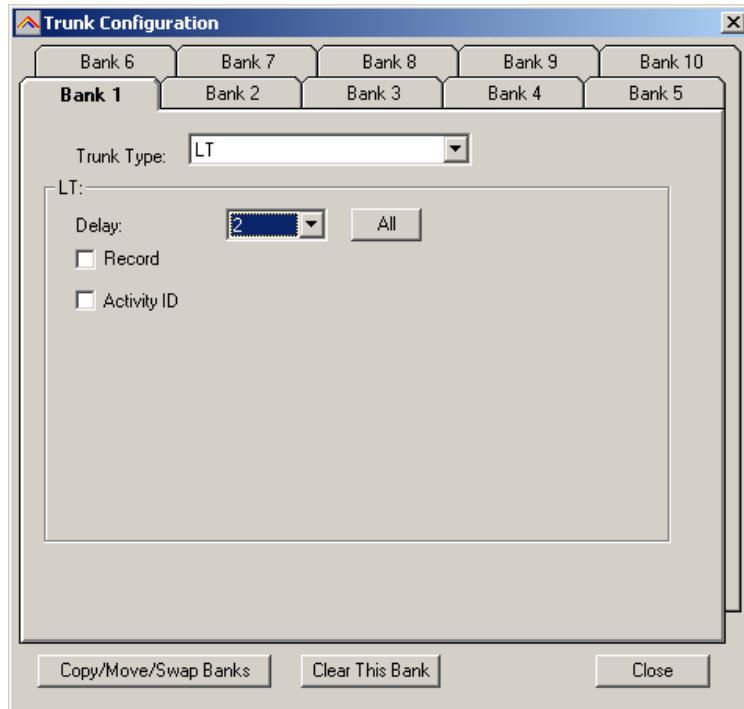


You can use either AFS or decimal trunk id format. ARC250 will accept both AFS and decimal trunk id's in the trunk id editor.

When you program EDACS frequencies, it is critical that you store each frequency in the correct location. This often is not the frequency order, so you must be sure you have the right sequence.

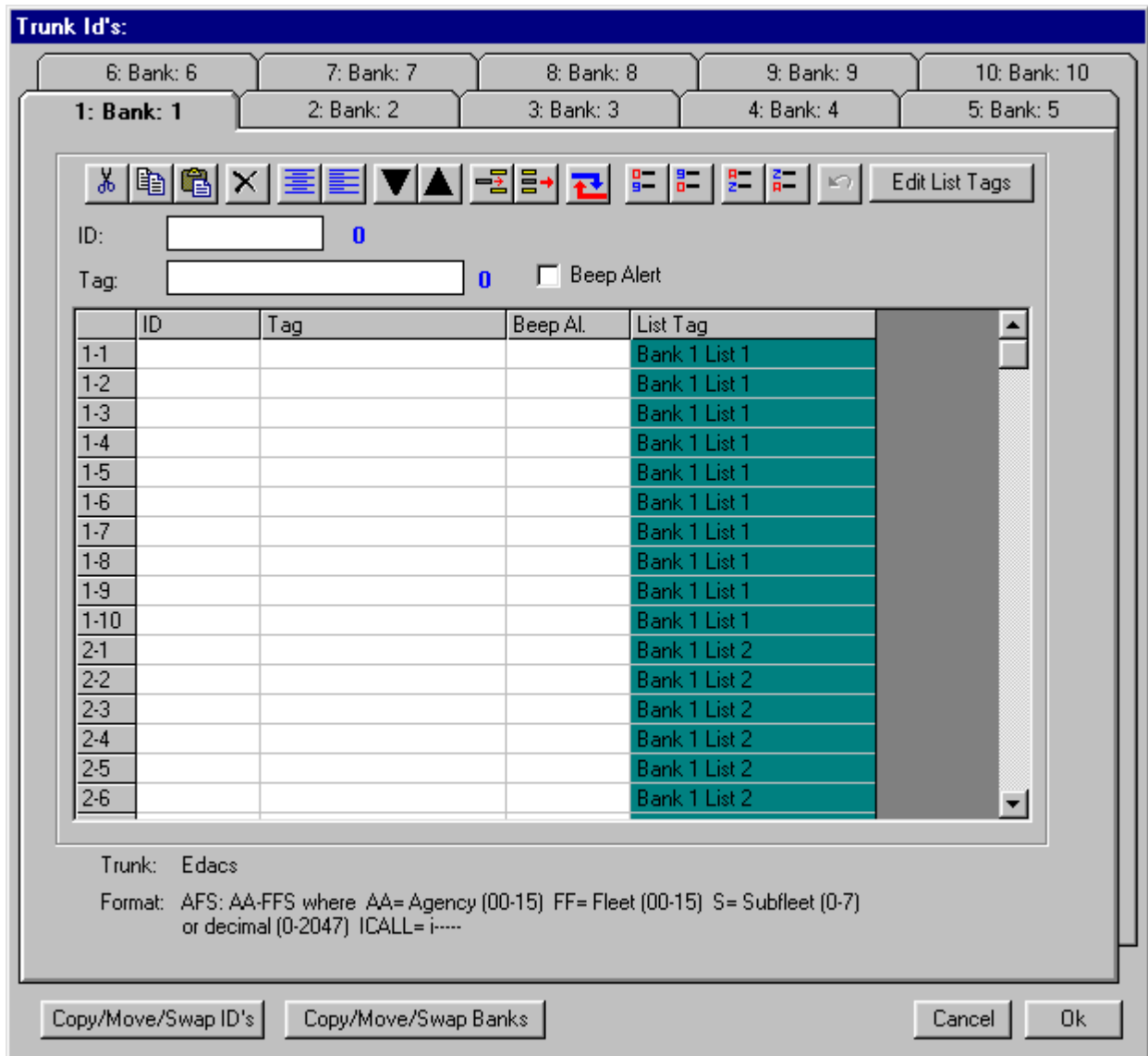
It is normal that during Edacs trunk scanning or trunk searching the mode of the memory channels assigned to Edacs systems changes. Edacs Wide always uses FM mode, Edacs narrow always use NFM mode.

### **3.7 LT system:**



## **4 TRUNK ID editor:**

Every bank can store a maximum of 100 trunk id's (also known as talkgroups). You can also program a tag for every trunk id. The 100 trunk id's are divided into 10 lists called scanlists. You can program a tag for these scanlists.



**IMPORTANT:** before you program trunk id's you must set the correct trunk system type (select TRUNK \_ SYSTEM SETTINGS. The trunk id editor will show the active trunk type, the software uses this information to check and correct new id's that are entered.

You can edit an id directly in the grid or you can use the editor bar above the grid. For your convenience the software shows the number of characters for the trunk id and the trunk id tag in blue.

Toolbar Buttons:

**CUT/COPY/PASTE:** in the grid you can cut/copy/paste data. You can also use the CTRL C / X / V keyboard shortcuts or use right mouse click.

**DELETE:** clear the selected cells in the grid.

Align left / center: align the trunk tags in the grid.

MOVE UP/DOWN: select a line in the grid, and then use the up/down buttons to move the data in the grid.

INSERT: insert an id in the list

REMOVE: remove selected ID from list

REPLACE: find and replace text in tag column

Sort Buttons: you can software trunk id's using either the id or the tag column.

EDIT ScanList TAGS: you can program a tag for every list of 10 trunk id's. A new window is shown. The list tag editor also shows the number of characters. You can also use double click in the Scanlist tag column to open the listtags editor.

List No.	Tag	Characters
List No.1	List 1	6
List No.2	List 2	6
List No.3	List 3	6
List No.4	List 4	6
List No.5	List 5	6
List No.6	List 6	6
List No.7	List 7	6
List No.8	List 8	6
List No.9	List 9	6
List No.10	List 10	7

Buttons: Clear All, Left, Cancel, Default, Center, Ok

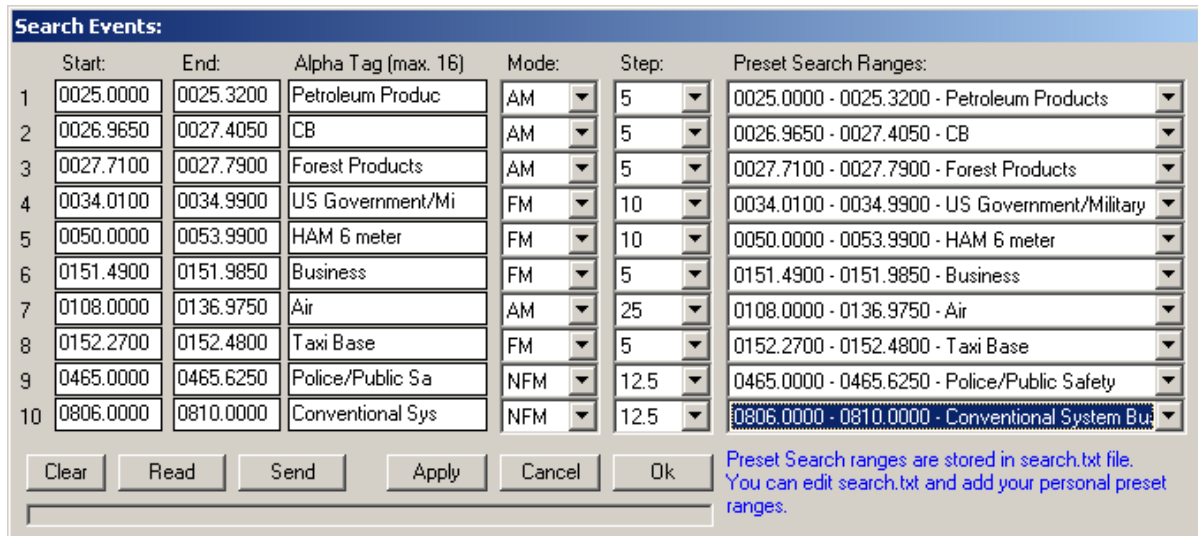
CLEAR ALL: clear all edit boxes

DEFAULT: load default data in the edit boxes

LEFT: align the list tags left

CENTER: center the list tags

## 5 SEARCH RANGE EDITOR:



	Start:	End:	Alpha Tag (max. 16)	Mode:	Step:	Preset Search Ranges:
1	0025.0000	0025.3200	Petroleum Produc	AM	5	0025.0000 - 0025.3200 - Petroleum Products
2	0026.9650	0027.4050	CB	AM	5	0026.9650 - 0027.4050 - CB
3	0027.7100	0027.7900	Forest Products	AM	5	0027.7100 - 0027.7900 - Forest Products
4	0034.0100	0034.9900	US Government/Mi	FM	10	0034.0100 - 0034.9900 - US Government/Military
5	0050.0000	0053.9900	HAM 6 meter	FM	10	0050.0000 - 0053.9900 - HAM 6 meter
6	0151.4900	0151.9850	Business	FM	5	0151.4900 - 0151.9850 - Business
7	0108.0000	0136.9750	Air	AM	25	0108.0000 - 0136.9750 - Air
8	0152.2700	0152.4800	Taxi Base	FM	5	0152.2700 - 0152.4800 - Taxi Base
9	0465.0000	0465.6250	Police/Public Sa	NFM	12.5	0465.0000 - 0465.6250 - Police/Public Safety
10	0806.0000	0810.0000	Conventional Sys	NFM	12.5	0806.0000 - 0810.0000 - Conventional System Bu

Clear Read Send Apply Cancel Ok

Preset Search ranges are stored in search.txt file.  
You can edit search.txt and add your personal preset ranges.

The scanner has 10 user programmable search ranges. For your convenience the software uses a preset list. You can select from the preset list, the data is then automatically copied. The search ranges are stored in a mem file.

The preset list can be modified. Preset ranges are stored in a file called search.txt, see section 7.3 (search range extender).

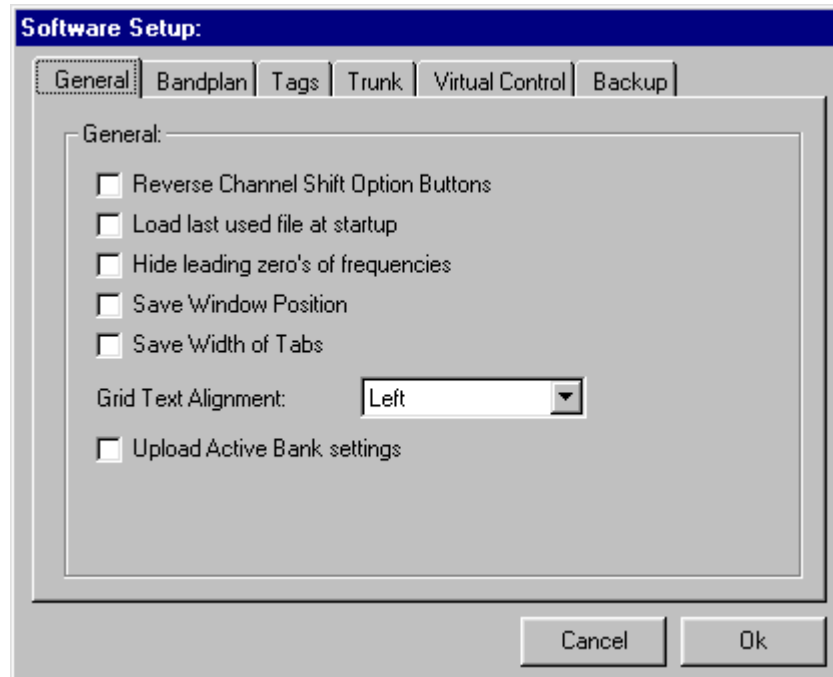
CLEAR: clear all search ranges

READ: read data from the scanner

SEND: send data to the scanner

## **6 Software Settings**

### **6.1 General:**



Reverse Channel Shift Option Buttons: In the memory editor grid two toolbar buttons are used to shift channels up/down. You can reverse the direction of these buttons.

Load last used file: Automatically loads the last mem file during startup of the software.

Hide leading zero's: Hide leading zero's in the memory editor grid.

Save Window position: stores the size and position of the main editor screen.

Save width of tabs: You can change the width of the columns in the main editor grid. This option remembers the width of the columns.

Grid text alignment: sets the alignment of text in the main editor grid (left, right, center).

*Note: this option only sets alignment in the editor grid. For centering memory channel tags there is a separate option.*

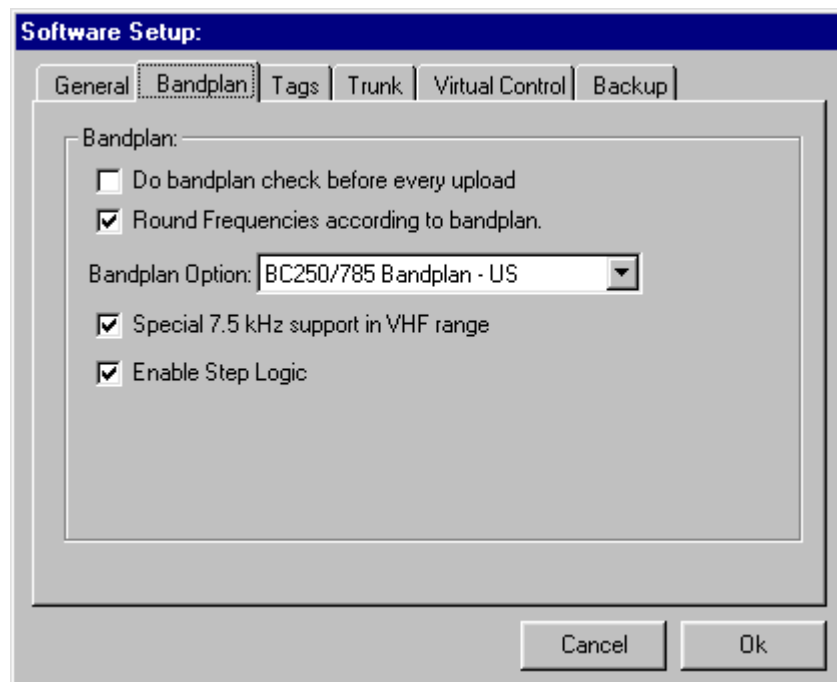
Upload Active Bank Settings: you can set the active banks and store this in a MEM file (in main menu select SETUP \_ ACTIVE BANKS). When this option is selected, the active banks are programmed during a data upload.

## **6.2 Software settings: Bandplan**

Your scanner has a build in bandplan. This means that when you enter a frequency, the scanner will automatically select mode and step from a predefined list. For your convenience, ARC250 also knows this bandplan. You can also modify the bandplan that is used by the software (see section 8).

IMPORTANT: you cannot modify the bandplan that is stored in your scanner.

Setup bandplan option: select SETUP \_ SOFTWARE OPTIONS and then select the BANDPLAN TAB:



Bandplan option:

- NONE > do not use the bandplan option
- BC250/785 Bandplan > use the predefined bandplan
- Custom bandplan > use the custom bandplan

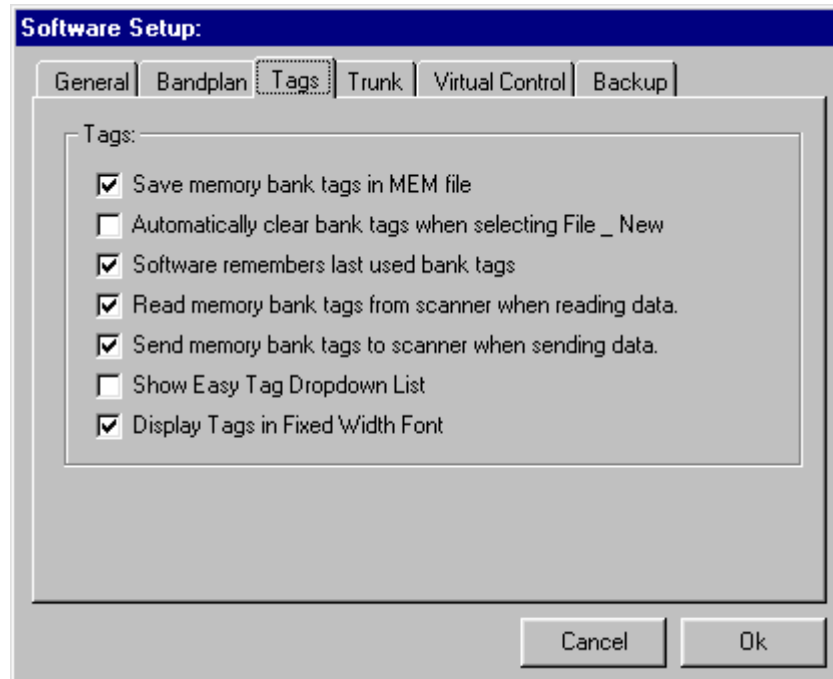
Round option:

Like the scanner, ARC250 can round of frequencies. If you enter a frequency the software looks up the step in the bandplan list, and then uses that information to round of the frequency.

Bandplan check before upload:

When this option is selected the software will check the mode/step settings before every data upload and correct if necessary.

### **6.3 Software settings: Tags**



Save memory banks tags: stores the tags of memory banks in mem files.

Automatically clear bank tags: selecting FILE NEW clears the bank tags. If this option is not selected, ARC250 will show the most recent bank tags stored in your scanner.

Software remembers last used bank tags: If this option is selected the software will store and remember the latest memory bank tags.

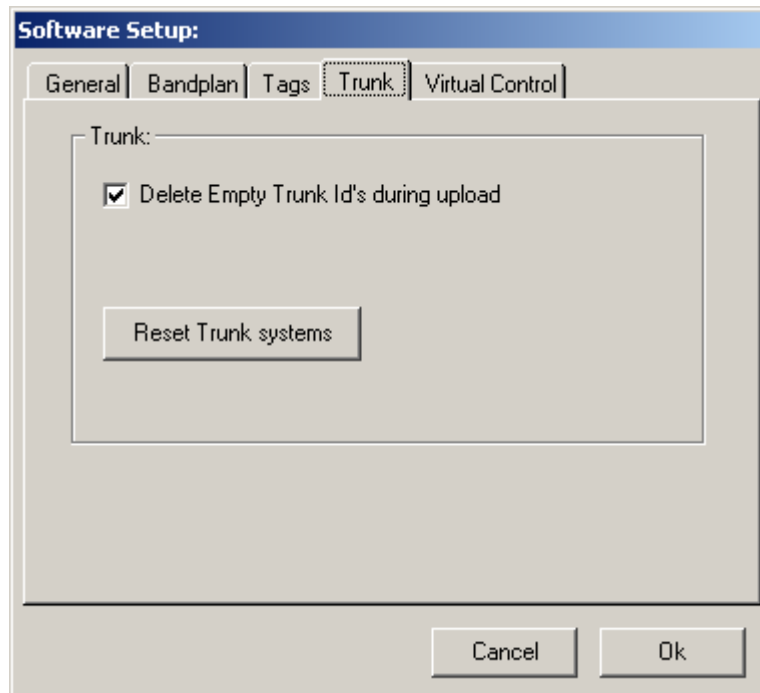
Read/Send memory bank tags: this option defines whether you want to synchronize the tags while reading/sending data to/from scanner.

Show Easy Tag dropdown menu: If the tag column is active an extra dropdown list is shown. All programmed tags are added to this list. This makes it easy to reprogram memory channel tags without re-typing the tag.

To use this option you first select the tag you want to program, then go to the editor box left of the dropdown list and press enter to store the data in the grid. For your convenience there is a dropdown list that contains all tags programmed and a list only containing the tags programmed in the active bank.

Display tags in fixed width font: if your system has a fixed width font installed, the software can display bank and scanlist tags in this fixed width font.

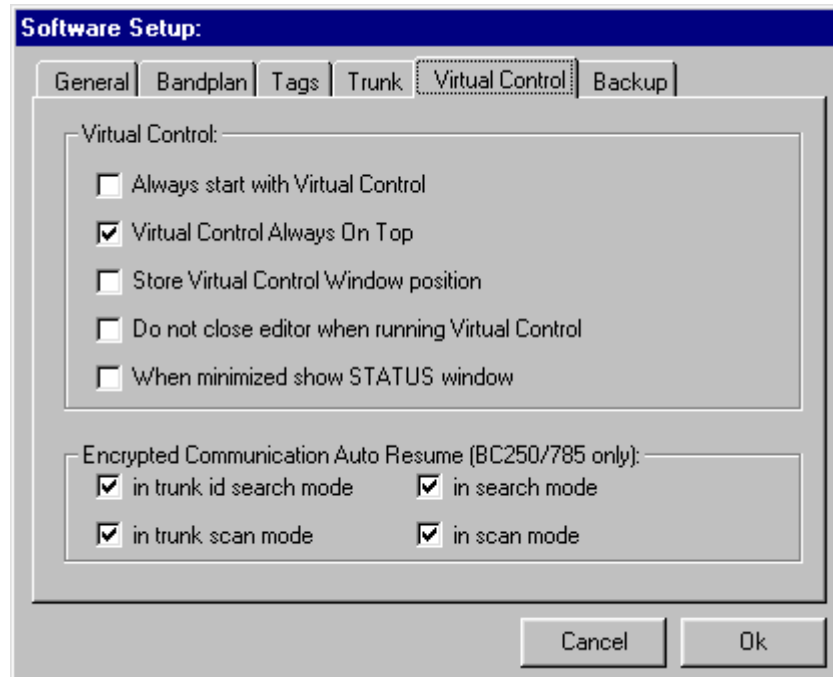
## **6.4 Software settings: Trunk**



Delete empty trunk id's: select whether you want to clear trunk id's. If this option is not selected the software will not delete any trunk id's that are stored in your scanner.

Read/Send Record: the 785/796 models have a record output. If you use the record output enable this option. This option will slow down overall communication. if you do not use the record output make sure this option is not selected.

## **6.5 Software settings: Virtual Control**



Always start with VC: after starting the software, virtual is automatically loaded.

VC always on top: Puts the VC window on top.

Store VC position: stores and remembers the virtual control window position.

Do not close editor: while running VC you can still access the memory editor. **IMPORTANT:** while Virtual Control is active you can not use other options in the software that communicate with the scanner, only one window can have access to the serial communications port.

Show Status Window: when VC is minimized a status window is shown. The default position is the right bottom corner of your screen.

You can change this position:

Open VFO.ini with notepad. Locate the [statuswindow] section.

You can change the left and top parameters to set position of status window.

When custom settings are used the custom parameter must be set to 1:

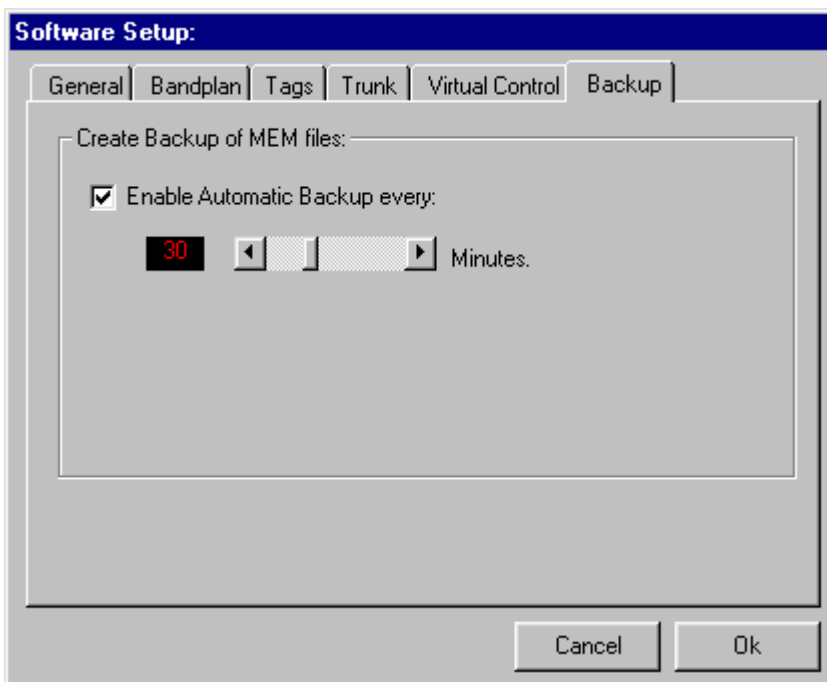
left=1

top=1

custom=1

will show status window in left top corner of your screen.

## **6.6 Software settings: Backup**



ARC250 can generate automatic backups of your work. Backups are stored in C:\PROGRAM FILES\ARC250\BACKUP or C:\PROGRAM FILES\ARC250PRO\BACKUP .

The backup file contains time and date so you can easily find backup files. The backup process does not work while Virtual Control is active and during data read/send operation.

You can set the interval in minutes.

**IMPORTANT:** ARC250 does not delete any backup files, you must check the contents of the BACKUP directory at regular intervals and remove old backup data.

## **6.7 SCANNER GENERAL PARAMETERS:**

You can setup the general parameters using ARC250. These parameters are not stored in mem files ( FIPS codes are stored in MEM files). Refer to scanner operating manual for more information about these parameters.

RESET: You can fully reset the scanner. In the reset edit box type RESET then select the RESET BC250D or RESET BC785D button.

**WARNING: all data stored in the scanner will be lost, make sure you store backup copies before using the reset option.**

BC250/296:

The screenshot shows the 'BC250 General Parameters' dialog box. It is divided into three main sections: 'General', 'Reset', and 'Fips'.  
- **General:** Contains several dropdown menus: Dimmer Light (High), Dimmer Time (15 sec.), Screen Mask (Off), Key Beep (Off), Enter Lock (Off), Data Skip (Off), SQ Mode (Tone SQ), Apco Card (Enable), and Clone (empty).  
- **Reset:** Features a text input field containing 'RESET' and a button labeled 'Reset BC250D'.  
- **Fips:** A 3x3 grid of input boxes for a 6-digit FIPS code, with the first box containing '000001'. Below the grid, it says 'Fips code: 6 digits.'  
At the bottom, there are three buttons: 'Get from scanner', 'Send to scanner' (which is highlighted with a dashed border), and 'Close'.

BC785/796:

The screenshot shows the 'BC785 General parameters' dialog box. It is divided into three main sections: 'General', 'Reset', and 'Fips'.  
- **General:** Contains several dropdown menus: Screen Mask (On), Key Beep (Off), Enter Lock (Off), Data Skip (Off), SQ Mode (Tone SQ), Apco Card (Enable), and Clone (empty).  
- **Reset:** Features a text input field containing 'RESET' and a button labeled 'Reset BC785D'.  
- **Fips:** A 3x3 grid of input boxes for a 6-digit FIPS code, with the first box containing '000012'. Below the grid, it says 'Fips code: 6 digits.'  
At the bottom, there are three buttons: 'Get from scanner', 'Send to scanner' (which is highlighted with a dashed border), and 'Close'.

## 7 Virtual Control

Both ARC250BASIC and ARC250PRO include a virtual control option. ARC250BASIC is a basic version of Virtual Control. Enhanced options are only available in ARC250PRO.

### 7.1 Virtual Control: Keyboard

*(In ARC250BASIC the tabs are NOT shown!)*



The keyboard tab gives you direct control over the BC250/BC785. The display includes a status option where you can directly check the current status of your scanner.

All buttons have a colored indicator providing quick status information. The buttons use the intelli-button interface; the text automatically changes depending on scanner mode.

Some buttons support the right mouse button click:

PRI: right click for setting a trunk channel

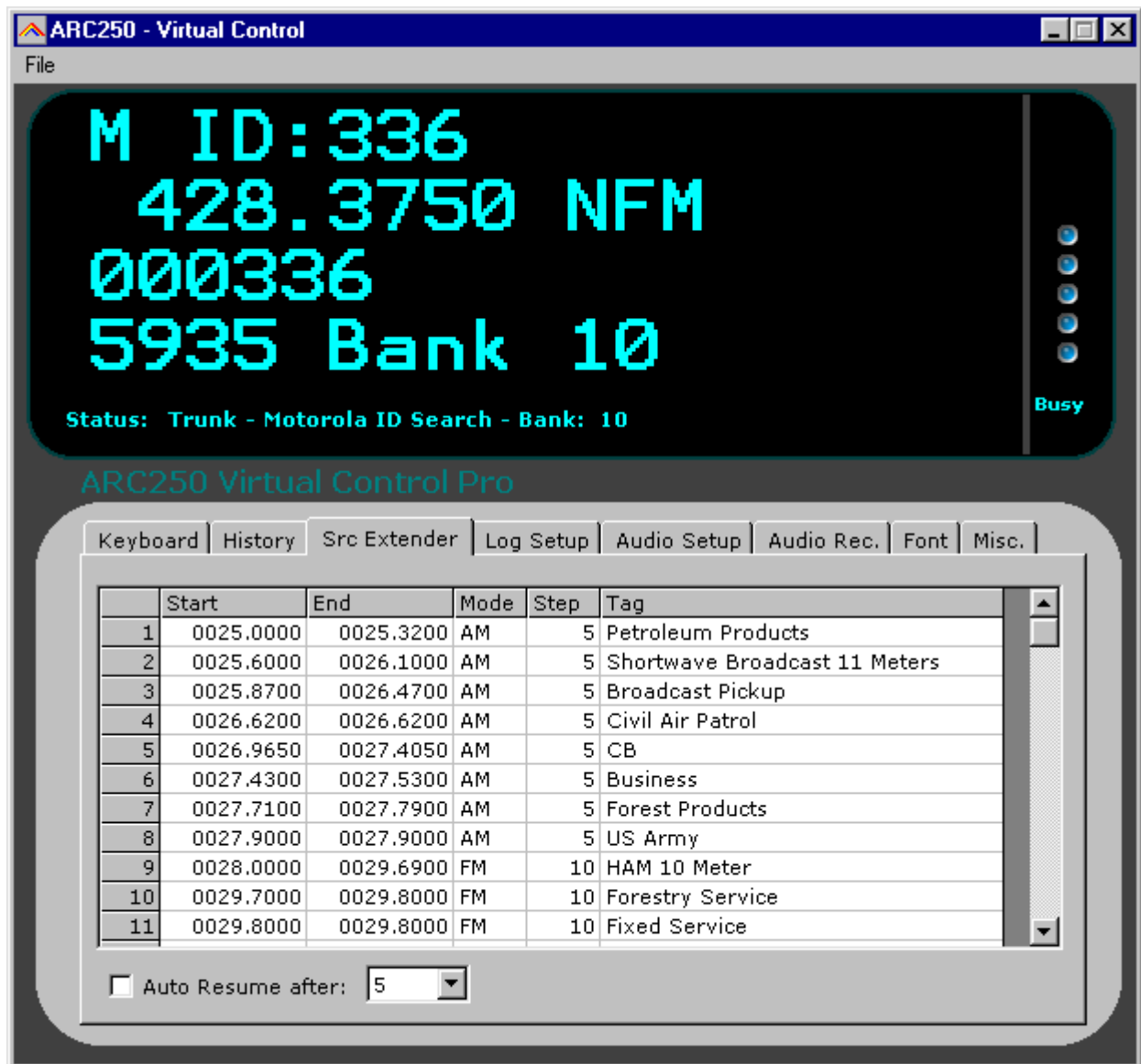
Lock Out: right click for clearing all lockout channels / frequencies / id's  
(depends on scanner status mode).

MANUAL will always set you scanner back to manual mode.



### **7.3 Virtual Control: search range extender (PRO VERSION ONLY)**

The search range extender will add 200 extra search ranges to your BC250/785.



The search ranges are presented in a grid. If you double click on a search range, the 250/785 is automatically programmed with that range. Bank 10 of the 250/785 is reserved for the search range extender.

The search ranges are stored in a file called search.txt. You can modify this file yourself with any text editor.

We advise you to look at search.txt and use that as a template for your own personal search.txt file.

The file has a fixed format:

(The first 3 lines are always ignored!)

Every line must contain a START frequency, STOP frequency, MODE, STEP and TEXT.

Example:

118.00 , 136.00 , AM , 25 , AIRBAND

Mode: AM / FM / WFM / NFM

Step: 5 / 7.5 / 10 / 12.5 / 25 / 50 / 500

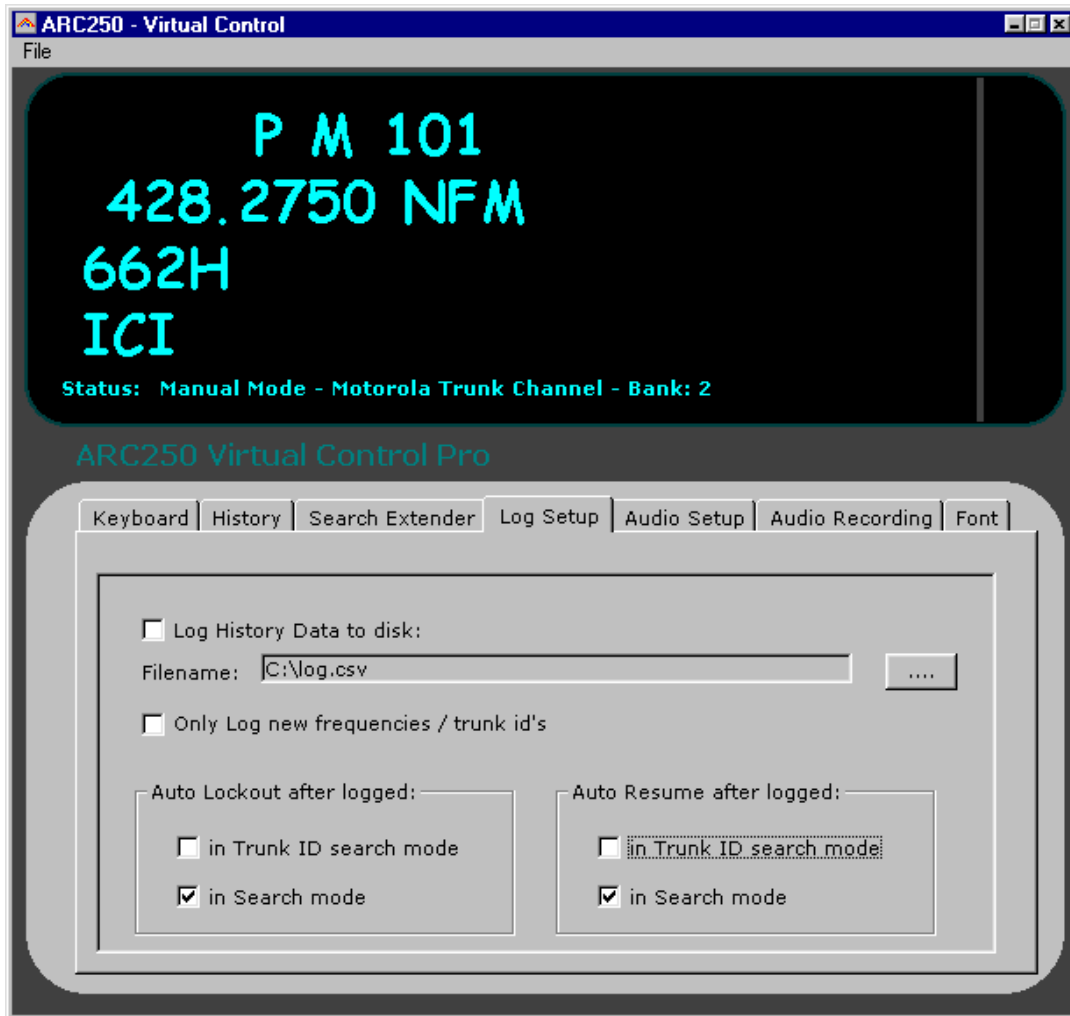
Important:

You cannot use comma or dot in the TEXT part.

Instead of 118.00 you can also use 118.

Mode is not case sensitive.

## **7.4: Virtual Control: Log Setup (PRO VERSION ONLY):**



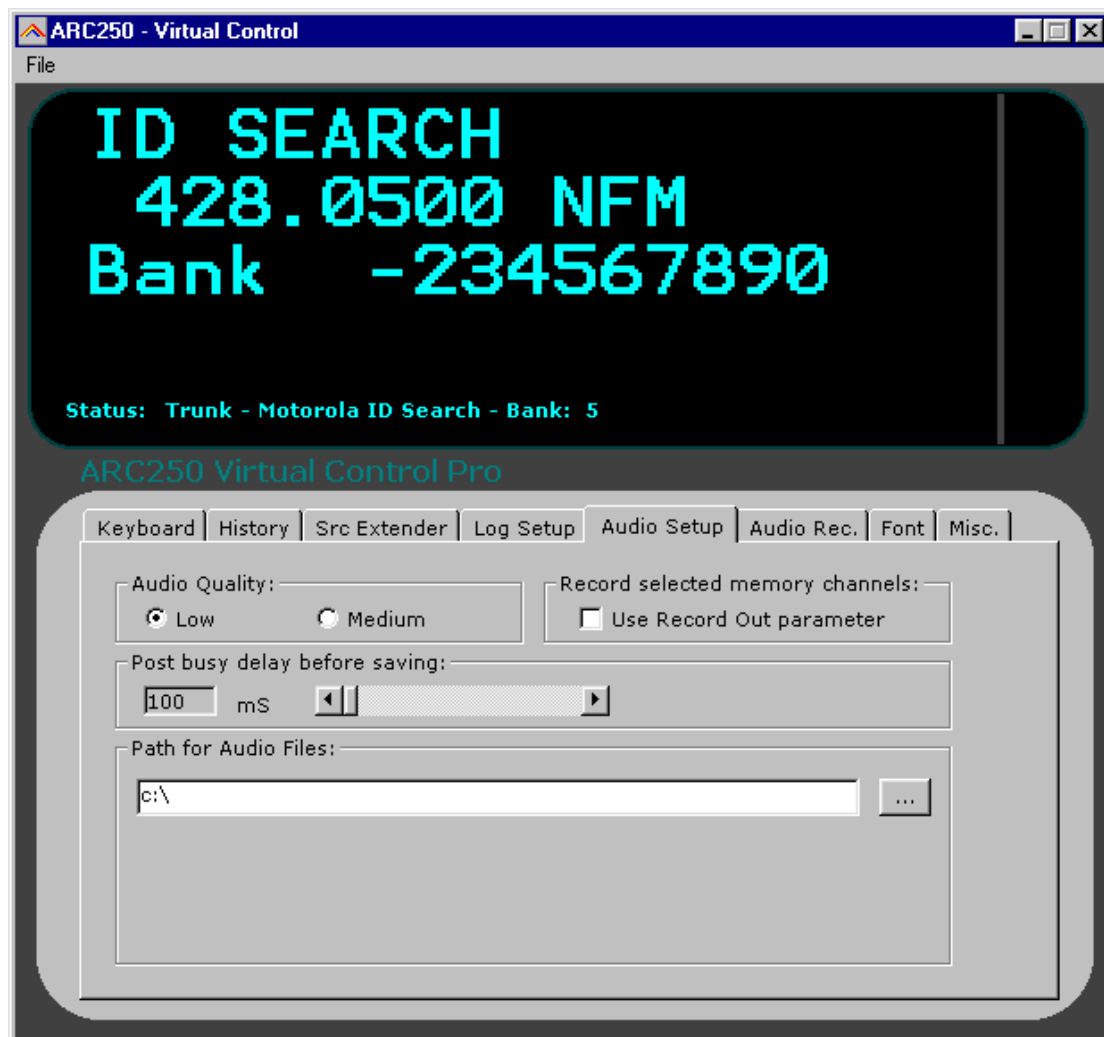
You can log data to disk; ARC250 saves log files in the CSV format. CSV files can be opened in Excel.

To avoid long log files you can choose to log only new frequencies/id's.

For discovering new frequencies or id's in search mode you can automatically lockout id's that are logged. This increases the possibility of discovering new frequencies/id's as the scanner will not hold on known frequencies/id's.

Also you can auto resume once an id or frequency is logged. If this option is selected you will not hear the full transmission. This again increases the possibility of discovering new frequencies/id's.

## **7.5 Virtual Control: audio recording setup (PRO VERSION ONLY)**



In the Audio Setup TAB, the parameters for audio recording are set.

Audio Quality: 2 quality settings are available; the size of the files that are created depends on the quality settings.

The post busy delay time sets the time the software waits before a file is saved.

Path for audio files: sets the location where audio files are stored.

Record Selected memory channels (785/796 only): only record memory channels that have the record parameter set to ON.

IMPORTANT: a mem file containing the record on/off parameters must be loaded first!

## **7.6 Virtual Control: audio recording (PRO VERSION ONLY)**



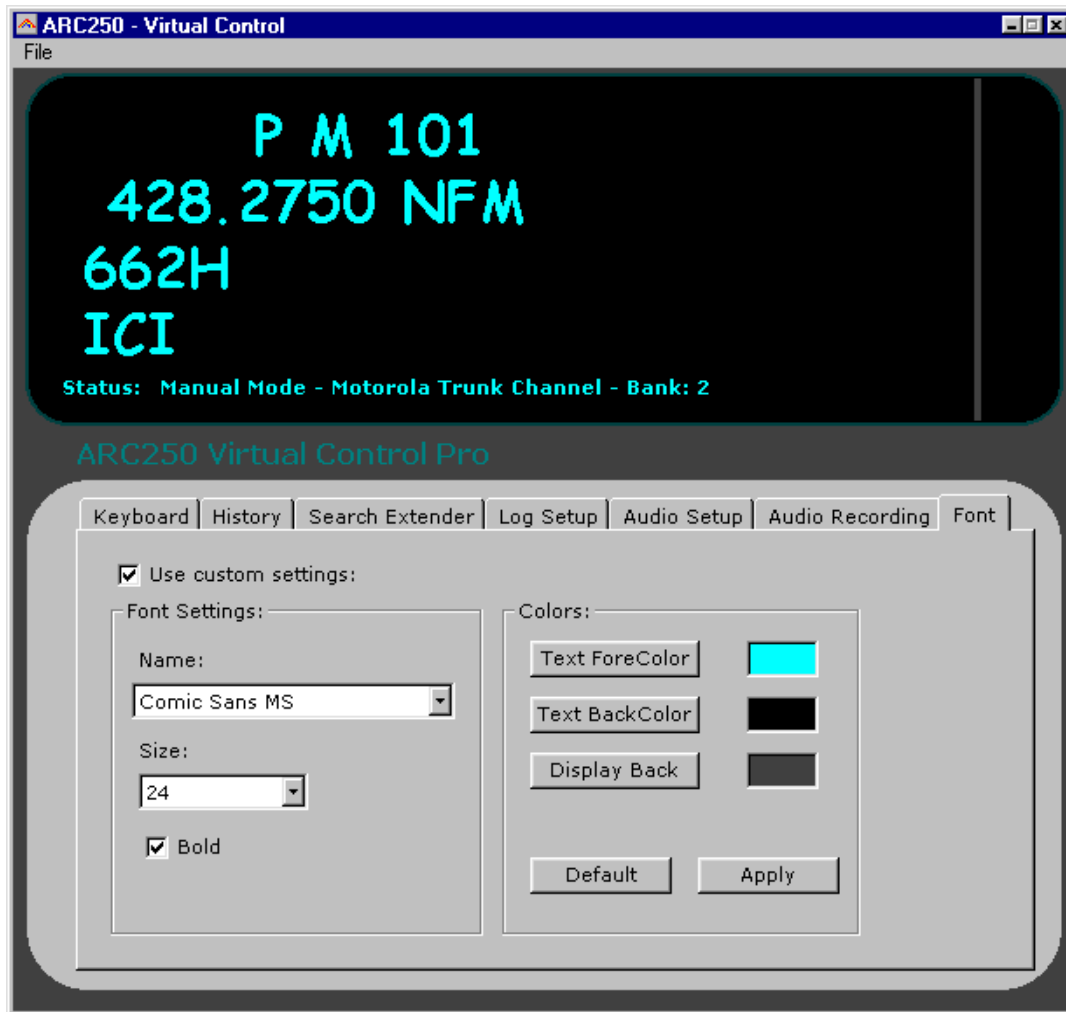
ARC250PRO includes an auto recording option. The recording option creates WAV files. Every WAV file contains frequency, trunk id and start/end time/date. Audio recording is 'busy' triggered. If the busy indicator is ON the software starts recording.

For audio recording you must have a soundcard installed. You must connect the audio output of the scanner to the line input of the sound card. The BC785 has a record output. Audio at this output is only available if the record parameter is programmed.

Set audio recording level: the recording level is setup in the windows audio screen. Double click the speaker icon in your taskbar for setting up audio recording level.

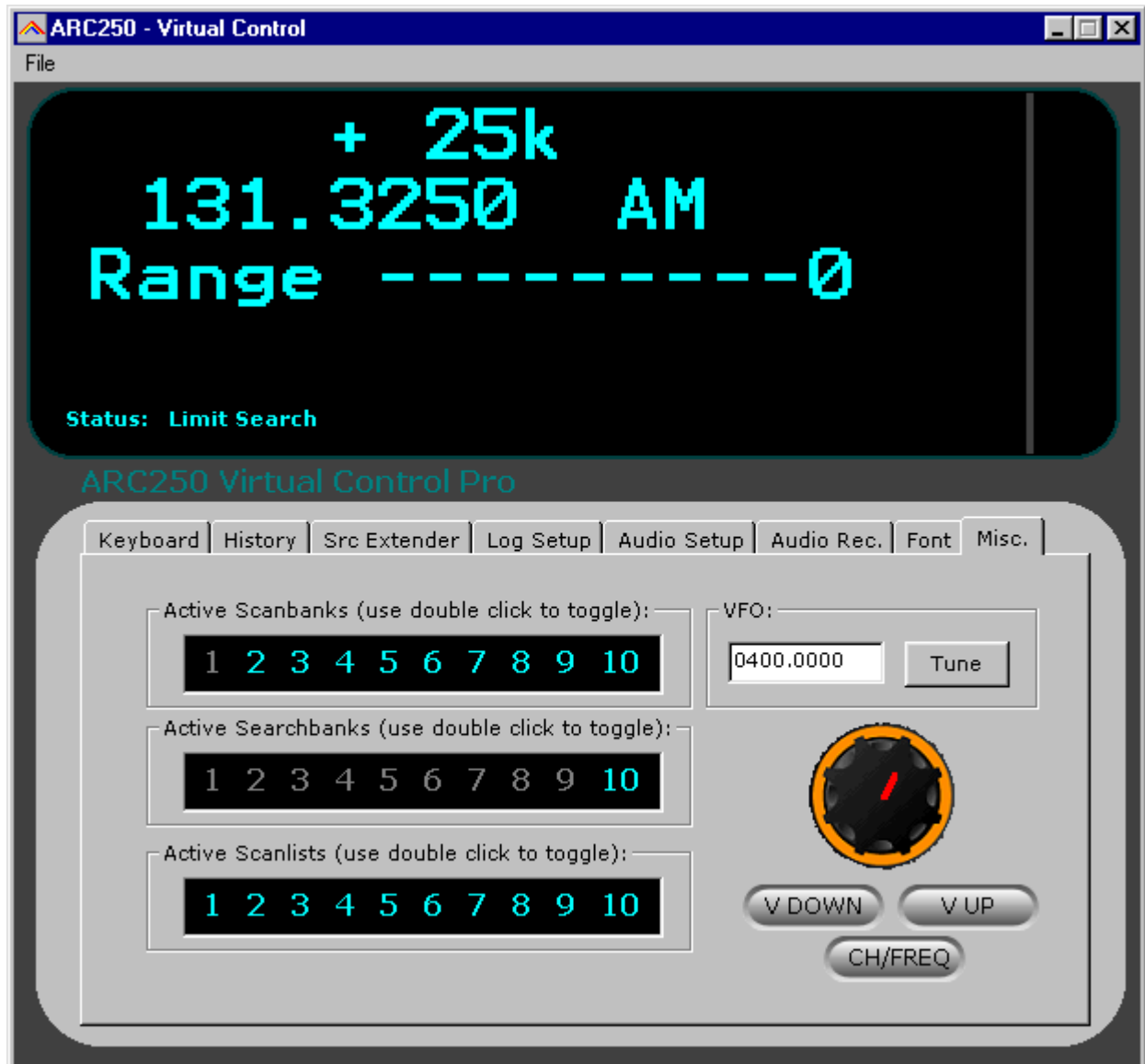
For playing file we advise to use Windows Media Player. ARC250 does not include a player for WAV files.

## 7.7 Virtual Control: fonts settings (PRO VERSION ONLY)



Use this tab to set your personal font and color settings. The default font for virtual control is TERMINAL.

## 7.8 Virtual Control: Misc. options (PRO VERSION ONLY)



VFO knob and VFO buttons are only available when BC796/296 model is used

Active Scan/Search/Scanlist: set the active memorybank/searchbank/trunk scanlist. Use doubleclick to toggle bank on/off.

VFO: tune scanner to frequency using VFO. Enter frequency and press TUNE.

VFO knob: The 296/796 models can also control the scanners VFO knob. To use the 'software knob' press and hold left mouse button for tune down. Press and hold right mouse button for tune up.

V.DOWN/V.UP (296/796 only): tune VFO up or down.

CH/FREQ: select VFO knob mode: tune channels or frequency

## **8 General information and troubleshooting**

### **8.1 Custom Bandplan:**

You can customize the bandplan with a text editor. Any changes are stored automatically. The bandplan is stored in bandplan.dat.

The bandplan.dat file must be stored in the same directory where ARC250/785 is installed!

You can add lines in the bandplan file; use the included file as template to create your own custom bandplan.

Bandplan example:

```
FR25 MD2 ST0
FR26.965 MD3 ST0
FR28 MD2 ST2
FR54 MD3 ST3
FR88 MD1 ST6
FR108 MD2 ST4
FR137 MD3 ST0
FR144 MD3 ST0
FR146 MD3 ST2
FR174 MD1 ST5
FR225 MD2 ST5
FR400 MD3 ST2
```

```
'mode: 0=FM 1=WFM 2=AM 3=NFM
```

```
'step: 0=5.0 1=7.5 2=10.0 3=12.5 4=25.0 5=50.0 6=100.0
```

## **8.2 INI file settings:**

The setup.ini file contains some additional options you can set. You can open and edit setup.ini with notepad. Do NOT change any other parameters then the parameters shown in this section!

expert=0 : software will ask confirmation before uploading/deleting data  
expert=1 : software will not ask conformation

option4=0 : enable software exit message  
option4=1 : disable software exit message

option6=0 : Display warning before sorting an Edacs systems  
option6=1 : Disable Edacs sort warning

All other parameters in setup.ini should not be changed!

If you want to restore the default setup.ini, delete the setup.ini file and start the software, this will create a new setup.ini file.

### **8.3 Troubleshooting communication problems**

In case of communication problems you can use the information in this section to troubleshoot communication problems.

#### **8.3.1 Set/Check scanner communication settings:**

Switch on the scanner, select MENU \_ 3 \_ 5. The display shows the current communication settings. The speed must be set to 4800, 9600 or 19200. Press the enter button to store the selection. We advise 19200 baudrate for best performance (57600 for 296/796 models). The scanner does not indicate whether it is in remote mode or not.

In the picture below the serial communication is disabled:



#### **8.3.2 Check your cable**

Most problems are traced back to serial cable problems. For the BC785D you need a so called straight RS232 cable, not a null modem cable! See below for wiring details.

##### **BC250/296:**

The BC250 comes with a special serial cable. Connect the cable directly to your PC serial port (9 pin male connector). If you use extra cables remove them and connect your scanner directly to your PC.

##### **BC785/796:**

If you used the required serial cable before for serial devices, it is unlikely there is a problem with your cable.

If you did not use the serial cable before, there may be a problem with your serial cable because there are different types of serial cables available and not all cables work with the BC785!

The serial cable used for the BC785 must be a straight thru cable, use a multimeter to check and verify the wiring of your cable:

9 pin sub D female (PC)	9 pin sub D male (scanner)	Signal Name
Pin 1	Pin 1	Data Carrier Detect
Pin 2	Pin 2	Received Data
Pin 3	Pin 3	Transmitted Data
Pin 4	Pin 4	DTE (Data Terminal) Ready
Pin 5	Pin 5	Signal Ground
Pin 6	Pin 6	DCE (Data Set) Ready
Pin 7	Pin 7	Request to Send
Pin 8	Pin 8	Clear to Send
Pin 9	Pin 9	Ring Indicator

### 8.3.3 Other serial drivers:

If you also use the serial port for programming your PDA/PAL/POCKET PC or mobile phone (GSM), there may be resident software that constantly polls the serial ports. Disable any PDA/mobile phone programming software; they may interfere with the scanner serial communication.

### 8.3.4 Serial/USB devices:

ARC250 does not support USB/serial devices. Use a serial port connection using a PCMCIA or PCI option card. For USB support contact the supplier of the converter, BuTel does not provide any support for USB devices.

### 8.3.5 Use the ARC250 Autodetect option:

The ARC250 autodetect option has been well tested. Connect your scanner using a straight thru serial cable, switch on your scanner and set serial communication to 19200 (MENU \_ 3 \_ 5 \_ ENT), and then select autodetect.

### 8.3.6 Comm error 8018:

Communication error number 8018 will occur when other software is already controlling the selected comport. This error means that ARC250 can not get access to the selected comport usually because other software has control over the comport. Close the other software.

### 8.3.7 Increase RS232 communication delay:

In the 'Read' and 'Send' data window you can set the rs232 communication delay. In case of problem use the default value 100mS.

In general you can increase the overall speed by decreasing the delay. This depends on your pc configuration and other applications that are running during data transfer. For best performance do not run other applications during data transfer.

#### **8.4 Support:**

The latest versions of ARC250 are available for download at [www.butelsoftware.com](http://www.butelsoftware.com)

In case of problems contact BuTel customer support at [support@butel.nl](mailto:support@butel.nl) , support is only available by e-mail, BuTel does not provide telephone support.

## **8.5 Revision history:**

### ARC250 V1.051:

- fixed problem 7.5khz steps
- view option for toolbar
- import trunk id's per bank
- auto backup mem files
- fips stored in mem file
- setup prio channels and store in mem file
- easy tag per bank
- direct tune
- insert option in trunk id editor
- fixed bug when edit trunk list tags
- Virtual control minimized now shows small status window 'on top'
- fixed problem It system uploaded as edacs sct
- set active banks (scan/search mode)
- limited support for 296/796

### 1.051 PRO:

- record per channel option
- fixed id tag problem bank 10
- fixed LTR id log problem
- VC: vfo option
- VC: set active banks (scan/search)
- demo version

### 1.053:

- full support for 296/796
- full support for 38400/57600 baudrate
- fixed 'scanner detect' problem
- fixed problem empty bank during download
- improved up/download speed
- fixed upload trunk id/tag problem
- tags can be shown in fixed width font ( trunk / banknames / scan lists )

### 1.053 PRO:

- improved 'active bank' detection
- fixed problem logging P25 id's
- fixed misc. problems custom font settings
- VC now remembers all settings
- set active trunk scan lists

### 1.10:

- fixed problem
- support for 6.25 khz step 296/796
- easy tags load when open a mem file

## 1.10 PRO:

- VFO knob for bc296/796 models