

BCPROG v2.10

ELECTRA BEARCAT 101 SWITCH CODE GENERATOR
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Recently, I decided that the original BCPROG manual is just a bit too long and overloaded with notes, comments, and assorted extra tech-babble that might be distracting to those who just want to know how to run the program, so here is a condensed version with – at least as far as I can manage – just the relevant details. I have trimmed 19 pages down to 10.

ABOUT BCPROG

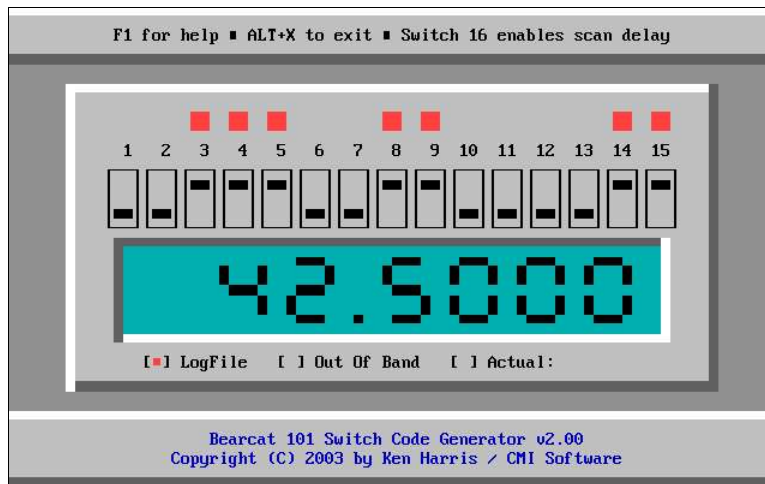
BCPROG is a DOS-native utility for generating and displaying the switch codes used for programming the Electra Bearcat 101 scanner. It includes a simple database manager for keeping track of your programmed frequencies, and also includes a unique “reverse lookup” feature which displays the frequencies which correspond to selected switch sequences. It has the ability to generate a printable chart for use in programming your scanner.

This program is designed for use only with the Electra Bearcat 101; it does not generate codes for any other scanner.

SYSTEM REQUIREMENTS

This program is a DOS-native “real mode” application and has been compiled so that it should work even on machines as old as 8088-based XT’s. There are no particular system requirements other than about 140K available RAM, color video capable of handling multiple [4] screen pages, and the ability to run DOS applications. Under newer versions of Windows, such as Windows XP, it may be necessary to enable “Legacy” support for DOS programs.

RUNNING BCPROG



The above image is a screen capture of this code generator's color ASCII graphic display. Frequencies are entered by typing them into the large "LED" display area; the digits will scroll from right to left as they are entered, like a calculator. It is not necessary to enter the decimal point – in fact, in the frequency entry window, only digits are accepted. Decimal point placement is fixed and automatic. To enter a frequency such as the 42.5000 MHz shown above, simply type **425000** and press ENTER.

While the Bearcat 101 actually has 16 switches for programming, only the first 15 are displayed by this program. Switch #16, when UP, is used to enable scan delay for the selected frequency – it is not used for frequency encoding. Switches #14 and #15 are used to select one of three band ranges – UP/UP for the low band, DOWN/UP for the middle band, and UP/DOWN for the high band.

The command keys for BCPROG's main screen are as follows:

F1	Help
0 - 9	Frequency Entry
ESC	Clear Entry Window
ENTER	Encode Frequency
ALT+R	Reverse Lookup
CTRL+P	View Programming
CTRL+S	Save Frequency
ALT+O	Configuration Menu
ALT+L	Toggle LogFile On/Off
ALT+X	Exit BCPROG

BCPROG will reset the switch sequence display to "all switches down" at the start of each new frequency entry, and will display the sequence – if it can – once the frequency has been entered. This is done mainly as a visual aid – if there is a valid frequency in the LED window but no switch sequence is displayed, then the frequency hasn't been entered yet.

A couple of basic editing keys are available for frequency entry – the backspace key works like you'd expect, deleting the last digit, and ESC clears your input. You do not need to press ESC to clear the LED display before entering each new frequency – again, as with a calculator, once the ENTER key has been pressed and a frequency has been entered, any digit key will begin a new entry. Switch sequences are not calculated and displayed until a frequency has been entered.

If your entry is presumed to be acceptable by the Bearcat 101, then the program will display the code sequence graphically in switches and lights, and the LED display below that will show the last valid frequency entered. That's really all there is to it!

Any entered frequency which does not exactly fit the BC101's band plan and frequency spacing will cause the actual frequency – the nearest even frequency, the one which truly and directly corresponds to the resulting switch sequence – to be displayed below it, next to the "Actual:" indicator. Such results can be authenticated via BCPROG's reverse lookup feature.

Any frequency which is outside of the published or theoretical band limits [see chart below], but which in theory can still be entered into the BC101, will be indicated by a blinking red dot next to "Out Of Band" on the main screen. This is simply an advisory to let you know that, while the frequency is programmable in theory, it is outside of the published band limits and might not be receivable. When the ENFORCE_RANGES option is set ON in BCPROG.INI, only the published ranges [as opposed to the theoretical ranges] will be accepted by BCPROG.

The CTRL+LEFT and CTRL+RIGHT keys rotate the frequency display window through five different color schemes – red LED, blue fluorescent, plain LCD, LCD with a green backlight, or LCD with a blue backlight. The CTRL+UP and CTRL+DOWN keys change the digit style between plain [seven-segment] and fancy. Your display format is saved to BCPROG.INI when you exit the program.

While running the program, you may press F1 to display a help screen [not that much help is required for this program once you get used to it, which shouldn't take very long]. If an invalid frequency is entered, the program will briefly display "Error" in the LED window; the F1 or ? keys will display pop-up help which lists the acceptable ranges.

There are several "input box" prompts throughout the program, used for entering channel numbers, frequencies, and alpha tags. Despite their varying appearances, they all share a common input routine within the program, which is designed to allow a fixed number of characters depending on the type of input expected.

The editing keys used by the input box routine are generally intuitive – F1, INS, DEL, HOME, END, backspace, and the LEFT/RIGHT arrow keys work like you'd expect. The ESC key clears the input line – it does not exit the input routine. Only the ENTER and ALT+X keys can do that.

The CTRL+U key in the input boxes will undo all changes you may have made to the original contents of the field being edited, reverting back to the original text as long as it has not already been saved.

The ALT+L key at the main screen will toggle the logfile on or off. When logging is ON, this will be indicated by a red dot next to "LogFile" on the main screen, and all valid frequencies entered will be written to the logfile, along with their switch sequences. The logfile's name is BCPROG.LOG in the current directory.

Logging is OFF by default when the program is started; however, you may use the /LOG command line option [run BCPROG.EXE /LOG] to automatically enable logging. BCPROG also maintains a list of your 16 channels' programming; see "Master Programming List" below.

ALT+X will close the program. On exit, BCPROG will do a final update of its data files, writing your saved programming to BCPROG.INI and regenerating the BCPSET.TXT file. These files are also automatically updated whenever you make any changes to your saved programming while running BCPROG. In general, they are updated as often as is practical – whenever necessary – minimizing the risk that your changes could be lost in the event of a crash.

ACCEPTABLE FREQUENCIES

Electra's manual for the Bearcat 101 listed the valid ranges as being 30-50 MHz, 146-174 MHz, and 416-512 MHz. According to other BC101 owners, and to my own research and calculations, it appears that perhaps a much wider range of frequencies may be programmed. However, please note that receive sensitivity outside of the published bands, or the scanner's ability to tune to such frequencies, may range from poor to nonexistent.

It seems that the range of programmable frequencies – or, more accurately, the range of frequencies which may be programmable if all possible switch combinations equate to frequencies which the BC101 can synthesize – may be as listed in the "theoretical" column below:

PUBLISHED	THEORETICAL	STEP SIZE
30.0000 to 50.0000 MHz	10.7450 to 51.7000 MHz	5.0 kHz
146.0000 to 174.0000 MHz	143.7450 to 184.7000 MHz	5.0 kHz
416.0000 to 512.0000 Mhz	409.6625 to 512.0500 Mhz	12.5 kHz

When the ENFORCE_RANGES option is OFF, BCPROG will accept, and generate switch sequences for, any frequency within the above theoretical limits. I cannot and will not guarantee that your BC101 actually can synthesize and receive frequencies outside of the band limits published by Electra. But, assuming these frequencies can in fact be programmed and received, this code generator will show you which switches to set for them.

A NOTE ABOUT STEP SIZES: Electra's manual lists a step size of 10 kHz for the low band [30 to 50 MHz], but the mathematics prove that toggling switch #13 – the "least bit" of the algorithm – will result in a 5 kHz difference between the "up" and "down" positions for both the low and middle bands. So, the table above shows a 5 kHz step for the low band even though the original manual claims a 10 kHz step.

SPLITTING CHANNELS: In the event you wish to program a frequency which falls between the normal channel steps, keep in mind that BCPROG accepts only four decimal places. In the high band with its 12.5 kHz stepping [.0125 MHz], a "half-channel" would use a 6.25 kHz step [.00625 MHz]. For example, the frequency halfway between 507.5625 MHz and 507.5750 MHz would be 507.56875 MHz. Since BCPROG accepts only four decimal places, you would need to round up to the fourth decimal place on your own – i.e., you would enter 507.5688, or any frequency between that and 507.5750.

While this may create a bit of confusion when splitting high-band channels, it is not a problem with the low and middle bands – their 5 kHz stepping [.005 MHz] can easily be split into 2.5 kHz half-steps [.0025 MHz]. BCPROG accepts only four decimal places because this is all that is necessary for entering "even" frequencies which fit the BC101's normal stepping. It would not be particularly difficult to modify BCPROG to handle five decimal places, and I can do it if enough users beg me to, but for now I just don't feel that it's really necessary, especially not when one considers that this would only facilitate the entry of frequencies which the BC101 cannot properly tune anyway. The

easiest way to avoid such problems? Don't try to split channels. If you must program a half-channel, though, try entering the next lowest and next highest even frequencies and see which one gives the best reception.

PROGRAMMING THE BEARCAT 101

This information is available on various web pages – usually located easily with a Google search – and usually has been copied directly from the original Bearcat 101 manual, but here it is again [in my own words] for those of you who might not have a copy of the manual or who might not know anything at all about this scanner.

First, set all 16 channel switches and the READY switch to the DOWN position. The READY indicator should light.

Then, press down on the SCAN/MANUAL switch to step through the channels until you have selected the channel number you wish to program. The LED above the channel number will indicate the selected channel.

Set all switches indicated by BCPROG for the desired frequency to the UP position – remember that switch #16 enables scan delay for the channel being programmed, so whether you set it on or not is purely a matter of preference – then press down the ENTER switch. [It's always a good idea to double-check your switches before you press ENTER.] The LED above the selected channel number should go out for about a second, then come back on; this indicates successful programming of that channel. Continue stepping through the channels and setting switches as indicated by BCPROG until all desired channels have been programmed.

After you have finished programming your channels, set the READY switch back to the UP position. You are now ready to scan.

REVERSE LOOKUP

The "reverse lookup" feature will allow you to manually select a switch sequence and have BCPROG automatically display the frequency which corresponds to it.

Operation of the reverse lookup feature is very simple – when ALT+R is pressed at the main screen, the program will draw a double red box around the first switch, and the main screen will indicate that you have entered the reverse lookup mode. This is your starting point. The LEFT/RIGHT arrow keys let you move the double red box left or right to select switches, and the spacebar toggles switches up or down. Any changes will automatically update the frequency display. The ESC key will exit the reverse lookup and return you to the frequency entry mode.

While using the reverse lookup, keep in mind that the only valid selections for switches #14 and #15 – which are used for band selection – are UP/UP for the low band, DOWN/UP for the middle band, and UP/DOWN for the high band. If both of these switches are set DOWN – which apparently does not correspond to any known band selection – then the reverse lookup will display the frequency as **000.0000** regardless of how switches #1 through #13 are currently set.

Frequencies selected via the reverse lookup are not written to BCPROG.LOG as they are selected. However, they can be saved to BCPROG.INI with the CTRL+S key [see below], or written to BCPROG.LOG if you first exit the reverse lookup, then press ENTER.

THE MASTER PROGRAMMING LIST

BCPROG can save entered frequencies to a data file [BCPROG.INI] and use that file to generate a master programming chart in plain ASCII text, which can be VERY useful for keeping track of the frequencies you have programmed into your BC101. This chart will list the channel numbers, assigned alpha tags [you will be prompted to enter these; more below], and correct sequences for switches #1 to #15. [Switch #16 enables scan delay for the channel being programmed; whether you turn it on or not is your choice.]

The master programming list is automatically generated under the filename BCPRSET.TXT; you do not need to press any keys to force BCPROG to generate this file while the program is running. You can, however, manually force the generation of BCPRSET.TXT from the DOS command prompt by running BCPROG with the /COMPILE command line option - details below.

Note that BCPRSET.TXT is a different file than the optional BCPROG.LOG file. BCPRSET.TXT is a chart specifically detailing your chosen programming for your 16 channels, showing frequencies, switch sequences, and alpha tags - a printout of this file is what you will want to have in front of you while you are programming your BC101. It also serves as a great form of future reference.

After you enter a frequency into BCPROG or select one using the reverse lookup, press CTRL+S to save that frequency. You will be prompted for the channel number [1-16] in which to store it. Entering any other value, or nothing at all, will cancel the save operation. If you select a channel which already contains a frequency, you will be asked whether you wish to replace it with the new frequency.

When the CTRL+S key is pressed, BCPROG scans your saved frequencies to find the first available empty channel, if one exists. If you do have at least one empty channel, then that channel number will automatically appear in the "channel number" prompt box, and you may simply press ENTER to save the frequency to that location. This simplifies the process of defining your channels, particularly if you are a first-time user and are setting up all 16 of your channels.

After selecting the channel, you may enter a short description [alpha tag] for that frequency. BCPROG.INI and BCPRSET.TXT will be updated automatically. Repeat this process for all of the frequencies you wish to program.

The BCPROG.INI file is plain ASCII text and can be directly edited. Note, however, that you must always save it as plain text - if it is saved in any other format such as DOC or WRI, it cannot be read by BCPROG and will be replaced by BCPROG [consequently wiping out your saved programming!] while the program initializes.

The format of BCPROG.INI is as follows: The file must start with a line which reads **[BCPROG]** to indicate the start of your settings, and below that, there are 16 lines for your programming. Example:

```
[BCPROG]
CHAN="1"  FREQ="146.7000"  TAG="KB5TJJ Repeater"
```

As you can see, each line of programming has a field for the channel number [indicated by **CHAN=**], a frequency [indicated by **FREQ=**], and an optional alpha tag [indicated by **TAG=**]. The values for each field must be enclosed in quotes; i.e., **FREQ="146.7000"** instead of **FREQ=146.7000**. Any line which contains invalid settings or which cannot be parsed by BCPROG will be discarded, as will all blank lines and comments.

If the **[BCPROG]** marker cannot be found in BCPROG.INI, your channels will not be read! It **MUST** precede your channel definitions.

Since the BC101 has only 16 channels, only numbers from 1 to 16 are valid for the **CHAN=** settings.

The **FREQ=** settings must be for frequencies which are within the BC101's range; invalid or out-of-range entries will cause the entire line to be discarded. BCPROG will accept all frequencies within the theoretical ranges listed above. Any frequencies which do not exactly fit the BC101's channel spacing [5.0 kHz low/mid bands, 12.5 kHz high band] will be adjusted to the nearest step.

The **TAG=** settings may be empty [no text between the quotes], but they must still be present – any line which is missing any of these three fields will be discarded. The contents of the **TAG=** settings can be up to 50 characters of alphanumeric text; anything longer than 50 characters will be truncated.

You may enter these three fields in any order; however, BCPROG will always write them in the **CHAN/FREQ/TAG** order shown above. Also, you may rearrange your channels simply by changing the values which follow **CHAN=**, and BCPROG will put them in proper numeric order for you. [In other words, your channel order is defined by the **CHAN=** fields, not by their physical order within BCPROG.INI.]

You will not need to create BCPROG.INI before running the program. It will be automatically created for you. You may still create it beforehand if you wish – it's just not necessary.

Your digit display format is saved to BCPROG.INI when you exit the program. This is written in a single line. The format for this line is:

```
DIGIT_STYLE="P1"
```

In this example, the digit style is plain and the color scheme is #1 [red LED]. For fancy digits with color scheme #5 [LCD with a blue backlight], you would use DIGIT_STYLE="F5". In other words, the first character will be either P or F [for plain or fancy], and the second character will be a digit from 1 to 5. Any characters other than these, or a reversed order [digit first], will cause the setting to be ignored, and BCPROG will revert to the original P1 style [plain red LED].

The **"ENFORCE_RANGES"** option determines whether BCPROG will accept all frequencies in the theoretical ranges [see page 4], or accept only frequencies within the published ranges. When this option is ON, BCPROG will accept only the published ranges. When it is OFF, BCPROG will accept the theoretical ranges. Note that if range enforcement is ON and BCPROG.INI contains out-of-range frequencies [frequencies outside of the published ranges], *those channels will be discarded when BCPROG loads and reads the BCPROG.INI file.*

The **/COMPILE** command line option [run BCPROG.EXE /COMPILE] will force BCPROG to read the BCPROG.INI file and generate the BCPRSET.TXT master programming chart based on the contents of BCPROG.INI. Note that the **/COMPILE** option will also cause BCPROG to exit immediately after it finishes generating BCPRSET.TXT. This option is essentially a shortcut which enables you to generate a new BCPRSET.TXT file after editing BCPROG.INI without your having to load and manually exit from BCPROG. Remember, though, that BCPROG still automatically updates BCPRSET.TXT whenever it is run, whenever you save any frequencies with the CTRL+S key, and whenever you make any changes from within the channel editor [see below].

Since the **/COMPILE** option forces the program to exit after generating the BCPRSET.TXT file, all other command line options [such as /LOG] will be ignored when /COMPILE is used.

THE CHANNEL EDITOR

The CTRL+P key at the main screen brings up an interactive channel editor, with which you may view and modify your current programming as saved in BCPROG.INI. If you wish to program several channels at once, the channel editor may be a more efficient and intuitive method than using the CTRL+S key to save frequencies.

The command keys for the channel editor are as follows:

F1	Help
LEFT / RIGHT	Select View
UP / DOWN	Select Channel
ENTER	Edit Channel
ALT+S	Sort Channels
ALT+P	Print BCPRSET.TXT
ESC	Return To Main
ALT+X	Exit BCPROG

The LEFT/RIGHT arrow keys will let you toggle between the two types of lists – one shows the channel numbers, frequencies, and alpha tags, and the other shows the corresponding switch sequences instead of the alpha tags. [The 80x25 DOS screen in which BCPROG runs simply isn't wide enough or tall enough to show everything at once.]

The UP/DOWN arrow keys let you select a channel to modify; this is indicated by a scroll bar highlighting the selected channel. The ENTER key places you into edit mode for the selected channel. At that point, you may choose to modify the channel number, frequency, and/or alpha tag. Switch sequences cannot be edited; they are generated automatically, based on the current channel's frequency.

Upon entering edit mode, you will first be prompted for the channel number. If you wish to move the current channel to a new location, enter that new location here, and the contents of the channel list will be rearranged accordingly. To keep the current location, simply press ENTER without editing the channel number. Your input in this window will not be accepted until it is valid [not blank, and in the range 1 to 16].

After entering the channel number, the input window moves to the frequency column. As with the channel number, simply press ENTER without editing to keep the frequency as-is. Entering a blank line at the frequency prompt will CLEAR the current channel. You will be given a YES/NO confirmation prompt before the channel is cleared. If you do clear the channel, the alpha tag will also be cleared.

If your current list view includes the alpha tags, then the input window will move to the alpha tags column after you enter the frequency [assuming you did not enter a blank line to clear the channel]. If the current view shows the switch sequences instead of the alpha tags, then you will enter the alpha tags in a pop-up window. Again, entering a blank line will clear the alpha tag, and as with the frequency entry window, you will be given a YES/NO confirmation prompt before the alpha tag is cleared.

Please note that there is no undo feature available once a field has been entered, although you can use the CTRL+U key to undo all changes to the field being edited as long as you have not yet pressed ENTER. When editing channel data, your changes are saved to BCPROG.INI as soon as you enter the last field [the alpha tag].

The ALT+S key will enable you to sort your channel list, either by frequency or by alpha tag, and either in forward or reverse order. As with the field editor above, there is no undo available for the channel sort operation.

The ALT+P key will send your current programming to the printer. This is printed in the same format as the BCPRSET.TXT file. [There might be no output if you have a USB printer. If this is the case, use an accessory such as Notepad to print BCPRSET.TXT from within Windows, or install a DOS-to-USB print utility such as DOSprn, available at <http://www.dosprn.com>. For best results, print using a fixed-width font such as Courier or Terminal.]

The ESC key exits the channel editor and returns you to the frequency entry screen. ALT+X, as always, will close the program.

REVISION HISTORY

FEBRUARY, 2003: Thanks to the generosity of a user on the [Strong Signals](#) web site, I recently acquired a beautiful old fully-functional Electra Bearcat 101 scanner. Upon browsing the manual and reading about the encoding scheme for programming frequencies which aren't listed in the guide – and there are a lot of them! – I realized that writing a code generator program would be more or less a trivial exercise, not to mention that such an encoder would be very useful to any Bearcat 101 owner [translation: "me, first and foremost, and other BC101 owners if I decide to distribute it"]. The earliest version was very plain "text-in, text-out" and written mainly for fine-tuning the encoding routines. The graphical user interface was later wrapped around those routines; the eventual result was this program. In truth, the actual encoding routines are only a very small and simple part of the program – the vast majority of the code is for the user interface and the extra goodies that make BCPRG more than just a simple switch code generator.

SEPTEMBER 27th, 2003: v1.00 released.

SEPTEMBER 28th, 2003: v1.01 released [yes, just one day later <blush>]. Maintenance release; patched a couple of minor and esoteric bugs in the user interface that should have been spotted earlier [and were still hard to spot under normal use anyway, but I'm picky like that], and tweaked up a few small bits of code. None of these patches affected the switch code generation algorithms.

NOVEMBER 21st, 2003: v2.00 released. Many changes and enhancements to the user interface and GUI screen design. CTRL+P "View Programming" screen is now an interactive channel editor, with the ability to edit frequencies and alpha tags, sort and rearrange channels, and print the master programming chart [this is the same data that is written to BCPRSET.TXT]. Assorted "behind-the-scenes" tweaks throughout the program.

FEBRUARY 13th, 2004: v2.01 released, on BCPRG's first birthday [development started on 02/13/2003]. Discovered and patched a few very minor user interface bugs – for starters, the "Out Of Band" indicator was not remaining on, when necessary, on exit from the reverse lookup. I only had to change one short line of code to fix that, so it really was a very minor bug, but I don't like to ignore bugs in my programs, not even tiny cosmetic ones that most users wouldn't even notice. I'm very picky that way. No changes made to any critical routines. Added one little cosmetic feature – the CTRL+LEFT and CTRL+RIGHT keys will change the digit display color, rotating among five different schemes [LED, fluorescent, plain LCD, LCD with a green backlight, or LCD with a blue backlight]. The CTRL+UP and CTRL+DOWN keys toggle between "plain" and "fancy" digits. Your display preference is saved to BCPRG.INI.

JUNE 5th, 2004: v2.02 released. Cosmetic bug patch in "plain/fancy" digit selection code. Added one tiny new feature – the CTRL+S "save frequency" command now locates the first available empty channel in BCPRG.INI to simplify the process of defining multiple channels.

OCTOBER 14th, 2004: v2.03 released. Bug patch in CTRL+S "save frequency" command.

FEBRUARY 13th, 2006: v2.10 released. Added ALT+O configuration menu. Added "band enforcement" option. Source code split into two modules, which increases the executable's size and memory requirements somewhat, but it was necessary due to compiler limitations [too much code for one module, basically]. At this point, I am not aware of any other bugs anywhere in the program, and I can't think of any more features to add, so this might be the final version of BCPROG unless one of you users has any suggestions or bug reports.

C R E D I T S A N D W H A T N O T

This program and its documentation are Copyright © 2003-2006 by Ken Harris / CMI Software. Users may freely copy and distribute this program to others, provided it is kept in its original and unmodified form, including this documentation. No fees may be charged for distribution. Users may not modify, decompile, or reverse-engineer this program, nor may they reproduce any portion of this documentation without permission from the author. All applicable domestic [United States] and international rights remain the exclusive property of the author; the author does not claim any rights to which he is not legally entitled.

BCPROG is written in Microsoft BASIC v7.1 [PDS] and is entirely original in its source code. GUI display routines and screen encoding schemes are property of CMI Software; no user interface toolkits or third-party libraries were used. Plain text documentation and GUI screens were created using TheDraw [property of TheSoft] and QEdit [property of SemWare]. Adobe PDF documentation was created in the [OpenOffice.org Writer](#). Graphics in this document were created in Paint Shop Pro. The Bearcat 101 graphic on page 1 was directly drawn over a digital photograph of my own scanner using Paint Shop Pro.

Please be sure to inform me if you discover any bugs in this program – detail the exact circumstances under which the bug occurred if you can, particularly if you are able to consistently reproduce it. The code for generating switch sequences is relatively simple, and my testing has shown that its results match what is listed in my copy of the BC101's original frequency guide – not to mention that the program automatically self-verifies its results – so I don't really expect any major malfunctions in the switch code generation routines. Any problems are most likely to be in the user interface code. Comments, questions, suggestions, and bug reports may be sent to xfire905@aol.com.

When e-mailing me, please make sure the subject of your mail is something that I am not likely to discard as spam! I tend to dump [delete, kill, ignore, get rid of, nuke, not read] mail from unknown senders unless the subject clearly shows that the mail is one that I will want to read. Something like "hey" would not really be a particularly good subject, but anything about BCPROG or "Bearcat 101" would definitely get my attention.

This program is being distributed free of charge; however, I won't refuse donations if they are offered. E-mail me at the address above if you would like to make a donation. I accept PayPal.

Kudos to Rich Wells N2MCA and Mike Agner KA3JJZ of the [Strong Signals](#) web site. Many thanks as well to "T.P." [he knows who he is] for the fine, fun, and free vintage scanner! BCPROG wouldn't exist without you.

BCPROG is dedicated to the memories of Ray "The Navigator" Harris, Jim "K9 S&D" Johnston, Pete "Crowbar/571" Parker, and Bob "Four Wheels" Geary – radio guys, every one of 'em.