

# Trunked Radio Communications

## New Update From RadioShack PRO-96 CQPSK Upgrade Released!

By Mark Colborn

Ask and you shall receive! On January 29, 2004, the GRE Digital Scanner Development Team posted the following press release to the internet: "Our team has completed work on a DSP App update for the PRO-96 that enables reception of the CQPSK modulation used in newer Linear Simulcast Modulation digital trunked radio systems. The update will be a free download available from the radioshack.com web site. A link to the download file will be available very soon. In addition to enabling CQPSK reception, this update also fine tunes the digital audio level to better match that of analog audio levels, and provides some improvement to reception of C4FM digital signals in very weak signal conditions. All PRO-96 users will want to download this update and apply it to their radios. A significant amount of time and effort was required to make this possible. We would like to extend our sincere thanks to the PRO-96 user community for their patience and support!"

The download is easy, and all reports from users on the PRO-96 Yahoo Users Group and Trunkedradio.net say it works great on these new systems. Kudos to Radio Shack and the GRE Digital Scanner Development Team, thank you. To download the executable 224kb upgrade and 122kb Adobe Reader instruction manual go to:

<http://www.radioshack.com/ProdSupport/DocumentDetail/DocumentDetailIndex.asp?P=&D=soft&T=htm>

By using Don Starr's WIN96 software to program the PRO-96, the following frequency ranges (excluding cellular) can be "opened" by checking the box in the software entitled "extended frequencies":

17 - 25  
54 - 108  
225 - 406  
512 - 550  
764 - 806

960 - 1240

Frequencies can be entered via the software, or via the scanner's keypad, to include the SR6 - Limit Search. The obvious benefit to this feature is the military UHF air band, and users report good reception in this band. Although television audio and good time FM radio broadcasts can be tuned, there is no way to enable wide (WFM) channel reception so audio quality is poor.

The PRO-96 Yahoo Users Group has been very active since September of last year, and members have posted a multitude of WIN96 files for various areas across the country, and the list keeps growing. This is great for listeners who travel a great deal, or if on holiday.

The PRO-96 will scan conventional frequencies and trunked systems in the same bank. If a particular bank is set to MO (which it will need to be to trunk), it will also scan conventional frequencies as long as each conventional frequency channel is set to FM, CT, or DC. For example, in bank nine (9) I have a Motorola 400MHz Federal mixed digital/analog system along with several CTCSS channels (Texas DPS), several digitally coded squelch (DCS) channels and several FM channels (Secret Service, TSA, and several other federal frequencies; a mixture of analog and digital channels).

The bank is set to "MO". The trunking control channels are set to "MO" and the other channels are set to "FM", "CT" or "DC". The scanner trunks the mixed analog/digital 400MHz system as it should, and the rest of the conventional channels are received perfectly when there is traffic on them. If the "CT" or "DC" feature is used, the scanner will only open squelch on a transmission that carries the selected sub-audible tone. The scanner will not open squelch on a frequency with a digital transmission unless the "FM" feature is selected. Also, the PRO-96 will

not display a talkgroup ID number and alpha tag at the same time, but users can toggle between the two by pressing the TEXT button when on an active talkgroup.

There are two ways to monitor trunked radio systems in the PRO-96, open and closed mode. Choose open mode to hear all active talkgroups on a system and closed mode to monitor only those talkgroups you have programmed into the scanner's talkgroup ID lists. Conventional channels in the same bank are not affected by either mode. I use the closed mode feature on the Fort Worth Public Safety system to receive only the talkgroups that interest me. Since the Fort Worth Public Safety system has over 650 groups of users and over 4000 radios, you can imagine how easy it would be to get lost following all of the traffic on the system.

Each of the PRO-96's ten channel storage banks has an associated talkgroup ID list, and each ID list has 5 sub-banks of 30 IDs each, or 150 talkgroup IDs and their associated alpha tags can be stored per channel bank. Talkgroup ID sub-banks in each bank can be toggled on and off. For instance, you may want to put 30 police talkgroup IDs in the first list (which is "0"), 30 fire department talkgroup IDs in list 1, EMS IDs in list 2, surveillance units in list 3, etc., and toggle them on and off depending on your listening mood. However, in order for this feature to work, the channel bank has to be set to CLOSED mode. Otherwise, you will continue to hear and see the numerical ID or alpha tag for an ID of any talkgroup that becomes active on the system unless you have that talkgroup specifically locked out. When operating in OPEN mode, you can lockout those annoying or unwanted talkgroups when the scanner stops on a voice call by hitting L/OUT.

There is a "firmware bug" however, that has been reported on the newsgroups and confirmed with my scanner. The bug will only allow 127 talkgroups per channel bank to be locked out. For instance, if you have entered 120 talkgroups into the first four sub-banks, the scanner will only allow you to lockout an additional seven (7) talkgroups. In order to utilize the full 150-talkgroup storage capacity per bank (either locked out or not), fill up sub-bank four (4) first with alpha tagged talkgroups. The scanner will then place subsequent locked out talkgroups into the next available slot in the first four sub-banks - up to the limit of the storage capacity.

The PRO-96 has an attenuator, ostensibly to reduce strong signal overload interference when operating the scanner near cellular or pager towers. There are two attenuator modes in the PRO-96, normal and global. Normal mode allows the user to set the attenuator on a per-channel basis. The global attenuator applies approximately 20dB attenuation to every channel in the scanner. The PRO-96 manual states on page 71, that to turn on the global attenuator hit FUNC, then ATT and Global ATT appears for

2 seconds at the bottom of the screen, then ATT- appears on the bottom line. Then the manual says to press ATT again to activate the attenuator, and then ATTon appears. On my PRO-96, the global attenuator appears to be operational even if ATT- is appearing on the screen.

I accidentally turned on this feature a while back and noticed a marked decrease in signal strength of my favorite trunked systems. I actually thought my antenna had gone bad or there was a problem with the scanner. A friend noticed the ATT- feature and asked why I had it on, and when I hit FUNC and ATT and turned the feature off, reception returned to normal. My recommendation would be to turn the global attenuator off unless you really need it, or activate it on a per-channel basis.

There are several features that users would like to see incorporated into future upgrades or desktop versions of the PRO-96. Support for "I" or individual calls and Logic Trunked Radio (LTR) system monitoring capability. Aurora, Colorado and DFW Airport DPS in Texas, to name a few agencies, have moved to M/A Com Pro-Voice systems and these systems are presently unmonitorable by the PRO-96 or the BC-296D/796D. Also, 12.5k step tuning for the federal government VHF band: 160 to 174 MHz. For instance, Secret Service "B" in the DFW area is 165.7875 and attempts to program this frequency into the PRO-96 end in 165.7900. Just enough off frequency to make reception of a digital channel difficult at a distance.

The PRO-96 has six pre-programmed search ranges and one user configurable search range. The Marine search bank (SR-0) will not start searching automatically when selected, even if "Search On" is checked in the WIN96 software. Press FUNC and SRCH again after selecting SR-0 to begin searching the pre-programmed 88 marine channels. The WIN96 software allows the user to select automatic "Search On" for the CB (SR-1) and FRS/GMRS/MURS (SR-2) ranges. The aircraft band (SR-4) begins searching automatically upon selection. The Police/Fire (SR-3) and Ham (SR-5) have specific groups of frequency ranges that can be turned on and off, either by selecting the proper group number on the keyboard or by checking or unchecking the appropriate boxes in the WIN96 software. The SR-6, or user configurable limit search, can be tailored to the listeners needs either through the keyboard or with the WIN96 software.

The PRO-96 is a truly fantastic scanner, and just like a pilot strapping into a new or more complex airplane or helicopter, the pilot needs time to adjust and has to live with the machine for a while to become completely comfortable with it's features, handling characteristics and performance. The more you use your new PRO-96, the more you'll like it, become comfortable with it, and take it everywhere!

