THE REPEATER

Newsletter of the North Shore Emergency Association

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FCC GMRS DATA

Total Active GMRS Licenses = 88,155
Total Active GMRS in Illinois = 2,489
Number Issued in October = 3,548
Number October in Illinois = 107

NSEA DATA

Regular Voting Members = 17
Probationary Members = 1
Auxiliary Members = 11
Applicants = 16
Affiliated GMRS Users on Roster = 55
Added on Systems - Last 3 Months = 9
Added on Systems - Last 30 Days = 2

FOR REPEATERS PERMISSION

Click this link:
https://nsea.com/index_files/Contact.html

FOR FCC RULES

Copy & paste:
https://www.ecfr.gov/cgi-bin/text-idx?SID=b7b411dcef7e2b190049b5ebfc58be1c&tpl=/ecfrbrowse/Title47/47cfr95_main_02.tpl

Or click FCC RULES & REGULATIONS link @ www.nsea.com

FOR NSEA RADIO PROCEDURE

Click this link:
https://nsea.com/index_files/Radio%20Procedure.pdf

TRAINING FOR GMRS OPERATORS

WEATHER SPOTTING

Skywarn online training:
https://www.weather.gov/lot/spotter_talk .

For Reporting: (800) 692 – 2110

DISASTERS (FEMA)

IS-100.c - Introduction to the Incident Command System (ICS);

IS-230.d – Fundamentals of Emergency Management; and

IS-700.b – An Introduction to the National Incident Management System (NIMS).
https://training.fema.gov/is/.

FEMA SID number:
https://cdp.dhs.gov/femasid

FIRST LOOK AT NEW WOUXUN KG-1000G MOBILE

Just FCC Certified in mid November, the new Wouxun 45 watt mobile unit has been heavily hawked as a full-fledged "commercial grade" radio by vendors such as online store www.BuytwowayRadios.com. They refer to the new Wouxun as "high end, professional grade GMRS equipment" giving rise to expectations of equivalent to ICOM or Kenwood, etc. One could hardly not be intrigued by such claims as "a GMRS mobile radio that didn't require any compromises."

"Professional grade" signals to me that technical specifications will be superior, rivaling any other band, bar none. I've been seeing typical "industry standard" specifications for many, many radios over the years, so I have some idea of what I might find to fit such a bill. In years gone by advertising for "commercial grade" radios have consistently always included technical details for both transmitter and receiver.

For example, see my ICOM IC-F6061 mobile unit advertising brochure specifications, below. This gives you a pretty good idea what "Industry Standard" specifications look like. Disappointingly, www.Buytwowayradios.com has NO such technical details. Thus, I eagerly looked forward to the forthcoming Instruction Manual for the new Wouxun. But, now that the Manual is finally available for download, once again I am very disappointed.

Compared to the normal Industry Standard specifications such as ICOM, the Wouxun specs are very sparse indeed (See graphic below.) As a consequence, I am doubtful indeed that the KG-1000G is really equivalent "commercial grade" radios.

As readers may recall, in a prior edition of THE REPEAtER, I identified a problem with FCC certification procedure preventing numerous channels with custom configurations of GMRS channels. Previously only one channel for each authorized frequency was all that was allowed. This has now been corrected and the new Wouxun does have up to 999 custom GMRS channels now.

But the grossly lack of specs for the Wouxun, especially for the receiver, leaves me wary. See graphic of Tech Specifications for Wouxun KG-1000G below. The KG-1000G has a number of interesting features, such as ability to chain two units together to configure a repeater, and tone scanning. Two features, however, make this new model a pass for me. In addition to CTCSS and DCS, beep tone and DTMF is included, ***but 2-tone / 5-tone is completely missing***. And 5-tone is by far the most unobtrusive signaling system that is easier on the ears of users' voice monitoring for calls in GMRS. It is vastly superior to DTMF, "Modat©", etc.

Also, the infernal "Roger Beep" is INEXCUSABLY included. This is **totally illegal** in GMRS, see §1733(a)(4):

"§95.1733 Prohibited GMRS uses.
(a) In addition to the prohibited uses outlined in §95.333 of this chapter, GMRS stations must not communicate:
(4) Music, whistling, sound effects or material to amuse or entertain;"

Far from being "professional grade" this belongs ONLY ON A TOY and has absolutely no business in GMRS.

The KG-1000G has a number of interesting features, such as ability to chain two units together to configure a repeater, and tone scanning. Two features, however, make this new model a pass for me. In addition to CTCSS and DCS, beep tone and DTMF is included, ***but 2-tone / 5-tone is completely missing***. And 5-tone is by far the most unobtrusive signaling system that is easier on the ears of users who voice monitor channels for calls in GMRS. It is vastly superior to DTMF, "Modat©", etc. Most "commercial grade" radios include both 2-tone and 5-tone selective signaling and control, such as ICOM. Even Baofeng Tech also includes both such capabilities in their GMRS radios.

And, keep in mind that features are only half the story. Equally, if not more important, are the technical specs, especially receiver performance. In a major urban area, like Chicago, with its high RF noise floor and abundance of mixing and intermodulation, this is even more critical. In a repeater configuration it's absolutely **VITAL**!

We understand that one or two of our system users have actually purchased one of these Wouxun KG-1000G units. So far their audio sounds good on our Sunday evening Radio Nets. We'll report more on actual on-the-air performance as more information comes in.

See graphics (over) for technical specifications.

VHF AND UHF TRANSCEIVERS

IC-F5061•IC-F6061

SPECIFICATIONS

GENERAL

- Frequency range :
  - IC-F5061 136–174MHz
  - IC-F6061 400–470MHz, 450–512MHz
- Number of channels : 512 channels/ 128 zones
- Channel spacing : 12.5/25kHz, 15/30kHz 6.25kHz (option)
- PLL channel step : 2.5kHz, 3.125kHz
- Antenna impedance : 50Ω
- Operating Temp. range : –30°C to +60°C ; –22°F to +140°F
- Power supply requirement : 13.6V DC nominal
- Current drain (approx) :
  - Tx 50W/45W 14.0A
  - Rx Max. audio 1200mA
  - Stand-by 300mA
- Dimensions (W×H×D) (projections not included) : 160×45×150 mm ; 6 5/16 ×1 25/32 ×5 29/32 in
- Weight (approx.) : 1.31kg; 2.9lb

Measurements made in accordance with EIA-152C/204D, TIA-603. All stated specifications are subject to change without notice or obligation.

TRANSMITTER

- Output power (approx) : 50W (VHF) 45W (UHF)
- Max. frequency deviation : ±5.0/2.5kHz (Wide/Narrow)
- Frequency error : ±1.0ppm
- Spurious emissions : 75dB typ.
- FM Hum and Noise : 45/40dB typ. (Wide/Narrow)
- Adjacent channel power : 70/60dB min. (Wide/Narrow)
- Audio harmonic distortion : 3% typ. (40% deviation)
- Modulation limiting : 70–100% of Max. deviation
- Ext. microphone impedance : 600Ω (8-pin modular)

RECEIVER

- Sensitivity (12dB SINAD) : 0.25μV typ.
- Squelch sensitivity : 0.25μV typ. (at threshold)
- Adjacent channel selectivity : 85/75dB typ. (Wide/Narrow)
- Spurious response : 90dB typ.
- Intermodulation : 77dB typ.
- Hum and noise ratio : 50/45dB typ. (Wide/Narrow)
- Audio output power : 4W typ. at 10% distortion with a 4Ω load
- External speaker connector : 2-conductor 3.5 (d) mm (1/8")/4Ω

Supplied Accessories
- Hand microphone, HM-148
- DC power cable
- Microphone hanger
- Mounting bracket kit
- Key assign stickers

Specifications

General		Receiver	Narrow bandwidth	
Frequency Range	Frequency Range for US: RX: 50.000-54.995MHz, 65.000-108MHz, 108.000-180.995MHz & 320.000-349.995MHz, 400.000-479.995MHz,700-824MHz, 849-869MHz,894-960MHz TX: 462.550-462.725MHz (GMRS Frequencies) 467.550-467.725MHz (GMRS Repeater Frequencies)	Adjacent Channel Selectivity	≤ 60dB	
		Intermodulation	≤ 60dB	
		Spurious Response	≤ 70dB	
		Audio Response	+1~-3dB(0.3~3KHz)	+1~-3dB(0.3~2.55KHz)
Step Frequency	2.5KHz / 5KHz / 6.25KHz / 10KHz / 12.5KHz / 20KHz / 25KHz / 30KHz / 50KHz / 100KHz	Signal to Noise Ratio	≥45dB	≥40dB
Memory Channels	999	Audio Distortion	≤5%	
Work Mode	F3E	Audio Power	Transceiver ≤ 3W Hand Microphone ≤ 1W	
Operating Temperature	-20℃~+40℃			
Antenna Impedance	50Ω			
Power Requirement	13.8VDC ± 15% (Negative Grounded)			
Weight	1437.8g (including microphone)			
Dimensions	140 x 44 x 207 (mm)			

Transmitter	
Type of Modulation	FM
Adjacent Channel Power	≥60dB
Spurious	≥60dB
Audio Response	+1~-3dB(0.3~2.55KHz)

A FEW RF FILTERING BASICS

RF filters are indispensable for configuring repeater systems. Some basic understanding of how they work is very helpful in understanding how systems work. You all know that antenna lengths are related to frequency. An RF filter is a tuned cavity the dimensions of which are related to frequency as well. By means of a rod inserted in the middle that can be moved in very fine increments (screwed), the filter can be very finely tuned for exact frequency.

RF Filters can be configured to be tuned to pass a certain frequency and reject the rest (band-pass) or tuned to reject a specific frequency and pass the rest (band-reject). So, in a duplexer, which allows both a transmitter and receiver to both use that same antenna at the same time, band-pass filters are between the receiver and the antenna (pass 467.675 MHz), and band-reject between the transmitter and antenna (reject 467.675 MHZ). The receiver only "sees" the input signal from the antenna, and the transmitter has the input frequency removed as it goes out before it gets to the antenna feed line or receiver.

The further away the frequency is from the tuned value the greater and greater the filtering removes the RF. But even at the selected tuned frequency there is a little loss. This is called the insertion loss, and the best filters have very little at the selected "tuned" frequency, typically on the order of ½ db. In our next article we'll include graphs of RF cavity filtering curves.

Would you like to contribute to The Repeater? Submissions are encouraged. Send to Randy@NSEA.com.

 P. Randall Knowles, KAA 8142, Editor. Randy@NSEA.com