WOUXUN KG-UVD1P
VHF / UHF Dual Band Handheld Transceiver

Many "low cost" Chinese VHF and UHF handheld transceivers can be found these days around the internet.
The quality and performance are on the bottom end of the scale for the most part.
However , the "Dual Band" Wouxun KG-UVD1P pars better for "Amateur Radio" use, but it's no where near perfect either.
I have provided an easy to understand "menu" chart on the bottom of this page.
NOTE : Also sold as the (relabeled) Midland CT790, Dynascan DB-48 , Albrecht DB-270, Team TeCom DB and Navcomm TK-890.
Two similar variants : The KG-UV2D and KG-UV3D (see text below).
(Photo : N9EWO)

Country of Origin, all pieces: (PRC) China
Approximate "Test Sample" Serial Number: I12-66xx

Optional Accessories Tested: 1700 mah Li-ion battery pack, PCO-001 USB Computer Programming Cable., SC-23 soft case.

Low Cost Chinese Quality - Roll of the Dice? / Perhaps Gives "The Big Boys" a Reason to Improve?

From my own experiences dealing with low cost Chinese radios over the years (receiver or transceiver) any purchase is a real shot in the dark. Quality control appears extremely variable or even non-existent more than normal. So any person ordering one of these radios direct from China could end up with "junk" instead of gem if something goes sour (DOA or down the road), and returning it will normally not be cost effective. So it's just like playing the lottery or slot machine. You are taking your chances more than usual with no REAL warranty.

You could also end up with what I call a "sweet and sour" sample. That is where it may work well enough to use it, but some parts are not working the way it should.

But with the big boys are also turning out handheld transceivers with similar or even worse nastiness. Seems the trend for many amateur radio operators is to get away from the ever more expensive sets from Japanese manufactures that also do not always work out of the box properly either (more than it should). Or it was just badly designed in the first place. I know this feeling from first hand experience many times over.

In fact Vertex-Standard-Yaesu has been selling Chinese made 2-meter handheld and mobile transceivers for some time now (entry level models). So it's not that any of the big boys have stayed out of China for manufacturing.

Made in at Least 8 Flavors / FCC Type Acceptance ????

According to the very poor "Chinglish" owner's manual the transceiver is made for the "World Market" in 8 different versions that vary with frequency coverage. VHF is the same with all : 136 to 174 Mhz. On the other band it varies. Three 220 Mhz versions between 216 to 280 Mhz and Five UHF versions between 350 to 520 Mhz. Of course all versions can transmit across its marked ranges without any modifications out of the box. Coverage of the sample is normally indicated on its outer box and the model sticker on the die-cast heat sink.

FCC OET website : This transceiver was "Type Accepted" on February 16, 2010. FCC ID : WVTWOUXUN04 , (For Part 90).

Direct PDF Link To Actual FCC Grant

IMPORTANT NOTE : Appears this is **ONLY** for 136-174 and (350?) 400 to 470 Mhz coverage model ?? At the time this report was typed, NO other version was FCC type accepted (unknown) ??

No Extended or 800~900 Mhz Receive Coverage

One minor trade off is the fact that the Wouxun does NOT offer 800 Mhz band or other extended "receive coverage". Here is where the "big boys" have the advantage with most mid range and up models. Not a big deal, but for the record I do miss the 800~900 Mhz coverage.

Solid Body / Buttons, Knobs and Encoder OK / Battery Packs are a Bit Weird / Good Audio Receive and Transmit / No DC Input Jack

The KG-UVD1P's shell is generally solid and robust with the use of external soft rubber-plastic parts restricted to the PTT and 2 other side mounted buttons. But I will admit it does not have quite the sturdiness over most of the big boys transceivers.

Keypad and the A/B and TDR (single of dual display function) are of a hard variety (with a rubber mat underneath) that gives a soft click when pushed. This "clicky key" idea was MUCH better done over Vertex-Standard-Yaesu's attempts (example: VX-3R, VX-8R) as it doesn't take as deep of a push to make happen. The keypad, PTT and 2 additional side buttons all have a good "above average" tactile feel at least when new. The PTT was a real treat in this area. But how well all holds up is another story?

2 knobs located on top are for a good old-fashioned "click" on/off volume control, and a tuning/selection encoder, which has an OK feel with no play but is a bit stiff when turning in a section of rotation over the rest of it. After a bit of use this encoder does loosen up along with some wobble as well (about par for a low cost radio).

Li-Ion battery pack engineering is a different approach. The latching part of it is 2 little spring clips that lock onto part of the die cast heat sink. It has held OK for the most part, except when we first used the larger 1700 mah (optional) battery it took a few tries to lock in. The 2 sliders move down to unlock the internal clips to remove the pack. They will giggle slightly when properly seated. The belt clip attaches to the battery pack (not tested as I don't use belt clips with HT's).

Again the power "on-off" is done with the old fashioned switch tied in with the volume control. The plus side to this over a "power button" type is the possibility of no or very little battery draw as the "button" arrangement always use a small amount of stand by current. This of course can run a battery down to nothing even if never turned on at all after a few weeks.

The set even stands up great without the risk of tipping over easy, especially with the optional 1700 mah battery in use.

Receive audio quality is very respectable. No excessive bass response like Icom and Yaesu seem to be pushing these days from HT's, which is big no-no. Clean and crisp, no resonations with plenty of audio kick.

There have been reports of the Transmit audio being low. In the case of this review I have to stand neutral, as the dealer mine came from has advertised my sample to have modifications (and or adjustments) to improve transmit audio quality and level. The audio is respectable all around with our sample. But treat these transmit audio issues as a warning if you prefer it above average.

No DC input jack is to be found. An optional accessory device (looks like a battery with a DC cord coming out of it) provides the voltage regulation for external car DC power operation. This was not tested.

Shame that the speaker/mic jack is located on the side of the set, but you may already know , I don't care for this arrangement.

Strange Antenna Jack But Generally Good Performance and Sensitivity / Good Included Antenna

Many of these low cost Chinese handheld transceivers have been using a weird male SMA jack for the antenna connection "On The Transceiver" and this Wouxun is no exception. I would think this would give for slightly increased robustness? If one screws in a dual female SMA barrel connector, you can use other aftermarket SMA antennas or be able to connect a thin SMA antenna cable. We tested this with a Diamond SRH519 thin duck and worked just fine (as expected it sticks up a bit).

The included 8-inch "Dual Band" antenna works reasonability well and I really like the thinness and flex of it. If it were more "thugly" would be a huge drawback in my view. But it would have been nice if Wouxun offered a shorter duck (say 4 inches) being it's not easy to fine one with the strange connector being used.

Overall sensitivity is very good on either band. Just as sensitive or even slightly better over the "Big Boy's". NOTE : The included antenna changed slightly with later samples, see photo at the end of this review.

Separate VHF and UHF Power Amplifier Sections / 2 RF Power Settings

Here is one that the big boys cut out to save costs. These days' most "dual band" handheld transceivers on the market use a single pre-driver, driver and the FET PA amplifier stage for BOTH bands.

Not the case with the KG-UVD1P. As we peer into the service manual and on line "internal" pictures floating around the VHF and UHF bands have separate RF output sections, including "Two" FET power output amplifiers.

2 RF output settings are provided. 5 Watts (4 on UHF) and 1 Watt (both bands). These settings are also stored in the memory channels (thank goodness). The only easy way to toggle the power output on the fly (from whatever is stored in memory) is to push the green TDR button **while in transmit**.

(n9ewo chart and test) **Wouxun KG-UVD1P "RF Output Power Test" (slightly "used" battery charge) Dummy load, Yaesu YS-500 meter Frequency in Mhz**	**LOW Power (in Watts)**	**HIGH Power (in Watts)**
144.3000	**1.3**	**5.0**
146.5200	**1.2**	**5.0**
440.3000	**1.5**	**4.0**
446.0000	**1.5**	**4.0**
151.8800 (MURS Ch 2)	**1.3**	**5.0**
154.6000 (MURS Ch 5)	**1.3**	**5.0**
455.0000	**1.3**	**4.0**
469.0000	**1.1**	**3.8**
462.5625 (FRS Ch 01)	**1.2**	**3.7**
462.6625 (FRS Ch 05)	**1.2**	**3.7**
467.6125 (FRS Ch 10)	**1.2**	**3.6**
467.7125 (FRS Ch 14)	**1.2**	**3.6**

My actual RF output testing of the test sample. as you can see "Low" power is a tad high.
High power is dead on. It's quite stable across the tested range.
As connected to a "dummy load" and a Yaesu YS-500 meter with a 18 inch Comet HS-05 SMA patch cable , double SMA female adapter on the transceiver and double "male" PL-259 adapter used on the Yaesu meter input.

Of course the transceiver is NOT legal for any USA "Family Radio Service" use, tested for reference only.
(n9ewo chart and test)

Built In FM Broadcast Coverage Only So-So / Killer LED Flashlight / Receive – Transmit LED's Are Not Switchable and Too Bright

The KG-UVD1P features FM broadcast coverage from 76 to 108 Mhz. There are also 20 memory channels (in 2 banks) just for the FMBC. FM performance on our test sample while quite sensitive using it's included antenna, has a nagging "buzzy" sound that irks any moderate to weaker signal. A solid strong signal then it's OK and works pretty good, if not could be a washout?

A top mounted huge white LED gives for a very useful emergency flashlight. Nice touch and works well.

Also on the top panel is a ruby Green receive LED and separate Red LED. Not only are these overly bright, but also cannot be switched off either like it is with many of the big boys handheld transceivers. These will also flash on and off when the computer interface is transfering data to or from the transceiver.

Dual Receive – NOT !!! / Sub Receive Indicator Hard To See

By reading the general advertisements and hype for this transceiver one would get the impression that it has a dual receiver and can simultaneously monitor 2 frequencies at once (even both in the same band). That's not the way it is I'm afraid.

You have 2 VFO's and a dual simultaneous display for each. You are able to receive one signal at a time. The transceiver only has one second IF stage.

Transmitting is on the "Master-Active" frequency (with the arrow pointing to it). Can receive on either VFO, but only one at a time. In other words, if a signal appears on "A" channel you can listen to it as long as you are not already listening to something on "B". If a signal appears on the "B" channel, you can listen to it as long as you're not already listening to something on "A.

So it turns out to be nothing more than an "easy access" priority function (scans back and forth between the VFO's) and not while in any scanning mode either. If you have the one side in the scan mode the other VFO is automatically disabled from receiving anything. I still find this "Dual" business useful, and at the price point understandable.

Additionally there is a indication on the LCD for sub channel receiver. A VERY TINY "S" that does appear for signals on the "non-arrow" side, but is too much of a chore to put this to any real use.

CTCSS Encode - Decode Work Good / Power Saver Pop / DTMF Encode

Unlike a number of Yaesu HT's over the years (VX-2, VX-5 to name a few) there is no CTCSS decode delay at all. It's zippy fast.

The power saver mode when returning back from the save-sleep gives "one" slight pop in the speaker. Only slightly annoying and was not a real drawback for me. The power saver can be switched off (# 3 in the menu's).

We find a DTMF DECODE function and works well with the right amount level. Geir LA6TPA reminds us that older samples only do short tone bursts. Latest samples are continuous DTMF tones as long as the button is pressed.

Nice LCD Display / Strange Offset Indication / Worthless "Feel Good" S-Meter

LCD has good contrast. Good thing too as there is no contrast adjustment provided. Backlighting is using white LED's and was well done. Even most of the keys are backlit (except for the A/B and TDR keys).

The frequency display area is a dot matrix and also supports 6 character alpha tags. The down side is that channels are "all" alpha tags are none (cannot select certain channels for alpha tags). More information on this topic in the computer programming section below.

Also when scanning the backlight stays on (if the Auto backlighting is set on in the # 22 menu).

A bar S-meter is found along the bottom of the display. It's just about always "full scale" even on weak signals and is pretty much totally useless.

The repeater offset indication is "+ -" in either direction (displays both no matter what way it's going).

The Chinese Voice / Almost useless Battery Indicator

Now here is something that no other handheld has (that I'm aware of). Voice synthesizer in a Female Chinese voice. One can select the language in English, Chinese or turn it off. Thank goodness you can shut it off too as for me became very annoying after awhile. Great conversation part of the transceiver for me, but after that forget it! NOTE : When using the "time out timer" (Menu 6) you need to have the Menu 9 voice function on to make this feature useful, otherwise it's just the TX LED that flashes and drops out.

There is also supposed to be where the voice that appears when the battery is low, but so far that has gone untested. The little battery indicator on the LCD is either all or nothing (just like the s-meter). Will this voice feature be as dismal as the battery indicator itself?

At power up the user can select to display the battery voltage for a few seconds (Menu # 12) just like the "Big Boy's" HT's.

At least 3 different versions of the included "drop in charger" are floating around.
Our test sample came with the AC Cord attached as in the LEFT photo above. This is the older AC cord version.
Later AC version is shown in the RIGHT photo (also features detachable cord). The 3rd version uses an external wall wart (12 vdc at 1000ma).
The charging output current is slightly different between the AC cord and DC Adapter versions. Either AC Cord version : 450 mah, Wall Wart version : 400 mah.
All 3 have a 12 volt jack for use in a car. MAJOR down side is these run very HOT and failures have been noted around the internet.
(Photos : N9EWO)

Lithium Ion Batteries / Low Battery Warning Does not Work / Nice Drop In Desk Charger Included - But Runs Very HOT!! / Charger Transistor Failures

Yes, even at this "dirt cheap" price level, the Wouxun uses Lithium Ion batteries. It comes stock with either (7.2 volt) a 1300 mah or 1400 mah capacity battery. The accessory 1700 mah battery prices are downright LOW when compared to the big boys.

One does not charge the batteries on the radio. Instead in the box with the transceiver is a nice desktop Lithium Ion “fast charger”. Charges the smaller included (when totally dead) 1300~1400 mah battery in about 3 hours and the larger optional 1700 mah battery in about 4 hours.

There is a "Low Battery" warning that is covered in the owners manual, but have yet to hear it work (transceiver just dies).

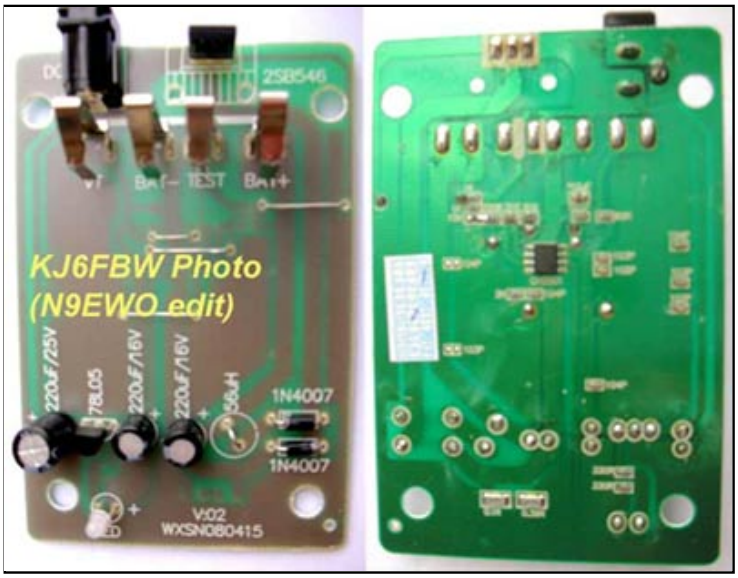
As we have seen around the Internet, there are 3 different versions of this charger that are floating around (and perhaps more??). The plastic shell looks similar, but our test sample charger has a hard-wired AC line cord emitting from the case (input rated 100 to 240 VAC, so yes it’s a switching mode charger). It includes a separate input jack for 12 dc for mobile use. The 2nd AC cord charger version has a slightly different style case and a detachable AC power cord.

The 3rd version (marked as model KG-HN-2) that we have seen uses an “external” switching wall wart (supply rated 12 vdc at 1000 ma) and just has the DC input jack. We are unaware of other differences between these 3 versions. Our test sample came with the “AC cord attached” version. We found the AC cord length to be a tad too short at only 4 feet.

Another observation is the output current is slightly different between the two chargers. The AC corded versions are 450 mah and 400 mah with the DC wall wart one. Output voltage is 8.4 vdc in either case.

There have been a few reports from users that have had failures with the electronics in the charger’s base. Appears to be connected to a transistor that goes out marked as SB772 (actually is a 2SB772).

I will say that the charger operates on the VERY HOT side. The heavy heat area is felt inside the charging cup on the right side.



Top and Bottom Internal Pictures of the Desk Charger (external "AC Adapter" version).
You can see the HOT transistor in question on the top of the board next to the DC input jack
It is marked on the board as a 2SB546 (and not as a SB772 as given in the above text, however both are a PNP devices)
(Photo : KJ6FBW, Edit N9EWO)

Another observation with some versions of the charger is a small hole with **AL** marked just under it. What this is really for is unknown (manual barely coves the operation of the charger at all). Perhaps an “alarm” of some kind in case the lithium ion battery has a meltdown , call the Fire Department and run for your life ? *UPDATE :* Turns out that this is nothing more than a tiny hole with a **AL** marking on the case. Strange it is. (info via Dan KJ6FBW)

I will NOT be held responsible for any info that is listed here
ALL DONE AT YOUR OWN RISK !

Programming With PC Cable / Display Mode Software Bug / 128 Memories / Slow scanning speed / No Frequency Search

I will say this about programming the radio; it there is ever a HT where you should use a computer to do it “This is the One”. I received the programming cable with my sample (USB version, the serial version was untested). I did not wish to do this one by hand and did not attempt it either…. whew!!!

IMPORTANT NOTE : One may wish to follow the information below “very carefully” on connecting AND disconnecting the computer interface cable (USB or Serial versions). There have been internet reports of failures of the Wouxun interface cables. Not saying that this was the killer, but just to play it safe?

(Yes, of course be sure and read the instructions provided FIRST also located on the included CD with the USB version.) Here we go.

First there is a USB driver to install even before you plug in anything (USB version only of course). The dealer included this on a mini-CD with a picture of a cross-eyed panda on it. Then one can plug the USB device in and hopefully the computer will recognize it OK without any bugs. IMPORTANT : If you are using Windows 7 , be sure you are installing the correct driver (this can be downloaded from the Wouxun web site). By the way it appears that Wouxun uses identical 2 pin Kenwood configuration with the “side mounted” speaker/mic plug and computer interfacing.

Next one enters the data into the programming software. We tested **version 1.15** of the software provided by Wouxun. It actually does have a cut and paste (right click), but these functions were in unreadable *gibberish with early versions* (ver 1.15 clears this up). There is no "insert" with the version 1.15 software that we could see.

When one is ready to up-load to the radio, FIRST I would pull out the cable from the computer (if you have it already connected). Make sure the transceiver is OFF.

Then attach the (radio end) cable to the powered OFF radio THEN plug the other end back into the computer end. The transceiver can now

be turned back on and transfer the data uploaded to the radio.

Once done , power the radio back off, remove the computer end of the cable **FIRST**. THEN unplug from from the powered **OFF** transceiver as the last step. This is the safe way that I did it anyway. I had no problems and worked perfect (Windows XP Home Edition with SP3, 32 bit). Sorry I did not and have no plans to test with Vista or Windows® 7.

Tip : Would be wise to have the PC cable connected only as needed (as short of operation time as you can). It runs hot after awhile and failures have been noted around the internet at least with the USB version. Do not leave it connected to the computer doing nothing.

Better yet, just use **Jim Mitchell's "Freeware" Commander program "KG-UV" .** Is a winner and much eaiser to use .

Enter Channel Data / Scan Channel "Lockout" by Software Only / WARNING : Be sure the "Computer Interface" Plug is fully inserted into Transceiver BEFORE use

You set your transmit and receiver frequencies separate when using the software. Transmitter power settings are either High (5 watts VHF and 4 watts UHF) or Low (1 watt both bands) each channel power level is stored. Wide or narrow transmit deviation setting too. *Note: This radio does NOT have a true narrow band receive filter.* Alpha tags are 6 char. in length and are limited to A to Z caps ONLY and 0 to 9. No other input is allowed (not even a decimal point).

I normally like to mix frequencies and alpha tags and this can be done with the Yaesu VX-2R (and others). Well this is not possible with the Wouxun. It's either all alpha tags or all frequencies. To get around this limitation, I switched all to the name mode (Menu 21) and in the case of the frequency entries just entered the numbers but without the decimal point. So there is a way around this one.

A very strange software bug is where if one has menu # 21 toggled for "Channel and Name" , jump over to the VFO to do some frequency hunting and goes back to memory mode, the # 21 CH-MDF "Channel & Name" select gets forced over to "Channel" display only and the owner has to drop down into the menu to switch it back everytime **(for EACH VFO seperate)**. This can be a real pain in the rump depending how much you use the VFO mode. By the way to toggle between the VFO and Memory mode , one hits the **MENU** and then the **TDR** button.

You have 128 memory channels and are shared on both sides. **To lock out channels that are scanned can ONLY be toggled with the software**. Also when scanning and with the backlight timer on, it stays on continuous when scanning unless turned totally off in the menu. Actually when it stops on a channel the backlighting goes off and then back on when it resumes. Totally weird, backwards what it should be in my view.

There is no indication on the LCD on which channels are locked out for scanning. There is an indication for repeater "reverse" on the LCD (but does not display the reversed frequency when the reverse button is pressed).

One last "very important" note with the Wouxun USB computer interface cable, when it was new the dual pin plug inserted very tightly into the transceiver. However after a half a dozen or so insertions, it was nowhere near as bad. **But be sure the plug is seated properly from day one (BE SURE it's all the way in) and clean.** Otherwise (again) you may put the interface at the risk of damage ?

Scanning the memory channels is not the speediest kid on the block. I have to say the speed about the same as the Icom IC-Q7A. If you only scan a half a dozen channels great, if you have 50+…it going be a very slow trip around indeed.

If you were looking for a "Frequency band search" in the VFO mode, here is one that the Wouxun totally lacks. It is missing this feature all together.

One does have direct keyboard access to the memory channels. Hit 33 and go to memory channel 33, or 011 for channel 11…. etc.

Good SC-23 Optional Case / Remember To Insert In From The Top

SC-23 soft case we also tested and is well made. Not sure if it's leather or not ?? Has a slight odor of new car tires when new (it goes away). Uses 2 snaps that attach the top part and velcro for the bottom. I think velcro might have been easier to use all the way around ? Anyway , one MUST insert the set in from the top. At first we tried to insert it from the bottom and this does not work. So keep that in mind.

If you are a user of belt clips (which I'm NOT), this will make for a bit harder job to insert as it's a pretty tight fit (with the 1700 mah larger battery is a bit worse). It includes a shoulder strap (with quick latches) which can be used instead. Also access to the speaker mic is a bit hampered in this case, but this is par for the course as with most HT's. The clear plastic on the case tends to stick to the LCD lens.

The only area that is not protected is about 3 inches on each side in the lower velcro area. Overall it's good but I hate having to dismount the antenna EVERY TIME I deal with the case.

The Wouxun SC-23 Case. Full protection of the front panel keys
Just remember to insert the radio from the top. You must remove the antenna every time.
(Photo : N9EWO)

Slightly Shorter Antenna In Later Versions
Later in production, the included antenna became slightly shorter.
Older version on the right in the above picture (sorry , we were unable to test performance between the two)
(photo : N9EWO)

Can Be A Good Deal IF You Get A Good Sample.

The Wouxun KG-UVD1P can be an excellent “low cost” dual band transceiver if you are lucky enough to obtain up a good sample off the assembly line. But that’s the game you must play if you purchase one and in most cases without any REAL warranty. Another evil is how long will it continue to work properly if you get one that works out of the box properly ?

So step up to the slot machine. If you care not to take your chances, I say stay well away !

UPDATE : There are a number of "long standing" amateur radio dealers in the USA now selling this Wouxun and usually comes with a real warranty. This of course changes the above text a bit and less chance of a "stuck with a dud". Also the quality control appears to have improved at bit.

NEW MODELS : KG-UV2D / KG-UV3D

Wouxun-China indicates (Jul 2010) : "*..... we now also have the other dual band **KG-UV2D**, but actually, the inside functions are the same, only with the different housing*". Ugly that version is too (at least to my eyes).

Ed Griffin a US Distributor for the Wouxun transceivers indicates to me directly: *"The UV2D's transmitter is even cleaner that the older model, with spurious emission suppression better than 70 dB! Also, exclusive to US models is that the Channel menu does not default back to Channel Number. It will return to your choice no matter how many times you switch between modes."*

Another variant that has appeared is the KG-UV3D. This version includes the slightly larger 1700 ma battery and some of the buttons and knobs are a bit different.

NOTE : We have NOT tested either new model and have no plans to do so. Our test sample of the KG-UVD1P came from "Total Radio Service" (also in the USA).

Dave N9EWO

Ver. 5.8

	KG-UVD1P Menu Selections.		*.....n9ewo chart*
MENU #	**FUNCTION**	**ON DISPLAY**	**SELECTIONS**
1	**Frequency Step**	**STEP**	**5 , 6.25 , 10 , 12.5 , 25 , 50 , 100 Khz (yes it has 6.25 Khz)**
2	**Squelch Level**	**SQ - LE**	**0 to 9 (4 was used with test sample, 5 is default)**
3	**Battery Save**	**SAVE**	**On or Off**
4	**Transmit Power**	**TXP**	**High (5 or 4 Watts, Low 1 Watt)**
5	**Transmit Voice Prompt**	**ROGER**	**On or Off**
6	**Time Out Timer**	**TOT**	**15 seconds and Up (Must have voice # 9 on in order to be useful)**
7	**Vox**	**VOX**	**1 to 10 and Off**
8	**Wide / Narrow Bandwidth**	**WN**	**25 or 12.5 Khz (works with transmit output only)**
9	**Voice Toggle**	**VOICE**	**Chinese , English and Off**
10	**Time Out Alert**	**TOA**	**1 to 10 seconds and Off**
11	**Beep**	**BEEP**	**On or Off**
12	**Power On Message**	**PONMSG**	**Off - Battery Voltage - Welcome**
13	**Lock Transmit**	**BCL**	**On or Off**
14	**Auto Lock**	**AUTOLK**	**On or Off**
15	**Receive CTCSS Tone**	**R-CTC**	**Set RX Tone Frequency**
16	**Transmit CTCSS Tone**	**T-CTC**	**Set TX Tone Frequency**
17	**Receive DCS**	**R-DCS**	**Set RX DCS Value**
18	**Transmit DCS**	**T-DCS**	**Set TX DCS Value**
19	**Scan Mode**	**SC-REV**	**TO-Time (5 sec), CO-Carrier (3 sec delay), SE-Carrier (instant)**
20	**Set Side Key**	**PF-1**	**Scan, Lamp, FM Radio, SOS (Wooooo, Woooo from speaker)**
21	**Freq Mode / Channel Mode Display**	**CH-MDF**	**Channel, Freq + Chan # , Channel Name**
22	**(Auto) Backlight**	**ABR**	**On or Off (no "on" full time is provided)**
23	**Offset Frequency**	**OFFSET**	**0 to 69.950 Mhz**
24	**Shift**	**SFT-D**	**- , + and Off**
25	**Stopwatch**	**SECOND**	**On and Off**
26	**Channel Name Edit**	**CHNAME**	**A to Z (caps only and No spaces) and 0 to 9**
27	**Enter Memory Channel**	**MEM-CH**	**1 to 128**
28	**Deleting Memory Channel**	**DEL-CH**	**1 to 128**
29	**Radio Reset**	**RESET**	**Menu or All**
30	**CTCSS / DCS Frequecny Scan**	**SCNCD**	**CTCSS or DCS**

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