2009 Ultralight Radio AM-DX Shootout

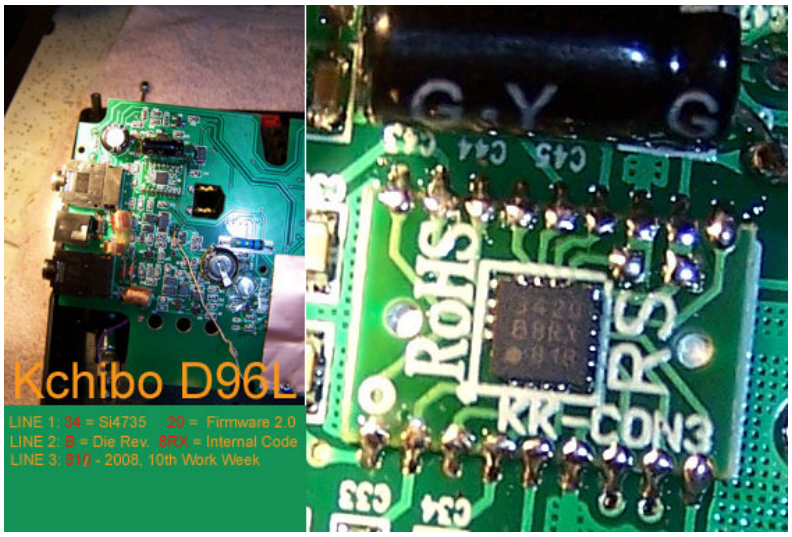
by Gary DeBock, Puyallup, WA USA September 2009

Introduction: What started in November of 2007 as a TP-DXing craze on the humble analog Sony SRF-59 has managed to spread worldwide in a little over a year, providing not only a rejuvenating force for dozens of medium-wave DXers, but for the general hobby itself. Based on the concept that a skilled, determined DXer can use superior knowledge and skill to make outstanding loggings on basic equipment, the thrilling challenge of Ultralight Radio DXing has proven irresistible for many, and provided a major force for innovation, experimentation and optimism among both new and experienced hobbyists.

From the beginning, one of the major attractions of "the Ultralight Boom" has been the chance to enjoy the latest in innovative pocket radios from the Far East, all offered at reasonable prices. The stiff competition between Chinese manufacturers has provided AM-DXers with amazingly capable and compact receivers, which continue to improve at an extremely rapid pace. Despite the current global economic issues, the Ultralight Radio DXer in 2009 is offered an unprecedented variety of exciting new radios, many of which incorporate breakthrough design improvements.

Fueled by the excitement offered by these innovative pocket radios, the collective enthusiasm and optimism of the Ultralight Radio enthusiast group has quickly spread to all continents of the world, flying completely in the face of pessimism over the future of the medium-wave DXing hobby. With the booming Ultralightdx Yahoo group now boasting over 350 members, the future of our cherished hobby has been firmly reestablished—although perhaps in a direction that few of us could have envisioned.

The Ultralight Revolution Meets the DSP Revolution Prior to this year, digital signal processing had been refined in table receivers to provide superb selectivity, offering hobbyists unprecedented freedom



to chase weak-signal DX adjacent to strong local stations. Most DXers probably assumed that this superb technology would remain limited to relatively expensive communication receivers—until the first DSP-enhanced pocket radios appeared in the Chinese domestic market early this year.

Suddenly the performance gap between Ultralight and table receivers was greatly narrowed. Major Chinese manufacturers invested heavily in new DSP-enhanced pocket radios, and the competition between them (and the Chinese sellers on eBay) kept prices relatively low for North American purchasers. The combination of excellent DSP-based performance and reasonable prices has led to an ordering boom for these breakthrough Ultralight radios, and intense interest in their relative DXing capabilities.

The Contestants: The seven Ultralight models chosen for the 2009 Shootout contain some innovative features that would have been unthinkable only a few years back. One radio combines DSP capabilities with a built-in MP3 recorder, and two of the models have five DSP selectivity choices. One radio has already proven to be a phenomenal performer as a fully modified DXpedition receiver, surpassing even the E100 equivalent in weak-signal capability. This combination of affordability and innovation is fairly unique in the radio hobby, and makes 2009 an ideal time to join in the fun of Ultralight radio DXing.

The seven pocket radios competing for top honors in this Shootout are two analog models-- the Kaito WRX911 (a.k.a. Tecsun R911) and the Tecsun R9012, and five digital models: the C.Crane SWP (a.k.a. Redsun RP300), the Degen DE1123, the Tecsun PL-300WT (a.k.a. Grundig G8), the Kchibo D92L and the Kchibo D96L. Informed readers will note that all of these models are products of the Chinese domestic market, a recent center of innovation and competition which has come to dominate the worldwide radio production system. Despite the negative global economic trends, the large Chinese manufacturers have invested heavily in research and development, especially in the practical application of the American-designed DSP chips. The huge Chinese domestic market is their primary target, made obvious by the fact that several of these models have only Chinese labeling for the radio controls, and Chinese owner's manuals. For those of us willing to accept these challenges, however, tremendous bargains are offered—as well as a possible DXing bonanza, due to breakthrough DSP-enhanced selectivity in several of the new digital models covered in this Shootout review.

As is customary, after thorough descriptions of each model, these contenders will be matched against all other top Ultralight radio models from previous Shootouts in relative judgments of sensitivity, selectivity, nulling ability, images/spurs, AGC, audio quality, digital tuning noise and

quality control record.. As always, it is the author's sincere hope that this definitive purchasing guide will motivate even more hobbyists to join our booming niche group, and personally experience the legendary DXing fun that these innovative pocket radios have to offer.

Tecsun R911 (a.k.a. Kaito WRX911)

This is first of two highly capable analog pocket radios, refined to excel in the highly competitive Chinese domestic market. Despite the rock-bottom price of $19.99 shipped (from eBay seller "Anon-co"), both the R911 and its Kaito WRX911 clone are high quality, well-built radios with an astonishing range of features: AM, FM (76-108 MHz) and 9 shortwave bands (covering the major international broadcast bands from 4.7 to 21.95 MHz), an LED tuning indicator, a built-in 150 mw speaker with decent audio quality, very long run time on two AA batteries, and even a carrying pouch (R911 only). This 4.75" x 3" x 1" (117 x 75 x 24 mm) radio weighs 3.7 ounces (88g) and is available in two colors: cobalt blue (both WRX911 and R911) and black (R911 only). The WRX911 variant (available from Amazon for $23.02 shipped) has been aligned to cover the 530-1700 kHz AM frequency range, while the R911 requires a simple alignment to extend its AM coverage to 1700 kHz. For AM DXers willing to tolerate the analog thumb wheel tuning, this model provides exceptional nulling ability, along with competitive sensitivity (but only when the FM/SW whip antenna is raised away from the loopstick at the top of the cabinet—a quirk in both this model and the R9012). The R911 is available from multiple Chinese eBay sources, generally for around $20.00 including shipping to North America.

Tecsun R9012

Analog DXers unimpressed with thumb wheel tuning can have an actual round tuning knob on this model, along with one more shortwave band than the R911 (3.7-4.1 MHz)—all for generally the same price. The sensitivity specs are the same as the R911, as well as the high quality and generous features. As with the similar single-conversion R911, this generally acceptable shortwave receiver avoids image problems by covering only narrow segments of the international broadcast bands. The Chinese-market only R9012 model is slightly larger than the R911 at 5" x 3.25" x 1.25" (130 x 77 x 25 mm) and weighs slightly more (4 ounces, or 95g), but the main attraction is the comfortable round knob tuning, especially at the high end of the band. Three different colors are available: white, back and yellow, so make sure that your Chinese eBay seller knows which one you prefer. Also be advised that the R9012 shares the R911 quirk of requiring that the FM/SW whip antenna be raised away from the top of the cabinet for best AM sensitivity, and make sure that your eBay seller knows that you want a model manufactured after April of 2007 (R9012 models made prior to that date have an inferior loopstick design, and cannot be aligned for good AM sensitivity. The preferred newer models have "2007.5 VER.2" on the shipping box flap). Like the R911, the factory R9012 will only cover up to about 1650 kHz, but can easily be adjusted up to 1700 kHz by a simple alignment. The current lowest eBay "buy it now" price is $19.99, including shipping from China (from sellers "Anon-co" and "Liypn"). These models come with a cloth carrying case and Chinese instruction manual, among other Chinese documents. For an outstanding analog DXing value, the R9012 is very tough to beat.

C.Crane SWP (a.k.a. Redsun RP300)
This digital AM-FM-SW model was initially reviewed in the 2008 Spring Shootout, but unknown at the time, the early production run model had a defective part on the RF board, which was not detected during alignment. The low sensitivity was therefore deemed to be a congenital problem typical of the model, and a harsh verdict was issued. A second model was ordered during the winter for 455 kHz IF model hot-rodding experimentation, and the typical stock performance was discovered to be far superior to that of the original defective model—and deserving of a fresh new review. The Redsun RP300 Chinese market model was inspired heavily by Tecsun's innovative PL-200 (a.k.a. Eton E100)introduced years ago, and has very similar size (5" x 3" x 1.2", or 127 x 75 x 28 mm), weight (6.5 ounces, or 150g) and features. Wideband FM (70-108 MHz) is offered with stereo capability through headphones, along with SW coverage from 2.3–7.5 MHz (SW1) and 9.2–22 MHz (SW2). AM coverage using 9 kHz tuning steps is from 522-1620 kHz, and is 520-1710 kHz with 10 kHz steps. 1 kHz AM tuning is also possible using the tuning knob, or direct frequency input. Auto-scan and memory-scan tuning options are offered, along with 200 memories. Two AA batteries supply power. The C.Crane SWP is available from C.Crane for $49.95 plus $6.95 shipping ($56.90 total), and comes with stereo earphones, a vinyl carrying case, English owner's manual, and registration card. The RP300 is available from the Chinese eBay seller "Tquchina" for $34.99 plus $14.00 shipping ($48.99 total).

The C.Crane SWP (RP300) models have several quirks of which purchasers should be aware. The push-button volume controls have caused consternation because of the wide variation in audio levels between steps on the low end. Unlike the E100 (PL200) models, there is no meaningful signal level bar graph, but only a "tune" display when signals reach a certain level. The digital input controls require serious fingertip pressure to operate properly, and such input changes will not cause the LCD display to light up automatically, as on competing models. Despite these quirks, the C.Crane SWP (RP300) models have an effective low-noise RF front end, and have proven to be outstanding performers when modified with external 7.5" sliding-coil ("Slider") loopsticks and Murata CFJ455K5 IF filters, surpassing even the E100 equivalents in 9 kHz-split DX chasing capability. Even in competition with the new DSP models, these super-modified Ultralights are tough to beat in transoceanic DXing.

Degen DE1123 At first glance, this DSP-enhanced model with a built-in MP3 player would seem like a dream receiver, combining excellent selectivity with the ability to directly record DX signals. With an extremely compact size (4.3" x 2.7" x .5", or 110 x 69 x 15 mm) and light weight (3 ounces, or 80 g), this innovative receiver was designed to provide a unique combination of freedom and modern function. The DE1123 combines FM stereo (87-108 MHz) and AM (522-1710 kHz with 9kHz steps, 520-1710 kHz with 10 kHz steps) with 2.3- 23 MHz SW coverage (5kHz steps), all with the ability to record DX signals directly on a built-in recorder (WAV format) combined with an MP3 player (1 GB memory capacity). Maximum recording time is 69 hours, with a built-in microphone for recording voice, or any other live audio. Recordings may be uploaded to your computer through a USB 2.0 jack, through which MP3's can also be dragged into the DE1123's memory for playback. The radio has 255 preset memories, but only 25 for the AM band (which

unfortunately gives a hint of the AM band performance priority in this radio). The radio operates on three AAA batteries, and has a built-in speaker, very short (7", or 180 mm) whip antenna, a digital clock with 12/24 hour options and alarm function, 5-90 minute sleep timer, push-button volume and tuning controls, various tuning methods (manual, auto-scan, and auto-tuning storage) and a multi-function LCD display showing time, date, band, frequency, battery condition, volume level, signal strength and memory status. Included in the DE1123 package are a "switching rechargeable adaptor" (110-250v) which supplies 5 VDC through a USB connector output, stereo earphones, 3 AAA rechargeable batteries, USB cable, carrying case and English manual.

Unfortunately, the designers of the "dream receiver" seem to have ignored AM performance, giving the DE1123 one of the worst loopsticks ever seen in a pocket radio—a midget 1.5" (88m) bar buried in the center of the cabinet. The on-board recorder also has a severe quirk, in which the user needs to adjust the radio volume to maximum before recording anything, presumably running down the batteries accordingly (the manual advises to plug in earphones during any recording, even if you aren't using them to listen to the radio signal). There is no in-line recording jack, making the radio incapable of recording any signals from an external source. The radio's 7" whip antenna looks fragile, and the SW reception seems mediocre at best. Only the FM section seems to have been a real priority with the designers—FM sensitivity and selectivity are not bad for the radio's size, but are not quite up to the standards of the newer DSP units. Possibly for this reason, the eBay going rate for the DE1123 has been seriously discounted recently, with the lowest current price being $49.99 shipped, from the Chinese seller "G8hkshop."

Tecsun PL-300WT (a.k.a. Grundig G8)

Tecsun's introduction of the DSP-enhanced PL-300WT model in May caused a sensation among Ultralight radio enthusiasts, who ordered the innovative LW-AM-FM-SW portable in droves from the Chinese eBay sellers. Powered by Silicon Labs' superlative new 4734 DSP chip, the PL-300WT immediately set a high new standard for FM sensitivity and selectivity among small portables, as well as for AM selectivity. Just when the Chinese sellers of the PL-300WT were enjoying an ordering boom in June, Grundig-Eton introduced their electrically identical G8 "Traveler II" clone through Amazon.com at a shipped price of $50, substantially undercutting the Chinese PL-300WT sellers on eBay. The G8's introduction was accompanied by a bizarre official denial by Eton's Austin Parker that the model had a DSP chip, along with incorrect size and weight information on Amazon and Universal Radio's web sites, as well as incorrect photos.—all of which continue to this day (along with absolutely no mention of DSP capability on Amazon's site).

The real PL300WT (G8) is a true FM-DXing powerhouse, fully capable of astonishing fringe reception using only the built-in 21.5" (55 cm) whip antenna. Unfortunately AM sensitivity is not always at such an optimum level, due to a possible inductance mismatch between the loopstick coil and the DSP chip—an issue which can be corrected by alignment. At 5.25" x 3.5" x 1" (135 x 85 x 27 mm) and weighing 7 ounces (204g), these models are packed with innovative features derived from the 4734 chip. A multi-functional digital display can show frequency, signal strength, S/N ratio, clock and alarm settings, temperature and battery condition. The 24-hour digital clock can be set to display both local and world zone time, according to a selection switch behind a front panel door (which has developed a reputation for being stubborn and tricky to open, in certain units). The alarm can be set to use either a buzzer or radio signal for wake-up, and the radio has a selectable 1-120 minute sleep timer. 500 total preset memories are available, with 100 memories for the AM band. The models have an innovative fast tuning option which speeds up manual tuning according to the user's input on the

tuning thumb wheel, which somewhat compensates for the radio's lack of a direct frequency input keypad. Besides manual tuning, the radio can auto-scan local stations and store them in memory, with memory recall tuning of the auto-scanned stations, or of the user-selected memory stations. Power comes from 3AA batteries, or a 4.5 VDC power adapter.

These models do have several quirks, which have proven to be disappointing to some owners. The AM band has several internally-generated heterodynes, notably around 640, 980, 1400-1430 and 1600-1640 kHz. The 4734 chip "soft mute" function causes a serious drop off in signal strength when tuning 1 kHz up or down from a DX station's frequency, during attempts to escape local QRM. This function also causes "audio pumping" of the AGC action, making it less than effective in smoothing out variations in stations' signal strength. There is no direct entry keypad for wide frequency changes, forcing the user to use the tuning thumb wheel if the desired station is not in memory. The PL-300WT (G8) models do not offer choices for DSP selectivity filtering, and the fixed option is not at the optimum 1 kHz DSP selectivity potential of the 4734 chip (as can be selected in the Kchibo D92L and D96L models). As mentioned initially, the AM sensitivity of these models has proven to be variable, depending upon inductance matching between the loopstick coil and the DSP chip. The LW and SW performance of these models is mediocre at best, and certainly was not a top priority in the radio's design. As mentioned previously, the front panel access door (to the world time selector switch and other controls) sticks badly on some units, and may require serious force to pry open. Finally, the English owner's manual supplied with the G8 is notoriously brief and incomplete, making it necessary for a purchaser to obtain the PL-300WT English manual (from the Ultralightdx Yahoo group file site) to understand even the basic radio functions. A wide variety of PL-300WT English owner's manuals has been received from the Chinese eBay sellers, including the good, bad and ugly. The best is from "Anon-co," who also happens to be the top-rated PL-300WT Chinese eBay seller in buyer satisfaction.

Despite the quirks, these models do offer AM selectivity superior to all previous pocket radios, and because of uniformly high FM sensitivity and selectivity, have quickly become the FM-DXing portables of choice—of any size. The PL-300WT models are available in three different colors—black, silver or gray, and have a standard plastic finish. The G8 models come only in black, and have a "rubberized" finish similar to that of the Eton E100. These models come with an English manual, vinyl carrying case, stereo earphones and registration card (G8 only). The current lowest price for a PL-300WT is $49.99 (including shipping) from Chinese eBay seller "Trinityforevertrading," and the current lowest price for a G8 is $50.00 (including shipping to the USA) from Amazon.com.

Kchibo D92L

The D92L is one of two innovative receivers offering the full range of selectivity choices available from Silicon Labs' 4734 DSP chip—1, 2, 3, 4 and 6 kHz options. As the first such Ultralight radio available to North American purchasers, this Chinese-market model was the subject of intense local interest in August, after its discovery by fellow Puyallup, WA resident Guy Atkins (following extensive web-based research). China's Kchibo company made a serious effort to ensure high quality in both the D92L and D96L DSP models, despite a previous reputation for making low-priced radios of questionable reliability. The emphasis on quality has paid off, and foreign orders have boomed—despite the fact that all the radios' labels and documentation are in Chinese.

The D92L is the more basic model which tunes only in 9 kHz fixed AM steps (from 522-1710 kHz), although manual tuning steps of 1 kHz are available. It can tune the FM band from 64- 108 MHz (50 or 100 kHz steps), and can tune the SW band from 2.3- 21.85 MHz (1 or 5 kHz steps). 900 total memories are available, including 300 for AM. Five tuning methods are possible—manual, memory

scan, direct frequency input, manual tuning shuttle, and auto-search. The digital clock is one of several functions shown in the bright green LCD display, along with battery condition, month, day and week (when power is off), and frequency, band, S/N ratio, signal strength, DSP selectivity choice (1, 2, 3, 4 or 6 kHz), and volume step (when power is on). There is a 10-90 minute sleep timer function, and an alarm which can use either live radio signals or a beeper to awaken the user. FM stereo reception is provided through the phone jack, and FM reception in general is excellent due to the DSP chip's processing (although not quite up to the PL-300WT/ G8 standard). The volume can be adjusted in 40 digital steps, with pushbutton up and down controls.

The D92L uses a rechargeable 3.7v lithium-ion battery (type KL-01) for power, two of which are provided with the radio, along with a 220VAC adapter/ battery charger. The 220VAC adapter/ charger typically does not provide a full charge for the batteries when used with 110VAC house current, even when connected overnight. A 110 VAC 6 volt or 5 volt DC adapter can provide a full charge, if the user carefully connects the negative lead to the center conductor of the supplied adapter's plug, and the positive lead to the outer conductor of the plug (this is the opposite of the D96L system, by the way). The batteries are reputed to have a life span of 300-500 charging cycles. The D92L has a .25 watt speaker with 100 mw output power, and has a size of 5.25" x 3.25" x .8" (135 x 80 x 20 mm) and weighs 5 ounces (135g). It comes in black plastic cabinet, with all the control labels in Chinese only (and no export model available, or currently contemplated).

Unfortunately, the D92L has some severe quirks which limit its usefulness as an AM-DXing receiver. The loopstick receives serious RF hash from nearby digital circuitry, reducing AM sensitivity significantly on all frequencies. The direct frequency input keypad is little more than a joke, being far too small for the average North American user to operate without consternation. The model has a serious digital "chuffing noise" after any control is changed, further reducing AM sensitivity for about 12 seconds. The "soft mute" issue affecting the PL-300WT/ G8 models also affects the D92L, with negative effects on AGC, and the ability to tune 1 khz further away from QRM when chasing weak signals. The model also suffers from the tuning heterodyne issue affecting the PL-300WT/ G8 units. The Chinese control labels and Chinese owner's manual may confuse native English speakers (a roughly translated English manual is posted in the Yahoo Ultralightdx file site), and warranty service is still a question mark, with no Kchibo service facilities on this continent. In competition with the slightly more expensive D96L, the D92L really has nothing to offer except for the savings of a few dollars (or yuan). It is available from seller "hygt" on http://www.ecrater.com for a price of $63.60 including shipping to North America, and comes with two 3.7v rechargeable lithium-ion batteries, a 220VAC adapter/ charger, stereo earphones, clip-on external wire antenna, cloth/vinyl carrying case, Chinese owner's manual and registration card.

Kchibo D96L This model is Kchibo's best DSP portable radio, and its combination of high AM sensitivity and variable DSP selectivity certainly makes it a formidable contender. The D96L is essentially a larger D92L with correction of most (but not all) of the AM-related deficiencies. The D96L has a larger loopstick for improved AM sensitivity, and there is no whining digital hash to cover weak signals. The radio will tune in both 10 and 9 kHz steps, and has a larger direct entry keypad for those with normal-sized fingers.

Otherwise, the D96L shares many features with the D92L, since they are both based on Silicon Labs' 4734 DSP chip. AM frequency coverage is from 522-1710 (9 kHz steps) or 520-1710 (10 kHz steps), with 1 kHz steps available on the tuning thumb wheel. Wideband FM coverage is from 64- 108 MHz (50 or 100 kHz steps), and SW coverage is from 2.3- 21.85 MHz (1 or 5 kHz steps). There are 900 total

memories, with 300 available for AM. Five tuning methods are possible—manual, memory scan, direct frequency input, manual tuning shuttle, and auto-search. The digital clock is one of several functions shown in the bright green LCD display, along with battery condition, month, day and week (when power is off), and frequency, band, S/N ratio, signal strength, DSP selectivity choice (1,2, 3, 4, or 6 kHz), and volume step (when power is on). There is a 10-90 minute sleep timer function, and an alarm which can use either live radio signals or a beeper to awaken the user. FM stereo reception is provided through the phone jack, and FM reception in general is excellent due to the DSP chip's processing (although not quite up to the PL-300WT/ G8 standard). The volume can be adjusted in 40 digital steps, with pushbutton up and down controls.

The D96L uses a rechargeable 3.7v lithium-ion battery (type KL-1000) for power, two of which are provided with the radio, along with a 220VAC adapter/ battery charger. The 220VAC adapter/ charger typically does not provide a full charge for the batteries when used with 110VAC house current, even when connected overnight. The supplied USB cable also allows battery charging from a computer, and several owners have obtained fully charged batteries this way. Another option to fully charge the battery is to use a 110VAC 6 volt or 5 volt DC adapter after rewiring the supplied adapter's plug, making sure that the positive lead is connected to the center conductor (the opposite of the D92L polarity system). The batteries are reputed to have a life span of 300-500 charging cycles. The D96L has a .25 watt speaker with 100 mw output power, and has a size of 5.6" x 3.5" x .9" (145 x 90 x 23mm) and weighs 7 ounces (200g). It comes in a black plastic cabinet with a metallic front panel, with all the control labels in Chinese only (and no export model available, or currently contemplated).

The D96L has some moderate quirks relating to design issues, which are mostly those that affect all of the Silicon Labs' 4734 DSP chip radios. The tuning heterodyne issue also affects the D96L, and the "soft mute" function affects AGC negatively, causing a large DX signal drop off when tuning 1 kHz farther away from QRM than the DX station's fundamental frequency. Like the D92L, the model also has digital "chuffing noise" whenever one of the controls is changed (with the LCD lit up), but it only continues for 5 seconds in the D96L (during which reception of weak signals may be compromised). With the exception of the 1 kHz selectivity choice, the DSP filtering selections are displayed incorrectly on the LCD (the actual 2, 3, 4 and 6 kHz settings are displayed as 6, 4, 3 and 2 kHz respectively). The keypad numerals are hard to read. The Chinese labels on the radio controls and the all-Chinese owner manual (and other documentation) may confuse native English speakers (there is a roughly translated English owner's manual posted in the Yahoo Ultralightdx file site), and warranty service is still a big question mark, with Kchibo having no known service facilities in North America.

Despite the quirks, the D96L provides far greater DXing performance than its D92L predecessor. Several DXers have found the D96L to be the first DSP ultralight radio with 1 kHz selectivity competitive for serious 9 kHz-split transoceanic DXing in North America, with performance roughly similar to the premium Murata CFJ455K5 ceramic filters transplanted into the Eton E100 units. As such, it really sets a high standard for relatively inexpensive pocket radios. The Kchibo D96L is currently available only from China, with the seller "hygt" offering the radios on http://www.ecrater.com for $70.46 including shipping to North America, and the same seller ("hygt369") offering the units on eBay for a bid price of $54.77, plus $16.80 shipping ($71.57 total). The D96L is also available from http://www.trafind.com for $52.58 plus $11.60 shipping ($64.18 total), the current lowest price for North American purchasers. The radio comes with two rechargeable 3.7v lithium-ion batteries, a dedicated 220VAC adapter- charger, USB cable, stereo earphones, a clip-on external wire antenna, cloth/ vinyl carrying case, Chinese owner's manual and registration card.

Shootout Day Preparations To prepare for the live signal competition, all 7 contenders were given fresh batteries (or recharged batteries, in the Kchibo models), operational checks, and in most cases, AM-band alignments (details on request). Fringe stations were chosen to test each radio's sensitivity and selectivity during mid-day ground wave conditions, and detailed checks were made for spurious signals and images in the author's typical suburban location in Puyallup, Washington (35 miles south

of Seattle). Nulling tests were conducted outdoors, away from electrical house wiring and other metallic distractions. Quality control data includes all reports received from owners of each model.

Shootout Day Arrives The gallant contestants assembled at noon on September 7, 2009 to decide their fate. They were joined by all surviving contestants of previous Ultralight radio Shootouts, who would join in the competition for ultimate Ultralight performance honors. The R911 and R9012 models were tested with the whip antenna in a vertical position. The D92L and D96L models were tested in the 1 kHz selectivity setting. Comments follow the grade in specific categories.

SENSITIVITY: (worst is 0, best is 5; final grade for model is listed after model)

	530-TIS	620-KPOJ	750-KXL	1040-CKST	1130-CKWX	1520-KGDD	1650-TIS
R911 (B)	3	1	0	0	3	3	4*
R9012 (B+)	3	2	0	0	3	3	4*
C.C. SWP (B+)	3*	2	0	0	3	3	4*
DE1123 (D)	2	0	0	0	2	1	2
G8 (B)	3*	2	0	0	3	2	3
D92L (D)	2	1	0	0	2	1	2
D96L (A)	3*	3	1	1	4	3	4*
SRF-59 (B)	3	1	0	0	3	3	3
SRF-39FP (B+)	3*	2	0	0	3	3	4
SRF-T615 (A-)	3*	2	1	0	3	3	4
SRF-M37V/W (B)	3	2	0	0	3	2	3
DT-400W (A-)	3*	2	1	1	4	3	4*
E100 (B+)	2	1	0	1	4	3	4*
DT-200VX (B)	3	1	0	0	3	3	3
DT-210V (B)	3	1	0	0	3	3	3

* Two TIS stations were received by these models on the frequency indicated (a superior result).

SENSITIVITY SUMMARY: The new Kchibo D96L has unsurpassed sensitivity on all AM frequencies, with a slight low and mid band advantage over all current contestants. It also has a slight edge over the DT-400W for top ULR sensitivity. The C.Crane SWP and R9012 are very competitive in sensitivity overall, with a slight high-band edge over the G8, which tends to perform better on the lower frequencies. The R911 tested here has a shade less sensitivity than its R9012 sibling on the low band, and both the D92L and DE1123 models are hopelessly outclassed in weak-signal performance--primarily because of weakly designed loopsticks.

SELECTIVITY: (worst is 0, best is 5; final grade for model is listed after model)

	560-KPQ	980-CKNW	1080-KFXX	1460-KARR
R911 (B-)	all KVI slop (0)	slight KOMO slop (4)	all KPTK slop (0)	heavy KSUH slop (1)
R9012 (B-)	all KVI slop (0)	slight KOMO slop (4)	all KPTK slop (0)	heavy KSUH slop (1)
C.C. SWP (C+)	all KVI slop (0)	slight KOMO slop (4)	all KPTK slop (0)	all KSUH slop (0)
DE1123 (B+)	all KVI slop (0)	no KOMO slop (5)	all KPTK slop (0)	no KSUH slop (5)
G8 (A-)	no KVI slop (5)	no KOMO slop (5)	strong KPTK slop (2)	slight KSUH slop (4)
D92L (B+)	all KVI slop (0)	no KOMO slop (5)	all KPTK slop (0)	no KSUH slop (5)
D96L (A)	no KVI slop (5)	no KOMO slop (5)	mod. KPTK slop (3)	no KSUH slop (5)

	560-KPQ	980-CKNW	1080-KFXX	1460-KARR
SRF-59 (B-)	all KVI slop (0)	slight KOMO slop (4)	all KPTK slop (0)	heavy KSUH slop (1)
SRF-39FP (B-)	all KVI slop (0)	slight KOMO slop (4)	all KPTK slop (0)	heavy KSUH slop (1)
SRF-T615 (C)	all KVI slop (0)	mod. KOMO slop (3)	all KPTK slop (0)	all KSUH slop (0)
SRF-M37V/W (F)	all KVI slop (0)	all KOMO slop (0)	all KPTK slop (0)	all KSUH slop (0)
DT-400W (C+)	all KVI slop (0)	slight KOMO slop (4)	all KPTK slop (0)	heavy KSUH slop (1)
E100 (B+)	all KVI slop (0)	no KOMO slop (5)	strong KPTK slop (2)	mod. KSUH slop (3)
DT-200VX (C+)	all KVI slop (0)	mod. KOMO slop (3)	all KPTK slop (0)	heavy KSUH slop (1)
DT-210V (B-)	all KVI slop (0)	mod. KOMO slop (3)	all KPTK slop (0)	strong KSUH slop (2)

SELECTIVITY SUMMARY: Once again, the D96L has superior performance with its 1 kHz DSP selectivity setting, an advantage that has practical DXing applications because of the model's class-leading sensitivity. The G8 is a close second, but lacks the D96L's 1 kHz filter choice option, and lags in sensitivity to dig out weak adjacent-channel DX. The DE1123 and D92L both have decent DSP selectivity designs, but suffer greatly from relatively deaf loopsticks in practical performance. The two analog models (R911 and R9012) have good selectivity for their price range, and the C.Crane SWP has fairly average selectivity in the general Ultralight category.

NULLING ABILITY: (final grade and comment)

R911 (A)	Excellent, near legendary performance (when whip antenna is raised to vertical)
R9012 (A)	Excellent, near legendary performance (when whip antenna is raised to vertical)
C.C. SWP (B)	Good, and decent sensitivity increases practical use
DE1123 (A)	Excellent, but lack of sensitivity limits practical use
G8 (B)	Good, and typical of the DSP models
D92L (B)	Good, but lack of sensitivity limits practical use
D96L (B)	Good, and excellent sensitivity increases ability to chase co-channel DX
SRF-59 (A)	Excellent, near legendary performance
SRF-39FP (A)	Excellent, near legendary performance
SRF-T615 (A)	Excellent, unique among non-DSP digital models
SRF-M37V/W (B)	Good, but terrible selectivity limits practical use
DT-400W (B)	Good, and good sensitivity increases practical use
E100 (B)	Good, and augments very good selectivity when chasing weak DX next to locals
DT-200VX (B)	Good, and decent sensitivity increases practical use
DT-210V (B)	Good, and augments good selectivity when chasing weak DX next to locals

IMAGES, SPURS and MAJOR SELECTIVITY DEFECTS (final grade after model)

R911 (A-)	Insignificant spurious whistle on 930
R9012 (A-)	Insignificant spurious whistle on 930
C.C. SWP (B)	KSUH-1450 image on 540 (strong); temporary tuning heterodynes on 935, 1041, 1144, 1250 and 1352 (all of which disappear after 2 seconds)
DE1123 (C)	Heterodyne on 1010 (moderate); spurious whistle on 1390 (strong); heterodynes From 1410-1440 (strong); spurious whistle on 1670 (strong)
G8 (C)	Heterodynes on 670 (strong), 1020 (moderate), 1130 (strong), 1140 (strong), 1240 (strong), 1410-1440 (strong), 1600-1640 (strong)
D92L (B)	Spurious open carrier on 730 (strong); heterodynes from 1410-1440 (strong)
D96L (B)	Heterodynes on 728 (strong), 1020 (moderate), 1410-1440 (strong), 1620 (mod.)

SRF-59 (A-)	Insignificant spurious whistle on 730
SRF-39FP (A-)	Insignificant spurious whistle on 730
SRF-T615 (C)	KSUH-1450 image on 550 (moderate); Puyallup TIS-1580 spur on 1600 (moderate); KZIZ-1560 spur on 1420; KSUH-1450 received from 1430-1510
SRF-M37V/W (F)	KSUH-1450 image on 550 (strong); spurious mix of KSUH-1450 and KZIZ-1560 on 1610 (strong); KKOL-1300 received from 1280-1340; KSUH-1450 received from 1410-1640
DT-400W (A)	Insignificant KSUH-1450 image on 550 (extremely weak)
E100 (A)	KSUH-1450 image on 540 (moderate)
DT-200VX (A-)	Insignificant spurious whistle on 750
DT-210V (B+)	KSUH-1450 image on 550 (weak); insignificant spurious whistle on 750

AGC (final grade and comment)

R911 (B)	Good; will not irritate the ears of searching DXers
R9012 (B)	Good; will not irritate the ears of searching DXers
C.C. SWP (B)	Generally good performance, but IBOC hiss not so pleasant
DE1123 (A-)	Excellent AGC, but poor sensitivity limits its practical value
G8 (B)	Generally good, but DSP chip's soft mute causes temporary delay in function
D92L (B)	Generally good, but DSP chip's soft mute causes temporary delay in function
D96L (B)	Generally good, but DSP chip's soft mute causes temporary delay in function

SRF-59 (B)	Good; will not irritate the ears of searching DXers
SRF-39FP (B)	Good; will not irritate the ears of searching DXers
SRF-T615 (A)	Outstanding AGC-- the best in the Ultralight class
SRF-M37V/W (B+)	Very good performance, except for IBOC hiss issue
DT-400W (A-)	Excellent AGC except for minor IBOC hiss issue
E100 (B+)	Very good performance, but minor issues with IBOC hiss and local slop
DT-200VX (A-)	Excellent AGC except for minor IBOC hiss issue
DT-210V (B)	Good; will not irritate the ears of searching DXers

AUDIO QUALITY (final grade and comment)

R911 (B)	Pleasing audio with emphasis on high frequencies
R9012 (B)	Pleasing audio with emphasis on high frequencies
C.C. SWP (B)	Generally good, but limited bass response
DE1123 (B-)	Very limited bass response; can be harsh at times
G8 (A-)	Pleasantly balanced audio is enhanced by relatively large speaker
D92L (A-)	Pleasantly balanced audio response (but can be affected by DSP filter selection)
D96L (A-)	Pleasantly balanced audio response (but can be affected by DSP filter selection)

SRF-59 (B+)	Pleasing audio with emphasis on high frequencies
SRF-39FP (A-)	Mellow audio with balanced highs and lows
SRF-T615 (A)	Excellent audio with great attention to fidelity
SRF-M37V/W (A)	Excellent audio with great attention to fidelity
DT-400W (A)	Excellent audio with great attention to fidelity; DBB function augments range
E100 (B)	Emphasis on high frequencies is acceptable for DXers; but not for music fans
DT-200VX (A)	Excellent audio with great attention to fidelity; DBB function augments range
DT-210V (A)	Excellent audio with great attention to fidelity; DBB function augments range

DIGITAL TUNING NOISE and DELAY (final grade and comment)

C.C. SWP (B-)	Moderate click and PLL chirp when using tuning knob on low AM band; no delay
DE1123 (A)	No noise, no delay
G8 (A-)	No noise, very short tuning delay; beep and 2-second delay when turned on
D92L (B-)	12-second digital "chuffing noise" when tuned; very short tuning delay
D96L (B)	5-second digital "chuffing noise" when tuned; very short tuning delay
SRF-T615 (A)	No noise, no delay
SRF-M37V/W (A-)	Function beep, no delay
DT-400W (A)	No noise, no delay
E100 (A-)	No tuning noise or delay, but two second delay and PLL chirp when turned on
DT-200VX (A)	No noise, no delay
DT-210V (B)	No noise, 1-second delay

QUALITY CONTROL RECORD (final grade and comment)

R911 (B)	All units have gained a significant improvement in AM sensitivity with alignment
R9012 (B)	All units have gained a significant improvement in AM sensitivity with alignment
C.C. SWP (B)	First unit received in 2007 was defective; variations in sensitivity reported
DE1123 (A)	No reports of defects; no problems in author's model
G8 (B)	Most models gain significant improvement in AM sensitivity with alignment
D92L (B)	Out of eight models, one model was received with a cracked loopstick
D96L (A)	No reports of defects; no problems in author's 2 models
SRF-59 (C)	Congenital breakdown of tuning capacitor over a 2-year period; AM alignment provides significant improvement in sensitivity in most models
SRF-39FP (A-)	Based on alignment of 24 units, 4 gained major improvement in AM sensitivity
SRF-T615 (A)	No reports of defects; no problem in author's 2 models
SRF-M37V/W (A)	No reports of defects; no problem in author's 3 models
DT-400W (A-)	Some reports of low AM sensitivity in isolated cases; author's 3 models are fine
E100 (B)	All units have gained a significant improvement in AM sensitivity with alignment; reports of other maintenance issues received, but good Q/C record in general
DT-200VX (A-)	AM alignment typically improves sensitivity on high or low band (but not both)
DT-210V (B-)	Own unit required AM alignment for optimum performance; first received unit was defective and not repairable; reports of other QC issues have been received

2009 Shootout Verdicts and Summary The new Kchibo D96L model's impressive combination of high AM sensitivity and superb DSP selectivity truly pushes the envelope in Ultralight radio performance, providing a new standard in overall DXing potential. The winners of the previous Shootouts (SRF-T615, E100 and DT-400W) are all very competent AM receivers, but lacking in DSP-enhanced selectivity, they cannot really compare with the D96L in adjacent-channel DXing capability. The D96L's unsurpassed AM sensitivity is the perfect complement for its 1 kHz DSP selectivity, which together provide a clear AM-DXing advantage over every other Ultralight radio. Although it does have some engineering quirks that make it less than perfect, for overall value, this Chinese market radio is a superb bargain—especially for those 9 kHz-split DXers looking for maximum fun at minimum cost.

The Tecsun PL-300WT (a.k.a. Grundig G8) models benefit greatly from their 4734 DSP chips, which provide class-leading FM sensitivity and selectivity. Unfortunately the Tecsun designers failed to ensure optimum AM sensitivity in their loopstick production process, leading to variable results in

DXing performance. With the optimum 1 kHz DSP selectivity potential of the 4734 chip not available, the PL-300WT/ G8 models will never perform at the high level of the D96L, either in AM sensitivity or selectivity. These models will certainly have high appeal for FM-DXers, however, and for urban AM-DXers troubled by multiple local pests. It has high resistance to overload, and can minimize the irritation of mixing products and spurious signals. The G8's overall appeal as an AM-FM DXing radio makes it a good choice as a travel portable, along with its D96L competitor.

The C.Crane SWP model provides decent sensitivity in combination with versatile digital features, and has earned a place of respect in the Ultralight DXing group despite its 2-year old design. It has a low-noise RF front-end and a 455 kHz IF, providing the essential ingredients to quickly become the modified Ultralight radio of choice among the somewhat fanatical ULR transoceanic DXers (of whom the author is a dedicated member). Although its stock capabilities are quite impressive, the radio becomes an overachieving DXing wonder when modified with a 7.5" sliding coil ("Slider") loopstick and a Murata CFJ455K5 IF filter. With capabilities similar to the Eton E100, it has low-band AM sensitivity superior to the E100, and generally provides very capable overall performance, whether in stock or modified form.

The Degen DE1123 model was inspired by some superb design ideas, but for practical application in AM-DXing, the radio's poor loopstick design is really a deal-breaker. The DE1123 is practically deaf to weak-signal DX, making its superior DSP selectivity and included digital signal recorder irrelevant. For an FM-DXer looking for maximum versatility in a compact travel portable the DE1123 would merit attention, and the option to record FM stereo music in an Ultralight radio is unique. For AM enthusiasts, however, the DE1123 is a classic example of how a poor loopstick design can ruin an otherwise innovative radio.

The Kchibo D92L is another classic example of great design objectives being nullified by poor manufacturing execution. The D92L has all the design ingredients for success, but the loopstick receives severe digital hash from adjacent circuitry, degrading the AM sensitivity to an unacceptable level. Apparently Kchibo learned many lessons from the D92L issues, however, in designing the superb new D96L model. The puzzle is why the Chinese market prices for the two models are so similar, with such a drastic difference in AM-DXing performance.

The two analog models, the Tecsun R911 and R9012, both prove an exceptional AM-DXing value for a rock-bottom price. In comparison with their SRF-59 competition, both models have a higher general level of quality and life expectancy, with similar sensitivity, selectivity and nulling ability. They also include an effective speaker, with multi-band SW coverage as a bonus. DXers preferring a round tuning knob should choose the R9012—but make sure that the Chinese seller is going to provide you with a new model (see the warning), and the color of your choice. In the author's opinion, there has never been such a $9.90 bargain in the history of AM-DXing!

Conclusion The new DSP-enhanced Ultralight radios have added even more DXing potential to the pocket radio class, and even more excitement to a niche hobby that was already a major enthusiasm center among the AM-DXing community. It is the author's sincere hope that this exhaustive purchasing guide will introduce you to the amazing new capabilities of these innovative receivers, and motivate you to join our fast-growing group of Ultralight radio enthusiasts. We welcome you to join in the legendary fun, and enjoy the thrilling AM-DXing future along with all of us.

73 and Best Wishes,
Gary DeBock

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