



REVIEW

A Poor Man's Ideal Portable - Degen DE1103

By Eric Bryan

With my old Sony ICF SW1 on the blink, I bought the Grundig Mini World 100PE, then the Kaito WRX911 (both pocket analog sets), as temporary measures while I hunted for a replacement. (See October 2004 *Monitoring Times* for my comparison of these two sets.) I was pleasantly surprised at the performance of these tiny, inexpensive units – pulling in African and European stations here on the U.S. West Coast.

Nothing beats the analog feel for band-scanning, but I still wanted a radio with digital precision for DXing. I was holding out for the ideal radio which would meet my list of desired features:

- * Full coverage of 100-30,000 kHz
- * Dual conversion for image rejection
- * SW tuning in 1 kHz increments
- * A tuning knob
- * Direct entry
- * Memories (20 to 40)
- * SSB reception
- * Sleep timer
- * Dial light
- * Small portable
- * Operation on two to four AA batteries

Of course I also wanted the radio to be sensitive and selective. And in the spirit of the poor man's shortwave listening post, I wanted to pay \$100 or less.

I was curious about some of the analog-digital hybrids, in which an analog tuner is fitted with digital readout. Many of these were intriguing and all had tuning knobs, but none of them read out to the last frequency digit. Does 9.46 MHz mean 9460 kHz, 9465, or even 9455 kHz? It would be nice to have analog-feel tuning, but the 15 kHz of frequency guesswork would hamper DXing.

The Grundig YB550PE had many of the functions I wanted but omitted LW and SSB. A huge plus was its scroll wheel which tunes in 1 kHz increments, and it was also fairly small. But then I discovered the Tecsun PL200, a tiny version of the YB550PE. The extreme portability of that set was almost a clincher plus it had a tuning knob, but the PL200 lacked the same things the YB550PE did. Next, I almost decided on the Grundig YB400PE because of its proven and venerable record. But it didn't cover all of long wave, required six AAs batteries, and lacked a tuning knob.

Thinking maybe I could find an analog-digital hybrid which read out to the last kHz digit, I searched online and came up with the reverse: a digital-analog which read out to the last kHz digit. The Degen DE1103 came with a bonus for someone like me with analog leanings – in addition to the precise digital readout,

it had a semi-analog dial and needle. Instead of achieving exact digital readout on an analog radio, the engineers here had done the reverse, adding an “analog” readout to a digital radio. I thought it was clever, but apparently Sony experimented with a similar thing several years ago (ICF SW40) without success.

While I was reading up on this radio which appeared to fulfill my wish list, I noticed it was being sold on eBay for a low price. When the Degen DE1103 suddenly dropped another \$10, I was hooked!

Vital Stats

Aside from all my requirements, the DE1103 has an extended FM band (76-108 MHz), a built-in battery charger (batteries charge inside the radio), an AC adaptor, a line-out jack, an external antenna jack (external antenna disables whip on SW and FM), a Wide/Narrow switch which lets



you select a 55.845 MHz or a 450 kHz IF (and doubles as an FM tone selector), a Hold (lock) button, a signal strength meter, a Local/DX switch, two alarms (radio only), 255 memories, auto scan, memory scan, a flip-out stand so the radio can sit at about a 30 degree angle, and all of these features presented within 6”x4”x1” dimensions and weighing in at a pound or less with the four included rechargeable 100 mA NiMH AAs inserted.

Honestly, I was so glad to be getting a digital radio with a knob which tuned in 1 kHz steps, many of these other features were extras to me.

The Buttons

The direct-entry digit buttons are in one row, 1-0, beneath the dial face. This is an inconvenient setup when fumbling in the darkness at the bedside to enter a memory or frequency,



where the traditional telephone-pad layout can be operated by touch. There's a slight ridge on button 5 to help orient you, and you can count your way in from 1 or 0. Still, the buttons are small, and your hand has to move around to find them, where the usual keypad format requires almost no movement and provides easy counting. But this is the price for having the semi-analog dial face where a standard keypad would normally be.

In the upper left corner are three buttons: M/F/AL1; STORE/AL2; and VOL/CHG. Underneath the direct entry buttons are seven more buttons: Power/Sleep; Reset; Hold; Time/Del; SSB/St-Mono; Band-/FM enter; Band+/AM enter.



The Jog Dial

Probably the main thing to keep in mind when approaching this radio is to recognize the jog dial as the multi-purpose control it is. Besides being a tuning knob, it's also for memory setting and scanning, charge, sleep, clock, and alarm time setting, and volume control. But all of these functions can be operated through direct entry, too, including volume (press a desired volume level/number, then push VOL). The volume control is easily mastered.



The LCD/Semi-Analog Dial Face

Information at the top of the dial includes a 4-position triangular signal strength meter, mode (AM or FM), frequency, volume (0-63), a note if either of the alarms is set, and a battery icon which appears during charging and which flashes when the cells are about to run out. Pressing Time changes the frequency to the clock momentarily. The clock displays when the radio is off, and while charging, the signal



strength meter doubles as a charging indicator, to show that charging is in progress. Further, the meter acts as a battery level indicator, to show how much charge is left in the cells. And, with the radio charging, pushing CHG changes the clock to the number of charging hours left.

LW, 120 meters, the 18900-19020 band, 11 meters, and the CB band aren't shown on the semi-analog face, only by the digital readout. The SW coverage of the semi-analog face is (kHz):

- 3100-4100
- 4500-5500
- 5500-6500
- 6500-7500
- 9000-10000
- 11450-12450
- 13450-14450
- 14950-15950
- 17050-18050
- 20950-21950

While in one of these bands, a thin LCD line appears and acts as the tuning needle. On SW it jumps in 25 kHz steps, so it reads anywhere from exactly on to 24 kHz off. On MW, it jumps every 30 kHz, and on FM, from .47 to 4.27 MHz, depending on where you are on the dial face.

The digital tuning increments via the knob are 1 kHz for MW and SW, and .02 and .03 MHz (alternating) on FM. When you reach the top or bottom of one of these bands, the needle snaps back to the opposite end of the band. To tune to frequencies outside these bands, you must enter them, or a memory, directly (but coverage is complete, from 100-29999 kHz).

Auto scanning up or down is in 5 kHz increments on SW, 1 kHz on MW, and .10 MHz on FM. Auto scan goes through the entire band on the dial, following the needle as it wraps around back to the top or bottom of the band. When auto scanning or manual tuning while outside one of the bands on the dial face, if you then enter one of the bands, you are locked in that band until you again direct-enter an outside frequency or memory or use Band - or + to enter another band on the dial face.

Memories

The memories are labeled from 0-9, then 0A-0F, 10-19, 1A-1F, 20-29, 2A-2F, and so on. Presets numbered 0-99 can be accessed through direct-entry. Any memory with a letter in its label (from 0A to FE; there is no FF) can only be accessed by the jog dial in memory mode.

Your positions on each of the 12 bands on the dial face are remembered, unless you switch to memory mode, when they are effaced by presets.

The operation manual refers to memories 0-99 as the "convenience" area, and memories 0A-FE as the "hidden" area. As you can see, deciding how to set and use your memories can be a confusing business.

Memory scanning is accomplished by entering memory mode and then turning the jog dial, which will run you up or down through all preset memories (unset memories and all other frequencies are skipped). This feature is the way to at least partially overcome the lack of a standard keypad for groggy bedside operation: If you preset all your sleep time frequencies consecutively in a cluster in the memory, then

enter memory mode, all you have to do is turn the tuning knob to carousel up and down through your group of chosen stations, without having to press a single button.

SSB

For SSB reception, you tune to a SSB signal with the knob or by direct entry, punch the SSB button, turn the knob until the transmission starts to become intelligible, then adjust the fine tune dial for precise demodulation. SSB is stable, and the fine tune dial feels smooth and solid. Once you fine tune a SSB signal, usually no further adjustment is necessary.

Illumination

With the light switch on, while running on batteries, the radio lights up whenever the jog dial is turned or one of the front buttons is pushed. Not only is the dial face illuminated with an amber glow, but all of the front buttons are, too. The lights stay on for 15 seconds after the last turn of the dial or press of a button. When running on AC power, with the light switch on, the lights are always on.

To get the lights to come on without changing your settings, punch any of the direct entry digit buttons. These functions only change the LCD readout for a few seconds before returning to the standard readout, giving you 14 "light buttons" to choose from.

Selectivity

Selectivity is excellent on all bands. I did a test on SW with the crushingly massive signal of Radio Thailand's 5890 relay. With the IF switch set to wide, I found the bleed-over ceased about 15 kHz up or down, at 5905 and 5875. On the narrow setting, RT's footprint was reduced to about a 5900 to 5880 spread. If there were fair signals on 5880 and 5990, they would be listenable with the narrow IF, though perhaps not on 5885 and 5895, but Radio Thailand is extremely strong in my area.

Overall, the IF selector works like a charm, and is usually only necessary to separate stations which are 5 kHz apart. If a station does interfere, switching the filter from wide to narrow will usually make the desired station listenable, providing it isn't too weak. The sound will be somewhat muffled and an increase in volume will be necessary, but the interfering signal will be drastically reduced or eliminated. A strong station 10 kHz away will rarely interfere, unless it's your local AM station.

The narrow IF setting is also helpful in pulling out a signal suffering under heavy noise.

Tuning up 49 meters, there are no traces of the spurious signals of RT or gospel stations in the background, as there are on single conversion units. Images are rare.

Tuning with the knob is smooth, probably as close to an analog feel as they could get it, with no muting. But when a band is quiet, some chirping can be heard with each 1 kHz step.

Sensitivity

The 1103 has a very low internal noise floor, so that weak stations inaudible on a noisier radio will appear on the 1103. The rat's

nest encountered around 6 MHz here in the Northwest in the evening on single conversion and lower quality radios is absent on the 1103. The BBC on 5975 usually has no interference, and the band is quiet on adjacent channels.

The 1103 can pull in almost any signal with the 36" telescopic antenna. Plugging in the included 35 foot wire and stringing it indoors gives a further boost. With the wire plugged in, the BBC on 11835 and Radio Vlaanderen Intl on 11635 often overload this radio, necessitating unplugging the wire or sliding the LO/DX switch to LO. Radio Havana Cuba on 9820 also sometimes overloads with the wire.

Table 1 lists some of the stations I've heard lately on the 1103, minus the monster stations. I always use the wire indoors, though just about all stations come in using the whip.

Table 1: Sample Loggings of Moderate-Strength Stations

Austria:.....	9870
Argentina:.....	15345
Belgium (RTBF):.....	17570 (via Julich)
Bulgaria:.....	9700 11700
Chile:.....	11665
Croatia:.....	9925 (via Julich)
Czech Rep:.....	6200 7345 17485
Dominican Rep (tent):	6025
Egypt:.....	7115 11855 12050
Gabon:.....	15475
Greece:.....	7475 12105 15630
Hungary:.....	9790
Indonesia:.....	9525 11785
Israel (Kol):.....	9435 11585 13635
	15640 17535
Israel (Galei Zahal):	15785
Italy:.....	11800
Jordan:.....	11690
Kuwait:.....	11675 15110 15505
Libya:.....	11635 15205 15315
	15660 17635 17695
	17880
Moldova (Clاند):.....	13800
Morocco:.....	15345
Nigeria:.....	7255 15120 17800
Philippines:.....	11720 15190 17720
Portugal:.....	15480 21830
Romania:.....	11820 15380
Saudi Arabia:.....	13710
Serbia/Montenegro:..	9580
Singapore:.....	6150
S. Africa:.....	7265 9770 15265
Spain:.....	6055 15110 15290
	15385
Switzerland:.....	13645 15445 15515 (all via Julich)
Syria:.....	12085 13610
Tunisia:.....	7275
Turkey:.....	7170 9460 15350
Ukraine:.....	7545
UN Radio:.....	15495 (UK)
Vatican:.....	7250 7300 12055 15570
	15595 17515

Also heard were many Middle Eastern and African relays of Radio France Intl, Deutsche Welle, BBC, and VOA. On 41 meters SSB, I've heard hams from Australia, Arkansas, and throughout the Midwest. On the CB band, "The Big Bad Wolf from The Bayou" and another from Dallas came crashing in during early afternoon.

At night on MW, a station is audible almost every 10 kHz with just the internal antenna. The

1103 pulls in the low powered FM stations well on the whip or wire.

Audio

The 1103's 3-inch speaker is powerful enough to be listenable in a mid-sized room. Those who have the 1103 and the bigger YB400PE say the Degen's sound isn't as rich and resonant as the Grundig's.

With the included earphones, which apparently are similar to the Sennheiser models MX/200 or MX/300, I tuned in Nigeria on 7255 near the top of the hour. I was stunned by the depth and timbre of the African drums during Voice of Nigeria's interval signal. They sounded huge. Through the earphones, music on decent SW signals has rich bass.

Build Quality

I was impressed with the feel of the cabinet, aluminum front, and controls of the 1103. The whip is fairly thick and heavy duty and the whole unit is solid. The silver model especially has a nice finish and the bare aluminum face looks sharp. The dark model has a flat gray finish, with the aluminum face painted a matte milk chocolate color.

A Fatal Flaw?

One of the 1103s I tried developed a faulty tuning shuttle, affecting all jog dial functions. The Yahoo! Kaito-de1103 user's group reported some other units with the same problem. The dealer I bought the radio from says Degen claims to have ironed out the shuttle fault and improved SW sensitivity (already extremely sensitive) in their recent batches of 1103s. My replacement from a new lot so far shows no problems, though the faulty radio took about two months to begin acting up. Time will tell.

Bottom Line

There are a few changes I could recommend for easier operation, but overall, besides the direct entry button configuration and possible future tuning shuttle faults, I may have found my ideal radio. Everything works well, from the sleep timer and alarms to the tuning knob and SSB fine tuning.

Availability

I bought my 1103 from eBay seller Liypn, a gentleman in Hong Kong who, unlike some of the other sellers, offers a one year warranty on the radio. His usual price is \$44.90 plus \$20 shipping to the US. The 1103 comes with a

220V AC adaptor, so Liypn offers a 110/220V transformer for \$7.90 at no extra shipping cost. Liypn currently carries a %100 satisfaction rating on eBay.

Radios4You.com plans to sell the KA1103 (Kaito version of the DE1103) in the US, with a 110V adaptor and one year warranty. (Tecsun is the parent company of Degen and Kaito, and they also manufacture a good part of the Grundig line at their factory in Hong Kong.) The KA1103 should be the same as the DE1103, relabeled as a Kaito.

Detailed specs of the 1103 and Degen line can be found at: <http://www.degen.com.cn>

Thank you to the Yahoo! kaito-de1103 users' group for their many helpful posts.

Note: If you get a DE1103, be aware that the factory set (and reset) volume level is 40 (it comes on in FM). My normal listening volume is between 8 and 12, 20 at the most to fill the room. I worry the 40 level is high enough to damage the speaker. The second you turn it on (out of the box or after resetting), immediately hit a direct entry button 1-0 and immediately punch VOL/CHG and save your speaker and ears. You will not have time to hit VOL/CHG and go to the jog wheel to turn it down. It has to be done instantaneously with the buttons.

Optoelectronics X Sweeper

By Bob Grove W8JHD

One of the handiest gadgets for the frequency explorer would be a handheld device that not only provides signal reception, but shows band activity on a wide-span spectrum display and also accurately reveals their frequencies. Scanners can slowly sweep and memorize search-discovered frequencies for later recall and monitoring, but have no wide-span spectrum display. Spectrum analyzers can manually be tuned to various portions of the spectrum to visually display signals and some have audio recovery, but they tend to be large and expensive.

For several years a Chinese manufacturer has offered such a device, but at \$2000 its slow sweep doesn't find wide appeal. Now a prominent, American test-equipment manufacturer has released a faster device at lower cost.

The new Optoelectronics X Sweeper expands technology embodied in a previous Opto product, their Xplorer, offering a continuous frequency range from 30-3000 MHz (3 GHz) (less cellular except on government models), and sweeping, acquiring and memorizing active frequencies in that entire range in as little as one second. Apparently it accomplishes this quick sweep of a vast amount of spectrum through the use of a proprietary comb-generating variable-frequency oscillator, mixing a large number of separate oscillator frequencies simultaneously.

❖ The X Sweeper at a Glance

As shown in the accompanying photo, it's a handful; the black plastic case measures 4-1/2"W x 8-1/4"H x 2-1/2"D and weighs nearly 2 pounds. A convenient (although hard to open), hinged, tilt bracket is recessed in the back, allowing desk-top placement at a comfortable viewing angle.

The 64 x 128 LCD is backlit for night viewing, and is strongly visible in direct sunlight as well. Contrast can be adjusted by a simple key press. Yet another selection can reverse the contrast from blue on white (normal) to white on blue. The backlight can be extinguished to extend battery life during high ambient lighting conditions.

The display shows currently-chosen functions, menu, center frequency, VFO settings, clock/calendar, span, spectrum bar graph, and other readouts as selected by the operator.

The X Sweeper's LCD spectrum display will show analog signals, but not digital, and the audio detector circuitry is designed to demodulate FM signals only, although weak audio from strong AM aircraft signals were heard during our test.

A 25-button membrane keypad allows direct frequency entry as well as selection of operating mode, setup instructions, lockout of undesired response frequencies, "joystick" up/down keys for VFO operation, rapid span/frequency changes, and bank selection for stored "hit" (active) frequencies.

As many as 1000 search-discovered frequencies can be automatically stored in its 10 memory banks (100 channels each) which may then be scanned for continued activity or identification.

Up to 65,000 hits are recorded and reported by the memory which also stores frequency, signal strength, and a time and date stamp. A separate log memory bank can store up to 1919 first- or last-sweep-discovered frequencies with their own reports.

An optional GPS unit (\$249, factory-installed at the time of order) provides automatic memorization of the X Sweeper's latitude and longitude for each signal record for mobile/portable applications.

Spans of frequency bands may be swept from user-selectable widths of 0.1, 0.3, 1, 3, 10, 100, 300, 1000 and 3000 MHz. Up to 2000 unwanted frequencies (inter-



ference, continuous carriers, signal harmonics, intermod products, "birdies," etc.) may be locked out of the scan/search function at the touch of a key.

An autoskip/autohold function allows the unit to search and register active-frequency hits without dwelling on each signal for audible monitoring, enabling a much faster registry of active frequencies. Alternatively, the unit will lock onto a search-discovered frequency for monitoring.

❖ Low sensitivity and broad selectivity

Near-field reception is assured, and weak, distant signals are ignored by the deliberately-low sensitivity of the unit. Typically, the Sweeper responds to signal levels above 20 microvolts in the 30-800 MHz range, increasing to 150 microvolts at 1 GHz, and 40 millivolts at the top end (2.4-3 GHz). Compared to the fractional-millivolt sensitivities of scanners and receivers, this is relatively deaf, but is necessary to reduce unwanted hits from distant signals.

Intermediate-frequency (IF) Selectivity is quite broad (nearly 100 kHz), dictating that the unit will respond to the strongest (and presumably the closest) signal in its passband.

❖ Power requirements

Power is provided for up to 6-10 hours (as warned by a Low Battery sign before shutdown) by 8 AA alkaline batteries (included), or continuously from the 120 VAC wall adaptor (included). Alternatively, the unit can be operated by user-provided and externally-recharged NiMH or NiCd cells.

Its 9-12 VDC power jack makes it a natural for long-duration mobile operation, identifying nearby signals as they are approached or passed. Alternatively, a 12 volt gel cell or other high-current, rechargeable battery in a belt or sling pouch would be a practical consideration for extended portable operation.

❖ Accessories

A swiveling, telescoping whip (4-1/2 to 22 inches) is provided (although when fully extended, the weight of our whip caused it to continually swivel downward from its loose connector sleeve). Optional antennas are available from Optoelectronics, but the standard BNC connector accepts an endless number of widely-available antennas.

Detected audio is clearly and loudly heard from the internal speaker, disconnected when an optional earphone is plugged into the 3.5 mm (1/8") jack. Volume and squelch controls are provided.

An RS232 jack (1/8" stereo) allows data download from a computer (cable and software included), and a CI5 Reaction Tuning jack is offered as well.

❖ Reaction Tuning

The ability of the X Sweeper to lock onto the frequency of a nearby transmitter may be used to control certain Icom, Uniden and Radio Shack scanners in order to use those radios' additional

reception capabilities. A list of such scanners is supplied in the user's manual. The installation of an Optoscan 535 or 456 digital interface (\$199 option) is required for some scanner models.

❖ Caveats

It must be pointed out that this is a piece of test equipment, not a scanner. As such, its display shows a single, narrow bar for a near-field signal, and the detector demodulates the strongest (usually closest) FM sources. It is not a selective, sensitive receiver that can distinguish between closely-spaced, weak or distant signals, nor does the display sweep or refresh quickly enough to show digital bursts, spread spectrum, frequency hopping, pulse, or single-signal waveforms.

The temptation to attach a large, outdoor antenna to this instrument is irresistible, but signal saturation from the receiver's limited dynamic range is likely, especially in a strong-signal environment, creating all sorts of phantom signals and misidentified frequency readouts from the resulting intermodulation, which also slows the search function. Adjusting the squelch knob to a looser setting reduces the false hits, but decreases the low sensitivity even further.

Since there is no attenuator, strong signals may be reduced by shortening the antenna or increasing the distance from the signal source.

No provision is made for rechargeable batteries to be charged in the X Sweeper – surprising considering the cost of the instrument and the presence of such a facility in other, less expensive Opto products. A separate charger must be acquired (available from Opto for \$89, although a less expensive discount-store model will work just fine), and two screws must be removed each time the batteries are accessed.

The sweep circuitry of the X Sweeper does emit RF noise into its immediate environment; while using it in my car I was unable to listen to weak and moderate FM signals on my car radio.

❖ Our Field Tests

Sweeping the spectrum from 30-3000 MHz, our sample could lock onto a nearby transmission within as little as one second, and no longer than a few seconds. Narrowing the span didn't make signal acquisition faster, but it did reduce the likelihood of false stops and certainly made the LCD spectrum display easier to read in an RF-rich environment.

Unlike many scanners that inaccurately display search-discovered frequencies slightly high or low of their actual carrier frequencies, we found the X Sweeper to have an excellent window detector that accurately displays intercepted frequencies to 4 decimal places (specified accuracy of 500 Hz).

The BNC antenna jack invites the user's



choice of whips, mobile antennas, or even base antennas as the requirement dictates. The supplied telescoping whip enabled reception of two-way base stations from several miles away using the monitoring function.

Sitting in my car at Wal-Mart with a roof-top antenna connected, I was unable to sweep-detect 460 MHz FRS handy-talkies in use by the clerks, but miles-distant paging signals and the sheriff's repeater came in loud and clear.

A more serious assignment to sweep a professional office for a suspected listening device made the X Sweeper a logical choice. Many interesting emissions from modern office equipment were revealed (but no bugs were found!).

❖ The Bottom Line

The outstanding features of this new test equipment are its wide frequency range, audio recovery capability, fast search and acquisition of signals, accurate frequency determination, scannable memory with auto-loaded hits, LCD display of signals over a wide spectrum, direct keyboard frequency entry, and small size and weight.

The signal-strength bar graph with its digital level readings is useful for antenna adjustments, bug detection, interference locating, signal-distance estimating and, with a directional antenna, hidden-transmitter hunting.

The X Sweeper is available for \$1599 plus \$10 shipping from Optoelectronics, 5821 NE 14th Ave. Ft. Lauderdale, FL 33334. For additional information or to place your order, phone (954) 771-2050, email them at sales@optoelectronics.com, or visit their website at <http://www.optoelectronics.com>.

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