MT REVIEW

Degen DE1123 AM/FM/SW Pocket Receiver

Good Performance and Bonus Recording/Playback

By Gary Sargent, KE8WO

A new pocket-sized AM/FM/Short-wave receiver was released late in 2008 by Degen that has some interesting features, including digital recording and playing MP3 files. The new Degen model DE1123 joins a growing field of Degen models, including the DE1102, DE1103, DE1121 and a host of others. I was anxious to learn more about this attractive, very small receiver, so I acquired one.

Inside the Box

DE1123 radio
120 VAC to 5 VDC power adaptor (CE approved)
Standard USB to mini-USB cable
Three AAA 650 ma Ni-Mh batteries
Stereo 'ear-bud' style headphones
Carry pouch & small carry strap
User's manual (in English & Chinese)

The 1123 is about 3 by 5 inches and a small 1/2 inch 'thin'. It is light weight with appropriate fit and finish, though mine had a few minor scuff marks on the back case. It has a nice look and solid feel. All buttons have a positive feel as you use them. The only connectors are a standard stereo jack for headphones and a mini-USB connector for remote power and connecting to your PC. (See the DE1123 photo.)

The display is surprisingly large and readable in direct or reduced light and has an attractive green backlight that remains on 15 seconds after any button is pressed.

The thin profile means it cannot stand upright, but, since the antenna does not tilt or swivel, laying the unit on a table will result in the antenna being in a horizontal position. The radio does work well in a shirt pocket, as I'm sure was intended.

Only a few multifunction buttons are available to operate the radio. No numeric keypad or rotary tuning control is provided. You will need the user's manual for the first few hours as you learn the various features. The small manual is 26 pages and is only adequate for explaining the unit's operation.

Neither the DE1123 box nor provided manual nor other printed inserts provided any sort of warranty statement. I purchased my unit from Amazon, and the Amazon web site specifies "30-day money back guarantee and 1-year Manufacturer's warranty." Kaito Electronics actually was the seller and likely would be the warrantor for this 1 year period.

❖ Radio Performance

I decided to compare the DE1123's performance to my Degen DE1103 receiver. The 1103 is comparably priced, is in wide use, and is a top-notch performer in the $75 to $150 price range of portable receivers. For the comparison, I only extended the 1103's whip to match the 1123's meager 10 inch whip antenna.

The 1123 offers good performance in the AM MW range with sensitivity only slightly reduced compared to the 1103. The 1123 selectivity seems to have less adjacent channel spill over than the 1103 when the 1103 is set to the wide filter setting. The AM band was free of internally generated noises and heterodynes, except some minor internal signals were heard at 1700 kHz and seemed somewhat associated with the display's backlight. The audio was slightly distorted at very low levels but was less noticeable at more typical listening volume settings.

FM performance also compared very favorably to the 1103 in both sensitivity and selectivity. Remote stations only 100 or 200 kHz from a powerful local station could be received. Powerful locals did not swamp large sections of the band as has been the case on some lesser performing receivers I have used. Stereo audio in headphones was free of noise and had high quality sound at all volume settings. The 1123 does not have any form of base or treble controls to tailor audio.

SW coverage is from 2.3 through 23 MHz. A single button will step through the 49m, 41m, 31m, 25m, 22m, 19m and 16m bands. The 1123 sensitivity is a step behind the 1103, more so on the higher frequency bands. Some stations that were very weak but readable on the 1103 were either not detected or not readable on the 1123. Again, the 1123 does have good immunity from splatter from another station just 5 kHz away. Adding more than a few feet of wire to the whip will overload the receiver. There is no connector for an external antenna and no signal attenuator button.

There are two SW performance caveats: I live in a typical suburban area (Dayton, Ohio) with a mix of local AM and FM radio stations. In particular, there is a 5 kW AM station on 1290 kHz about 5 miles away that has interfered to some extent on all of my radios (including a Sony 2010 and an Eton E1). This station and other locals show up on nearly all of the SW bands on the 1123 as a clear or garbled subdued background on many channels. This is not too much of a problem for medium to strong signal SW stations. Shortening the whip will often reduce this interference. However, for weaker stations this is an annoyance. Users without local AM stations will likely not experience this.

Secondly, the 1123 is very sensitive off just the short whip. I find that the 1123 will overload with the whip antenna at night time when the 49 meter band is booming in. Major stations can be received best with the whip antenna fully collapsed. Often readability is improved by plugging in headphones.

Overall, I much prefer the 1103 over the 1123 for SW usage when its size difference is not an issue. The 1103 is more pleasant sounding with its speaker or with headphones, in addition to its superior sensitivity.

❖ Digital Recorder / Player Performance

The 1123 can record AM, FM or SW

to its internal flash memory while in the receive mode and even when switching from one band to the next and tuning around. All recording is performed in the mono mode with a low sampling rate of 4 bits at 8 kHz and is saved as a "WAV" formatted file. This means recording quality is entirely appropriate for voices but not high-fidelity for music recording. The volume must be turned up to nearly maximum while recording to ensure the playback audio levels are loud enough, but this is not convenient if you are listening at the same time. Using headphones with an inline volume control is a work-around.

The 1123 can be set to play back a file based on an alarm setting but cannot be set to record based on a date and time for unattended program recording. The record function must be activated by pressing the record button and stopped by pressing another button. This, then, is a major limitation on the usefulness of the recording feature.

The 1123 does feature a built-in microphone for basic voice recording uses. I found it was appropriate for voice work within a few feet of the unit. The recorded audio levels for sounds some distance away (say in a conference room) will be low. Recorded voices sound natural and normal on playback.

Playback of MP3 and WMA audio files is supported by the 1123 and produces good fidelity on headphones. These files are copied to the 1123 from your PC via the USB connection (see below). During playback of these files, the file names and folders names are strictly numeric … no textual file, folder, or track information is displayed. Basic playback controls such as fast forward (at about 20x), reverse, pause, etc. are provided. But there are major omissions of features that you would find on typical MP3 players. I would consider the MP3 and WMA features acceptable for an entry level user who only wanted to listen to the 1123 in this mode occasionally.

The 1123 contains 1 gigabyte of flash memory for storage of these audio files. Degen says this is adequate for nearly 70 hours of recording from the radio (at the rate of about 14 megabytes per recording hour) or hundreds of MP3 or WMA files. Any mix of these files is supported as well and share the 1 GB flash memory.

❖ Computer Interface

I connected the 1123 to my Windows XP PC via the provided USB cable. A key point to remember is that the 1123 must be turned on and in the "MP3" mode. The 1123 was immediately recognized as a flash storage drive and the appropriate drivers installed without any actions on my part.

Once this process is completed, you may use Windows Explorer to move WAV, MP3 or WMA files to or from the 1123, create folders, etc. The USB interface is version 2, so the file transfer process is fast. The user's manual only has two small pages discussing the usage of the 1123 with a computer and does not specify which Windows versions it supports or if it is workable with a Mac.

HEART OF THE DE1123

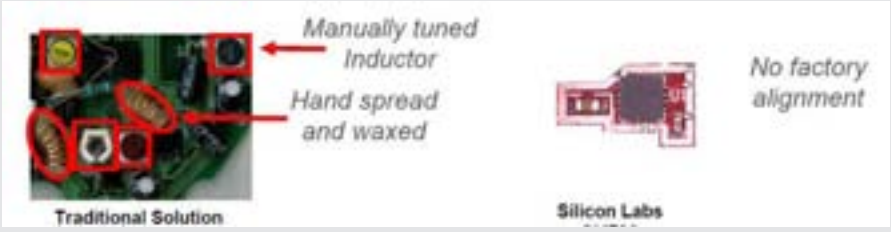
The key component of the Degen DE1123 is a single tiny electronic AM/FM/Shortwave receiver on a chip made by Silicon Labs. The Si4734 integrated circuit chip in the DE1123 is about the size of a pencil eraser and provides all of the 1123's radio capabilities with just a few external components. (The DE1123 also uses a microcomputer to control the Si4734, respond to the buttons, to control the display and provide the digital recording and playback features.)

This Si4734 IC chip first converts the incoming signal from the antenna to a very low intermediate frequency (IF). The signal is then converted to a digital form for all subsequent signal processing using digital signal processing (DSP) techniques. After this signal processing, the recovered audio is presented in analog form for amplification to drive the speaker. So technically, this is a single conversion receiver, but with the DSP providing at least some of the benefits of a second conversion step. This is a highly integrated form of a Software Defined Radio (SDR).

The Si4734 chip provides (not all used on DE1123):

- Excellent real-world performance
- Frequency synthesizer with integrated VCO
- Advanced seek tuning (based on programmable SNR and RSSI)
- Automatic frequency control (AFC)
- Automatic gain control (AGC)
- Digital FM stereo decoder
- Programmable de-emphasis
- Adaptive noise suppression
- AM/FM digital tuning
- AM tuning steps down to 1 kHz; Bandwidths selectable from 1 to 6 kHz
- No manual alignment necessary
- Volume control
- Programmable soft mute control
- RDS/RBDS processor
- Optional digital audio output
- Firmware upgradable
- Wide range of ferrite loop sticks and air loop antennas supported

The difference from a traditional radio design is dramatic. The figure below shows a comparison of a portion of a traditional design to a Si4734 based design. Notice the Silicon Labs Si4734 does not require the usual coils, transformers, capacitors, etc., nor the tuning and alignment of these components.



I suspect that this is the future of low to medium performance consumer radios in the future. (The above information is courtesy of Silicon Labs.)

❖ Bottom Line

The DE1123 Pluses

Pocket sized
Good sensitivity and selectivity for AM, FM and SW performance
Basic audio recording and playback features
Easy to move audio files to and from a PC

The DE1123 Negatives

No ability to schedule unattended radio recordings
No numeric keypad, slow frequency selection via provided up and down buttons
Limited audio file playback information display and playback features
SW interference from strong local AM MW stations and overloads easily

The DE1123 offers very acceptable overall radio performance in a small, extremely portable package. The digital audio recording and playback features are more basic. The 1123 will appeal to users looking for the ultimate in portability in a multiband receiver, with good performance and the ability to work with WAV, MP3 and WMA audio files. It is available from several suppliers with a street price in the $80 to $100 range.

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