

## Going Mobile with HD Radio

By Ken Reitz KS4ZR

Last year (*MT* April 2006) I reviewed the Kenwood EZ500 car stereo with the KTC-HR100MC HD Radio tuner which I had been using as a home receiver listening to HD Radio broadcasts. At the time the piece was written, October 2005, it was the only HD Radio receiver available and there were very few HD Radio stations on the air.

Since then, the market has been flooded with many home HD Radio receivers and there are now more than 1,300 HD Radio stations on both AM and FM bands throughout the U.S.

There have been some new developments in the mobile car stereo market, but in general HD Radio car stereos lag behind table-top sets by about two years. There is only one auto maker (BMW) which offers HD Radio as an option. Apparently car makers are more impressed with satellite radio than with the potential of HD Radio. Meanwhile, tens of millions of car owners might consider adding HD Radio to their cars via an after market converter.

Since April of '06 the EZ500 has been replaced with several other Kenwood products (see graphics), and the HD tuner is now the KTC-HR100TR. The tuner is only available for Kenwood brand car stereos and is compatible with most Kenwood HD-ready radios made since 2003. However, there are several other tuners for other specific brands of after market car stereos: The Alpine TUA-T500HD for select, compatible Alpine car stereos; Eclipse HDR105 for Eclipse car stereos, the Sony XT-100HD for Sony brand after-market car stereos, and Directed Car Connect Universal Add-On HD Radio Tuner. The Sony unit works with most Sony brand car stereos manufactured after 2005 which are satellite-ready.

The Directed unit uses a wired FM modulator which goes directly into your receiver via its AUX inputs. If you don't have such inputs, your best bet is to use a wireless FM modula-

tor. However, in my opinion it's generally best to avoid using a wireless FM modulator for HD Radio, because today's units are now under-powered and have notoriously poor quality audio, which won't do justice to the HD Radio signals they'll be feeding into your car stereo.

I found all available at Crutchfield, the national electronics outlet at [www.crutchfield.com](http://www.crutchfield.com) and selling for under \$200.

Recently, the built-in radio in my old 1978 Toyota Celica finally croaked after 29 years. I saw this as a great opportunity to update the old car to the new HD Radio standard, so I dusted off the Kenwood EZ500 with attached KTC-HR100MC HD tuner and set off to bring the '78 into the new century.

### ❖ Getting Started

If you're considering adding HD Radio to your ride, first consider what your time is worth. I made some inquiries locally and found an installer who would do a standard car stereo installation for \$45. That sounds reasonable to me. The cost would rise if I had extra amplifiers or other devices for them to contend with. If you do it yourself, you can expect to spend two or more hours doing the installation. The best part about having experts do the installation is that the work is guaranteed.

My own installation was going to require cutting an opening in the center console to accommodate the much larger new radio, so the pro option was out. If you opt for the pros, add that to the total to get an idea of how much the whole project will cost.

The last time I did a car radio installation (*MT* June 2006), I was putting a Sony XR-CA660X AM/FM/SW radio in my other car, a 1985 Toyota Celica. The first thing I did in both instances was consult the doctor – the

**Installldr.com** to be exact. This site lists all automobile makes, foreign and domestic, and gives you printable .pdf files showing the wire connectors used in your car, a list of the pin designations and how they relate to typical new radio equivalent wire colors. Go to [www.installldr.com](http://www.installldr.com) and click on your car's make.

You may also benefit from an automotive repair manual for



*An even cheaper Kenwood KDC-MP2035 is satellite and HD Radio ready at \$129.99 at Crutchfield. It's also XM or Sirius-ready with a built-in CD player. HD Tuner required for HD reception is extra. (Courtesy: Crutchfield)*

your particular year and make. This is different from the owner's manual. An automotive repair manual is used by mechanics for directions on how to replace a heater core or do a general engine overhaul, for example.

I use the Haynes publications manual because they have excellent photos and wiring diagrams on an 8.5" x 11" page. Of particular interest are the pages with the entire chassis electrical system in schematic diagram. It's possible to trace every wire to every connection in your car, should you need to. To locate such a manual for your car, check out your local bookstore or automotive repair store.

There are complications you'll have to deal with if your car is, say, from this century: extra speakers, alarm systems, motorized antenna and possibly outboard amplifiers. Since my car has none of those things, it was fairly simple. But, before you do anything else, pull the negative cable off the car battery so you don't accidentally short out a connection.

Following the instructions in the car stereo manual, the diagrams in the repair manual, and the sheet from [installldr.com](http://installldr.com), you should have the radio wired up in an hour or so. I found that half the time was spent trying to pry loose the old antenna, speaker, and power cables from



*Kenwood EZ500RB replaces the EZ500 with virtually identical features. It's a low cost entry into the world of mobile HD Radio for \$145 from [OnlineCarStereo.com](http://OnlineCarStereo.com). The HD Radio tuner is extra. This model is also Sirius-ready and has a built-in CD player. (Courtesy: Kenwood USA)*



*The Sony XT-100HD, at \$99.99, works with after-market Sony brand car radios. (Courtesy Sony)*

## MANUFACTURER SPECIFICATIONS

**Tuning Range:**  
 AM 530-1700 kHz (10 kHz steps)  
 FM 87.9-107.9 MHz (200 kHz steps)

**CD Player:**  
 Digital Filter: 8 times over sampling  
 Freq. Response: 10 Hz - 20 kHz

**Audio Amp:**  
 50 Watts x 4

**Aux. Input:**  
 Max. Voltage: 1,200 mV  
 Input Impedance: 100 kOhm

**Operating voltage:** 11-16 V DC  
**Current Consumption:** 10 A

**Installation size:**  
 7" W x 1 15/16" H x 6 5/16" D  
**Weight:** 2.87 pounds



*Directed "Car Connect" adds HD Radio capability to any built-in or after market car stereo for \$159.99 at Crutchfield. Turns any car stereo with AUX inputs into an HD Radio receiver. This unit is not satellite ready. (Courtesy: Crutchfield)*

The Kenwood EZ500 is typical of modern after-market car stereos. It has a built-in CD player, AUX input for additional audio (an MP3 player could be plugged in here with an adapter), it's satellite-ready (in this case Sirius), it has a connector for a multi-disk changer and an output for a separate woofer. That's actually quite a lot of car electronics for less than \$200.

Other features on this radio include white dot-matrix LED display which can scroll text from CDs, satellite radio, or HD Radio source; equalizer modes which let you tailor the sound for your ears or your speakers' capabilities. It lets you name your favorite stations, using a text entry system, and comes with an infra-red remote control.

the original radio. At one point I was literally sitting upside down in the front passenger seat with my arm snaking up through the dashboard to pull the wires.

In the '85 installation the original car stereo was exactly the same size as the new one and there was no trouble getting it situated. The '78 installation was a lot harder and required removing the center console and cutting a 7.25-inch notch in the top to make room for the radio. Even so, it sits out about an inch and a half from the front of the dash. Well, it's the only place it could go!

If you have a modern car this shouldn't be a problem; you'll be able to simply swap out the radios. Then again, yours may be like many new cars with a seemingly sealed dash and, of course, the anti-theft device which will no doubt go off when you remove the original radio. If you can't figure out how to disable it, your best bet is to take it to the pros.

## ❖ Kenwood HD Radio Features

The actual Kenwood HD Radio tuner is a 7.5" x 5.5" x 1" box which connects to your "HD-ready" radio via a special 16-ft long cable with 13 pin connectors at each end. One end plugs into your radio and the other end into the tuner. It uses the amp and speakers to give you the audio. Your car's antenna plugs into the tuner box, not the actual radio. There is a 20-ft car antenna coax cable which allows you to put the tuner box anywhere in the car and still reach the radio. Without the tuner box, your HD-ready radio is just another radio.



*Kenwood KTC-HR100TR (\$159.99 at Crutchfield) is the HD Radio tuner section for the EZ500 or most other Kenwood car stereos equipped with an HD Radio tuner jack going back to 2003. (Courtesy: Kenwood USA)*

## ❖ Tuning HD Radio in the Car

I've written many reviews about HD Radio reception from home and the mobile experience is no different. In the city where the signals are strong, there are many HD Radio and multicast channels to be found. The audio is outstanding (even through the small, paper cone, original 1978 speakers), though the amp in the Kenwood, at 25 watts per channel, could easily blow the speakers into dust.

Away from the city, the HD signals came and went and it was pretty obvious when they did. The audio would have that expansive, clear HD Radio sound and then go back to analog FM. Worse, the multicast stations would drop out entirely and the signal would revert to the main analog channel. I tried using an antenna pre-amplifier and it made a noticeable improvement as long as I was parked, but out on the road in the country with curves and hills, the HD part of the signal came and went anyway.

That's the big problem with HD Radio. If you spend your days and nights traveling in a 30 mile radius of a major city with numerous multicasting HD Radio stations, you will love having an HD Radio in your car. But, if you spend most of your time further away, you'll spend more time listening to analog radio.

The big advantage to putting an HD Radio in your car is that they have built-in CD players and, as the EZ500 does, they are satellite ready, which in the end saves the day for those of us not living within easy reception distance of a major metro area. We've still got the satellite radio option. Meanwhile, having added HD Radio to my '78 Celica, I've now got the same HD Radio options as a brand new BMW!

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