

## TravelPro

>> Harman Kardon's TrafficPro navigation system/  
CD receiver points you in the right direction with an  
impressive array of commands. BY KEN C. POHLMANN

**M**ORE OFTEN than not, the first time I get a glimpse of a new product is when I pull it out of the overnight box. Occasionally, though, I get sneak previews. For example, the first time I saw a TrafficPro CD/GPS head unit was while I was in Germany in the fall of 1999 with MOBILE ENTERTAINMENT'S technical director William Burton. Saab and Harman had invited us across the pond to play with some new Saabs in and around Frankfurt; the cars featured Harman audio systems. In the Saabs, we took a side trip to the Harman/Becker plant in the Black Forest and checked out a vehicle with the Becker version of the TrafficPro. I cruised the unfamiliar autobahns without maps, and, thanks to the TrafficPro, never got lost. I was duly impressed.

Fast forward to 2 years later, back on home soil. When I pulled the test sample of the Harman Kardon TrafficPro out of its FedEx box, I instantly remembered how cool it was. It plays CDs, has an AM/FM

receiver, and boasts four channels of power (each rated at 18 watts). Of course, as the TrafficPro name implies, its claim to fame is its ability to guide you from point A to point Z. It does so with an internal GPS receiver, two CD-ROMs that hold road maps of the United States (one labeled Eastern U.S., the other Western U.S.), and some other tricky techniques.

One glance at the TrafficPro's front panel shows its European design touches. The Europeans have very different ideas about how a head should look. The TrafficPro has a clean, sparse face, and its two large knobs might remind you of an old-time radio. Importantly, there's a large central

display. Where do you load CDs, you ask? A center chunk of the front panel folds down when you press a release button; it's not motorized, and you must manually raise it to its operating position. For security, you must enter a supplied secret code after the TrafficPro has been disconnected from power. Moreover, for added security, the center faceplate chunk can be removed and slipped into your pocket.

The TrafficPro (\$1,499) has some fairly traditional buttons for power, tone control, RBDS traffic program, CD select, radio select, navigation-mode select, and CD eject. However, most of its operation is handled by the left and right control knobs and a line of 10 multifunction keys below the displays; their specific operation depends on which mode you're in (the button labels appear above them in the display). Since this is a software-driven, soft-key, menu-controlled device, instead of talking about how various button combinations work, let's consider what the head can do functionally. CD playback is the most straightforward operation. The CD section provides typical features such as random play and search, and it can also control an optional CD changer.

The tuner section lets you search for stations in alphabetical or numerical order. As noted, the TrafficPro is equipped with RBDS (Radio Broadcast Data System), although the feature isn't very popular in the U.S.; in fact, few U.S. radio sta-

### THE VITALS

**PRICE** (including installation): \$1,499.

**WARRANTY:** 2 years. **MANUFACTURER:** Harman Kardon, Dept. ME, 250 Crossways Park Dr., Woodbury, NY 11797; 800-422-8027; www.hktrafficpro.com.



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tions broadcast RDS info. Michael Silber, director of product development at Harman, says around 700 U.S. radio stations broadcast RDS info. (The feature is more popular in Europe, where it's known as just RDS.) Using RDS, you can search for stations with particular formats (rock, news, talk, etc.) using the head's PTY (program type) function.

Of course, the head's most interesting feature is its navigation ability. The head uses an internal GPS receiver connected to an external GPS antenna and CD-ROM map discs, as well as an internal gyroscope, an electronic-speedometer speed signal, and a reverse signal to determine where your car is located. You enter a destination by keying in the first letters of the name (using the right-hand knob) or by selecting from a list; the Traf cPro automatically uses the letters to narrow your choices. To save entry time, you can store up to 50 destinations.

The kind of data depends on how far

you're going. For example, if you were starting in St. Louis, you might enter Chicago, Michigan Avenue, and 100 North. You load a navigation CD-ROM and the head computes a course and downloads a corridor road map from ROM and stores it in an 8-megabyte (MB) memory. After it accepts that data, you can unload the CD-ROM and play music CDs or listen to the radio as you navigate. You can choose either the fastest or shortest route, and can modify it further by adding or denying attributes such as highways, toll roads, ferries, and stopover locations. You can even enter in places where there are traffic jams or road construction and instruct the Traf cPro to avoid them.

The dot-matrix display shows things like a direction arrow (left, right, U-turn, jog left, jog right, hard right, hard left, or traffic circle), remaining distance, arrival time, and current road; next road and GPS position are displayed on request. A voice (male or female, in five different lan-

guages) calls out turn-by-turn directions through the connected speakers in your choice of three options: spoken directions only (no music), directions over music (overlay), or music that mutes when directions are given. The navigation database contains points of interest such as gas stations, airports, hospitals, restaurants, ATMs, and hotels. You can also scroll through a list of the streets on a planned route to see where the system is taking you and program the Traf cPro to announce an estimated time of arrival.

### Installation

I installed the Traf cPro in the dash of a 2000 Dodge Durango SUV. Before hooking things up, I called the Traf cPro hotline to make sure my vehicle was compatible with the Traf cPro head unit, and it was. (This info is also available at [www.hktrafcpro.com](http://www.hktrafcpro.com); the Traf cPro fits in most every vehicle except many with ISO-DIN mounting.)

To do what it can do, the Traf cPro has some other very specific input needs. First, you must plug in the supplied GPS antenna. This unobtrusive unit measures about 2 x 1 x 2 inches (w/h/l). It has a 6<sup>1</sup>/<sub>2</sub>-foot cable, and it can be placed inside the vehicle on a dashboard and under a windshield (don't worry; GPS signals can penetrate glass). However, some windshields with an integrated antenna, heating strips, or thermal-insulation coats of titanium or silver oxide can affect reception of GPS signals. If that's a problem, you can mount the antenna outside the vehicle.

It's also important to make sure that your vehicle puts out two other signals for the TrafficPro: a reverse signal and a speedometer signal. The reverse signal can come from your transmission shift linkage or your reverse lamp; it must go positive when the vehicle is in reverse. The speedometer signal is used to determine how fast the vehicle is going; when the vehicle is stopped, it's a square-wave pulse with a frequency ranging from 0 to 4,000 Hz and a voltage less than 1.5; when the vehicle is moving, it varies from 5 to 16 volts. If your car has a speed-sensitive radio, you can find this signal on the radio lead that controls that feature; otherwise, look at the electronic speedometer or cruise-control connector (cars are different, so check to see what works).

The Traf cPro has three multi-pin connector sockets in back. You can use supplied harnesses to plug into them. The main harness has leads for illumination, power antenna, phone mute, reverse signal, speedometer signal, etc. Four wire pairs provide speaker outputs. Another harness terminates in two RCA pigtailed providing stereo front/rear line output and subwoofer output. I popped these harnesses into their sockets and wired them up accordingly, along the GPS and regular FM/AM antenna. The harnesses don't cover these pins and I didn't use them, but the head also provides an auxiliary input and connections for an optional changer.

An important install note: Although the Traf cPro provides voice prompts for navigation, you'll use its display to enter destinations, show the directional arrows, and

so on; therefore, try to mount it as high in your dash as possible.

Before leaving the garage, I ran through a number of setup options; for example, I set the current time, selected English, and selected yards and miles (instead of meters and kilometers). Finally, I chose a female voice for the voice prompts, went through the necessary calibration procedures, and got down to some nav action.

### Performance on the Road

I usually start my test drives by heading downtown. The taller buildings create multipath interference, a tough test for any tuner section. I figured I'd let the Traf cPro guide me there, so I entered a destination on Main Street, and the unit

quickly downloaded the corridor it needed and plotted a course. As I headed out of the driveway, the Traf cPro told me to turn left at the next light, and I was on my way.

The Traf cPro's current corridor is always limited by the 8-MB memory size, but it can stretch as far as 621.5 miles a good day's drive. A long route has a narrow corridor, while a short route has a wider corridor. My distance to downtown was less than 15 miles, so my corridor was wide. Still, if I detoured outside the corridor, the head asked to see the CD-ROM again. If I disregarded or missed a turn, the head automatically calculated a new route from my new current position, and I simply picked up where I left off; I didn't

## LABORATORY MEASUREMENTS

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*All measurements made with 14.4-volt DC input.*

### CD SECTION

**MAXIMUM OUTPUT:** 2.9 volts  
**FREQUENCY RESPONSE** (referenced to 1,000 Hz): 20 to 20,000 Hz +0.03, -1.5 dB  
**CHANNEL SEPARATION:** at 1,000 Hz, 70.1 dB; at 20,000 Hz, 60.1 dB  
**DYNAMIC RANGE** (A-weighted, referenced to 0 dB): 90.4 dB  
**S/N RATIO** (A-weighted, referenced to 0 dB): 92.6 dB  
**THD PLUS NOISE** (referenced to 1,000 Hz): at 0 dB, 0.009%; at -20 dB, 0.055%  
**D/A LINEARITY** (at -90 dB): +0.4 dB  
**INTERCHANNEL PHASE ERROR** (at 20,000 Hz): 1.3 degrees  
**DE-EMPHASIS ERROR** (at 16,000 Hz): 0.01 dB  
**MAXIMUM DEFECT TRACKING** (with Pierre Verany Digital Test disc): 2,000 micrometers

### TUNER SECTION

*All measurements for FM only, except for frequency response.*

**MAXIMUM OUTPUT** (100% FM modulation): 2.9 volts  
**ADJACENT-CHANNEL SELECTIVITY:** 17.1 dB  
**ALTERNATE-CHANNEL SELECTIVITY:** 77.2 dB  
**CAPTURE RATIO** (at 65 dBf): 3.0 dB  
**USABLE SENSITIVITY** (mono, 75-ohm input): 12.2 dBf  
**50-dB QUIETING SENSITIVITY** (mono, 75-ohm input): 13.0 dBf  
**CHANNEL SEPARATION** (at 65 dBf, with 1,000 Hz): 34.5 dB  
**THD PLUS NOISE** (at 65 dBf): mono, 0.68%, stereo, 0.81%

**S/N RATIO** (A-weighted, at 65 dBf): mono, 71.6 dB; stereo, 68.9 dB  
**AM REJECTION** (at 65 dBf): 66.0 dB  
**IMAGE REJECTION:** 62.6 dB  
**FM FREQUENCY RESPONSE** (30 to 15,000 Hz, referenced to 1,000 Hz): +0.6, -2.1 dB  
**AM FREQUENCY RESPONSE** (30 to 3,000 Hz, referenced to 1,000 Hz): +0.2, -5.8 dB

### PREAMPLIFIER SECTION

**MAXIMUM BASS-CONTROL EFFECTS** (at 100 Hz): +10.5, -12.0 dB  
**MAXIMUM TREBLE-CONTROL EFFECTS** (at 10,000 Hz): +10.5, -12.4 dB

### POWER SECTION

*All measurements made with all channels driven into 4 ohms.*

**POWER** (at 1,000 Hz, into 4 ohms, with 1% THD plus noise): 15.6 watts x 4 channels  
**S/N RATIO** (A-weighted, referenced to 1 watt): 86.9 dB  
**THD PLUS NOISE** (at 0 dB, with 1,000 Hz, referenced to 1 watt): 0.038%  
**FREQUENCY RESPONSE** (20 to 20,000 Hz, referenced to 1,000 Hz): +0.02, -2.1 dB

### COMMENTS

The Harman Kardon TrafficPro navigation system/CD receiver provided good numbers on the test bench. The CD section's only minor flaw was a high-frequency rolloff of 1.5 dB at 20,000 Hz. Distortion was fine, as was low-level linearity. The TrafficPro tuner's THD+N distortion level was somewhat high, but other numbers were quite good, with good sensitivity and selectivity. Power output was typical for head units. —KCP

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have to return to where I deviated. If I lost contact with the GPS signals, the head fell back on its compass to give me general directions with a simple compass readout; once it got the GPS signals back, it calculated a detailed route.

Announcements were always made well ahead of the turn. For example, it might say, Keep to the right, or Prepare to

turn left in 300 yards, or even, Take the first road on the left and then turn right immediately. As I cruised through various routes, I always had time to make the turn. If I missed an announcement, I could have the last one repeated.

After arriving downtown, I figured I better check out the unit's tuner package. The Traf cPro's radio reception was up to

snuff. Given a strong signal, audio clarity was quite good, with nominal noise and distortion.

During the drive home, I auditioned the CD section with Tom Petty and The Heartbreakers' latest album, *The Last DJ* (Wamer Bros.). This is vintage Petty; the title track has the trademark Petty vocals, and his unmistakable nasal twang came through loud and clear on this head unit. Mike Campbell's lead guitar has real impact; you can hear his strings practically breaking to emphasize the bitter lyrics. Although the Harman Kardon Traf cPro has squeezed in the huge added functionality of navigation, it had in no way compromised its CD performance.

## Conclusions

Sure, you can buy a plain old CD receiver for a fraction of the price. And, if you always go to the same old boring places, then you might not need navigation. However, if you often head out into the unknown and don't have time to get lost, the Harman Kardon Traf cPro will get you there safely and quickly.

Unlike other nav systems, Traf cPro doesn't display a map. This makes it less distracting to drivers, and therefore safer. I tend to look at map displays, even when driving, and that's not a good thing. The Traf cPro's display is a good compromise between too many visuals and not enough. Overall, I was well satisfied with the navigation package. Of course, the added functionality of navigation (along with its non-mainstream European design roots) does make this head more complicated to operate than your normal CD receiver. Still, it's those differences that make it unique.

It's not often that I get to test a cool product in both Europe and America and I can attest that Traf cPro's navigation works as well here in the U.S. as it did in Europe. It's not often that one DIN-size unit does so much: playing CDs; receiving AM, FM, and RBDS; and providing navigation info without a dangerously distracting map display. And it's not often that one unit does so many things so well, but then the Traf cPro is one formidable head unit. Let it be your guide. 