



Product Review and Short Takes from *QST* Magazine

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Product Reviews:

Kenwood RC-D710 Control Head/TNC

PRODUCT REVIEW

Kenwood RC-D710 Control Head/TNC

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I killed packet radio.

Which is too bad, because I really liked packet. Back in the early '90s, when I got my first terminal node controller (TNC), it was exciting to get up early, stumble into the shack and connect to the local packet bulletin board system (PBBS). I could collect and read mail and bulletins from hams across the state, country and world.

I was far from an early adopter — packet had been around for more than a decade by then. This was before the Internet became mainstream, years before e-mail took its increasingly big bite out of our time. Back in the day, packet had passionate advocates and devotees spending money and time, building, learning, playing, arguing.

But like many of you (my co-conspirators in packet's demise), as the '90s wore on and the century turned, I gradually stepped away from packet. The Internet and e-mail were faster, easier and bigger. I stopped checking the local PBBS every day, or every week. I moved radios around, then moved to a new house, and somewhere along the line just never hooked the TNC back up at all. Last time I tried to use it just out of curiosity, it wouldn't boot up. I'm not sure why.

My experience was duplicated by hams around the world. PBBS systems that had been lovingly crafted — with maddeningly obscure parameters finally figured out, antennas raised higher... and a little higher... node stacks built, more radios added, links and paths for traffic hammered out — one by one had their plugs pulled as traffic and interested dwindled. And all just as things were about to really happen, too. Just as networks were being built and tuned that could really carry some traffic. Ham radio was on the verge of having a very cool system for public service that could fill in when this new Internet went *poof!*

New Life for Packet

I am aware that packet never totally died. Bob Bruninga, WB4APR, has almost single-handedly rejuvenated it with the Automatic Packet Reporting System (APRS, which is *not* a vehicle position tracking system, he insists, but we know better, don't we?). Kenwood helped, with mobile and handheld



radios that had built-in TNCs and software specifically designed for APRS (the, ahem, vehicle tracking function in particular, I think). Yaesu is stepping in with packet-enabled handhelds with optional GPS. DX spotting networks, *Winlink 2000* e-mail systems and such are hanging in there, too. There are even some PBBSs still around (using the Internet to move their traffic). A few states or regions still have packet systems dedicated to emergency communications. But it's not what it could have been. At its peak, packet never quite reached critical mass among the hams who were otherwise engaged in talking on repeaters, working DX, ragchewing on HF and whatever.

It's too bad, too, because we need that alternate Internet (can I coin the term *Alternet?* I didn't think so — Google shows I'm not that original). Sure, 1200 bits per second (bit/s) is pretty weak compared to the 6 megabits per second I can use to pull YouTube videos through my cable modem. But it beats the *zero* bits per second I got last time a hurricane blew through here, or an ice storm took all the lines down.

I have a theory about why packet radio died, besides Internet competition: It was too hard.

At the risk of sounding like an *appliance operator* (which I am, but a very good one) and bringing down the wrath of the *true believers*, I think packet was just too difficult for many hams to get into enough to start having fun. Those of us who achieved some degree of success tried to pass our knowledge and experience on, but newcomers faced not just a strange new concept with unusual equipment (TNC?) and an array of obscure abbreviations and acronyms (TNC?). A few steps in they were confronted with a bewildering array of software settings and adjustments. Manuals, articles, tutorials and meeting programs

all tried bravely to bridge the knowledge gap. But beyond the first steps, the learning curve appeared more like a wall. Those who persevered often accepted the default settings and got on the air. And we did have fun until the Internet came long and bled all the other users away.

I wasn't the last to leave, but I held out longer than most. But not as long as the diehards who just never gave up. And the newcomers who pretty much only know packet as APRS. For a few weeks, at least, I'm back.

Wasn't This Supposed to Be a Review?

Which brings me to the device I'm looking at now, Kenwood's RC-D710, um, device. Its manual calls it a "Control Panel." Kenwood's Web site calls it "The APRS upgrade for your transceiver." That's colorful, but I was puzzled about this device I had to review, and it took some digging for me to understand it! That's why I haven't really told you what it is yet. Here's what I found.

Kenwood offers two dual-band VHF/UHF FM transceivers. The TM-D710A does all the usual voice radio stuff, plus it has a 1200/9600 bit/s TNC built into the control head with firmware and on-screen display capabilities for APRS and DX PacketClusters. *QST* reviewed this radio in February 2008.¹

Bottom Line

Kenwood's RC-D710 upgrades the TM-V71A transceiver to add packet radio and APRS capabilities identical to Kenwood's TM-D710A transceiver, and it can be used with other radios as a stand-alone TNC.

The TM-V71A is one step lower on the food chain, a full-featured dual-band mobile with some stuff for *EchoLink* and easy cross-band repeat, but no TNC. It was reviewed in the November 2007 issue.²

My review project, the RC-D710 is essentially the control head/TNC from the TM-D710A radio. It is designed to plug into the TM-V71A, “upgrading” that radio to full TM-D710A capabilities. That “V71A plus the upgrade” ends up costing more than just buying the TM-D710A in the first place, but there still may be some advantages. If you already have the V71A and decide you want to add APRS/packet, the new control head is a good way to go. It’s priced competitively with other full-featured TNCs. And because the control head doesn’t physically mount to either radio — it’s always stand-alone — pairing it with the V71A gives you the flexibility to have either a single, self-contained radio (minus packet), or the packet-capable combo with detached control head.

But that’s still not why we’re here. The control head’s operation as an integrated TNC is covered in the TM-D710A review. If you’re interested in the capabilities of a V71A plus the control head, just read the TM-D710A review. I will note that when I first tried the RC-D710 on the TM-V71A that came with the review unit, it was dead! No lights, no noise. It did light up when connected to a separate interface box that I’ll talk about in a minute, so I knew it wasn’t completely dead. I hunted on the Kenwood Web site until I found software to update both the V71A and RC-D710. That cured the problem.

The RC-D710 as a Stand-alone TNC

We’re here today because the RC-D710 is also a stand-alone TNC that can be used with many other FM radios, Kenwood or not. You have to add the optional PG-5J interface

box. With that, you get the ability to use some APRS and DX PacketCluster functions using the control unit display — *without* a computer attached. That is the selling feature over any of the other TNCs out there. You can also connect a computer to the RC-D710 for more routine packet operation.

Connecting everything is easy. The PG-5J comes with a cable terminated with an RJ-45 connector that runs to the control head. A 6-pin mini-DIN cable runs to the “standard” data connector on most current FM mobiles. With that connection to the appropriate radio, the RC-D710 will do both 1200 and 9600 bit/s packet. I put quotes around the word “standard,” though, because I first tried to use the Kenwood control unit with my ICOM IC-2820 and ID-800 mobiles, only to find that they both have an *eight pin* mini-DIN on the back. So I pulled my old packet radio, an ICOM IC-207H, off the shelf and plugged it in. Success. Eventually.

Note that when it’s connected to a TM-V71A radio, the RC-D710 controls *all* of the radio functions. You remove the V71A’s original control head, and the RC-D710 takes over with dual-band frequency readout, and all parameter adjustments (frequency, volume, squelch and so forth). It does *not* do that with other radios, even other Kenwood radios. When booted up from the PG-5J interface, the RC-D710 comes up with just the packet display.

I tried the obligatory “what can I do before I read the manual” exercise. I got action before I did any more than plug it in, turn it on and set the radio for 144.39 MHz (the nationwide APRS channel). I heard a packet *braaap*, then the control unit beeped and the display changed to show me the call sign and some other information about the station that had sent the APRS beacon. That’s pretty satisfying.

I worked through some menus and figured out how to enter my call sign, coordinates, an APRS “icon” and a few other functions, and tried to send a beacon to my local digipeater. It ignored me. I listened to my packet signal on another radio, and the audio level sounded a little low. There was no way to increase the level in the IC-207H. Ordinary TNCs usually had a level adjustment, but that didn’t seem to be an option with the RC-D710. Maybe there

was an adjustment in the PG-5J? It was closed up tight. Time to break out the manual.

Thorough Documentation

That would be three manuals. There’s a printed manual, which initially looks thick (actually it’s two volumes), but that’s because the same limited set of instructions comes in six languages. And there’s a PDF version of the manual on CD that has more information (but doesn’t cover the basics of the printed manual). The information was not all that well organized, but after enough time, the manuals guided me through the various capabilities of the control unit and I became pretty familiar with it. But they didn’t tell me how to increase the transmit audio level.

An Internet search led me to Kenwood’s Web site and a really useful TM-D710A “In Depth” manual in PDF format. It covers the whole TM-D710A radio, so a lot of it applies only when you pair the RC-D710 with the TM-V71A. But it also has background information on APRS, along with more RC-D710 info that’s not in the other two manuals. Go to www.kenwoodusa.com/Support/AMA_Radios, look for Amateur Radio Manuals and select the RC-D710.

That manual told me that I had to download the *MCP-2A* control software and connect the RC-D710 to my PC. That’s the only way to adjust the transmitted audio level. I did, and it worked. I was digipeated, and I showed up on the various Internet APRS lookup sites such as FindU.com and aprs.fi.

At this point, the RC-D710 provides the same packet functions to other radios that it does to the TM-D710A, and many of those are covered in the TM-D710A review. So I’ll just hit some high points.

APRS Mode

The display defaults to a list of station types (digipeater, weather, mobile and so on), and it tallies up the number of stations of each type that it’s heard since you last flushed the list (Figure 1). When an APRS packet comes in, the display changes to show details about that station. There are three more “pages” of details behind the initial display. You access them by pushing the **DETAIL** button, and then pressing the **LEFT ARROW** and **RIGHT ARROW** keys. Figure 2 shows some information

¹H. Robins, W1HSR, “Kenwood TM-D710A Dual Band Mobile Transceiver,” Product Review, *QST*, Feb 2008, pp 45-48. *QST* Product Reviews are available on the Web at www.arrrl.org/members-only/prodrev/.

²H. Robins, W1HSR, “Kenwood TM-V71A Dual-Band Mobile Radio,” Product Review, *QST*, Nov 2007, pp 71-74.



Figure 1 — This display shows how many beacons of each APRS “type” have been received.



Figure 2 — Pressing the **DETAIL** button scrolls through screens of information available for each APRS station received. This screen shows information from a digipeater — power, height and antenna info.

about a local digipeater and Figure 3 shows some information about a mobile station.

You have some options to configure how those pages look, but it's basically the call sign, a message, an arrow that points toward the station from your current location and the distance from you (if you've programmed your location, or connected a GPS to your control unit). If you receive a packet from someone who has a weather station, you can see what the weather's like in their backyard. You can connect a Davis or Peet Bros weather station directly to the RC-D710 and let everyone know what's happening in your backyard, too.

As you monitor, the RC-D710 builds a list of up to 100 stations. It ignores packets that duplicate information it already has, so the list is 100 unique stations. The list can be sorted and filtered in several ways. You can sort by call sign, by age of the packet and by distance from you. You can filter the list by any of the parameters Kenwood defines (such as digipeater, weather, mobile), or a final OTHER category that's just "everything else." Those options cut the list down to size when you want to keep tabs on something specific.

To send your own position, you can program your coordinates for base station use (it holds five sets of coordinates, in case you move the radio between locations), or you can connect a GPS receiver for operation on the move. The cord from a GPS receiver plugs into a subminiature (3/32 inch) stereo jack on the side of the control unit. That's not exactly standard for GPS connections — most PCs accept 9-pin serial or USB. Kenwood provides a cable with the little plug on one end, and bare wire (very small, wispy wire that challenged my soldering skill) on the other. The manual shows a picture of a GPS that looks an awful lot like an antique Garmin GPSIII, which I just happened to have. So I connected that. The manual doesn't say anything about connecting some of the newer USB style GPS receivers. And the RC-D710 doesn't provide power for the GPS. Fortunately, my Garmin cable had separate power leads. I clipped off the old plug and attached my now-standard Anderson PowerPoles.

My Internet research turned up a couple of GPS units designed specifically for the Ken-

wood D710 (radio or control unit). I haven't played with them, so I'll let you search them up yourself. Just be aware that they exist.

There are several options for sending out your position beacon. For fixed stations, once every half hour or more should do. For mobiles, "SmartBeaconing" sends more beacons when you're moving quickly or turning than when you're moving slowly.

Weather stations (Davis or Peet Bros) also plug into the GPS port, so you have to choose. Okay, who has a weather station in their car? I know two hams who do!

You've Got Mail?

But remember that Bob Bruninga, WB4APR, reminds us that APRS does a lot more than just vehicle tracking. At the ARRL/TAPR Digital Communications Conference last September, Bob said that APRS should be *the* message channel for Amateur Radio. If anything is happening in your area, there should be bulletins about it on APRS.

The RC-D710 supports APRS messaging. Anytime someone sends a bulletin or message directed to you, it's right there on your screen. And you can dial back to read messages that flew by, until they become the 101st on the list and vaporize.

It's easier to *read* a message than it is to *send* one, as the unit lacks a keyboard. To enter a message, you use the dial to scroll through the alphabet — upper and lower case, numbers, punctuation and special characters — letter by letter to compose your message. See Figure 5. This is tedious, and not something to try while driving. There is some memory to compose and store a few routine messages.

DX PacketCluster Operation

There is no question that APRS is the killer app that the RC-D710 is aimed at. But along for the ride is the ability to monitor

(but not connect or send packets to) DX PacketClusters. Punch the DX button on one of the menus and you can collect a list of DX spots transmitted by your local cluster. Unfortunately, I couldn't get a strong enough signal from my local PacketCluster to test this feature.

No Mailbox

An optional cable connects an 8-pin mini DIN on the back of the control unit to a 9-pin serial connector on your PC. With this you can use just about any packet program for non-APRS operation such as bulletin boards, DX Cluster connections and APRS programs with maps, such as *UI-View* and *APRS+SA*. My PC has such a connector, but many do not, so you may need a serial to USB adapter.

One thing that the RC-D710 *doesn't* have, that most "full-featured" TNCs *do* have, is an internal mailbox. With a mailbox, other stations can connect to your packet station, leave and even retrieve mail. Some PBBSs can automatically connect to your mailbox and deposit mail that arrived via the packet network. I'd miss that feature. I used to enjoy surfing to other mailboxes and dropping a message. I don't think we called it surfing back then, but we would have if we had thought of it.

Packet Made Easy?

I said earlier that the packet learning curve quickly becomes a wall. The Kenwood system makes entry easier, but the RC-D710's TNC still has 100 individual parameters to set. You can leave most of them at the default setting and get by okay, but they are still there, begging the question: why? The manual provides a cursory explanation of each, but gives no clue about what changes you might want to make, and why. Some of



Figure 3 — Here's info on a mobile in motion (though his speed is zero, so he's sitting still). It shows the direction he's headed (229°), his altitude (43 feet) and that he's 77.6 miles southeast of me (the arrow pointing to 120°).



Figure 4 — This is what you see from a station with a weather station connected.

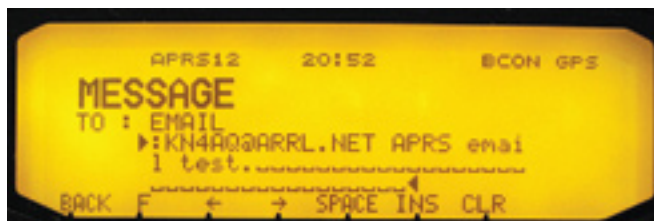


Figure 5 — I've composed a message that I want to be sent via Internet e-mail. It's very tedious to select each letter using the dial.

the answers are on the Internet, or in some of the textbooks available for packet radio. Perhaps you'll be interested enough to acquire this education.

The problem with reviewing equipment is that you end up wanting one of just about everything you review. I enjoyed my foray

back into packet, and before I send this unit back, it's going "balloon hunting" this weekend as I help chase a high-altitude balloon that's scheduled to float over Raleigh. After that, I'll probably try to resurrect my old TNC, but it won't be the same as having the information readily on display.

Please, Mr Editor, don't send me any \$6000 HF radios.

Manufacturer: Kenwood USA Corp, 3970 Johns Creek Ct, Suite 100, Suwanee, GA 30024; tel 310-639-4200, fax 310-537-8235; www.kenwoodusa.com. *Price:* RC-D710, \$350; PG-5J interface kit, \$85.