Edited by **Joe Bottiglieri, AA1GW** • Assistant Technical Editor

The Kenwood TS-570S(G) HF/6-Meter Transceiver

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An evaluation of the Kenwood TS-570D HF transceiver appeared in a *QST* product review in January 1997. Since that time some additional refinements have been made to this series. Shortly after that issue of *QST* hit the streets, Kenwood released a second version—the TS-570S. The 'S version of the radio was nearly identical to the 'D—the only difference being the addition of all-mode capabilities on the 6-meter band.

Just a few months ago, Kenwood announced a second generation of this already popular transceiver series. These new units are now designated "G" versions. Two separate models are still available—the TS-570D(G) for the HF bands, and the TS-570S(G) covering both HF and 6 meters.

This time around we'll be concentrating primarily on the changes made in the G versions, and presenting lab measurement data and some operational details on the 6-meter capabilities of the TS-570S(G). The HF performance specifications of the new units remain virtually unchanged from those of the previous review's TS-570D. The lab data presented in Table 1 for all bands other than the 6-meter band is data taken directly from that review (spot checks of our new unit confirmed very similar HF performance).

If you're considering purchasing any radio in this series you'll definitely want to have a look at the earlier review. Members can view that article (or reviews on any equipment that we've covered in the *QST* product review column since January 1980 for that matter) and an Expanded Test Result Report free of charge on our Member's Only Web site.

Non-members, or members without Internet access, can order paper copies for a nominal fee through the ARRL Technical information Service (860-594-0278 or **reprints@arrl.org**). Members receive a discount on these reprints. Additional lab test data on 6-meter band performance and the enhanced DSP capability of our product review '570S(G) is available as an Expanded Test Result Report.

Those who purchased the initial versions of these radios will be pleased to hear that the new capabilities offered in the G versions can be retrofitted to the earlier units by Kenwood's service facilities (currently $125 plus shipping). 6 meters, however, can not be added to either the D or D(G) models.

6-Meter Capabilities

The TS-570S(G) provides 100 W all-mode band coverage (25 W AM) from 160 through 6 meters and an extended general coverage receive range of 0.5 to 60 MHz. The built-in antenna tuner also works on 6 meters, and comes in very handy for matching a single 6-meter antenna across the relatively wide 4 MHz range between 50 and 54 MHz. The tuner is also effective for employing a number of antennas intended primarily for HF, such as 40 and 80-meter dipoles for example, on 6 as well.

Outputs are provided for two separate coax feedlines. Either can be assigned to any combination of bands—making it convenient to connect different antennas for HF and 6 meters.

For FM repeater operations, all versions of the '570 include CTCSS encode *and* decode built-in. Many of the repeaters on both 6 and 10 meters use CTCSS to control the interference between repeaters that commonly occurs when these bands are open. Operating frequencies for repeater inputs and outputs are entered independently using the same arrangement used for split VFO operation on the HF bands (not by setting offset and duplex as is common with the hand-helds and mobiles). CTCSS settings and repeater frequency pairs can be stored in any of the unit's memories. Independent CTCSS tones for transmit and receive on a single frequency or repeater pair, however, are not available.

As we mentioned in the earlier review, these transceivers have built-in features that make them well suited for use as an IF with external VHF and UHF transverters. These include a display arrangement that corrects the frequency readout to indicate the resulting operating frequency for 6 and 2 meters and 70 cm, and a system that automatically reduces the transmitter power output to a more manageable 5 W.

Couple this with the 'S version's 100 W all-mode 6-meter output and the radio's built-in digital signal processing, CW memory keyer (an optional voice recorder is also available) and compact size—and this unit could serve nicely as the backbone for a roving or hilltopping station for VHF/UHF contesters.

Bottom Line

The new G versions of the popular TS-570D and TS-570S add significant new features to these already nicely-equipped mid-priced transceivers.

What's New?

I happened to have access to an early production unmodified TS-570S. This gave me the unique opportunity to set up the new G version side by side with a first generation unit.

The G version includes a handful of new abilities and improvements on some of the original features. One of the more notable changes is an enhancement of the NR1 DSP noise reduction feature, used primarily on SSB. In the earlier model, the SSB noise reduction works well, but imparts the typical watery audio quality common in most of the current DSP implementations. In the new G version, a menu item has been added that allows you to vary the amount of noise reduction employed. While on the earlier radio I often found myself leaving NR1 off except under extreme conditions, with this new flexibility I can strike a balance between the amount of noise reduction and the resulting reduction in the overall audio clarity. There's also an "auto" setting that varies the level of noise reduction based on the signal strength.

Table 1

Kenwood TS-570S(G), serial number 00600059

Unless otherwise noted, HF specifications and measurements were taken from an earlier review of a TS-570D, serial number 80600403 (see text).

Manufacturer's Claimed Specifications	***Measured in the ARRL Lab***
Frequency coverage: Receive, 500 kHz–30 MHz; transmit, 1.8-2; 3.5-4; 7-7.3; 10.1-10.15; 14-14.35; 18.068-18.168; 21-21.45; 24.89-24.99; 28-29.7 MHz. TS-570S(G) adds 30–60 MHz on receive and 50–54 MHz on transmit.	Receive, 0.3–30 MHz (0.3-60 MHz for TS-570S(G)); transmit, as specified.
Modes of operation: USB, LSB, CW, AM, FM, FSK.	As specified.
Power requirement: Receive, 2 A (no signal); transmit, 20.5 A, at 13.8 V.	Receive, 0.8 A (max volume, no signal); transmit, 18 A (max), tested at 13.8 V.
Size (HWD): 3.8×10.6×10.6 inches; weight, ≈15 lb.	
Receiver	*Receiver Dynamic Testing*
SSB/CW/FSK sensitivity (bandwidth not specified, 10 dB [S+N]/N): 0.5-1.7 MHz, 4 μV; 1.7-24.5 MHz, 0.2 μV; 24.5-30 MHz, 0.13 μV; TS-570S(G) only, 50-54 MHz, 0.13 μV.	Minimum discernible signal (500-Hz filter): *Preamp off* / *Preamp on* 1.0 MHz: –113 dBm / –121 dBm 3.5 MHz: –132 dBm / –140 dBm 14 MHz: –130 dBm / –139 dBm 50 MHz: –128 dBm / –141 dBm
AM sensitivity (bandwidth not specified, 10 dB [S+N]/N): 0.5-1.7 MHz, 31.6 μV; 1.7-24.5 MHz, 2 μV; 24.5-30 MHz, 1.3 μV; TS-570S(G), 50-54 MHz, 1.3 μV.	10 dB (S+N)/N, signal 30% modulated with a 1-kHz tone: *Preamp off* / *Preamp on* 1.0 MHz: 8.4 μV / 3.3 μV 3.8 MHz: 1.05 μV / 0.4 μV 53 MHz: 1.43 μV / 0.38 μV
FM sensitivity: For 12-dB SINAD, 28-30 MHz, 0.25 μV; TS-570S(G), 50-54 MHz, 0.25 μV	For 12-dB SINAD: preamp off, 29 MHz, 0.6 μV; 52 MHz, 0.79 μV; preamp on, 29 MHz, 0.15 μV; 52 MHz, 0.19 μV.
Blocking dynamic range: Not specified.	Blocking dynamic range (500-Hz IF filter): *Preamp off* / *Preamp on* 1.0 MHz: 114 dB* / 115 dB 3.5 MHz: 114 dB* / 119 dB* 14 MHz: 115 dB* / 115 dB* 50 MHz: 108 dB* / 106 dB*
Two-tone, third-order IMD dynamic range: Not specified.	Two-tone, third-order IMD dynamic range (500-Hz IF filter:) *Preamp off* / *Preamp on* 1.0 MHz: 86 dB / 91 dB 3.5 MHz: 99 dB / 99 dB 14 MHz: 98 dB* / 97 dB* 50 MHz: 98 dB* / 88 dB
Third-order input intercept point: Not specified.	*Preamp off* / *Preamp on* 1.0 MHz: +19.5 dBm / +19.5 dBm 3.5 MHz: +17 dBm / +9.4 dBm 14 MHz: +21.7 dBm / +9.6 dBm 50 MHz: +21.0 dBm / –9.5 dBm
Second-order intercept point: Not specified.	14 MHz, preamp off, +60 dBm; preamp on, +59 dBm.
FM adjacent channel rejection: Not specified.	Preamp on, 29 MHz, 68 dB; 52 MHz, 66 dB

The manual settings worked best for me.

All versions include a menu item that allows you to tailor the transmit audio characteristics. Settings include flat (or "off"), high boost, formant pass, bass boost and "conventional." A separate variable speech processor is also included. These are nice capabilities—the only problem is that with the earlier '570s, you can't listen to the resulting audio without a second receiver!

The G version now includes a transmit audio monitor. You can switch this on and vary the monitor audio output level through a menu setting. A sample of your transmit audio can now be monitored through the speaker or by using headphones. This feature is also very convenient for evaluating the performance of accessory microphones.

Curiously, the transmit audio equalizer menu item on the G now also includes a setting titled "U." The manual refers to this setting only as "Not *currently* available." Hmmm…

Another nice addition in the G is a receive audio equalizer. This allows you to perform the same types of audio shaping on received audio. Anyone who has spent extended periods of time operating, during contests for example, will appreciate the ability to vary the audio tone of the receiver occasionally. This can go a long way toward reducing fatigue as the hours roll on! This menu item also includes the mysterious "U" setting.

Just for the CW Operators

The G models have also added some new features particularly of interest to CW operators.

There's a new setting that allows you to manually adjust the CW weighting. The earlier versions have auto weighting—the ratio automatically tracks the keying speed. With auto weighting disabled, the previous models would default to 3.0:1. The new versions allow you to use the auto weighting *or* to manually adjust the weighting to your own preferences—16 ratios between 2.5:1 and 4.0:1 are available.

One of the most innovative features included in all the '570s is "CW Zero-Beat." Tune close to a CW signal, press the **CW TUNE** button, and the radio automatically tunes to and zero-beats the signal. The system works very well with all but the weakest signals or busiest band conditions.

In the G versions, the **CW TUNE** button can also be used to automatically set an RIT offset. A menu setting can unlock the transmit and receive frequencies of the "Auto Zero-Beat" system, allowing you to retune to CW signals without changing your transmit frequency, a very handy capability for net or roundtable operations.

All '570s use DSP to provide a wide range of CW filter bandwidths (optional conventional CW filters for 500 or 270 Hz are also available). The new units have even improved on this slightly. The originals included DSP-based bandwidths of 50, 100, 200, 300, 400 and 600 Hz and 1.0 and 2.0 kHz. The G versions add some welcome additional bandwidths of 80, 150 and 500 Hz.

Computer Controllability

As we mentioned in the earlier review, the 570 series radios include a built-in level converter for easy connection to your computer. Since that time, Kenwood has made available a very impressive *Windows*-based software package. You can download this free from Kenwood's Web site: **http://www.kenwood.net**. Download the software,

Manufacturer's Claimed Specifications	*Measured in the ARRL Lab*
FM two-tone, third-order IMD dynamic range: Not specified	Preamp on, 20 kHz spacing, 29 MHz, 67 dB; 52 MHz, 62 dB; 10 MHz spacing, 52 MHz, 96 dB.
Noise reduction: Not specified.	NR1, ≈10 dB; NR2, ≈20 dB (at default 20 ms setting).
Beat cancel attenuation: Not specified.	50 dB or greater notch.
S-meter sensitivity: Not specified.	S9 signal at 14 MHz: preamp off, 94 μV; preamp on, 25 μV. 52 MHz: preamp off, 90 μV; preamp on, 12 μV.
Squelch sensitivity: SSB, CW, FSK, AM, 0.5-1.7 MHz, 20 μV or less; 1.7-30 MHz, 2 μV or less; FM, 28-30, 50-54 MHz, 0.25 μV or less.	FM, at threshold, 29 MHz, 0.04 μV; 52 MHz, 0.04 μV; SSB, at threshold, 14 MHz, preamp on, 0.4 μV.
Receiver audio output: 1.5 W at 10% THD into 8Ω.	2.1 W at 3.7% THD into 8 Ω.
IF/audio response: Not specified.	Range at –6 dB points, (bandwidth): CW (500-Hz IF/600-Hz DSP): 258-769 Hz (511 Hz) CW (500-Hz IF/100-Hz DSP): 443-557 Hz (114 Hz) CW (500-Hz IF/50-Hz DSP): 470-530 Hz (60 Hz) USB wide: 286-2433 Hz (2147 Hz) USB narrow (DSP controls at 12 o'clock): 404-1633 Hz (1229 Hz) LSB wide: 287-2428 Hz (2141 Hz) LSB narrow (DSP controls at 12 o'clock): 404-1626 Hz (1222 Hz) AM wide: 115-2670 Hz (2555 Hz) AM narrow:113-1270 Hz (1157 Hz)
IF rejection: 70 dB.	115 dB.
Image rejection: 70 dB.	109 dB.
Transmitter	*Transmitter Dynamic Testing*
Power output: SSB, CW, FM, FSK, 5-100 W; AM, 5-25 W.	SSB, 5-115 W; CW, 5-108 W (varies slightly from band to band); AM, 5-23 W; FM, 5-109 W.
Spurious-signal and harmonic suppression: 50 dB.	As specified. Meets FCC requirements for spectral purity.
SSB carrier suppression: 40 dB or greater.	As specified.
Undesired sideband suppression: 40 dB or greater.	As specified.
Third-order intermodulation distortion (IMD) products:	See Figure 1.
CW keyer speed range: Not specified.	Approximately 10-75 wpm.
Transmit-receive turnaround time (PTT release to 50% audio output): Not specified.	S9 signal, 50 ms.
Receive-transmit turnaround time ("tx delay"): Not specified.	SSB, 18 ms; FM, 14 ms.

Unless otherwise noted, all dynamic range measurements are taken at the ARRL Lab standard spacing of 20 kHz.
*Measurement was noise-limited at the value indicated.

Expanded Product Review Report Available

The ARRL Laboratory offers a detailed test result report on the Kenwood TS-570S(G) that gives in-depth, technical data on the transceiver's performance. Request the *TS-570S(G) Test Result Report* from the ARRL Technical Department, 860-594-0278; e-mail **mlevesque@arrl.org**. Members can see this on-line on our Member's Only Web site.

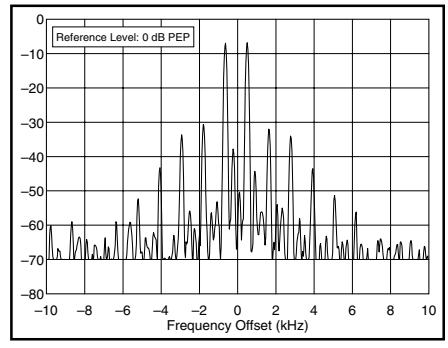

Figure 1—Spectral display of the TS-570S(G) transmitter during two-tone intermodulation distortion (IMD) testing on 6 meters. The worst-case third-order product is approximately 32 dB below PEP output, and the worst-case fifth-order product is approximately 35 dB down. The transceiver was being operated at 100 W output at 50.2 MHz.

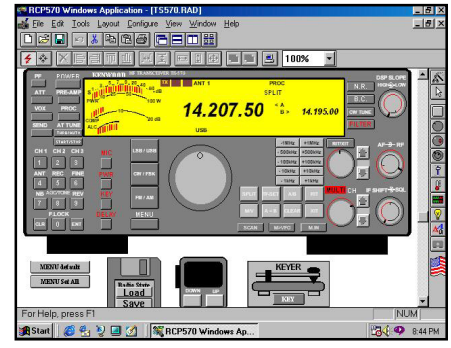

Figure 2—The Kenwood RCP570 control software displays a virtual front panel nearly identical to that of the actual transceiver. Extensive documentation in the owner's manual and the software package should be very helpful to those interested in developing their own control software.

install a common computer interconnect cable between the male DB-9 connector on the back of the transceiver and the COM port on your computer, load the software and you're ready to go—no additional interface hardware is required.

The software displays a virtual representation of the front panel (see Figure 2). While under computer control, you can use either the actual front panel switches and knobs or the mouse and virtual front panel to operate nearly any control on the radio—even the rotary controls such as the volume, squelch and DSP slope settings for example.

The presently available version of the software was designed for the earlier radios. It does not yet include the program modifications necessary to operate the expanded features in the G versions.

The Future?

The improvements made in the new G versions of the TS-570s are subtle but significant—those who purchased the earlier radios will certainly want to consider sending them in for updating.

Kenwood's willingness and ability to install these added capabilities into the earlier existing TS-570D and S models is certainly noteworthy. These changes do not reflect corrections of significant operational defects in the original units—they are simply improvements that further refine an already well-designed product. Will the time come when the processors or internal control and applications software included in most amateur transceivers become user updateable?—Perhaps.

Modern electronics and computer-based products continue to evolve rapidly. What a great time to be a Ham!

Manufacturer: Kenwood Communications Corp, 2201 E Dominguez St, Long Beach, CA 90801; tel 310-639-5300, fax 310-537-8235; **http://www.kenwood.net**. Manufacturer's suggested retail price, $2070. Typical current street price, $1400.