Conducted By James W. Healy, NJ2L
Assistant Technical Editor

Kenwood TS-790A VHF/UHF Transceiver

Reviewed by James W. ("Rus") Healy, NJ2L

Kenwood's marketing of the triband TS-790A plays heavily on this transceiver's satellite capabilities. Considering the number of Amateur Radio satellites that are currently in service—and that just about anyone, anywhere, can put up satellite antennas and work neat stuff through them—that's probably a sound strategy. For those whose interests lie more in terrestrial and extraterrestrial weak-signal work and contesting, the rig's satellite conveniences aren't as important as a strong receiver, easy operation and a good balance of features. Fortunately, the Kenwood engineers who designed the TS-790A were also thinking of weak-signal operators and contesters when they designed this radio.

Standard Features and Options

Some of the TS-790A's features are common to most similar rigs. Among these features are direct frequency entry, computer-control capability, and selectable automatic mode and repeater-offset selection (according to ARRL band plans). Other TS-790A features, though, haven't often been offered in rigs in its class. For instance, the '790 can receive simultaneously on two bands—and can receive on one band *while you're transmitting* on another. It comes with a 500-Hz CW filter, two VFOs per band, relatively high power output (discussed later), a speech processor, and fast/slow receiver-AGC selection. The TS-790A also has Automatic Lock Tuning (ALT—a circuit designed to minimize drift during FM operation on the 23-cm band) and dual AF-gain and squelch controls (one set for each receiver). A 287-MHz IF input/output is also included to make 23-cm fast-scan-TV operation easy.

Coverage of the 144- and 430-MHz bands is standard on the TS-790A; the 1240- to 1300-MHz module is optional. Installing the 23-cm module is easy, requiring only plugging two wiring harnesses into the appropriate chassis-mounted connectors and installing the dozen-plus screws that secure the die-cast aluminum module to the radio's sturdy steel subchassis. It took me less than 15 minutes to unpack and install the 23-cm module, including replacing the rig's top cover. This process is expedited by good instructions and diagrams in the *TS-790A Instruction Manual*.

Kenwood has included a number of useful features common to the better MF/HF transceivers on the market. These include split-VFO operation and easy VFO manipulation (**A/B** selects the current VFO, **A=B** equalizes the settings of the two VFOs, **M/VFO** toggles between memory-channel and VFO operation). Each VFO stores frequency, mode, CW-filter selection, RIT status (but not the actual RIT offset) and frequency-step size. The TS-790A also has RIT and IF shift. In short, this rig is quite reminiscent of modern low-band radios; so much so, in fact, that most operators familiar with such rigs should have no trouble learning and using the '790.

The TS-790A is laid out well for operating on two bands at once. Audio from each receive channel can be routed to separate speakers or the two channels of stereo headphones, or it can be mixed and delivered via an external speaker or the radio's internal speaker. A front-panel push button selects monaural or stereo audio, and separate **AF** gain controls regulate the received-audio levels on each band. The radio's receivers can operate on any two of the installed bands.

The TS-790A has dual 100-Hz-resolution displays. The main display shows frequency, mode, filter selection (on CW), RIT offset and the status of several other functions pertinent to the main (transceive) band. The sub (receive-only) band display includes all the information that the main display shows, except RIT status and offset, CW wide/narrow filter selection, and split-VFO operation, none of which are available on the sub band. Both displays are easy to read from most angles and under essentially all lighting conditions.

The '790's multifunction analog meter is easy to read, as is the sub-band fluorescent S meter. Although somewhat slower in response than the analog meter, the sub-receiver meter agrees closely with the main receiver's analog meter and provides a useful visual indication of sub-band signal strength. This is important during simultaneous two-band reception; when you're listening to separately-regulated audio from both bands, a visual indication of relative signal levels on each band is useful. Neither meter is reliable for absolute signal-strength measurements (see the section called FM Operation, later in this review), but both meters are useful nonetheless.

Separate antenna connections are provided for each band. UHF connectors are used on the 144- and 430-MHz bands, and an N connector provides the 1296-MHz attachment point. The TS-790A can independently control power amplifiers for each band via a DIN jack on the rig's back panel. The control outputs are open-collector transistors that aren't capable of directly controlling high-current relay solenoids, although they can handle small relays or external transistors.

The only thing close to an RF-gain con-

Table 1

Kenwood TS-790A VHF/UHF Multimode Transceiver, Serial no. 0010613

Manufacturer's Claimed Specifications	*Measured in ARRL Lab*
Frequency coverage: 144-148 and 430-450 MHz standard; 1240-1300 MHz optional.	Transmit, as specified. Receive: 140-165 MHz, 430-450 MHz, 1240-1300 MHz.
Modes of operation: CW, FM, LSB, USB.	As specified.
*Receiver**	*Receiver Dynamic Testing**
Sensitivity (bandwidth not specified): Less than 0.16 μV (−123 dBm).	Minimum discernible signal (noise floor) with 500-Hz filter: 144 MHz, −143 dBm; 432 MHz, −142 dBm; 1296 MHz, −142 dBm.†
Dynamic range: Not specified.	Blocking dynamic range:‡ 144 MHz, 126 dB; 432 MHz, 111 dB; 1296 MHz, not measured.†
	Two-tone, third-order intermodulation distortion dynamic range:‡ 144 MHz, 79 dB; 432 MHz, 81 dB; 1296 MHz, not measured.†
	Third-order input intercept: 144 MHz, −24.5 dBm; 432 MHz, −20.5 dBm; 1296 MHz, not calculated.†
RIT range: CW/SSB: ±1.9 kHz; FM, ±9.9 kHz.	As specified.
S-meter sensitivity (μV for S9 reading): Not specified	144 MHz, 4.5; 432 MHz, 7.5; 1296 MHz, not measured.
SSB squelch sensitivity: Less than 0.20 μV.	144 MHz, 0.05-0.5 μV; 432 MHz, 0.3-1.1 μV.
Transmitter	*Transmitter Dynamic Testing*
Transmitter power output (watts):	

	CW/FM	SSB
144 MHz	45	35
430 MHz	40	30
1296 MHz	10	10

	—CW—		—FM—		—SSB—	
	Min	Max	Min	Max	Min	Max
144 MHz	4.4	50	4.2	48	3.2	37
430 MHz	4.0	44	4.0	44	3.2	35
1296 MHz	1.1	11	1.1	11	1.1	11

Spurious signal and harmonic suppression: 144 and 430 MHz, −60 dBc; 1240 MHz, −50 dBc.	As specified. See Fig 1.
Third-order intermodulation distortion products: Not specified.	See Figs 2-4.
Transmit-receive turnaround time (PTT release to 90% audio output, S1 and S9 signals): Not specified.	S1 signal, 19 ms; S9 signal, 16-19 ms.
Other	
Power requirement: 13.8 V, 2.5-15 A.	Receive: 2.1-2.2 A. Transmit low power: 4.5-5.1 A; transmit high power, 7.5 A (1240 MHz) to 13 A (430 MHz).
Receiver audio output: 1.5 W at 10% total harmonic distortion (THD) with an 8-Ω load.	1.8 W at 10% THD with an 8-Ω load.
Size (height × width × depth): 5.3 × 13.5 × 14.5 inches, 20.2 lb.	

*See Table 2 for FM receiver specifications and test results.

†Test-equipment limitations prevented measuring 1296-MHz receiver performance (except MDS, which was measured using the TS-790A's 287-MHz auxiliary IF input/output).

‡Blocking and third-order IMD dynamic range measurements were made at the ARRL Lab standard signal spacing of 20 kHz.

trol on the TS-790A is the front-panel **144 ATT** button. This switch usually toggles a 10-dB attenuator in and out of the 144-MHz receive line, but it can also be used to control an external 2-meter preamplifier, if desired.

The '790 comes with DIN plugs to match its accessory connectors, a power cable (fused in both leads) and a hand microphone with up/down frequency-control buttons. Options include a 13.8-V power supply (model PS-31) with a dual-speed, thermostatically controlled fan, a voice synthesizer, a computer-control interface (RS-232-C to TTL level converter), a programmable CTCSS decoder, external speakers, SWR/wattmeters, and other accessories and microphones.

Frequency Control

Getting the TS-790A on frequency is straightforward. The multifunction keypad just to the left of the tuning knob allows direct frequency entry, and the **BAND** key lets you select among the three bands. Either receiver can be easily programmed from the keypad or the **BAND** key by first selecting the desired receiver using the **MAIN** and **SUB** keys (indicators above these buttons shows you which receiver is selected). The **MHZ** button turns the main-tuning knob into a 1-MHz-step control, and the **CH.Q** button lets you tune in 5-kHz steps (1-kHz steps when the **STEP** function is activated). The main-tuning knob usually tunes the TS-790A in 20-Hz steps (10 kHz per knob revolution), and in 100-Hz steps (50 kHz per revolution) when the **STEP** function is enabled. The '790 senses knob-rotation speed and increases tuning rate when the knob is turned quickly. The RIT tunes in 20-Hz steps.

When the **CH.Q** button is pressed, a solenoid engages (with a *clunk*) a detent mechanism in the main-tuning knob's drive train, giving the radio a channelized feel. This is particularly useful for FM operation when the radio is set to tune in 5-kHz steps, and it's also the most convenient way to make quick frequency transitions of 100 kHz or so during SSB/CW operation.

The TS-790A's grouped function keys, **MAIN, SUB, A/B, A=B, MAIN ⇆SUB, VFO/M, BAND** and **MHZ**, are the center of activity. These controls typify the radio's front-panel layout: simple, uncluttered and easy to use. Most of the radio's controls are reasonably intuitive. For instance, the **MAIN ⇆SUB** key swaps the contents of the main and sub receivers. Here's how that function is useful: The TS-790A transmits only on the main band, so if you're tuning two bands at once and you come across a station you want to work on the sub band, you need to swap the contents of the main and sub bands to work the station.

On the Air

As Table 1 reveals, the TS-790A's SSB

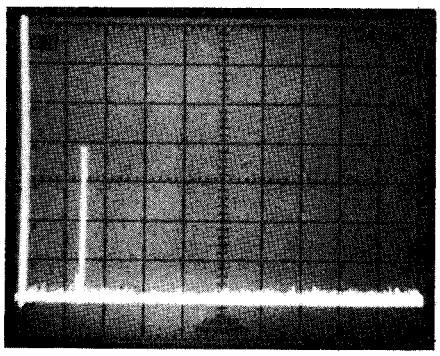


Fig 1—Kenwood TS-790A worst-case spectral display. Horizontal divisions are 100 MHz; vertical divisions are 10 dB. Output power is approximately 4.5 W at 144.2 MHz. The fundamental has been notched by approximately 32 dB to prevent spectrum-analyzer overload. All harmonics and spurious emissions are at least 64 dB below peak fundamental output. The TS-790A complies with current FCC specifications for spectral purity for equipment in this power-output class and frequency range.

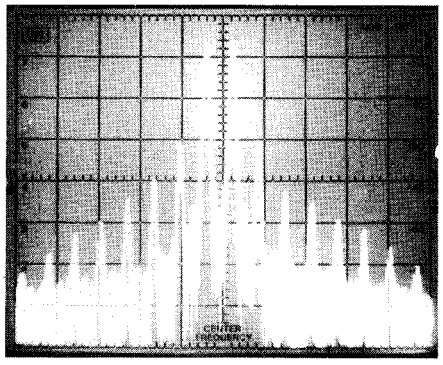


Fig 2—Spectral display of the TS-790A transmitter during two-tone intermodulation distortion (IMD) testing at 144 MHz. Third-order products are approximately 30 dB below PEP output, and fifth-order products are approximately 40 dB down. Vertical divisions are 10 dB; horizontal divisions are 2 kHz. The transceiver was being operated at 36 W PEP output on 144.2 MHz.

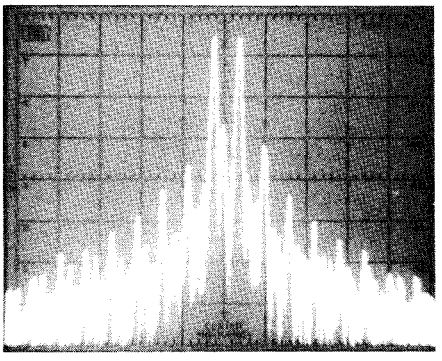


Fig 3—Spectral display of the TS-790A transmitter during two-tone intermodulation distortion (IMD) testing at 432 MHz. Third-order products are approximately 32 dB below PEP output, and fifth-order products are approximately 43 dB down. Vertical divisions are 10 dB; horizontal divisions are 2 kHz. The transceiver was being operated at 30 W PEP output on 432.2 MHz.

Table 2
Kenwood TS-790A Receiver FM Specifications and Lab-Test Results

Manufacturer's Claimed Specifications	*Measured in the ARRL Lab*
Sensitivity: Less than 0.22 μV (−120 dBm).	12 dB SINAD: 146 MHz, −124 dBm; 440 MHz, −124 dBm; 1296 MHz, not measured.†
Squelch sensitivity: Less than 0.16 μV.	*Min* / *Max*: *146 MHz* 0.2 μV / 0.04 μV; *440 MHz* 0.35 μV / 0.1 μV; *1296 MHz* Not measured.†

†See Table 1.

and CW receiver performance is a great improvement over most earlier multimode VHF/UHF radios. Specifically, the radio's blocking and IMD dynamic ranges are generally better than any other multiband VHF/UHF transceiver we've tested in the ARRL Lab.[1] As long as strong in-band signals are clean, it's possible to operate quite close in frequency to them with the '790, even with high-gain, low-noise preamplifiers ahead of the receiver. Although the '790's IMD dynamic range isn't as good as the current crop of MF/HF transceivers, it's better than most other VHF/UHF radios. With the wide range of signal amplitudes commonly found on VHF and UHF, wide blocking dynamic range is (arguably) more important than IMD dynamic range, and in this area, the TS-790A is far ahead of its competition. Its sharp, 20-kHz-wide first IF ("roofing") filter helps keep relatively distant in-band signals from degrading receiver performance. Although we lack the equipment needed to make quantitative receiver tests on the 23-cm band, in practice, the TS-790A performs almost as well on that band as it does on the 144- and 432-MHz bands.

Because the TS-790A is reasonably sensitive, it can be used without external receiving preamplifiers for some operation, but to wring the most performance from this radio, preamps are a must for any kind of weak-signal work—especially on 23 cm. The TS-790A's noise blankers (one in each receiver) are enabled by a single button. The blankers are effective against automotive ignition noise and radar signals, as long as these signals are above the blanker threshold. In many cases, such signals can be strong enough to be annoying, but still below the blanker threshold, unless external preamplifiers are used.

Preamplifier use is important for another reason. During weak-signal tropo work, many copyable signals are above the noise floor, but below the TS-790A's AGC threshold. This results in annoying changes in received-audio level as signals fade up and down. Preamplifiers push incoming signals above the AGC threshold, minimizing this problem.

[1]Yaesu's FT-736R (reviewed in May 1990 *QST*) performs comparably on 144 MHz.

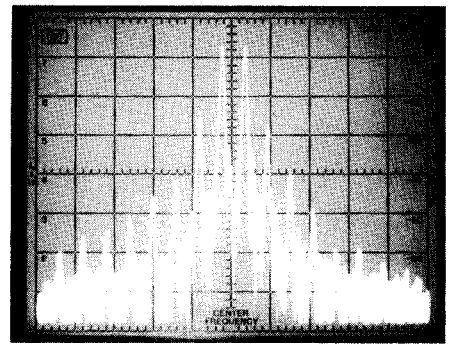


Fig 4—Spectral display of the TS-790A transmitter during two-tone intermodulation distortion (IMD) testing at 1296 MHz. Third-order products are approximately 25 dB below PEP output, and fifth-order products are approximately 40 dB down. Vertical divisions are 10 dB; horizontal divisions are 2 kHz. The transceiver was being operated at 10 W PEP output on 1296.1 MHz.

I used the TS-790A in several contests, including an ARRL September VHF QSO Party trip to a 3000-foot-ASL mountaintop in eastern New York (grid square FN21), where the radio performed quite well. From that location, I was quite close to a number of big-signal multioperator stations, but I was easily able to work stations close to them in frequency, even with external preamplifiers in line. When I was operating more than 10 kHz away from clean signals, I couldn't even tell they were there; only dirty signals caused me problems. The CW and SSB filters have good shape factors and high stop-band attenuation. In the past, it's been necessary to use purpose-built receive converters with strong HF receivers to get this kind of performance at VHF and UHF. The radio's many conveniences and ease of operation, particularly its quick band-change capability, make it a pleasure to operate for long periods.

Signal reports I received from other stations indicate that the '790's transmitted SSB audio is good, but that the speech processor decreases signal intelligibility. Using the processor also makes the rig's

very touchy **MIC**rophone-gain control even more sensitive and difficult to adjust. Other TS-790A users have mentioned this also.

The TS-790's power levels are well suited to hilltop-portable operation (especially here in "The Corridor" between Boston and Washington, DC). Sporting 35-45 W on 2 meters, 30-40 W on 70 cm, and 10 W on 23 cm, the '790 has enough power for real DX QSOs with reasonably small antennas and favorable conditions. From most home stations, the rig doesn't produce quite enough power (except, arguably, on 1296, where considerably higher antenna gain is practical), but it has more than enough power to drive most solid-state and tube-type linear amplifiers. That's where one aspect of the rig's design got in my way. The power amplifiers I use require different relative drive levels, but the TS-790A has only one **RF PWR** control, so I had to use attenuators between the radio and the amplifiers. (The **RF PWR** control has about a 10:1 adjustment range, but having to adjust that control with each band change impairs the '790's great band-changing flexibility.)

Two-Band Operation

In both satellite and terrestrial weak-signal work, the TS-790A is quite capable. Select the active receiver using the **MAIN** and **SUB** keys, choose an audio mode (one receiver in each ear, for instance), then tune the active receiver. If you're working stations on the main band and you find a station you want to work on the sub band, hit the **MAIN ⇆ SUB** button, call and work the station, and poke the button again to get back to your main-band frequency. This is also quite handy for moving stations from band to band during contests. To make two-band operation easier, the TS-790A includes a **MUTE** button for each receiver. If you come across a weak station on one band while you're listening to a strong signal on another band, pressing the appropriate **MUTE** button cuts the strong signal's audio by a user-adjustable level that's factory-preset at 12 dB.

Because the receivers are entirely separate, you can tune one band while you're transmitting on another band. Even when I ran 500 W on 2 meters, I could tune 432 MHz—with the two antennas less than three feet apart on the same mast—with very little interference from the third harmonic of my 144-MHz signal. Steve Powlishen, K1FO, ran 1.5 kW into his 16-Yagi 432-MHz array and had similar results when tuning 1296 MHz; and his 23-cm Yagi is right smack in the middle of the 432 array! Of course, if you use an amplifier with relatively poor third-harmonic suppression, you may need to add output filtering to it to get similar performance during multiband operation.

One of the '790's most interesting and useful features is implemented by the **TRACE** button. Let's say you're tuning 144 and 432 MHz, looking for stations to work in a contest or during a tropo opening. Tune the main receiver to 144.200 and the sub receiver to 432.100, then press the **TRACE** button. The tuning knob now tunes both receivers simultaneously, doubling your tuning efficiency. Wherever you first come across a station to work, you can quickly do so and then continue tuning both bands. This function's only restrictions are that the same mode and frequency step must be used on both bands.

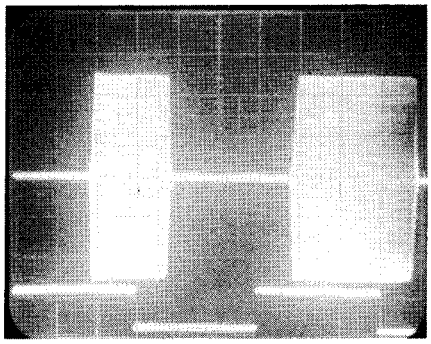


Fig 5—CW-keying waveform for the Kenwood TS-790A in the semi-break-in mode. The lower trace is the key closure; the upper trace is the RF envelope. Horizontal divisions are 10 ms. The transceiver was being operated at 46 W output on 144.1 MHz. The TS-790A's CW keying shaping is generally good, but in VOX mode, the first element after key closure is shortened by approximately 11 ms.

Satellites

As mentioned earlier, the TS-790A is marketed as a satellite radio. It performs well in this service. In satellite operation, you select from a set of ten memories that store "loop frequencies" (the sum of uplink and downlink frequencies for a given satellite transponder). The factory stores transponder loop frequencies in three of these memories; you can program the remaining memories for loop frequencies of your choice. After you've selected a transponder you want to use, select the appropriate bands, tune the sub receiver to the desired downlink frequency and press the **SAT** key to separate the receiver and transmitter by the loop frequency. You can compensate for Doppler shift by tuning the main band (the uplink), or by changing the programed loop frequency, to keep your downlink frequency constant. Because the TS-790A's satellite mode uses the sub receiver for the downlink, you can't use RIT or the CW filter for satellite reception.

FM

In FM operation, the TS-790A works well, although this radio is clearly not optimized for this mode. Some operators consider the radio's discriminator and FM selectivity suboptimal. On FM, S1 to S9 on the meters is a fairly reasonable 26.5 dB, but S9 to S9 plus 40 dB is just *11.5 dB* (on both meters). This makes it difficult to peak an antenna on an FM station, because almost all signals put the S meter on the pin. Curiously, the S meters behave *just the opposite* on CW and SSB: S1 to S9 is only 16.5 dB, but S9 to an indicated S9 plus 20 dB is almost 40 dB, and it takes another 20 dB to push the meters to S9 plus 30 dB.

The '790's sensitive receiver, automatic repeater-offset selection, flexible scanning modes and high power output make it a capable FM rig, and it's easy to connect a TNC to the radio via a rear-panel DIN jack for packet-radio operation. The TS-790A's multiple scanning modes and two-band receiving capability make it useful for monitoring activity on several FM frequencies. In short, though, if you're looking for an FM-only rig, the TS-790A is overkill; there are better alternatives on the market.

Memories and Scanning

Of the TS-790A's 68 memories, 30 store frequency, mode, tone-squelch information and frequency step. Nineteen others store split-frequency information for duplex operation. Three memories hold the limits for programmed-scan operation, and six others (two for each band) store Priority Alert and Call frequencies; these functions operate like those of Kenwood's other scanning FM radios. (Programming the '790's memories is just like programming those of the TS-440S, '940S, etc.)

The TS-790A has three scanning modes: memory scan (all or selected memories), programmed scan and band scan. Like most other VHF/UHF multimode rigs, the '790 won't scan with the squelch open. Fortunately, the squelch threshold can be set low enough that most Q5 signals open it.

The Manuals

For the most part, the *TS-790A Instruction Manual* is well done. One notable exception is the description of satellite operation; if you're not familiar with such operation, the manual isn't very helpful. It takes quite a bit of practice to learn this radio's ins and outs in this mode. Fortunately, the instructions and diagrams on connecting external amplifiers and other accessories to the TS-790A are clear and simple to follow.

The Smooth...

In general, the TS-790A is highly refined. It has a great frequency-control scheme, good looks, efficient layout, Kenwood's hallmark smooth controls, and a very good receiver. It also has transmitted-signal cleanliness and keying shaping that rival current MF/HF transceivers. The rig also has excellent frequency stability and readout accuracy. The '790's fast AGC is good for weak CW and SSB signals.

To supplement what I've said about this rig's good points, here are a few of K1FO's observations:

• In moonbounce operation, the TS-790A is almost as good as an optimized receive converter and HF receiver, as long as enough preamplifier gain is used ahead of the receiver.

• The receiver is pleasantly free of birdies.

• No hum or rumble is present in received audio; the receivers are quite usable without external audio filtering, which can't be said of many other radios.

...and the Rough

You can't change modes on the TS-790A without changing the operating frequency somewhat. It's possible to tune a CW signal for an 800-Hz beat note in SSB, but when you switch to CW, the signal is offset by 1600 Hz. If you tune a CW signal for a 0-Hz beat note in SSB, you'll be right on frequency when you switch to CW. Switching from CW to SSB produces a similar problem. In weak-signal operation, frequent mode changes are common—sometimes you do so several times during a single QSO—so it makes sense for Kenwood to look into this.

The CW VOX can't be disabled, but the radio supports only PTT operation on voice modes. Some means of disabling the CW VOX would minimize the possibility of destroying a preamplifier by accidentally keying the rig before switching out the preamp.

The radio's ALT function is designed to operate like the AFC circuits in many TVs and FM-broadcast receivers. It tunes your receiver to follow drifting signals, but works only on 23-cm FM, and only on strong signals.

No receiver RF-gain controls (except the 10-dB 144-MHz attenuator) are included. This makes preamplifier switching and receiver-gain reduction cumbersome on 432 and 1296 MHz.

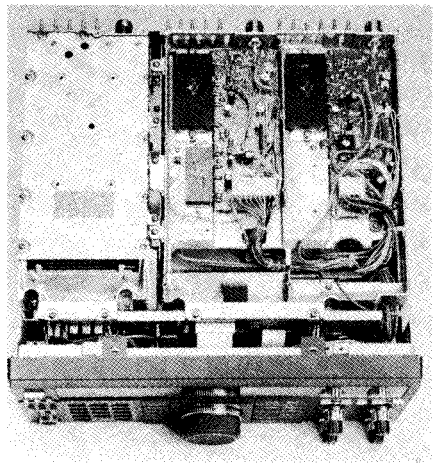
K1FO:

• Very strong SSB signals cause noticeable receiver-audio distortion. A similar problem exists at the turn-on threshold of the mute/busy LEDs for each receiver.

• The synthesizer pops annoyingly every 40 kHz on the 144- and 430-MHz bands, and every 80 kHz on the 1240-MHz band.

• The CW filter has about 13 dB of insertion loss, so input attenuation, preamp gain or audio gain must be modified when the CW filter is switched in and out. Some IF-amplifier noise is also apparent, especially when the CW filter is switched in, but this doesn't pose a major problem in copying weak signals.

• When you change modes between SSB and CW, the radio's transmitter output varies (power output is higher on CW than SSB, because the hybrid power amplifiers used in the '790 deliver more output when operated class C, as they are on CW and FM). Even though the radio has separate ALC inputs for each band, you have to remember to reduce power when you change from SSB to CW when you're using an external power amplifier.



An inside view of the TS-790A.

• The TS-790A's slow AGC is too slow for all but very strong signals.

A TS-790A Wish List

Even though the '790 is a good radio, it has some areas that, if paid some attention, would make the rig even better. In no particular order, here are some areas that could use improvement:

K1FO:

• Faster synthesizer lock-up time and 10-Hz tuning steps (instead of 20-Hz steps) would make the receiver sound and work better, especially in EME operation.

• A source of low-level 144-MHz output and a separate 144-MHz receiver input would make the TS-790A much more useful as an IF rig for bands that the '790 doesn't cover. 144 MHz has become a standard IF for microwave transverters, and such capability would enhance this radio's value, especially to multiband portable operators.

• IF-gain distribution should be such that there's no difference in audio level when the CW filter is switched in and out of the circuit.

• A medium AGC speed would be quite useful for moderately strong signals. It would also be useful to be able to turn off the receiver AGC.

• The receiver frequency and the transmitter power output should not vary when you change modes. The display should show the actual listening frequency on all modes (*not* the zero-beat frequency on CW).

• A choice of CW IF filters would be really nice (500 Hz is a bit too wide for EME operation).

NJ2L:

• The manual needs better instructions on satellite operation.

• Separate drive controls for each band, adjustable so that the **RF PWR** control's maximum setting gives a user-preset maximum output level on each band, would be a great addition for those who use external power amplifiers.

• Those of us who prefer to listen to CW at low frequencies (*much* less than 800 Hz) would appreciate a variable CW offset and a sidetone pitch to match it.

• Better speech-processor performance and **MIC**-gain control linearity would help on SSB—especially in barefoot operation.

• RIT and a CW filter in the sub-receiver IF chain would improve the '790's satellite and weak-signal performance.

• A tuning rate of 2.5 or 5 kHz per knob revolution (instead of 10 kHz) would make weak-signal CW operation easier.

These things basically amount to giving the TS-790A the performance and ergonomics of current MF/HF transceivers. After all, multiband VHF/UHF transceivers are intended to be used by operators who are just as demanding as MF/HF transceiver users; the application is simply slightly different. As is, the '790 isn't far from the mark.

Summary

In the TS-790A, Kenwood has done a good job of blending essential HF-transceiver features and flexibility with solid VHF/UHF performance into one compact package. At first blush, the TS-790A may seem inferior to Yaesu's FT-736R because it has only three-band capability. Looking closer, though, you'll see that the FT-736R can handle a maximum of only four bands at once, and doesn't have anything like the TS-790A's two-receiver flexibility (other than the '736's duplex satellite capability). The TS-790A's great receiver performance, higher power output, easier operation, comparable cost (similarly equipped) and better general polish give the '790 several advantages over the FT-736R. The TS-790A's 13.8-V operation can be an advantage or a hassle, depending on your application; in any case, it keeps power-supply heat out of the radio. The TS-790A warrants careful consideration for hams interested in multiband weak-signal and satellite operation. As with any major radio purchase, I suggest that you buy the manual from Kenwood (and those for any other rigs you're considering) *before* making a decision.

Manufacturer's suggested retail prices: TS-790A, $2000; UT-10 1240- to 1300-MHz module, $540; PS-31 13.8-V power supply, $200; VS-2 voice synthesizer, $63; TSU-5 CTCSS decoder, $51. Manufacturer: Kenwood USA Corp, 2201 E Dominguez St, Long Beach, CA 90801-5745, tel 213-639-4200.

Acknowledgement

Thanks to 432-MHz enthusiast Steve Powlishen, K1FO, for his critical look at the TS-790A, and for his comments.