

HF SSB Operating Manual for Kenwood TS-830S

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Figure 1: *Kenwood TS-830S, front view.*

Introduction

The Kenwood TS-830S transceiver is a hybrid solid-state/tube model manufactured in the 1980s. The radio has gained a bit of a cult following in the amateur radio world: some refer to it as the finest Kenwood ever manufactured. This manual will instruct you in its basic operation.

“High Frequency” or HF communications span the 0–30MHz frequencies. In Canada, you must obtain the “Basic with Honours” amateur radio certification in order to operate on these bands, or arrange supervision with an appropriately qualified individual.

“Single-side band” or SSB is an RF transmission mode common for voice on HF, with lower-side band (LSB) usually used on frequencies below 10MHz and upper-side band (USB) used above 10MHz.

Required Equipment

- Kenwood TS-830S radio transceiver with microphone
- Antenna (matched with transmission band, see “Select a band”)
- Dummy load
- Grounding cable, approximately 4ft in length
- Feed line, likely coaxial cable
- Power source



Figure 2: *Kenwood TS-830S, rear view.*

1 Select an operating location

You will need access to power to operate the radio, but you also will need to maintain an appropriate distance from the antenna to protect yourself from the emitted radiation. In general, locations high on buildings or hills without surrounding structures will provide for the best reception and transmission. The Kenwood TS-830S has a carrying strap, so feel free to get creative.

Often, you can use a designated location with antenna feed line access (colloquially referred to as a “ham shack”).

2 Select a band

Before you can communicate on your radio, you need to select the frequency which you will monitor and transmit on. The Kenwood TS-830S supports every popular amateur band, listed here.

Metres	Frequency	Band Plan for SSB	Mode	Suggested Use
10m	28–29MHz	28.2 to 29.7 MHz	USB	daytime, esp. during sunspots
12m	24.5 MHz	24.930 to 24.990 MHz	USB	daytime
15m	21 MHz	21.1 to 21.450 MHz	USB	daytime
17m	18 MHz	18.110 to 18.168 MHz	USB	world-wide daytime, at night
20m	14MHz	14.101 to 14.350 MHz	USB	world-wide daytime, at night
30m	10MHz	No SSB on this band	N/A	CW and digital modes
40m	7MHz	7.150 to 7.3 MHz	LSB	at night, local daytime
80m	3.5MHz	3.728 to 4.0 MHz	LSB	at night, local daytime
160m	1.5MHz	1.840 to 2.0 MHz	LSB	at night

Table 1: *Quick band reference for operating in Canada*

HF bands are capable of long-distance and international transmissions (often referred to as “DX”) because the radio bands bounce off a layer of the atmosphere (called the “ionosphere”) before reaching the ground. This allows for transmissions that can reach much further than those received via line-of-sight. In general, the higher frequency bands work better during the day, and the lower frequency bands work better overnight.

Solar phenomena and their effects on the ionosphere can have profound effects on RF propagation. You can check for reports of this online; many amateur clubs and other reference sites host solar activity information.

3 Erect an appropriate antenna



Figure 3: *Antenna setup, Field Day 2015*

You may already have an available antenna mounted somewhere. If so, you can skip this step.

Otherwise, once you have selected a band, we need to select an antenna of appropriate length, corresponding to the band you want to transmit and receive on. There are a number of different antenna types, but we’ll just refer to a simple wire dipole; for more complex antennas, see their operating manuals.

A wire dipole is cut to a specific length, attached at the center to a feed line, and can conveniently be strung up in trees or on other tall, non-conductive structures. Simply tie the ends of the antenna to some twine and hoist each end up to an appropriate height: about 5m above the ground works best. Secure the twine and you are ready to connect your antenna to your transceiver.

4 Ground the transceiver

Attach a ground line by loosening the wingnut on the **GND** port, attaching a ground wire, and then tightening the wingnut. You’ll need to ground the other end by driving it into the ground with a grounding pole.

If that’s not an option, attach it to a metal surface that is known to be grounded with electrical tape, such as window siding or water pipes. (I recommend you do *not* attach it to your faucet.)

5 Power and tuning

Plug in your radio to a standard power source. The Kenwood TS-830S supports both 120V and 220V power sources, so make sure the switch on the back is set correctly.

Ensure that the microphone is connected and the radio is in **REC** (receive) mode. **DO NOT leave the radio in SEND mode or key the microphone for more than 10 seconds at a time!** This could damage the vacuum tubes in the radio. Now, we can tune it:

1. Plug your antenna into your dummy load, using the feed line. While the radio is turned off, attach the feed line to the dummy load to the **ANT** port at the back of the radio. If the cable doesn't fit, use a UHF PL-259 converter.
2. Toggle the **POWER** switch on the front of the radio, and then the **HEATER** in order to turn the unit on. Use the main tuner (large knob) to select a frequency in the middle of the band range you'll be operating on.
3. Set the **MODE** switch to **USB**, or **LSB** if you are transmitting below 10MHz, and the **METER** switch to **IP** (plate current).
4. Key the microphone and ensure that **IP** on the meter reads 60mA.
5. Change the **MODE** switch to **TUNE** and the **METER** switch to **ALC** (active level control). Key the microphone and adjust the **CAR** knob until **ALC** reads a little lower than the top of the range on the meter.
6. Change the **METER** back to **IP** and key the microphone. Adjust the **PLATE** until the meter needle dips to 5 mA. Your plate setting should fall within the band you are operating on, with some minor adjustment.
7. Change the **METER** switch to **RF**. Key the microphone and adjust the **LOAD** control until the meter reaches its maximum—there is no scale printed on the meter for **RF**.
8. Change the **MODE** switch to either **USB** or **LSB**, set the **METER** switch to **ALC**, and turn the **MIC** (microphone gain) all the way down. Key the microphone and speak into it normally. Increase the **MIC** until it peaks within the **ALC** range on the meter.
9. Change the **METER** switch to **COMP** (voice compression), key the microphone, and speak into it normally. Adjust the **COMP** level until it peaks below 10DB.

Now you're ready to transmit! You could use an additional tuner for your antenna, but this is probably sufficient. Detach the dummy load and attach the real antenna.

6 Receiving

Once your antenna is connected, use the main tuner on the front of the radio to adjust the frequency. You'll notice it only allows you to select 0.0 to 0.500 MHz. If you are operating at the top of a band (e.g. on 12m), make sure you hit the **+0.5** switch beside the **BAND** selector. The digital display will reflect the correct frequency. Scan through the band by adjusting the frequency to see if anyone is on the air!

Here are some tips for cleaning up signal problems:

- *Too high-pitched:* Try increasing the frequency. If the voice is too low-pitched, reduce the frequency.

- *Incomprehensible voice:* Try adjusting frequency more than you would to adjust the pitch.
- *Too much band noise:* Turn on the notch filter by pushing the NOTCH button and adjusting the NOTCH knob until you can hear the voice more clearly. You will also want to adjust the IF SHIFT (inner knob) to match the NOTCH (outer knob) for best signal.
- *Still too high- or low-pitched:* VBT can help adjust the tone of the signal; if you're tuned to the correct frequency but someone still sounds too high-pitched, reduce this (or increase it if they sound too low-pitched).

7 Transmitting

Once you're tuned up and you've heard someone, you can try contacting them. Always start your transmission with your callsign. Here are some references to help you get on the air!

CQ I'm looking for people to talk to!
 QRZ Who's calling? / My callsign is ...
 QSL Can you acknowledge receipt of my transmission? / Receipt acknowledged.
 QRM Are you being interfered with? / There's interference.
 RST What's my readability/signal/tone?
 73 Best wishes!

Table 2: *Common "Q-codes" and other radio slang*

VE3UOW This is VE3UOW, CQ, CQ, CQ.
 VA3JIT This is VA3JIT, Victor-Alpha-Three-Juliet-India-Tango, QRZ?
 VE3UOW This is Victor-Echo-Three-Uniform-Oscar-Whiskey, what's my RST?
 VA3JIT VE3UOW, you are 5-9.
 VE3UOW Thank you, VA3JIT; you are 5-9. QSL?
 VA3JIT QSL, thank you very much! 73!

Table 3: *An example contact*

Make sure to record your contacts in your log book and send QSL cards!

Some references

"Boatanchor Tune Up Procedure - Peak The Load - Dip The Plate." Helpful video demo of tuning a Kenwood TS-830S. <https://www.youtube.com/watch?v=y8svua8n5Lw>

eHam.net Band Reference. Also has handy forums and many other references. <http://www.eham.net/newham/bands>

K4EAA *Ken's Kenwood Hybrid Tranceiver Sales, Restoration & Service.* Lots of useful information about this and other Kenwood hybrids. <http://www.k4eaa.com/>

Official Kenwood TS-830S Manual. (38MB) <http://inform3.kenwoodusa.com/Manuals%5CTS-830.pdf>

Radio Amateurs of Canada (RAC). General purpose amateur resource. <http://rac.ca>