KENWOOD

TS-2000/2000X
All-Mode Multibander

TS-B2000
**Distinctive by Design, Packed for Performance**

- **All-mode multibander:** HF/50/144/440/1200MHz* in one compact rig offering wide-band receive (500kHz to 1300MHz, non-contiguous) and 100W output (HF/50/144MHz) — ideal for both base station use and mobile operation.
  *
  - TS-2000 & TS-B2000 require optional UT-20 1200MHz all-mode unit. The UT-20 can only be installed by a qualified technician; do not attempt to install it yourself.

- **Black box version:** The TS-B2000 can be used exclusively for computer control or in a vehicle with a remote head*.
  *
  - Optional RC-2000 mobile controller

- **Dual-channel receive:** Featuring an all-mode multiband transceiver (with satellite mode) plus a sub 144/440MHz FM/AM receiver, so two frequencies (HF/50/144/440/1200*: ALL MODE + 144/440MHz: FM/AM) can be received simultaneously, even on the same band (144/440MHz).
  *
  - With optional UT-20 1200MHz all-mode unit

- **Digital signal processing:** IF-DSP (main band) combines with AF-DSP (sub band) to provide precision filtering and interference reduction.

- **Satellite communications:** Main-band circuits are used for satellite mode, which thus benefits from IF-DSP.

- **Striking design:** With its large amber LCD and backlit keys, the distinctive front panel of the TS-2000/2000X improves operating ease.

- **Kenwood Skycommand System II Plus:** Built-in Transporter function means the TS-2000/2000X/B2000 can be operated remotely with one handheld transceiver.

- **High-speed processing:** Superior performance is assured with two 16-bit DSP chips, double-precision computing and a 100MHz speed CPU, plus 24-bit A/D and D/A converters.

- **High frequency stability:** Built-in TCXO offers professional performance — ±0.5ppm* (-10~+50°C).
  *
  - Main-band SSB, CW, FSK, AM modes only.

- **Other features** include a mobile controller and radio control software (both options), built-in auto antenna tuner, DX cluster tune, and an antenna terminal dedicated to HF low-band reception.
Kenwood’s new all-mode multibander breaks new ground in more ways than one.

This TS-B2000 black box version offers the same functionality and performance as the TS-2000 — minus the controls — so you can carry it in the trunk of your car, or set up on the desk with your personal computer.

**TS-B2000**
Cutting-edge Technology in a Streamlined Package

Kenwood’s new all-mode multibander breaks new ground in more ways than one.

This TS-B2000 black box version offers the same functionality and performance as the TS-2000 — minus the controls — so you can carry it in the trunk of your car, or set up on the desk with your personal computer.
Sleek front panel with power switch and mic/headphone terminals

Optional RC-2000 mobile controller available for mobile use

ARCP-2000 radio control software supplied for PC use

TS-B2000
HF/50/144/440/1200MHz
All-mode Multibander

* With optional UT-20 1200MHz all-mode unit
A marvel of electronic engineering: Kenwood’s stylish new all-mode multibander is packed with top-end features yet compact enough to use at home, in your car, or on a DXpedition. With its 3D front panel, featuring backlit keys and large amber display, its appearance is as distinctive as its performance.

**TS-2000**  
HF/50/144/440/1200MHz

**TS-2000X**  
HF/50/144/440/1200MHz

*With optional UT-20 1200MHz all-mode unit*
Kenwood's new TS-2000/2000X/B2000 all-mode multibander may be compact, but it's equipped with all the features you would expect to find in a top-of-the-line rig.

**IF Digital Signal Processing**

The TS-2000/2000X/B2000 is serious about digital signal processing. Kenwood's advanced digital technology converts analog waveforms into digital data in real-time, enabling such digital processing as IF filtering, slope tune, auto notch and AGC. IF-stage DSP on main-band transmit and receive — including V/UHF bands — allows the greatest range of control and unprecedented performance.

**DSP Detection**

IF-stage DSP means that the TS-2000/2000X/B2000 offers significantly lower distortion and higher quality detection in all modes. (FM: digital AF filter)

**Digital Filtering**

There is absolutely no need to purchase optional filters: digital IF filters are available for each mode (FM: digital AF filter), offering performance superior to anything possible with analog circuitry. When operating in SSB/FM/AM modes, this digital filtering enables both high- and low-cut frequency variance. Employing slope tune, you can thus cut out noise with minimal effect on sound quality. In AM mode, the high-cut frequency can reduce interference by controlling the IF pass bandwidth — useful for receiving shortwave broadcasts. In CW mode, the WIDTH function is supplemented by center frequency shift, allowing adjacent signal interference to be tuned out. The WIDTH function also provides noise reduction capabilities in FSK with 4 steps available: 250, 500, 1000 and 1500Hz. And thanks to AF-stage DSP, independent control of high-cut and low-cut frequencies (12 steps each) provides slope tune capability in FM as well.

**IF Auto Notch**

Since it is working with a digital signal, IF Auto Notch (main band, SSB mode) can provide extremely sharp filtering of carrier frequencies from broadcast and continuous beat sources. The interfering beat is removed far more accurately than in conventional analog systems, and Auto Notch will even track changes in the beat signal (tracking speed can be varied in 5 steps).

**IF AGC**

The digital AGC circuit (main band only) delivers very fast release characteristics, surpassing even the best analog designs. You can select a custom release time (20 steps) for each mode, except FM.
AF Digital Signal Processing

DSP is also executed at the AF stage, offering Beat Cancel and CW Auto Tune functions. It also enables you to achieve remarkable noise reduction and apply custom enhancements to your transmitted voice.

Beat Cancel
Automatic Beat Cancel, available for the main band (SSB and AM modes), immediately eliminates multiple beats interfering with a desired signal. It works well in combination with IF Auto-Notch (SSB).

Manual Beat Cancel
A new Manual Beat Cancel function, which operates as a manual AF notch, can be used in all modes — though it is particularly effective in CW.

CW Auto Tune
You no longer have to adjust the VFO while operating on CW — CW Auto Tune does it for you automatically by adjusting the VFO to your preset pitch at the touch of a button.

Noise Reduction
There are 2 types of noise reduction: LEM (NR1) and SPAC (NR2). LEM (Line Enhancer Method) — available for all modes on the main band and FM/AM on the sub band — automatically forms a filter shape around the target signal for a custom, dynamic noise reduction capability. The degree of enhancement can also be set manually for main-band use. The SPAC (Speech Processing/Auto Correlation) function utilizes a special statistical/correlation algorithm to pull out weak signals that are buried deep in noise. Although available for all modes on the main band, it’s especially useful for tough CW conditions. The correlation time setting can be adjusted in 10 steps between 2ms and 20ms.

TX Audio Shaping
You have 3 ways to tailor audio quality with DSP: the TX/RX equalizer (SSB/FM/AM), TX filter bandwidth (SSB/AM), and speech processor (SSB/FM/AM). The TX/RX equalizer offers 4 frequency response settings on SSB, FM and AM: high boost for improved clarity, formant pass to minimize extraneous sounds, bass boost for stronger sound, and conventional mode for an ‘analog’ sound. On SSB and AM transmit you can choose between 6 TX filter bandwidth settings according to your microphone and operating requirements. The speech processor works across three bands (SSB, FM and AM) for high compression and minimal distortion.
### Expanded Power and Performance

**DX Cluster (Packet Cluster) Tune**

DX cluster information received on the sub band is not just displayed on the LCD; it can also be used for instantly setting up the main band frequency to cluster information. Up to 10 items can be stored in memory.

**Built-in 1200/9600bps TNC**

The simple 2-chip TNC is compliant with the AX.25 protocol for Sky Command and DX cluster tune.

**Dual-Channel Watch**

Provision of main and sub bands enables dual-channel watch. This all-mode multiband can simultaneously receive two frequencies, even on the same band, allowing such combinations as HF+V/UHF, VHF+VHF, UHF+UHF and VHF/UHF (the sub band is used exclusively for 144/440MHz reception on FM/AM). This means, for instance, that you can pick up local information on V/UHF while operating HF on the main band.

**Satellite Communications**

Satellite operations are enhanced with the IF-DSP. 10 dedicated memory channels, Doppler effect frequency adjustment (manual) and the ability to choose either normal or reverse shift for the trace.

### High-duty Transmitter Section

This transceiver is the perfect choice for contesting, mobiling and FSK applications, delivering up to 100 (AM: 25) watts on HF/50/144MHz bands.

Output is 50 (AM: 12.5) watts on the 440MHz band, and 10 (AM: 2.5) watts on 1200MHz. But there’s more than just power: the built-in TCXO ensures excellent frequency stability — ±0.5ppm (except in FM mode).

*Minimum output is 5 watts for HF/50/144/440MHz bands, 1 watt for 1200MHz.*

**CW Features**

In addition to the new Auto Tune function, there is a full range of CW features. The full/semi break-in switching and delay time settings are fully adjustable. In semi break-in the delay time between key release and active receive mode can be set for between 50ms and 1000ms. When using VOX operation the delay time can be set for between 150ms and 3000ms. Other CW features include pitch control (400-1000Hz), side tone monitor with 10-step volume setting, DSP-based rise time adjustment, and CW reverse mode.

**FSK Features**

When operating in FSK mode, you can select shift frequencies (170, 200, 425 and 850Hz) and switch both KEY polarity and Hi/Low tones to suit your RTTY device. Additionally, the FSK reverse function lets you match transmission methods to the other party if necessary, for example changing the BFO frequency from LSB (normal) to USB (reverse).

**FM Features**

As well as switchable Narrow/Wide deviation modes, the TS-2000/2000X/B2000 has built-in CTCSS functionality with 38 EIA-standard sub-tones settings plus 1750Hz tone burst. Other features include DCS (104 codes), both cross-band and fixed-band repeater operation, and 1200MHz ALT.

**Data Communication Features**

Packet filter bandwidth is fully selectable to match packet speed, and you can also switch ACC2 (PKD) input/output levels. For PSK31 mode, the menu offers a 100Hz bandwidth IF-DSP filter.
The TS-2000/2000X/B2000 is fully equipped for Kenwood’s Skycommand System II Plus. With just a handheld transceiver you can relax in your garden while DX’ing from your shack. Alternatively, you could enjoy HF access via the multibander in your parked car while taking in a baseball game.

Conventionally two extra transceivers are required for KSS operation — a Commander and a Transporter — but the TS-2000/2000X/B2000 has Transporter functions built in. This means you can operate it remotely with a single mobile or handheld unit, such as the TH-D7A or TM-D700A, transmitting control signals to the Transporter, which also relays your voice to the HF radio. In return, HF signals are transmitted back to the Commander. This system allows you to transmit and receive HF signals, set frequencies (with LCD confirmation), switch memory channels, and much more — all remotely.

Kenwood Skycommand System II Plus is the most sophisticated version yet developed, enabling full-duplex operation with access to such HF functions as RIT/XIT, mode switching (USB, FM, etc.), split-frequency operations on/off, and memory shift. Control is effected via simple TNC, compatible with the AX.25 protocol. In addition, if a second TS-2000/2000X/B2000 unit is used as the Commander, you have control over noise reduction, noise blanker on/off and antenna switching among other functions.
Options

**Do not install the MB-430 Mobile Bracket vertically as this would adversely affect transceiver operation and safety.**

*The UT-20 can only be installed by a qualified technician; do not attempt to install it yourself.

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### Specifications

#### TRANSMITTER

- **RF Output Power**
  - SSB/CW/AM/FSK=100W, AM=25W, FSK=25W
- **Modulation**
  - SSB: Balanced modulation
  - AM: Reactance modulation
- **Maximum Frequency Deviation (FM)**
  - Less than 15 kHz (wide)
  - Less than 2.5 kHz (narrow)
- **Spurious Radiation**
  - 1.8 – 2.8 MHz: Less than -50dB
  - 50 – 430 MHz: Less than -60dB
  - 1200 MHz: Less than -50dB
- **Carrier Suppression**
  - More than 50 dB
- **Unwanted Sideband Suppression**
  - More than 50 dB
- **Transmit Frequency Response (SSB)**
  - 400 – 2600 Hz (within -6 dB)
- **XII Variable Range**
  - 320.50 kHz
- **Antenna Tunable Range**
  - 16.71 – 100.14 (160 – 6m band)

#### RECEIVER

- **Circuitry**
  - Main: SSB/CW/AM/FSK
  - FM: Double conversion superheterodyne
- **Intermediate Frequency**
  - Main: 1st IF: 69.085 MHz or 75.925 MHz (HF – 50 MHz)
  - 2nd IF: 41.885 MHz (144/440 MHz), 135.495 MHz (1000MHz)
  - 3rd IF: 10.695 MHz
  - 4th IF: 12.0 kHz
  - Sub: 1st IF: 58.525 MHz
  - 2nd IF: 455 kHz
- **Receive Selectivity**
  - More than 2.2 kHz (-6 dB)
  - Less than 4.4 kHz (-60 dB)
  - AM (Low/1000 MHz): More than 6.0 kHz (-6 dB)
  - Hi (3000 MHz): More than 12.0 kHz (-50 dB)
  - FM: More than 12.0 kHz (-6 dB)
  - Less than 25.0 kHz (-50 dB)
  - AM (Narrow): More than 12.0 kHz (-6 dB)
  - Less than 25.0 kHz (-50 dB)
- **RF Variable Range**
  - 1000 kHz

#### Receiver (Continued)

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<tbody>
<tr>
<td>Sensitivity</td>
<td>Main: SSB/CW/FSK (S/N 10 dB)</td>
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<tr>
<td></td>
<td>Less than 4 µV (500 kHz – 1.705 MHz)</td>
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<td></td>
<td>Less than 2 µV (1.705 – 24.5 MHz)</td>
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<td></td>
<td>Less than 0.2 µV (24.5 – 36 MHz)</td>
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<tr>
<td></td>
<td>Less than 0.1 µV (50 – 54 MHz)</td>
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<td>Less than 0.1 µV (240 – 300 MHz)</td>
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<td>Less than 0.1 µV (1240 – 1300 MHz)</td>
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<td>AM (S/N 10 dB)</td>
<td>Less than 31.6 µV (900 kHz – 1.705 MHz)</td>
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<td></td>
<td>Less than 2 µV (1.705 – 24.5 MHz)</td>
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<td></td>
<td>Less than 1.3 µV (24.5 – 36 MHz)</td>
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<tr>
<td></td>
<td>Less than 1.3 µV (50 – 54 MHz)</td>
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<td></td>
<td>Less than 1.4 µV (144 – 148 MHz)</td>
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<td></td>
<td>Less than 1.0 µV (430 – 450 MHz)</td>
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<td>Less than 1.0 µV (1240 – 1300 MHz)</td>
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<td>FM (12 dB SINAD)</td>
<td>Less than 0.18 µV (430 – 450 MHz)</td>
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<td>Less than 0.18 µV (1240 – 1300 MHz)</td>
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<tr>
<td>FM (12 dB SINAD)</td>
<td>Less than 0.18 µV (1240 – 1300 MHz)</td>
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<td>Squelch sensitivity</td>
<td>Main: SSB/CW/AM/FSK</td>
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<tr>
<td></td>
<td>Less than 18 µV (500 kHz – 1.705 MHz)</td>
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<tr>
<td></td>
<td>Less than 1.8 µV (1.8 – 28.7 MHz)</td>
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<td></td>
<td>Less than 1.1 µV (50 – 54 MHz)</td>
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<td></td>
<td>Less than 1.1 µV (144 – 148 MHz)</td>
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<td>Less than 1.1 µV (440 – 450 MHz)</td>
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<td></td>
<td>Less than 1.1 µV (1240 – 1300 MHz)</td>
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<td>FM</td>
<td>Less than 0.2 µV (28 – 30 MHz)</td>
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<td></td>
<td>Less than 0.2 µV (50 – 54 MHz)</td>
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<td>Less than 0.16 µV (144 – 148 MHz)</td>
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<td>Less than 0.1 µV (430 – 450 MHz)</td>
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<td>Less than 0.1 µV (1240 – 1300 MHz)</td>
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<td>Sub: AM</td>
<td>Less than 1.1 µV (144 – 148 MHz)</td>
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<td></td>
<td>Less than 1.1 µV (438 – 450 MHz)</td>
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<tr>
<td>FM</td>
<td>Less than 0.23 µV (144 – 148 MHz)</td>
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<td>Less than 0.18 µV (438 – 450 MHz)</td>
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</tbody>
</table>

#### Image Rejection Ratio

- Main / Sub: More than 70 dB / More than 60 dB

#### IF Rejection Ratio

- Main / Sub: More than 70 dB / More than 60 dB

#### Notch Filter Reduction

- More than 30 dB (1 kHz)

#### Beat Elimination

- More than 40 dB (1 kHz)

#### Low Frequency Output

- More than 1.5 W at 12.5% distortion

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*These specifications are guaranteed for Amateur Bands only.

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