

# INTERFERENCE REJECTION

## NARROW (NAR) ONE-TOUCH IF FILTER SELECTION

Pressing the **[NAR]** button provides one-touch, mode-specific, selection of a narrow IF DSP filter setting that does not require resetting the **[WIDTH]** knob.

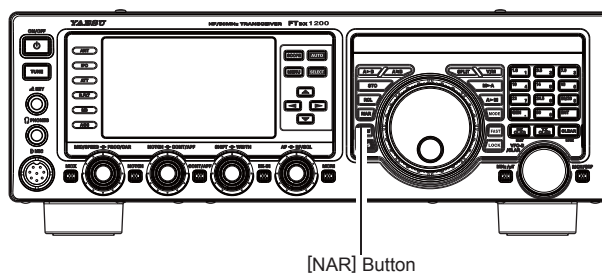
Pressing the **[NAR]** button once more returns the bandwidth control to the **WIDTH**/SHIFT system. The factory default bandwidths are:

OPERATING MODE	[NAR] SWITCH	
	"ON"	"OFF"
SSB	200 Hz ~ 1.8 kHz <sup>*</sup> (1.8 kHz)	1.8 ~ 4.0 kHz <sup>*</sup> (2.4 kHz)
CW	50 ~ 500 Hz <sup>*</sup> (500 Hz)	500 Hz ~ 2.4 kHz <sup>*</sup> (2.4 kHz)
RTTY/DATA	50 ~ 500 Hz <sup>*</sup> (500 Hz)	500 Hz ~ 2.4 kHz <sup>*</sup> (2.4 kHz)
AM	6 kHz	6 kHz
FM (28/50 MHz Bands)	9 kHz	9 kHz

※: Depends on the **[WIDTH]** knob  
( ): Default Bandwidth

### ADVICE:

- When the narrow bandwidth is selected, the "**NAR**" icon will appear in the display.
- If the **[NAR]** button has been pressed to engage the narrow filter, you may still adjust the narrow IF bandwidth by rotating the **[WIDTH]** knob. The IF SHIFT is also operational. For many applications, you may find that simply pressing the **[NAR]** button instead of adjustment of the **[WIDTH]** knob, may be satisfactory for interference reduction.
- When you press the **[NAR]** button in the FM mode, both transmit and receive bandwidths are narrowed.



**WIDTH INDICATOR**

# INTERFERENCE REJECTION

## IF NOTCH FILTER OPERATION (SSB/CW/RTTY/DATA/AM MODES)

The IF NOTCH filter is a highly effective system that allows you to slice out an interfering beat note or other carrier signal from inside the receiver passband.

1. Press the **[NOTCH]** button to activate the Notch filter. The DSP graphic display will illuminate and the current “null” position of the NOTCH filter will appear in the NOTCH indicator on the display. The **[NOTCH]** knob functions as the Notch adjustment knob.
2. Rotate the **[NOTCH]** knob to adjust the “null” position of the Notch filter.

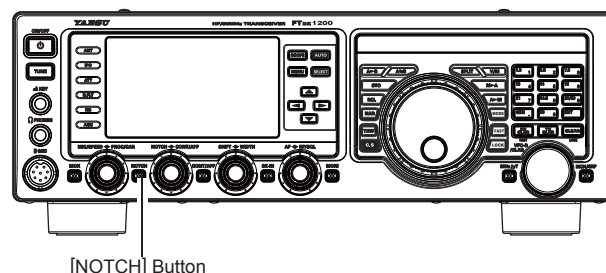
**ADVICE:**

The frequency display will show the Notch frequency for 3 seconds whenever the **[NOTCH]** knob is turned.

3. To cancel the NOTCH filter, press the **[NOTCH]** button momentarily. The graphic disappears from the NOTCH indicator on the display, confirming that the NOTCH filter is no longer in operation.

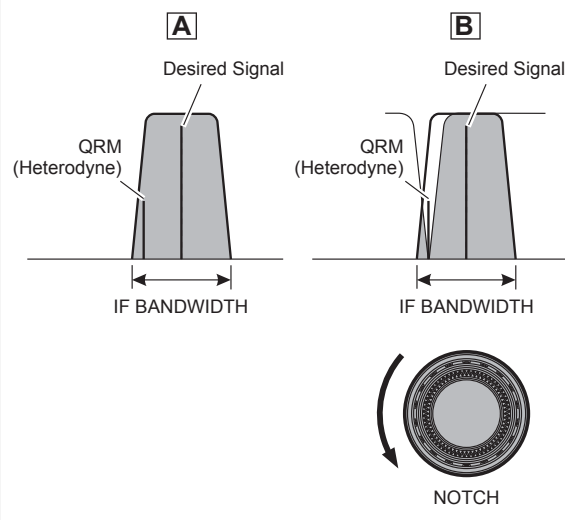
**ADVICE:**

Alternate presses of the **[NOTCH]** button, will switch the NOTCH filter between on and off.



WIDTH INDICATOR

The performance of the IF NOTCH filter is illustrated in Figure “A”, where the effect of rotation of the **[NOTCH]** knob is depicted. In Figure “B” you can see the notching effect of the IF NOTCH filter as you rotate the **[NOTCH]** knob to eliminate the interfering heterodyne.



# INTERFERENCE REJECTION

## DIGITAL NOTCH FILTER (DNF) OPERATION

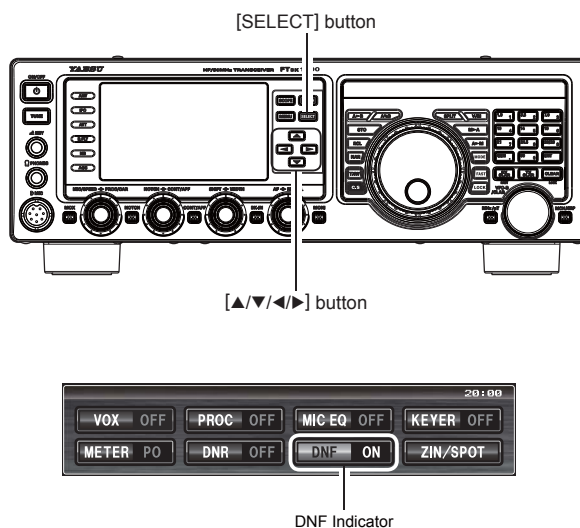
The Digital NOTCH Filter (DNF) is an effective beat-canceling filter that can null out a number of interfering beat notes inside the receiver passband. Because this is an Auto-Notch feature, there is no adjustment knob associated with this filter.

### ADVICE:

If a very strong interfering carrier is encountered, we recommend you first use the IF NOTCH filter, as it is the most effective notching tool in the receiver section.

1. Press the [▲/▼/◀/▶] button to select the “DNF”.
2. Press the [SELECT] button to choose “ON”. The “DNF” will appear in the display.

To disable the Digital NOTCH Filter, just repeat the above procedure, pressing the [SELECT] button to choose “OFF” in step 2 above. The “DNF” will turn off, confirming that the Digital NOTCH Filter is not active.

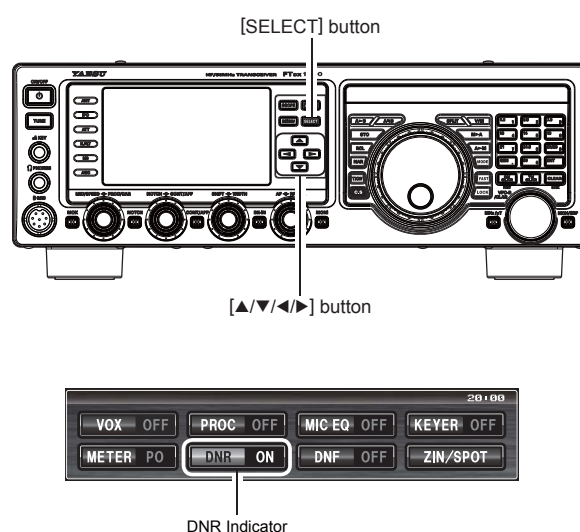


## DIGITAL NOISE REDUCTION (DNR) OPERATION

The Digital Noise Reduction (DNR) system is designed to reduce the level of random noise found on the HF and 50 MHz bands, and it is especially effective during SSB operation. By setting the Menu item “109 DNR LEVEL”, any of 15 different noise-reduction algorithms can be selected; each of these algorithms was created for dealing with a different noise profile. You will want to experiment with the DNR system to find the best setting corresponding to the noise currently being experienced.

1. Press the [▲/▼/◀/▶] button to select the “DNR”.
2. Press the [SELECT] button to choose “ON”. The “DNR” will appear in the display.

To disable the DNR system, just repeat the above procedure, pressing the [SELECT] button to choose “OFF” in step 2 above. The “DNR” will turn off, confirming that the DNR system is not active.



# INTERFERENCE REJECTION

## RF GAIN

The RF Gain control provides manual adjustment of the gain levels for the receiver RF and IF stages, to account for noise and signal strength conditions at the moment.

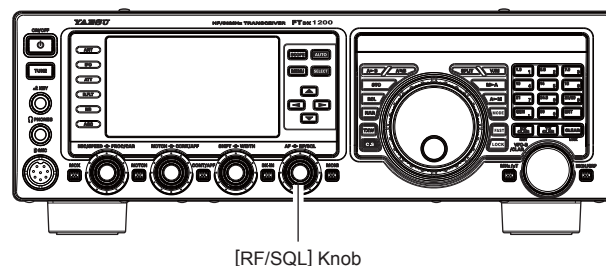
1. The [RF/SQL] knob should, initially, be rotated to the fully clockwise position. This is the point of maximum sensitivity.
2. Counter-clockwise rotation of the [RF/SQL] knob will gradually reduce the system gain.

### ADVICE:

- As the [RF/SQL] knob is rotated counterclockwise to reduce the gain, the S-meter reading will rise. This indicates that the AGC voltage being applied to the receiver is increasing (this causes a *reduction* in receiver gain).
- Rotating the [RF/SQL] knob control to the fully counter-clockwise position will essentially disable the receiver, as the gain will be greatly reduced. In this case, the S-meter will appear to be “pegged” against the right edge of the analog S-meter scale.

### QUICK POINT:

- Reception frequently can be optimized by rotating the [RF/SQL] knob slightly counter-clockwise to the point where the “stationary” meter indication is set just about the same as the incoming noise level. This will reduce the RF gain to find a level of improved signal to noise ratio.
- The RF Gain control, along with the IPO and the Attenuator features, all affect the system receiver gain in different ways. The IPO generally should be the first feature engaged when dealing with a high noise level, or a crowded, high-level signal environment. Also, the IPO generally should be the first feature engaged, if the frequency is low enough to allow the preamplifier to be bypassed. Thereafter, the RF Gain and Attenuator features may be employed to provide precise, delicate adjustment of the receiver gain to fully optimize performance.

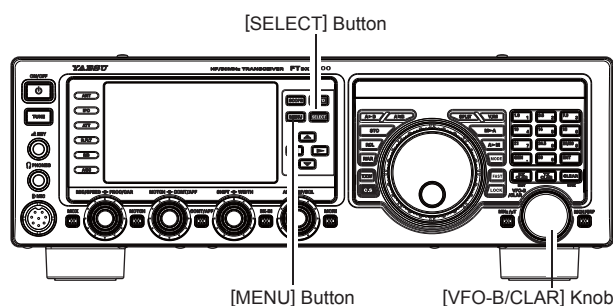


# TOOLS FOR COMFORTABLE AND EFFECTIVE RECEPTION

## AUDIO PITCH CONTROL (SSB MODE)

The **FTdx1200** permits adjustment of the receiver audio response by shifting the carrier point during SSB operation.

1. Press the **[MENU]** button to enter the Menu mode.
2. Rotate the **[VFO-B/CLAR]** knob (or press the **▲/▼** button) to select Menu item “104 LSB RX CARRIER” or “105 USB RX CARRIER”.
3. Press the **[SELECT]** button.
4. Rotate the **[VFO-B/CLAR]** knob (or press the **▲/▼** button) to adjust the receiver audio response as desired.
5. Press the **[SELECT]** button, then press the **[MENU]** button to save the new setting and exit to normal operation.



## AUDIO PEAK FILTER

1. Press the **[CONT/APF]** button to activate the APF (Audio Peak Filter) which provides a very narrow audio bandwidth.

The LED inside the **[CONT/APF]** button glows orange.

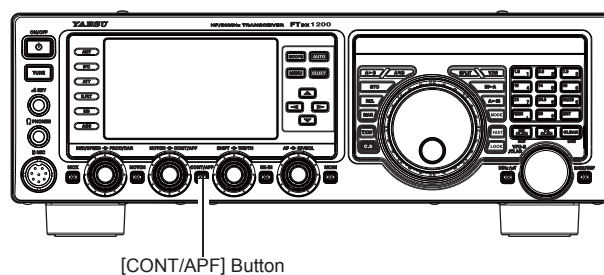
### ADVICE:

When APF is engaged, the peak position of the APF is depicted graphically in the NOTCH indicator on the display.

2. Press the **[CONT/APF]** button to disable the APF.

### ADVICE:

The APF may only be activated while the transceiver is in CW mode.



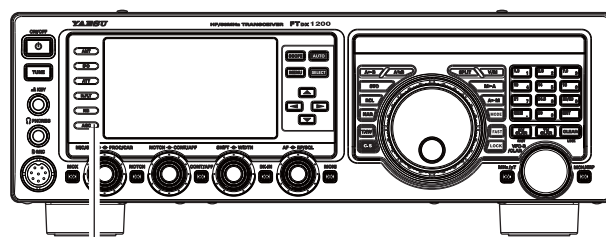
APF INDICATOR

# TOOLS FOR COMFORTABLE AND EFFECTIVE RECEPTION

## AGC (AUTOMATIC GAIN CONTROL)

The AGC system is designed to help compensate for fading and other propagation effects. The AGC characteristics can be individually set for each operating mode. The basic objective of AGC is to maintain a constant audio output level once a certain minimum threshold of signal strength is achieved.

Press the **[AGC]** button repeatedly to select the desired receiver-recovery time constant. You will observe the AGC status notation in the AGC column of the Block Diagram Display on the TFT display, denoting the AGC receiver-recovery time currently in use. For most operations, we recommend the “AUTO” mode. Additionally, you may disable the AGC by pressing and holding in the **[AGC]** button for one second.



[AGC] Button

### NOTE:

- ❑ The “AUTO” selection mode selects the optimum receiver-recovery time for the reception mode. In this case, the selected receiver-recovery time in the AGC column of the Block Diagram Display glows yellow (Normally glows Blue).
- ❑ Pressing the **[AGC]** button allows selection of the desired receiver-recovery time constant. Normally, the “AUTO” selection is satisfactory for most situations, but in the event of operation on a crowded band where you wish to receive a weak signal, you may wish to change the setting to FAST. The AUTO mode selections are:

OPERATING MODE	AUTO AGC SELECTION
LSB/USB/AM	SLOW
CW/FM	FAST
RTTY/DATA	MID

### ADVICE:

- ❑ If the AGC receiver-recovery time is set to “Off” by pressing and holding in the **[AGC]** button, the S-meter will no longer deflect. Additionally, you will likely encounter distortion on stronger signals, as the IF amplifiers and the following stages are probably being overloaded.

### QUICK POINT:

Several aspects of AGC performance may be configured via the Menu. However, because AGC can have such a profound impact on overall receiver performance, we generally do not recommend any changes to the AGC Menu selections until you are thoroughly familiar with the performance of the **FTdx1200**.

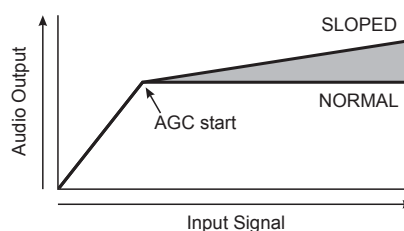
### TERMINOLOGY:

Automatic Gain Control, or AGC, is a circuit that senses the received signal strength, and then limits the gain of the RF and IF stages to keep the output audio volume at a more-or-less constant level. AGC also protects the RF, IF, Audio, and DSP stages from overload, as it limits the signal strength that is allowed to flow, irrespective of the input signal level.

### SLOPED AGC Operation

In traditional AGC systems, the audio output from the transceiver becomes essentially fixed once the threshold for AGC action is reached (usually several dozen dB above the no-signal noise floor). The **FTdx1200**, however, includes an innovative Sloped AGC system on the Main band (VFO-A) receiver, that allows the audio volume to rise and fall slightly according to signal strength. Although the rise/fall slope is not dramatic, it is sufficient to allow you to use your ear to discern and separate signals according to signal strength, not just audio frequency. Using Sloped AGC

1. Press the **[MENU]** button to engage the Menu mode.
2. Rotate the **[VFO-B/CLAR]** knob (or press the **▲/▼** button) to select Menu item “004 AGC SLOPE”.
3. Press the **[SELECT]** button, then rotate the **[VFO-B/CLAR]** knob (or press the **▲/▼** button) to change the setting to “SLOPE”.
4. Press the **[SELECT]** button, then press the **[MENU]** button to lock in the new setting and exit to normal operation. You will now be using the Sloped AGC system.

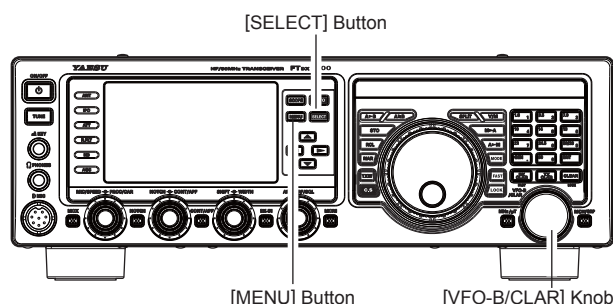


# TOOLS FOR COMFORTABLE AND EFFECTIVE RECEPTION

## ADJUSTABLE RECEIVER AUDIO FILTER

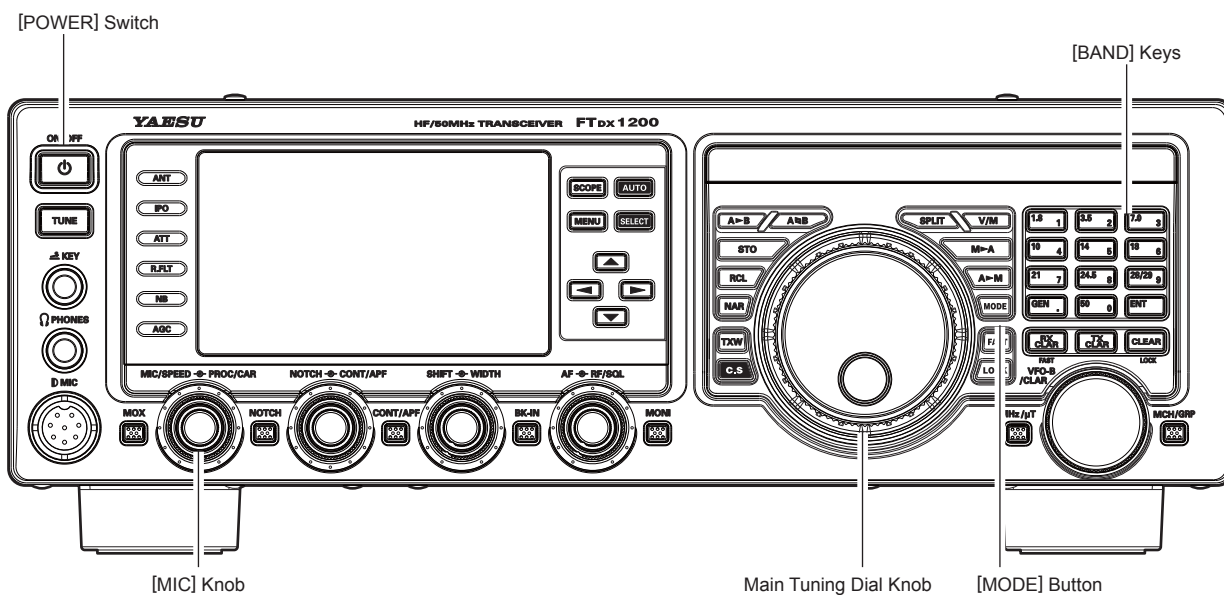
The **FTdx1200** includes an adjustable receiver audio filter, that provides precise, independent control of the low; and upper audio ranges.

1. Press the **[MENU]** button to enter the Menu mode.
2. Rotate the **[VFO-B/CLAR]** knob (or press the **▲/▼** button) to find Menu items “048” through “051” these parameters apply to the adjustment of the receiver audio filter in the AM mode, Menu items “055” through “058” apply to the adjustment of the RX audio filter in the CW mode, Menu items “071” through “074” apply to the adjustment of the RX audio filter in the DATA mode, Menu items “080” through “083” apply to the adjustment of the RX audio filter in the FM mode, Menu items “089” through “092” apply to the adjustment of the RX audio filter in the RTTY mode, and Menu items “099” through “102” apply to the adjustment of the RX audio filter in the SSB mode
3. Press the **[SELECT]** button.
4. Rotate the **[VFO-B/CLAR]** knob (or press the **▲/▼** button) to adjust the receiver audio response as desired.
5. Press the **[SELECT]** button, then press the **[MENU]** button to save the new setting and exit to normal operation.

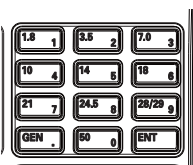


AM	048 AM LCUT FREQ	OFF/100(Hz) ~ 1000(Hz)
	049 AM LCUT SLOPE	6dB/oct / 18dB/oct
	050 AM HCUT FREQ	700(Hz) ~ 4000(Hz)/OFF
	051 AM HCUT SLOPE	6dB/oct / 18dB/oct
CW	055 CW LCUT FREQ	OFF/100(Hz) ~ 1000(Hz)
	056 CW LCUT SLOPE	6dB/oct / 18dB/oct
	057 CW HCUT FREQ	700(Hz) ~ 4000(Hz)/OFF
	058 CW HCUT SLOPE	6dB/oct / 18dB/oct
DATA	071 DATA LCUT FREQ	OFF/100(Hz) ~ 1000(Hz)
	072 DATA LCUT SLOPE	6dB/oct / 18dB/oct
	073 DATA HCUT FREQ	700(Hz) ~ 4000(Hz)/OFF
	074 DATA HCUT SLOPE	6dB/oct / 18dB/oct
FM	080 FM LCUT FREQ	OFF/100(Hz) ~ 1000(Hz)
	081 FM LCUT SLOPE	6dB/oct / 18dB/oct
	082 FM HCUT FREQ	700(Hz) ~ 4000(Hz)/OFF
	083 FM HCUT SLOPE	6dB/oct / 18dB/oct
RTTY	089 RTTY LCUT FREQ	OFF/100(Hz) ~ 1000(Hz)
	090 RTTY LCUT SLOPE	6dB/oct / 18dB/oct
	091 RTTY HCUT FREQ	700(Hz) ~ 4000(Hz)/OFF
	092 RTTY HCUT SLOPE	6dB/oct / 18dB/oct
SSB	099 SSB LCUT FREQ	OFF/100(Hz) ~ 1000(Hz)
	100 SSB LCUT SLOPE	6dB/oct / 18dB/oct
	101 SSB HCUT FREQ	700(Hz) ~ 4000(Hz)/OFF
	102 SSB HCUT SLOPE	6dB/oct / 18dB/oct

# SSB/AM MODE TRANSMISSION



1. Press the **[BAND]** button corresponding to the Amateur band on which you wish to operate.



2. Press the **[MODE]** button to select the operating mode. Press and hold in this button to toggle to the alternate mode.

For example, *In the LSB or USB modes*, pressing and holding in this button toggles between “LSB” and “USB” mode.

**ADVICE:**

By convention, LSB is used in the 7 MHz and lower Amateur bands for SSB communication, and USB is used on the 14 MHz and higher bands (the 10 MHz band is used for CW and data modes only).

3. Rotate the Main Tuning Dial knob to adjust the operating frequency. Alternately, you may use the **[UP]/[DWN]** scanning buttons on the **MH-31B8** Hand Microphone to sweep up or down the current band.

4. Press the microphone **PTT** (Push To Talk) switch to begin transmission; speak into the microphone in a normal voice level.

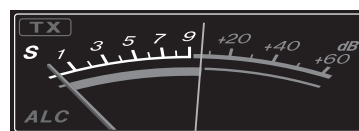
**ADVICE:**

- The “TX” indicator will light up in the LED display area, confirming that transmission is in progress.
- When transmitting in the AM mode, set a maximum (carrier) power output of 25 Watts via the **[PROC/CAR]** knob.

5. Adjust the microphone amplifier gain to match the microphone and your voice level: Press the **[▲/▼/◀/▶]** buttons to select the “METER”, then press the **[SELECT]** button to select “ALC”.

Close the **PTT** switch, and speak into the microphone in a normal voice level.

*In the SSB mode*, adjust the **[MIC/SPEED]** knob so that the ALC meter stays within the ALC zone of the meter (up to half scale deflection) on voice peaks.



*In the AM mode*, adjust the **[MIC/SPEED]** knob so that the ALC meter does not deflect at voice peaks.

**ADVICE:**

The frequency display will show the relative microphone gain level for 3 seconds whenever the **[MIC/SPEED]** knob is turned.

6. Release the **PTT** switch at the end of your transmission. The transceiver will return to the receive mode.



25W



# SSB/AM MODE TRANSMISSION

## ADVICE:

- ❑ ALC meter deflection may be caused by excessive drive power, but also by reflected power detected in the antenna system. If the impedance presented to the transceiver is other than 50 Ohms, ALC meter action may be observed that is not related to the proper setting of the [MIC/SPEED] knob. Therefore, we recommend that you make the [MIC/SPEED] knob adjustments into a dummy load or antenna system presenting impedance very close to 50 Ohms.
- ❑ **In the SSB mode**, you may set the desired power output via Menu item "176 TX MAX POWER". The adjustment range is between 5 Watts and 100 Watts. You should always use the minimum power necessary to maintain reliable communications.
- ❑ When performing "on air" tests (such as the setup of microphone gain), be sure to check the frequency before transmitting, to avoid interference to others who may already be using the frequency.

- ❑ Four techniques for exercising Transmit/Receive control are provided on the **FTdx1200**. You may choose the technique(s) that best suit your operating needs:
  - Pressing the microphone **PTT** switch will engage the transmitter.
  - The rear panel **PTT** jack may be connected to a foot switch or other manual switching device in order to engage the transmitter.
  - Pressing the front panel [MOX] button will lock the transmitter on. Press the [MOX] button again to return to receive.
  - The VOX (Voice Operated Xmit) circuit will engage the transmitter automatically when you speak into the microphone. For details of VOX operation refer to page 72.

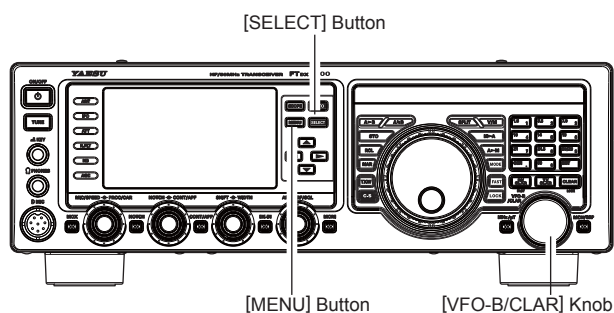
## Adjusting the SSB TX Power Output

1. Press the [MENU] button to enter the Menu mode.
2. Rotate the [VFO-B/CLAR] knob (or press the ▲/▼ button) to select Menu item "176 TX MAX POWER".
3. Press the [SELECT] button, then rotate the [VFO-B/CLAR] knob (or press the ▲/▼ button) to adjust the desired power output on the Multi-Display Window.

### ADVICE:

The value (5 -100) displayed in the Multi-Display window is a relative percentage of the maximum TX power available in the selected mode. It is not the true TX output level.

4. Press the [SELECT] button, then press the [MENU] button to save the new setting and exit to normal operation.



### ADVICE:

The TX Power Output setting cannot be stored in any of the memory channels.

# USING THE AUTOMATIC ANTENNA TUNER

The Automatic Antenna Tuner (hereinafter referred to as the “ATU”) built into each **FTDx1200** is designed to ensure a 50-Ohm load for the final amplifier stage of the transmitter. We recommend that the ATU be used whenever you operate on the **FTDx1200**.

## ADVICE:

- ❑ Because the ATU of the **FTDx1200** is located inside the station, it only adjusts the impedance presented to the transceiver at the station end of your coaxial cable feedline. It does not “tune” the SWR at the antenna feed point itself. When designing and building your antenna system, we recommend that every effort be made to ensure a low SWR at the antenna feed point.
- ❑ The ATU of the **FTDx1200** includes 100 memories for tuning data. Eleven of these memories are allocated, one per Amateur band, so that each band has at least one setting preset for use on that band. The remaining 89 memories are reserved for the 89 most-recent tuning points, for quick frequency change without the need to retune the ATU.
- ❑ The ATU in the **FTDx1200** is designed to match impedances within the range of 16.5 Ohms to 150 Ohms, corresponding to an SWR of 3:1 or less on the 160 through 6 meter amateur bands. Accordingly, simple non-resonant whip antennas, along with random-length wires and the “G5RV” antenna (on most bands) may not be within the impedance matching range of the ATU.

## ATU OPERATION

1. Use the Main Tuning Dial knob to set the radio to the desired operating frequency within the Amateur band.
2. Press the **[TUNE]** button momentarily to place the ATU in the transmit line (no adjustment/tuning will occur yet). The “**TUNER**” icon will appear in the display.

### QUICK POINT:

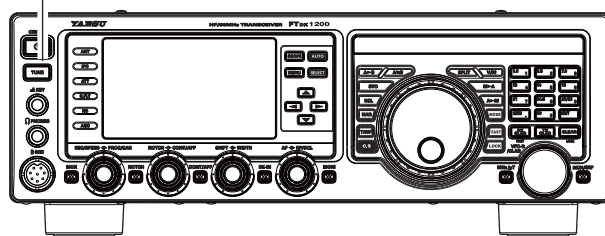
The momentary press of the **[TUNE]** button will turn the tuner on, and the microprocessor will automatically select the tuning point closest to the current operating frequency.

3. Press and hold in the **[TUNE]** button for one second to begin automatic tuning. The transmitter will be engaged, and the “**TUNER**” icon will blink while tuning is in progress. When the optimum tuning point has been reached, the radio will return to receive, and the “**TUNER**” icon will again glow steadily (instead of blinking).
4. To disconnect the ATU from the transmit line, press the **[TUNE]** button momentarily. The “**TUNER**” icon will turn off, confirming that the ATU has been turned off. In the “Off” mode, the transceiver will be directly connected to the coaxial cable connected to your antenna, and will respond to whatever impedance is present at the station end of the coax.

## ADVICE:

The ATU circuit is located between the final amplifier and the rear-panel antenna jack; reception is not affected by the ATU.

[TUNE] Button



### QUICK POINTS:

As shipped from the factory, only one ATU alignment point is saved on each Amateur band. This was memorized during the final alignment and performance verification stages on the production line.

### NOTE:

Please check the operating frequency before beginning the tuning process, to be sure you are not interfering with others who may already be using the frequency.

### TERMINOLOGY:

**Antenna Tuner Memories:** The microprocessor of the ATU makes a note of the selected tuning capacitors and inductors, and stores the data for each 10 kHz window in which tuning has occurred. This eliminates the need to re-tune every time you return to a frequency on which you have already completed the tuning process.