FT-891 Quick Manual

RF/SQL knob

Rotate this knob counterclockwise. ➠ The background noise and the system gain will be reduced.

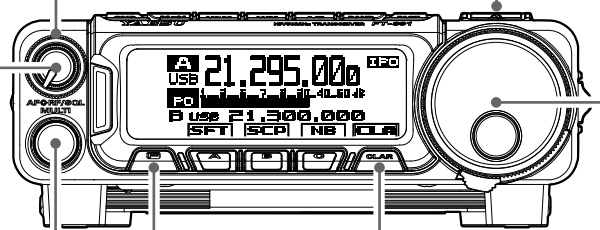
- ○ Rotate the knob slightly counter-clockwise to the point where the “stationary” meter indication is set just about the same as the incoming noise level.
- ○ This control may be changed to function as the squelch control by selecting “**SQL**” on Menu Mode “**05-05** [**RF/SQL VR**]”.

[PWR/LOCK] key

Press and hold this key. ➠ Turns the transceiver ON or OFF.
Briefly press the key while the transceiver is ON. ➠ this key toggles the **MAIN DIAL** knob lock ON/OFF.

AF Knob

The (inner) **AF** knob adjusts the receiver audio volume level of the internal or external speaker. Clockwise rotation increases the volume level.



MAIN DIAL

Rotate this knob clockwise to increases the operating frequency and rotate it counterclockwise to decrease the operating frequency.

- ○ Pressing the [**FAST**] key will change the tuning of the **MAIN DIAL** to a higher step rate.
- ○ Pressing [**PWR/LOCK**] key briefly will engage or release the **DIAL** knob lock.

MULTI function knob

- **Adjusts the operating frequency of VFO-A in 500 kHz Steps (except for AM and FM mode)**
  Repeatedly press this knob momentarily until the “A” is displayed. ➠ Rotate this knob.
- **Adjusts the operating frequency of VFO-B**
  Repeatedly press this knob momentarily until the “B” is displayed. ➠ Rotate this knob.
- **Operates the [A]/[B]/[C]/[CLAR] key function**
  The default assignment of the [**A**] key is the IF SHIFT function.
  Press the [**A**] key. ➠ IF SHIFT pop-up screen appears ➠ Rotate this knob to Adjust the DSP filter passband.
  - ○ Press and hold this knob to restore the IF SHIFT setting to the factory default.
- **Selects the Desired memory channel**
  When the “MEMORY CHANNEL” list screen is displayed, the desired memory channel can be selected by rotating and pressing this knob.
- **Switches the function ON or OFF through the “Setting/Function” Modes**
  Rotate this knob to operate “Setting/Function” Modes are displayed by pressing [**F**] key.
  - Menu Selection (Rotate this knob)
  - Switching the function ON or OFF (Press this knob)
  - Changing setting values (Press this knob and rotate it)
- **Changes the Menu Mode setting values**

[CLAR] key

Press this key. ➠ Rotate the **MULTI** function knob ➠ Adjust the VFO-A RX clarifier offset value up to ±9.998 kHz.
This feature is ideal for following a drifting station, or for setting the small frequency offsets sometimes utilized in DX “Split” work.

- ○ The clarifier offset value (frequency) can be restored to “0 (zero)” by pressing the **MULTI** function knob for more than one second.

[F] key

Press this key. ➠ Switch through the “Setting/Function” Modes as follows

➠ **FUNCTION-1** ➠ **FUNCTION-2** ➠ **CW SETTING** ➠

- ○ Select the desired function from the “Function/Setting” Mode, and then press the **MULTI** function knob to switch the function ON or OFF.
- ○ Assigns “Function/Setting” Modes to the [**A**]/[**B**]/[**C**] keys, rotate the **MULTI** function knob to select the desired function on the “Setting/Function” Mode, and then press and hold the [**A**]/[**B**]/[**C**] key.
- ○ FM SETTING, REC SETTING and ATAS SETTING function screens may be enabled via Menu mode “**05-10**”, “**05-11**” or “**05-12**”.

Press and hold this key. ➠ Activating the Menu Mode.

[QMB] key

Press and hold this key for more than one second to write the frequency and the data presently set for VFO-A onto the quick memory bank (QMB).

- ○ Once all 5 QMB memories have data on them, previous data will be over-written on a first-in, first-out basis.
- ○ 5 QMB memory channels are provided. Press this key briefly to recall the data written onto the quick memory banks (QMB) one by one.
- ○ To change the frequency in the recalled quick memory bank (QMB), rotate the MAIN DIAL.

[M▶V] key

This key will copy the saved data from the written memory channel to VFO-A.
Press this key. ➠ The "MEMORY CHANNEL" list screen is displayed. ➠ Press the **MULTI** function knob to select the desired channel ➠ Press this key. ➠ The currently selected memory channel data is copied to VFO-A.

[V▶M] key

This key is to save the data from VFO-A to the memory channel.
Press this key. ➠ The "MEMORY CHANNEL" list screen is displayed. ➠ Press the **MULTI** function knob to select the desired channel. ➠ Press this key. ➠ The current operating data is copied to the selected memory channel.

- ○ When the "MEMORY CHANNEL" list screen is displayed, press the [**A**]/[**B**]/[**C**] key to edit the selected memory channel.

[V/M] key

This key toggles frequency control between the VFO and the memory systems.

- ○ When the memory channel data is recalled, the Memory channel number is displayed like "M01". The previously selected Memory Channel is recalled.
- ○ Rotate the **MULTI** function knob to change the memory channel number.
- ○ While operating on a memory channel, Rotate **MAIN DIAL**. ➠ the "Memory Channel Number" will be replaced by the MEMORY TUNE indicator "MT".
  "MT" indicates that the operating frequency in the Memory Channel is temporarily changed.
  Press [**V/M**] key in this state. ➠ Previous memory channel data is restored.

[A/B] key

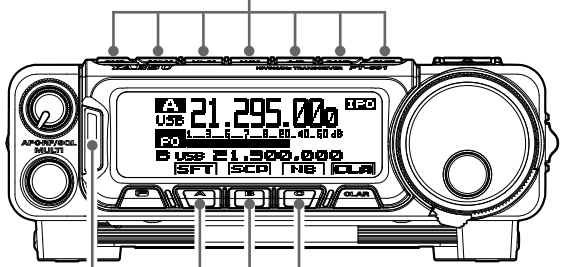
Press this key. ➠ The frequency and memory channel data, of VFO-A and VFO-B are exchanged.
Press and hold this key. ➠ The frequency and data values of VFO-A are copied to VFO-B.

[BAND(MODE)] key

Press this key. ➠ The "BAND SELECT" screen will appear in the display. ➠ Rotate the **DIAL** knob to select the desired frequency band (operating band). ➠ The selected frequency band is set automatically in one second and the display returns to normal operation.
Press and hold this key. ➠ The "MODE SELECT" screen will appear in the display. ➠ Rotate the DIAL knob to select the radio modulation form (operating mode). ➠ The selected mode is set automatically in one second and the display returns to normal operation.

[FAST] key

Pressing this key will change the tuning of the **MAIN DIAL** to a higher step rate.
Press this key. ➠ "FST" is displayed. ➠ The main dial frequency tuning rate doubles.



TX/BUSY Indicator

The Indicator glows green:	On receiving signals while the squelch opens.
The Indicator glows blue:	While Zeroing during CW mode.
	On receiving a signal with a CTCSS/DCS tone matching the squelch tone code setting of the transceiver.
The Indicator glows red:	When transmit is engaged.

[A]/[B]/[C] keys

These three keys are user programmable, allowing quick access to often used features.

- ○ [**A**]/[**B**]/[**C**] keys are assigned the following functions as default settings:

- **[A] (SFT): IF SHIFT function**
  IF SHIFT permits moving the DSP filter passband higher or lower, without changing the pitch of the incoming signal, and thus reduces or eliminates interference.
  Press this key ➠ The IF SHIFT screen will appear in the display ➠ Rotate the **MULTI** function knob to the left or right to reduce interfering signals.
  Press and hold the **MULTI** function knob to restore the IF SHIFT setting to the factory default.
- **[B] (SCP): The SCOPE function**
  The SCOPE function provides a spectrum display of the band conditions.
  Press this key. ➠ the band condition (spectrum) is displayed.
  When the SCOPE function is active, the [**A**]/[**B**]/[**C**] keys are automatically changed to the below operations.
  [**A**](SPN) key: This key changes the displayed bandwidth. Available selections are 750 kHz, 375 kHz, 150 kHz, 75 kHz, or 37.5 kHz ranges.
  [**B**](SWP) key: Each time the [B](SWP) key is pressed, a new scan of the spectrum scope is shown on the LCD display.
  [**C**](LV1-3) key: This key changes the reference level.
  - ○ While the Spectrum Scope is activated, Press the **MULTI** function knob, and then rotate it to adjust the operating frequency tuning steps of VFO-A by the 500 kHz.
- **[C] (NB): Noise Blanker function**
  The IF Noise Blanker can significantly reduced noise that is caused by automotive ignition systems.

EH065H550

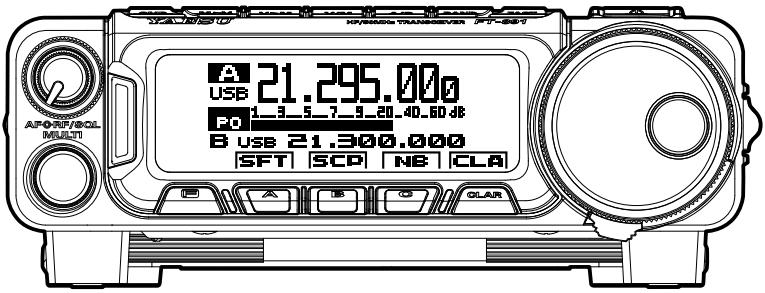
YAESU MUSEN CO., LTD.

YAESU
The radio

FT-891

Operating Manual

HF/50MHz TRANSCEIVER



Contents

The FT-891 is a rugged and innovative, multiband, multimode, mobile/portable transceiver for Operation in the amateur radio HF/50 MHz bands. Providing coverage of the 160 - 6 meter bands, the FT-891 includes operation in the SSB, CW, AM and FM modes, yielding the most comprehensive performance package available for mobile and field operation.

Engineered for high performance, the FT-891 transceiver outputs 100 watts of power on the 160 through 6 meter bands.

The display includes bar-graph indications of: power output, ALC voltage, SWR, speech processor compression level, drain current of the final stage FET, and signal strength. Also included are a number of operating status icons, as well as function displays for the three operating function keys ([**A**], [**B**], and [**C**]).

Many advanced features that are included in the FT-891, have formerly only been incorporated in large base station transceivers. These include:

- ❒ Split-Frequency operation using the Dual VFOs
- ❒ Digital Signal Processing (IF SHIFT, IF WIDTH, CONTOUR, IF NOTCH, Noise Reduction, Auto-Notch)
- ❒ SSB Clarifier operation to permit offset adjustment of the receive frequency on SSB mode.
- ❒ IF Noise Blanker
- ❒ AGC Fast/Middle/Slow/Auto selection
- ❒ RF Gain and Squelch control
- ❒ IPO (Intercept Point Optimization) and a receiver front-end Attenuator
- ❒ AM Broadcast reception
- ❒ VOX
- ❒ Built-in Electronic Keyer with Memories and a Beacon mode
- ❒ Adjustable CW Pitch
- ❒ Spectrum Scope
- ❒ 99 Memories and Band-limiting Memories
- ❒ Alpha-Numeric Labeling of Memories
- ❒ Automatic Power-Off (APO) and Time-Out Timer (TOT) functions
- ❒ Computer Interface capability

We urge you to read this manual and also the Advance Manual (available for download on the Yaesu website) in its entirety, to gain a full understanding of the amazing capability of the exciting new FT-891 Transceiver.

Safety Precautions

Note beforehand that the company shall not be liable for any damages suffered by the customer or third parties in using this product, or for any failures and faults that occur during the use or misuse of this product, unless otherwise provided for under the law.

Type and meaning of the marks

DANGER	This symbol indicates the possibility of death or serious injury being inflicted on the user and the surrounding people when these instructions are ignored and the product is mishandled.
WARNING	This symbol indicates the possibility of death or serious injury being inflicted on the user and the surrounding people when these instructions are ignored and the product is mishandled.
CAUTION	This symbol indicates the possibility of physical impediments occurring or impediments being inflicted on the user and the surrounding people when these instructions are ignored and the product is mishandled.

Type and meaning of symbols

	Prohibited actions that must not be attempted, in order to use this radio safely. For example, signifies that disassembly is prohibited.
	Precautions that must be adhered to in order to use this radio safely. For example, signifies that the power supply is to be disconnected.

DANGER

Do not use the device in "regions or aircrafts and vehicles where its use is prohibited" such as in hospitals and airplanes.
This may exert an impact on electronic and medical devices.

Do not use this product while driving or riding a motorbike. This may result in accidents.
Make sure to stop the car in a safe location first before use if the device is going to be used by the driver.

Do not operate the device when flammable gas is generated.
Doing so may result in fire and explosion.

Do not transmit in crowded places in consideration of people who are fitted with medical devices such as heart pacemakers.
Electromagnetic waves from the device may affect the medical device, resulting in accidents caused by malfunctions.

Never touch the antenna during transmission.
This may result in injury, electric shock and equipment failure.

When an alarm goes off with the external antenna connected, cut off the power supply to this radio immediately and disconnect the external antenna from this radio.
If not, this may result in fire, electric shock and equipment failure.

Do not touch any liquid leaking from the liquid display with your bare hands.
There is a risk of chemical burns occurring when the liquid comes into contact with the skin or gets into the eyes. In this case, seek medical treatment immediately.

⚠ WARNING

Do not use voltages other than the specified power supply voltage.
Doing so may result in fire and electric shock.

Do not transmit continuously for long periods of time.
This may cause the temperature of the main body to rise and result in burns and failures due to overheating.

Do not dismantle or modify the device.
This may result in injury, electric shock and equipment failure.

Do not handle the power plug and connector etc. with wet hands. Also do not plug and unplug the power plug with wet hands.
This may result in injury, liquid leak, electric shock and equipment failure.

When smoke or strange odors are emitted from the radio, turn off the power and disconnect the power cord from the socket.
This may result in fire, liquid leak, overheating, damage, ignition and equipment failure. Please contact our company amateur customer support or the retail store where you purchased the device.

Keep the power plug pins and the surrounding areas clean at all times.
This may result in fire, liquid leak, overheating, breakage, ignition etc.

Disconnect the power cord and connection cables before incorporating items sold separately and replacing the fuse.
This may result in fire, electric shock and equipment failure.

Never cut off the fuse holder of the DC power cord.
This may cause short-circuiting and result in ignition and fire.

Do not use fuses other than those specified.
Doing so may result in fire and equipment failure.

Do not allow metallic objects such as wires and water to get inside the product.
This may result in fire, electric shock and equipment failure.

Do not place the device in areas that may get wet easily (e.g. near a humidifier).
This may result in fire, electric shock and equipment failure.

When connecting a DC power cord, pay due care not to mix up the positive and negative polarities.
This may result in fire, electric shock and equipment failure.

Do not use DC power cords other than the one enclosed or specified.
This may result in fire, electric shock and equipment failure.

Do not bend, twist, pull, heat and modify the power cord and connection cables in an unreasonable manner.
This may cut or damage the cables and result in fire, electric shock and equipment failure.

Do not pull the cable when plugging and unplugging the power cord and connection cables.
Please hold the plug or connector when unplugging. If not, this may result in fire, electric shock and equipment failure.

Refrain from using headphones and earphones at a loud volume.
Continuous exposure to loud volumes may result in hearing impairment.

Do not use the device when the power cord and connection cables are damaged, and when the DC power connector cannot be plugged in tightly.
Please contact our company amateur customer support or the retail store where you purchased the device as this may result in fire, electric shock and equipment failure.

Follow the instructions given when installing items sold separately and replacing the fuse.
This may result in fire, electric shock and equipment failure.

Do not use the device when the alarm goes off.
For safety reasons, please pull the power plug of the DC power equipment connected to the product out of the AC socket.
Never touch the antenna as well. This may result in fire, electric shock and equipment failure due to thunder.

⚠ CAUTION

Do not place this device near a heating instrument or in a location exposed to direct sunlight.
This may result in deformation and discoloration.

Do not place this device in a location where there is a lot of dust and humidity.
Doing so may result in fire and equipment failure.

Stay as far away from the antenna as possible during transmission.
Long-term exposure to electromagnetic radiation may have a negative effect on the human body.

Do not wipe the case using thinner and benzene etc.
Please use a soft and dry piece of cloth to wipe away the stains on the case.

Keep out of the reach of small children.
If not, this may result in injuries to children.

Do not put heavy objects on top of the power cord and connection cables.
This may damage the power cord and connection cables, resulting in fire and electric shock.

Do not transmit near the television and radio.
This may result in electromagnetic interference.

Do not use optional products other than those specified by our company.
If not, this may result in equipment failure.

When using the device in a hybrid car or fuel-saving car, make sure to check with the car manufacturer before using.
The device may not be able to receive transmissions normally due to the influence of noises from the electrical devices (inverters etc.) fitted in the car.

For safety reasons, switch off the power and pull out the DC power cord connected to the DC power connector when the device is not going to be used for a long period of time.
If not, this may result in fire and overheating.

Do not throw or subject the device to strong impact forces.
This may result in equipment failure.

Do not the put this device near magnetic cards and video tapes.
The data in the cash card and video tape etc. may be erased.

Do not turn on the volume too high when using a headphone or earphone.
This may result in hearing impairment.

Do not place the device on an unsteady or sloping surface, or in a location where there is a lot of vibration.
The device may fall over or drop, resulting in fire, injury and equipment failure.

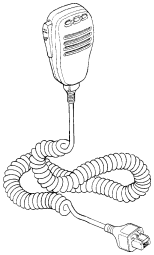
Do not stand on top of the product, and do not place heavy objects on top or insert objects inside it.
If not, this may result in equipment failure.

Do not use a microphone other than those specified when connecting a microphone to the device.
If not, this may result in equipment failure.

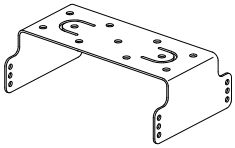
Do not touch the heat radiating parts.
When used for a long period of time, the temperature of the heat radiating parts will get higher, resulting in burns when touched.

Do not open the case of the product except when replacing the fuse and when installing items sold separately.
This may result in injury, electric shock and equipment failure.

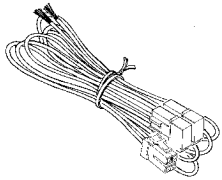
Supplied Accessories



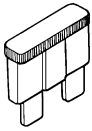
Microphone
MH-31A8J



Mobile Mounting Bracket
MMB-82
(Attachment screw set)



DC power cable w/Fuse



Spare fuse (25 A)

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Quick Manual

Warranty Card

Optional Accessories

MH-31A8J	Microphone
MH-36E8J	DTMF Microphone
M-1	Reference Microphone
MD-200A8X	Ultra-High-Fidelity Desktop Microphone
MD-100A8X	Desktop Microphone
MLS-100	High-Power External Speaker
YH-77STA	Lightweight Stereo Headphone
VL-1000/VP-1000	Linear Amplifier / AC Power Supply
FC-40	External Automatic Antenna Tuner
FC-50	External Automatic Antenna Tuner
ATAS-120A	Active Tuning Antenna (Automatic Type)
ATAS-25	Active Tuning Antenna (Manual Type)
ATBK-100	Antenna Base Kit
FH-2	Remote Control Keypad
YSK-891	Separation Kit
MMB-82	Mobile Mounting Bracket
SCU-17	USB Interface Unit
CT-58	VL-1000 Linear Amplifier Connection Cable
CT-39A	Packet Interface Cable
FP-1030A	AC Power Supply (25 A) (USA and Asian market only)

Installing the Radio

Antenna considerations

The FT-891 is designed for 50 Ohm resistive impedance at the amateur operating frequencies. Select the proper antenna (dipole antenna, YAGI antenna, cubical quad antenna, etc.) suitable for the chosen operation and bands.

Construct the antenna and coaxial cable, or use a suitable antenna tuner, to maintain the impedance presented to the FT-891 antenna connector for an SWR of 1.5 or less. Careful preparation of the antenna and/or tuner will permit maximum performance and protect the transceiver from damage. High voltages may be present on the antenna; install it so it will not be easily touched when in operation.

❒ Create a loop (slack) in the co-axial cable directly underneath the antenna and fasten it so that the weight of the cable does not pull on the antenna or connector itself.

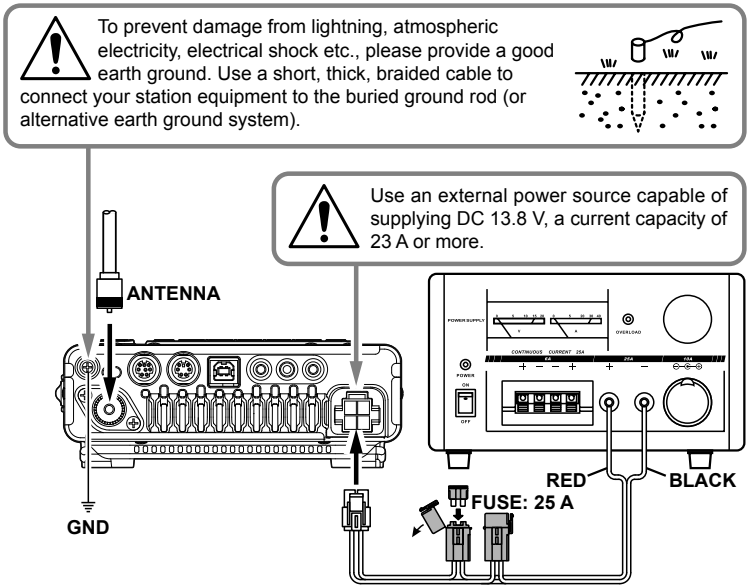
❒ Install the antenna taking into consideration the securing supports and how the guying wires are positioned, so that the antenna does not fall over or get blown away in strong winds.

About coaxial Cable

Use high-quality 50-Ohm coaxial cable for the lead-in to your FT-891 transceiver.

Connection of Antenna and Power Cables

Please follow the outline in the illustration regarding the proper connection of antenna coaxial cables.



Important precautions for mobile radio operation

❒ The use of protective tape or covering is recommended to protect the wiring and the power cord inside the vehicle.

❒ When installing the unit inside a vehicle, locate the radio, antenna, co-axial cable, etc. at least 20 cm (8 inches) away from the following control equipment:

- Engine-related: Fuel injection equipment and engine control
- Transmission-related: Transmission and 4WD electronic control unit
- Others: ECS/EPS/ABS/ETACS/Fully automatic air-conditioner/Auto-heater control unit/G sensor

- ❒ Install the antenna and co-axial cable away from the control unit and wiring harness. Place all cables so they do not entangle and impede the driver or passengers. Never place any equipment in a location where it may pose a danger to the passengers, where it may interfere with driving, or obstruct the driver field of view.
- ❒ Do not install any apparatus in such a way that it may interfere with the proper operation of the air bags.
- ❒ After installing the radio, check that the brake lamp, head lamp, turning indicator lights, wiper, etc. are working normally with the radio power switched on.
- ❒ Keep full attention on driving, do not operate the radio controls or look at the radio display while driving. Stop the vehicle at a safe location, before operating the radio controls or looking at the display.
- ❒ Do not drive the car in such a way that external sounds required for safe driving cannot be heard. Most areas and districts prohibit the use of earphones and headphones while driving.
- ❒ If operation of the radio transmitter appears to have abnormal effects on the control equipment of the vehicle, stop the engine, turn off the transceiver power supply, and disconnect the power cord. Resolve the problem before continuing to operate the radio equipment.
- ❒ When using the radio in an electric or hybrid car, the receiver may experience high RF interference and noise from the inverters that are built into the electric vehicle.

Precautions during installation

Note the following when installing this radio.

- ❒ Do not install the radio in a place where there is extreme vibration, where there is a lot of dust, excessive humidity or high temperature, or where it is exposed to direct sunlight.
- ❒ Install the radio in a well ventilated position, so heat release is not obstructed because the heat sink gets hot when transmitting repeatedly.

Install the Antenna

- ❒ Ensure that the antenna base is securely fixed.
- ❒ Ensure that the antenna base is securely grounded to the car body.
- ❒ Avoid routing the co-axial cable enclosed with a commercial car antenna cable.
- ❒ Do not place the co-axial cable or connectors inside the car where rain water or moisture may penetrate them.

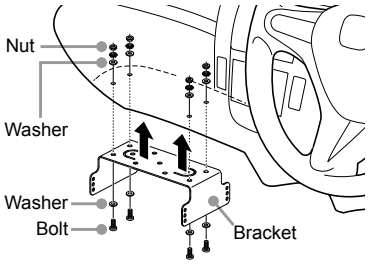
Install the main body

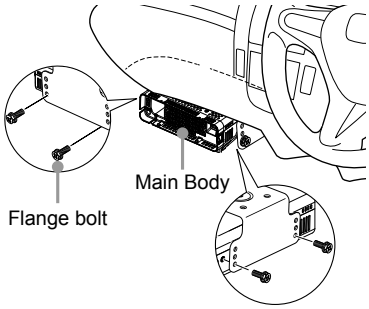
Install the main body using the provided MMB-82 bracket.

❒ Do not install the FT-891 in a place with intense vibration.

❒ Attach the bracket firmly with the supplied screws, so it will not become loose.

1. **Holes in the location where the bracket is to be mounted**
   Drill four 6 mm diameter holes in the location where the bracket is to be mounted matching the positions of the bolting holes of the bracket.
2. **Attach the bracket**
   Using the provided bolts, nuts and washers.
3. **Fasten the transceiver to the bracket**
   Using the provided flange bolts, as shown in the drawing.
   ❒ The mounting angle can be changed depending on the securing position of the flange bolts.





Install the Front Panel

Install the front panel using the optional bracket.

❒ The bracket can be bent by hand to match the location where the controller is going to be installed. Take due care not to injure yourself when bending the bracket.

❒ Select a stable, flat location with as few dents and protrusions as possible.

Installation location when used in a mobile unit

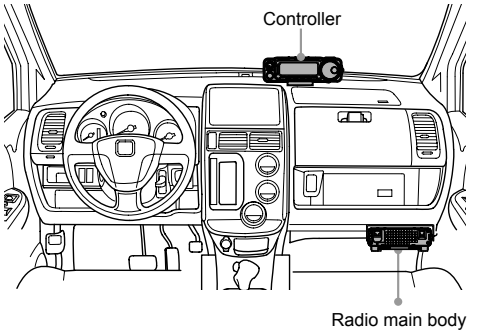
Front Panel

It is recommended that the front panel be installed on top of the car dash board.

Main body

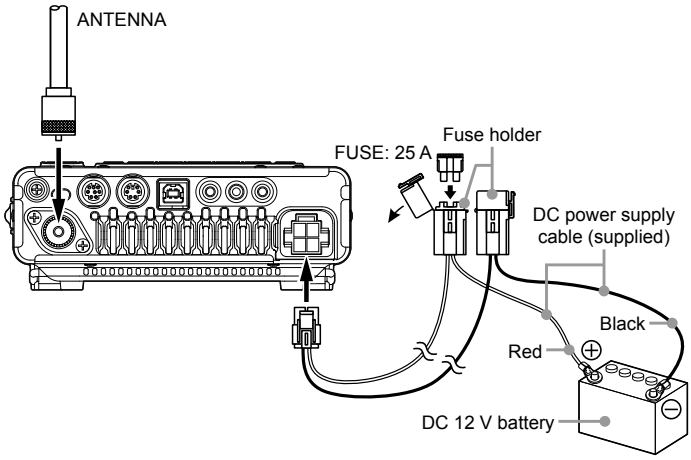
It is recommended that the main body be installed below the car dash board.

❒ Do not install the front panel, the transceiver or the wire cables near the air bags. In case of emergency, the transceiver may interfere with air bag deployment and result in accidents and injury. The wire cables may also cause the air bag to malfunction.



Connection of Antenna and Power Cables

Please follow the outline in the illustration regarding the proper connection of antenna coaxial cables, as well as the DC power cable.
High current is carried during transmissions. The DC power supply cable must connect directly to the negative ground, 12 V car battery.



- ❒ Use the transceiver only in a car with a negative ground 12 V DC system, where the minus (-) pole of the battery is connected to the car body.
- ❒ Do not connect the radio to the 24 V battery of a large vehicle.
- ❒ Do not use a DC power cable other than the one that is supplied or specified.
- ❒ High current is carried during transmissions; do not use the cigarette lighter connector inside the car as a power source.

High RF voltage is present in the TX RF section of the transceiver while transmitting. Absolutely! Do not touch the TX RF section while transmitting.

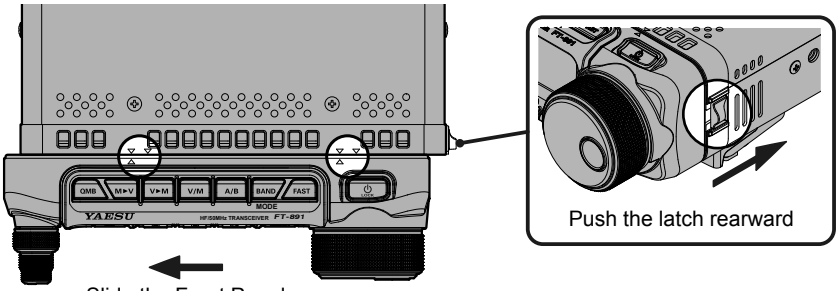
Permanent damage can result when improper supply voltage, or reverse polarity voltage, is applied to the FT-891. The Limited Warranty on this transceiver does not cover damage caused by application of AC voltage, reverse polarity DC, or DC voltage outside the specified range of 13.8 V ±15 %. When replacing fuses, be certain to use a fuse of the proper rating. The FT-891 requires a 25 Amp blade fuse.

About Antenna

The FT-891 is designed for 50 Ohm resistive impedance at the amateur operating frequencies.
Select the proper antenna, suitable for the chosen operation and bands. Maintain the impedance presented to the FT-891 antenna connector for an SWR of 1.5 or less.
Careful preparation of the antenna and/or tuner will permit maximum performance and protect the transceiver from damage.
High voltages may be present on the antenna; install it so it will not be easily touched when in operation.

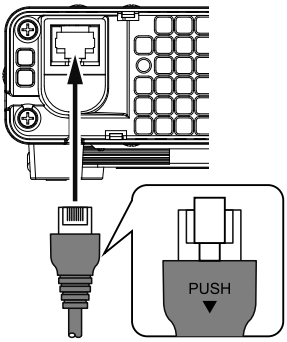
Installing the Microphone

1. To separate the Front Panel, use your thumb to push the latch on the right-hand side of the panel slightly rearward, and then slide the Front Panel to the left and away from the transceiver.

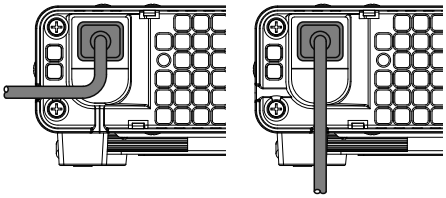


2. Insert the microphone plug into the recessed jack on the transceiver, as shown in the illustration.

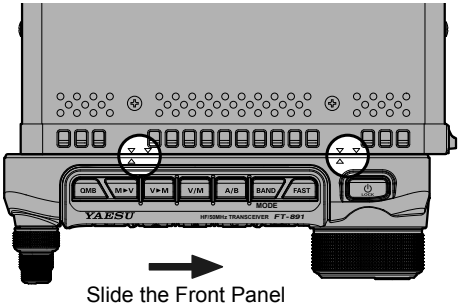
   NOTE: When disconnecting the microphone, pull the cable while pressing the connector latch.



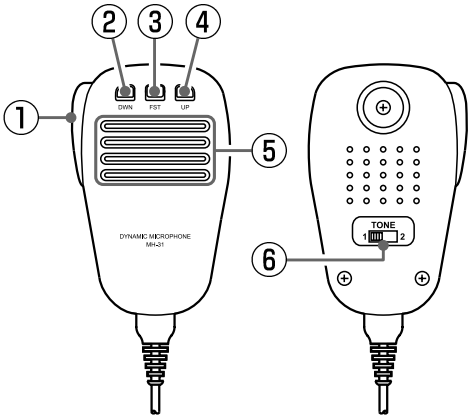
3. The microphone cable may be positioned so that it will exit from the side or the bottom of the transceiver. Just route the cable into the appropriate channel provided, as shown in the illustration.



4. Install the Front Panel by sliding it into the position shown; you will hear a “click” when the panel locks into place.



MH-31A8J Microphone Key Buttons



① **PTT Switch**
Switches transmit/receive.
Press to transmit and release to receive.

② **DWN key**
Press the **DWN** (Down) key to scan the frequency downward.

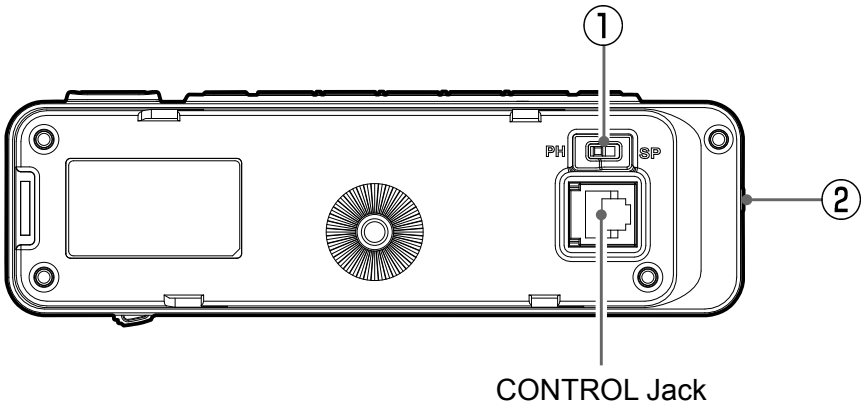
③ **FST key**
Changes the frequency step, this key works in the same way as the [**FAST**] key on the transceiver top panel.

④ **UP key**
Press the **UP** key to scan the frequency upward.

⑤ **Microphone**
Speak into the microphone in a normal tone of voice with the microphone 5 cm away from your mouth.

⑥ **TONE Switch**
Alters transmit sound quality. Slide the switch to the “1” position for a “flat transmit audio response, Slide the switch to the “2” position to emphasize transmit audio.

Control Panel Switch & Connectors

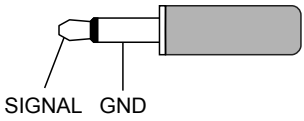


① SP-PH switch

If you use earphones with this transceiver, move this switch to the "PH" position before inserting the earphone plug into the SP/PH Jack, to prevent injury your ears.

② SP/PH jack

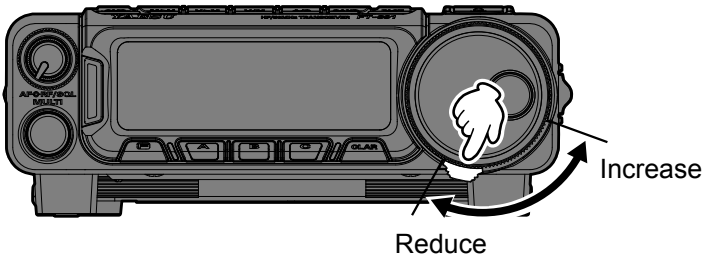
This 3.5-mm, 2-pin jack provides adjustable audio output for an external speaker (4 Ω ~ 16 Ω impedance) or earphones. The audio level varies according to the setting of the front panel AF knob.



Important Note: When an earphone plug is inserted into this jack, the SP-PH slide switch (located on the back side of the front panel) MUST BE set to the "PH" position, to prevent the possibility of injury to your ears.

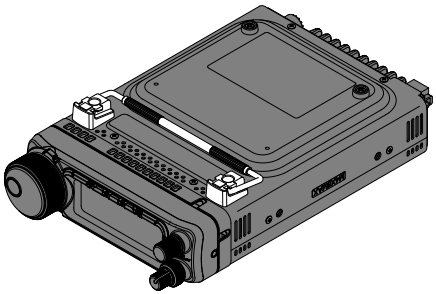
Adjusting the Main tuning DIAL torque

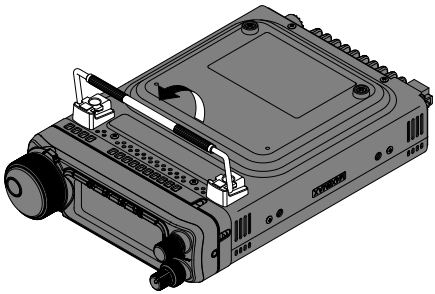
The torque (drag) of the Main Tuning **DIAL** knob may be adjusted for your operating preferences. Slide the lever clockwise to reduce the drag, or counter-clockwise to increase the drag.



Base Station Tilt Stand

The sturdy stand on the bottom of the transceiver allows the transceiver to be tilted upward for better viewing. Simply fold the stand forward to raise the front of the transceiver, and fold it back against the bottom case to lower the front of the FT-891.

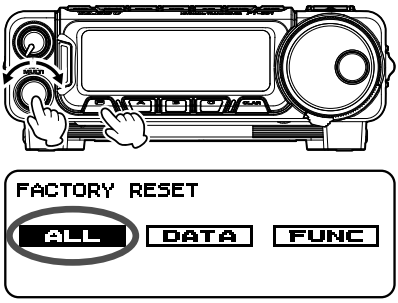




Resetting the Microprocessor

All Reset

Use this procedure to restore all settings to their original factory defaults. All Memories will be cleared by this procedure.

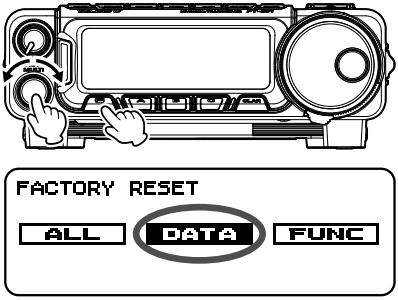


1. Press and hold in the ⑪ **[F]** key for one second to activate the Menu mode.
2. Rotate the ⑰ **MULTI** function knob to select Menu Mode "**17-01** [**RESET**]".
3. Press the ⑰ **MULTI** function knob, and then rotate the ⑰ **MULTI** function knob to select "ALL".
4. Press and hold the ⑰ **MULTI** function knob to reset and automatically restart the transceiver.

Resetting Memories (only)

Use this procedure to reset (clear) the previously stored Memory channels, without affecting any configuration changes you may have made to the Menu settings.

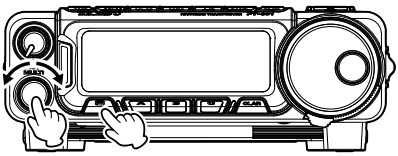
NOTE: The FT-891 cannot erase the memory channels "01" (and "501" through "510": U.S. version).



1. Press and hold in the ⑪ **[F]** key for one second to activate the Menu mode.
2. Rotate the ⑰ **MULTI** function knob to select Menu Mode "**17-01** [**RESET**]".
3. Press the ⑰ **MULTI** function knob, and then rotate the ⑰ **MULTI** function knob to select "DATA".
4. Press and hold the ⑰ **MULTI** function knob to reset and automatically restart the transceiver.

Function Resetting

Use this procedure to restore Menu and Programmable Multi Function ⑫ [**A**]/[**B**]/[**C**] key settings to their factory defaults, without affecting the programmed memories.

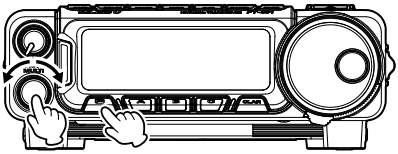


1. Press and hold in the ⑪ [**F**] key for one second to activate the Menu mode.
2. Rotate the ⑰ **MULTI** function knob to select Menu Mode "**17-01** [**RESET**]".
3. Press the ⑰ **MULTI** function knob, and then rotate the ⑰ **MULTI** function knob to select "FUNC".
4. Press and hold the ⑰ **MULTI** function knob to reset and automatically restart the transceiver.

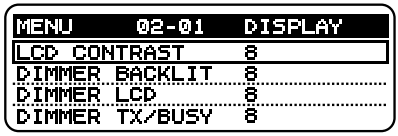
Adjusting the display settings

Display Contrast

The LCD contrast may be adjusted using the Menu Mode.



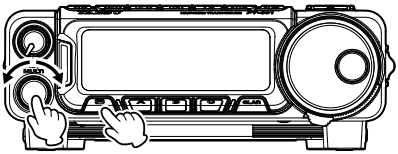
1. Press and hold in the ⑪ [**F**] key for one second to activate the Menu mode.
2. Rotate the ⑰ **MULTI** function knob to select Menu Mode "**02-01** [**LCD CONTRAST**]".
3. Press the ⑰ **MULTI** function knob, and then rotate it to adjust the contrast. The contrast change may be observed as the knob is adjusted.



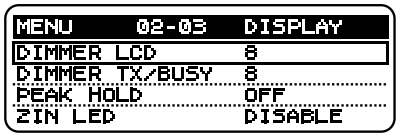
4. When the adjustment is satisfactory, press the ⑰ **MULTI** function knob.
5. Press the ⑪ [**F**] key to save the new setting and exit the Menu mode to normal operation.

Display Dimmer

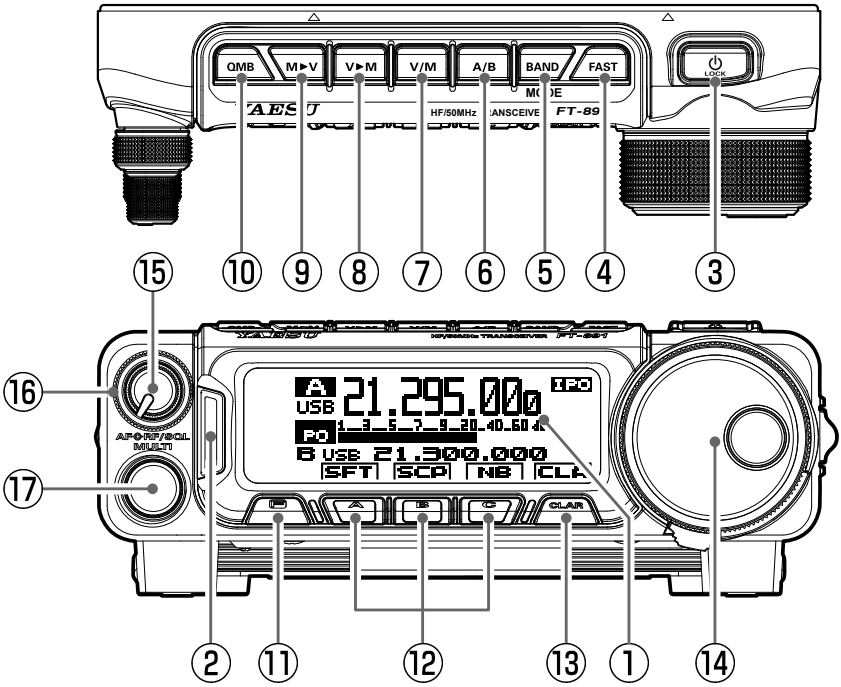
The LCD illumination level may also be adjusted using the Menu Mode.



1. Press and hold in the ⑪ [**F**] key for one second to activate the Menu mode.
2. Rotate the ⑰ **MULTI** function knob to select Menu Mode "**02-03** [**DIMMER LCD**]".
3. Press the ⑰ **MULTI** function knob, and then rotate it to adjust the display illumination for a comfortable brightness level. The change may be observed as the knob is adjusted.



4. When the adjustment is completed, press the ⑰ **MULTI** function knob.
5. Press the ⑪ [**F**] key to save the new setting and exit the Menu mode to normal operation.



① **LCD Display**

The LCD (Liquid Crystal Display) shows the operating frequency and indicates of the status of other transceiver functions.

② **TX/BUSY** Indicator

The Indicator glows green: While the squelch opens on receiving signals.
The Indicator glows blue: While Zeroing during CW mode.
On receiving a signal with a CTCSS/DCS tone matching the squelch tone code setting of the transceiver.
The Indicator glows red: When transmit is engaged.

③ [**PWR/LOCK**] key

Press and hold this key to turn the transceiver ON or OFF.
Briefly press the key while the transceiver is ON to engage the ⑭ **MAIN DIAL** knob lock.
This key toggles the ⑭ **MAIN DIAL** knob lock ON/OFF.

④ [**FAST**] key

Press this key to change the tuning of the ⑭ **MAIN DIAL** to a higher step rate.
The "**FST**" will be displayed at the bottom right corner of the screen.
The tuning steps for the ⑭ **MAIN DIAL** knob are set at the factory to 10 Hz -100 Hz for one step and 20 kHz for each dial rotation, in the SSB/AM/CW/RTTY/DATA Mode (One kHz for each step and 200 kHz for each dial rotation in the FM Mode).

⑤ [**BAND** (**MODE**)] key

- Press this key to display the "BAND SELECT" screen (Operating band selection screen).
  Rotate the ⑭ **MAIN DIAL** knob to select the desired frequency band (operating band).
  The selected frequency band will be set automatically in one second and the display will return to normal operation.
- Press and hold this key to display the "MODE SELECT" screen.
  Rotate the ⑭ **MAIN DIAL** knob to select the radio modulation form (operating mode).
  The selected operating mode will be set automatically in one second and the display will return to normal operation in the selected operating mode. (The mode is automatically preset for each operating band, it is only necessary to set "MODE SELECT" when a change is desired).

⑥ [**A/B**] key

Pressing this key momentarily, exchanges the frequency and memory channel data of VFO-A and VFO-B.
Press and hold this key for one second to set VFO-A and VFO-B to the same frequency and data values.

⑦ [**V/M**] key

This key toggles frequency control between the VFO and the memory systems.

- When the memory channel data is recalled, the previously selected Memory channel number is displayed like "M01".
- Rotate the ⑰ **MULTI** function knob to change the memory channel number.
- While operating on a memory channel, if the ⑭ **MAIN DIAL** knob is turned, the "Memory Channel Number" will be replaced by the MEMORY TUNE indicator "MT"; this indicates that the operating frequency of the Memory Channel is temporarily changed. Pressing the [**V/M**] key while in the MEMORY TUNE state will restore the previous memory channel data.

⑧ [**V►M**] key

This key is used to save the data from VFO-A to a memory channel.
Press this key to display the "MEMORY CHANNEL" list screen.
Rotate the ⑰ **MULTI** function knob to select the desired memory channel.
Press this key again to copy the VFO-A operating data to the selected memory channel.

- When the "MEMORY CHANNEL" list screen is displayed, press the ⑫ [**A**]/[**B**]/[**C**] key to edit the selected memory channel.

⑨ [**M►V**] key

This key will copy the saved data from a written memory channel to VFO-A.
Press this key to display the "MEMORY CHANNEL" list screen.
Rotate the ⑰ **MULTI** function knob to select the desired previously written memory

channel.
Press this key again to copy the currently selected memory channel data to VFO-A.

⑩ [QMB] key

Press and hold this key for more than one second to write the frequency and the data presently displayed on VFO-A to the quick memory bank (QMB).

- Once all 5 QMB memories have data written on them, the previous data will be over-written on a first-in, first-out basis.
- 5 QMB memory channels are provided. Press this key briefly to recall the data written onto the quick memory banks (QMB) one by one.
- To change the frequency in the recalled quick memory bank (QMB), rotate the ⑭ **MAIN DIAL**.

NOTE: For details on the Quick Memory Bank function, see page 31.

⑪ [F] key

Repeatedly press this key momentarily to step through the Setting Modes as follows:

➠ FUNCTION-1 ➠ FUNCTION-2 ➠ CW SETTING ➠

- Select the desired function from the **Setting Modes**, and then press the ⑰ **MULTI** function knob to switch the selected function ON or OFF.
- While in the **Setting Modes**, to assign the **Setting Modes** to the ⑫ [**A**]/[**B**]/[**C**] keys, rotate the ⑰ **MULTI** function knob to select the desired function, and then press and hold the ⑫ [**A**]/[**B**]/[**C**] key.
- **FM SETTING**, **REC SETTING** and **ATAS SETTING** function screens may be enabled via Menu mode "**05-10**", "**05-11**" or "**05-12**".
- To return to normal operation, rotate the ⑭ **MAIN DIAL** or press another key.

Press and hold this key to activate the Menu mode.

⑫ Programmable Multi Function [A]/[B]/[C] keys

These three keys are user programmable, allowing quick access to often used functions.

- [**A**]/[**B**]/[**C**] keys are assigned the following functions as default settings:

• [A] (SFT): IF SHIFT function

In the SSB mode, IF SHIFT permits moving the DSP filter passband higher or lower, without changing the pitch of the incoming signal, and thus reduces or eliminates interference.

1. Press this key to display the IF SHIFT screen.
2. Rotate the ⑰ **MULTI** function knob to the left or right to reduce interfering signals.
3. Press and hold the ⑰ **MULTI** function knob to restore the IF SHIFT setting to the factory default.

- **[B] (SCP): The SCOPE function**

  The SCOPE function provides a spectrum display of the band conditions.

  Press this key to display the band condition (spectrum).

  When the SCOPE function is active, the [**A**]/[**B**]/[**C**] keys are automatically changed to the below operations.

  [**A**](SPN) key: This key changes the displayed bandwidth. Available selections are 750 kHz, 375 kHz, 150 kHz, 75 kHz, or 37.5 kHz ranges.

  [**B**](SWP) key: Each time the [**B**](SWP) key is pressed, a new scan of the spectrum scope is shown on the LCD display.

  The SWP icon blinking on the LCD is confirmation that the "Continuous Sweeping mode" is running.

- Since the FT-891 has only one receiver the audio will be muted while the spectrum scope is scanning. To stop scanning and turn the receiver on, set the desired frequency and press the [**B**](SWP) key again.

  [**C**](LV1-3) key: This key changes the gain.

- While the Spectrum Scope is activated, Press the ⑰ **MULTI** function knob, and then rotate it to adjust the operating frequency tuning steps of VFO-A by the 500 kHz.

- **[C] (NB): Noise Blanker function**

  The IF Noise Blanker can significantly reduce the noise that is caused by automotive ignition systems.

⑬ [**CLAR**] key

During reception, press this key, and then rotate the ⑰ **MULTI** function knob to adjust the VFO-A RX clarifier offset value up to ±9.998 kHz.

- The clarifier offset value (frequency) can be restored to "0 (zero)" by pressing the ⑰ **MULTI** function knob for more than one second.

NOTE: For details on the clarifier function, see "Clarifier (Offsets the receive frequency on the SSB/CW mode)" on page 33.

⑭ **MAIN DIAL**

This is the main tuning dial for the transceiver. Rotate this knob clockwise to increase the operating frequency and rotate it counterclockwise to decrease the operating frequency.

- Pressing the ④ [**FAST**] key will change the tuning of the **MAIN DIAL** to a higher step rate.The frequency steps available are 10Hz and 100Hz per step (2kHz and 20kHz per rotation).
- Pressing the ③ [**PWR/LOCK**] key briefly will engage or release the DIAL knob lock.

⑮ **AF Knob**

The (inner) AF knob adjusts the receiver audio volume level of the internal or external speaker. Clockwise rotation increases the volume level.

⑯ RF/SQL knob

Rotate this knob counter-clockwise to reduce the background noise and the system gain. Rotate this knob fully clockwise to set the gain to the highest level for normal operations. Counter-clockwise rotation will raise the start position of the S-Meter indication. When receiving a strong signal, the noise is reduced and the signal is emphasized.

- Rotate this knob slightly counter-clockwise to the point where the "stationary" meter indication is set just about the same as the receiver noise level.
- This control may be changed to function as the squelch control by selecting "**SQL**" on Menu Mode "**05-05** [**RF/SQL VR**]".

NOTE: For additional details, refer to the Advanced Manual which may be downloaded from the Yaesu website.

⑰ MULTI function knob

This knob incorporates multiple tasks and makes it very convenient to operate the various functions of the FT-891.

1 Adjusts the operating frequency of VFO-A in 500 kHz Steps (except the for AM and FM modes)

By pressing the **MULTI** function Knob momentarily until the"A"is displayed, the operating frequency steps of VFO-A may be adjusted in 500 kHz steps.

By rotating the **DIAL** knob while "A" is displayed, the 500 kHz step adjustment of the **MULTI** function knob is canceled (the "A" indication will be returned to "A").

If you want to adjust the operating frequency steps of VFO-A by the 500 kHz again, make sure that the "A" is displayed on the screen.

- The operating frequency 500 kHz steps of VFO-A can be changed via Menu mode 14-01"[**QUICK DIAL**]"

2 Adjusts the operating frequency of VFO-B

By pressing **MULTI** function Knob momentarily until the "B" is displayed, the operating frequency of VFO-B may be adjusted.This function is convenient for changing the transmit frequency on split operation.

3 Operates the ⑫ [A]/[B]/[C]/ ⑬ [CLAR] key function

When the ⑫ [**A**] key is assigned to the IF SHIFT function:

Pressing the ⑫ [**A**] key will display the IF SHIFT pop-up screen, and then rotation of the **MULTI** function Knob will adjust the DSP filter passband.

- An indication mark is displayed to the left of the function key status icon.
- Press and hold the **MULTI** function Knob to restore the IF SHIFT setting to factory defaults.
- When another function assigned to an ⑫ [**A**]/[**B**]/[**C**] key has no setting that can be adjusted by the **MULTI** function Knob, the **MULTI** function Knob is not active.

4 Selects the Desired memory channel

When the "MEMORY CHANNEL" list screen is displayed, the desired memory channel can be selected by rotating and pressing **MULTI** function Knob.

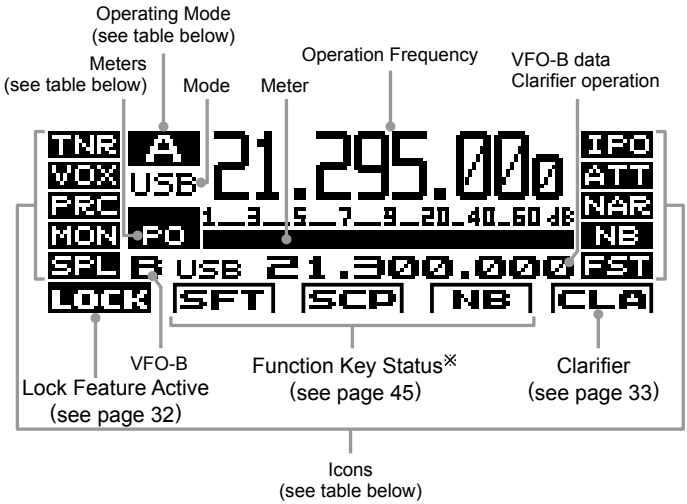
5 Switches the Setting Modes ON/OFF

Operates the Setting Modes that are displayed by pressing the ⑪ [**F**] key:

- Select menu functions (Rotate the **MULTI** function Knob)
- Switch the function ON or OFF (Press the **MULTI** function Knob)
- Change the setting values (Press the **MULTI** function Knob, to turn the functions ON and then rotate it)
- Reset the setting values to the factory default value (Rotate the **MULTI** function Knob to select the function, and then press and hold the **MULTI** function Knob)

6 Changes the Menu Mode setting values

Refer to the “Menu Mode” on page 51.



※ Display examples of the Function key（in the case of Noise Blanker）

[NB] : Function “OFF”.

NB : Function “ON”.

NB : Function “ON” and then turn the ⑰ **MULTI** function knob to change the assigned feature setting.

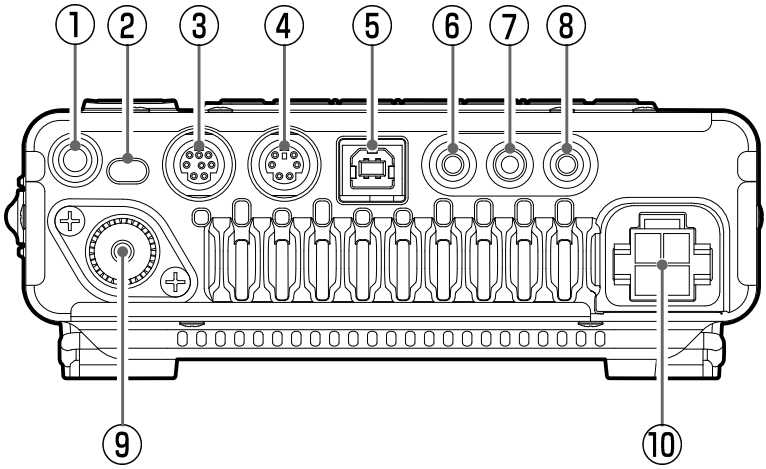
Operating Mode Indicators	
A / A	VFO-A
M01 / M01	Memory Channel Number
PMS / PMS	Programmable Memory Scanning
QMB / QMB	Operating with the Quick Memory Bank
MT / MT	Memory tune
EMG / EMG	Recalling the emergency contact frequency

Meters	
PO	Displays transmitter output power
ALC	Displays ALC voltage
SWR	Displays Standing Wave Ratio
CMP	Displays the speech processor compression level
IDD	Displays the drain current of the final stage FET transistors

※ **The Indication of each meter is not precise but is a relative value and a rough indication.**

Icons			
TNR	Antenna Tuner	SPL	Running split operation
ATS	Active Tuning Antenna System	IPO	The receiver preamplifier is OFF
LAP	Connecting the linear amplifier	ATT	The attenuator is in use
VOX	The VOX function is in use	NAR	The Narrow IF DSP filter is in use
PRC	The Speech Processor function is in use	NB	The noise blanker is in use
MON	The Monitor function is in use	FST	MAIN DIAL at a higher step rate.

About the Rear Panel



① GND

Use this terminal to connect the transceiver to a good earth ground, for safety and optimum performance.

Use a large diameter, short braided cable to make the ground connections.

② Firmware update switch

Use this switch when updating the firmware. When a new firmware update for the FT-891 is available, go to the YAESU website to download the programming data and update the FT-891 to its newest state.

To update the firmware, connect the USB Jack ⑤ to a computer.

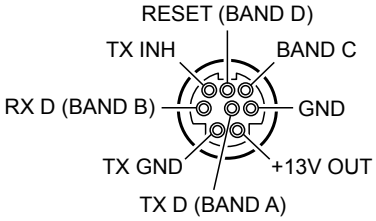
③ TUN/LIN

Connect the optional external antenna tuner “FC-50”, “FC-40” or the linear amplifier “VL-1000”.

Connect a Linear Amplifier “VL-1000” with an optional “CT-58” Linear Amplifier Connection Cable.

Connect an External Automatic Antenna Tuner FC-40,FC-50 with the control cable supplied with the tuner.

NOTE: For details, refer to the Advanced Manual (download from the Yaesu website).

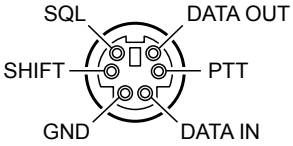


④ RTTY/DATA

This is the input/output jack to connect a terminal unit for RTTY and TNC for packet communications.

Connect a terminal unit with the optional “CT-39A” Packet Interface Cable.

NOTE: For details, refer to the Advanced Manual (download from the Yaesu website).



⑤ USB Jack

Control the transceiver remotely from a computer using the CAT commands.

Transmission control, can also be done from the computer.

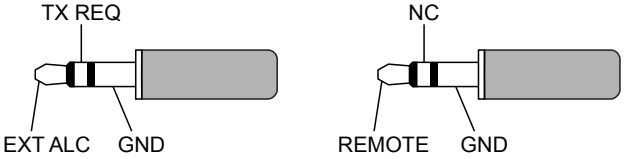
Connect the computer with a commercially available USB cable.

NOTE:To control the transceiver remotely from the computer, a USB driver is required. For details on the USB driver, visit the Yaesu website.

⑥ REM/ALC

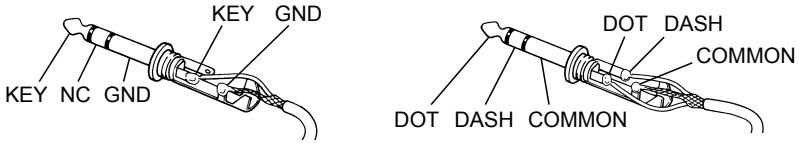
Connect the optional remote control keypad “FH-2”.

When a device such as a linear amplifier is connected, this is an external ALC current input jack.



⑦ KEY Jack

Connect a telegraph key or electronic keyer paddle to use for CW mode operation.



When connecting a single straight key

When connecting an electronic keyer paddle

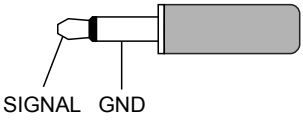
This 3.5 mm, 3-contact jack accepts a CW key or keyer paddles (for the built-in electronic keyer), or the output from an external electronic keyer. Contact connections are shown below. Keyup is 5 volts, and key down current is 1 mA. Use only the 3.5 mm 3 contact type plug. An incorrect size plug may damage the jack. If the Keyer plug is inserted into and removed from the jack while the FT-891 is in operation, the FT-891 may be switched to the transmit mode.

About the Rear Panel

Always turn off the power of the FT-891 before connecting or disconnecting the Keyer.

⑧ EXT SPKR

This is the monaural jack to connect an external speaker (4 Ω to 8 Ω).
Connecting an external speaker to this jack will deactivate the internal speaker.

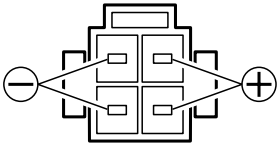


⑨ ANT Jack

This is the M-type coaxial connector to connect HF band and 50 MHz band antennas (50 ohms).

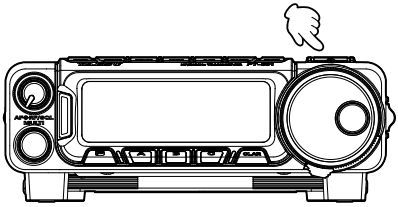
⑩ DC IN Jack

This is the DC power supply connection for the transceiver. Use the supplied DC cable to connect directly to a DC power supply, which must be capable of supplying at least 23 A @13.8 VDC.



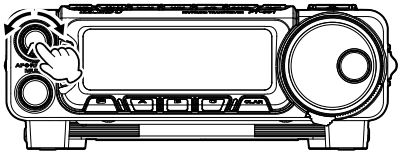
Turning the Transceiver ON and OFF

1. To turn the transceiver ON, press and hold the ③ [**PWR/LOCK**] key for one second.
2. To turn the transceiver OFF, again press and hold the ③ [**PWR/LOCK**] key for one second.



Adjusting the Audio Volume Level

Rotate the ⑮ **AF knob** to set a comfortable listening level.



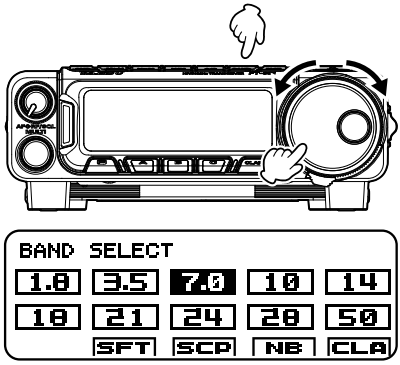
Operating Band and Mode Selection

Follow the below instructions to easily select the Amateur Bands and preset modes. Frequencies outside the Amateur Bands may only be received(No Transmit).

1. Press the ⑤ [**BAND**(**MODE**)] key.
   The "BAND SELECT" screen will appear in the display.
2. Rotate the **DIAL** knob to select the desired operating band.

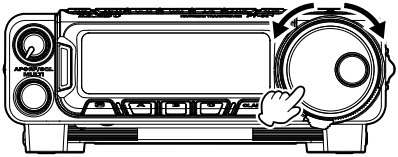
   The selections available are:
   ...⇔ 1.8 MHz ⇔ 3.5 MHz ⇔
   ⇔ 7.0 MHz ⇔ 10 MHz ⇔ 14 MHz ⇔
   ⇔ 18 MHz ⇔ 21 MHz ⇔ 24 MHz ⇔
   ⇔ 28 MHz ⇔ 50 MHz ⇔...

   NOTE: When the desired operating Band is selected, the display will automatically return to normal operation after 0.5 second.



Setting the Operating Frequency

Rotate the **DIAL** knob to set the frequency. Rotate clockwise to increases the operating frequency and rotate counter-clockwise to decrease the operating frequency.



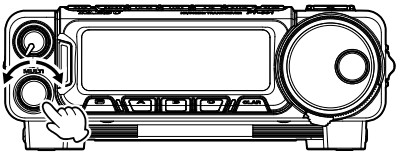
❒ Two settings, one “normal” and one “fast”, are available for each operating mode. Pressing the ④ [**FAST**] key engages the “Fast” tuning selection (see table below).

Operating Mode	1 Step	1 Step (FAST key)	1 Dial Rotation	1 Dial Rotation (FAST key)
SSB, AM	10 Hz	100 Hz	2 kHz	20 kHz
CW, RTTY, DATA	5 Hz	100 Hz	1 kHz	20 kHz
FM	100 Hz	1 kHz	20 kHz	200 kHz

❒ The Main Tuning Dial tuning step default settings are: SSB,AM (10 Hz); CW/RTTY/DATA (5 Hz); and FM (100 Hz). The step settings may be changed according to operator preference via MENU items “**14-02**” to “**14-05**”.

Changing frequency up and down quickly with the MULTI function Knob

Press the ⑰ **MULTI** function knob, and then rotate it to adjust the frequency up and down.



NOTE: If the frequency is not changed by rotating the ⑰ **MULTI** function knob, press the ⑰ **MULTI** function knob repeatedly to restore the up and down function.

❒ The frequency steps can be changed via Menu mode “**14-01** [**QUICK DIAL**]”, “**14-06** [**AM CH STEP**]” and “**14-07** [**FM CH STEP**]”.

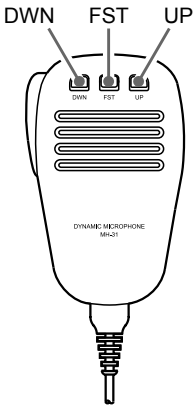
Operating Mode	Frequency Step
SSB, CW, RTTY, DATA	50, 100, ***500*** (kHz)
AM	2.5, ***5***, 9, 10, 12.5, 25 (kHz)
FM	***5***, 6.25, 10, 12.5, 15, 20, 25 (kHz)

(Default: ***Bold Italic***)

Using the UP/DWN keys of the Supplied MH-31A8J Hand Microphone

The **UP**/**DWN** keys on the supplied MH-31A8J Hand Microphone may also be used to manually scan the frequency upward or downward.

In modes other than AM/FM, the frequency changes by the same step as the main dial.
When the microphone [**FST**] key is pressed, the tuning rate increases by a factor of ten, in the same manner as the transceiver top panel ④ [**FAST**] key.

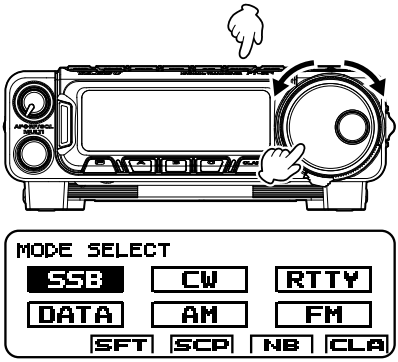


Mode Selection

1. Press and hold the ⑤ [**BAND**(**MODE**)] key for one second.
   The "MODE SELECT" screen will appear in the display.
2. Rotate the **DIAL** knob to select the desired radio operating mode.

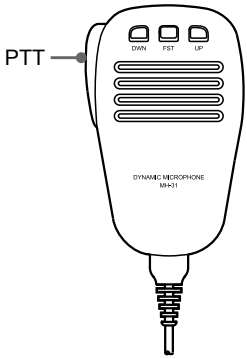
   The selections available are:
   ... ⇔ SSB ⇔ CW ⇔ RTTY ⇔
   ⇔ DATA ⇔ AM ⇔ FM ⇔ ...

   NOTE: When the desired radio operating mode is selected, the display will automatically return to normal operation after 0.5 second.



❒ After changing the selected operating mode on an amateur band, that same mode will automatically be selected when returning to that band.

Transmission (SSB/AM/FM mode)



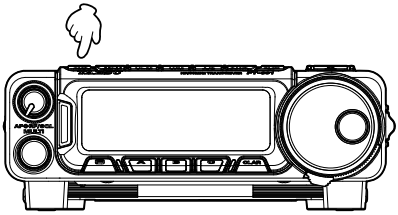
1. Press the microphone **PTT** switch to begin transmitting; speak into the microphone in a normal voice level.
   - ❒ The ② TX/BUSY indicator will glow red during transmission.
   - ❒ Normally, the factory default microphone gain setting will provide a good transmit audio level.
   - ❒ To adjust the microphone gain, utilize Menu mode "**16-07** [**SSB MIC GAIN**]", "**16-08** [**AM MIC GAIN**]" or "**16-09** [**FM MIC GAIN**]".
   - ❒ When transmitting in the AM mode, set a maximum (carrier) power output of 25 Watts via Menu mode "**16-02** [**HF AM PWR**]" or "**16-05** [**50M AM PWR**]".
2. Release the **PTT** switch to return to receive mode.

QMB (Quick Memory Bank) Channels

The Quick Memory Bank consists of five memories independent from the regular and PMS memories. The QMB memories can quickly store operating parameters for later recall.

QMB Channel Storage

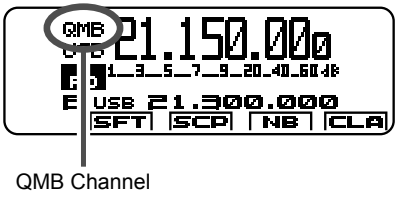
1. Tune in the desired frequency and set the operating mode on VFO-A.
2. Press and hold in the ⑩ [**QMB**] key until "beeps" are heard. The beep provides audible confirmation that the data has been stored into the QMB memory.



Repeated one second presses of the ⑩ [**QMB**] key will write the VFO-A contents to successive QMB memories. Once all five QMB memories have data on them, previous data will be overwritten on a first-in, first-out basis.

QMB Channel Recall

1. Press the ⑩ [**QMB**] key momentarily. The current QMB channel data will be shown on the frequency display area.
   The "QMB" icon will appear on the LCD.
2. Repeated brief presses of the ⑩ [**QMB**] key will toggle through the QMB channels.



QMB Channel

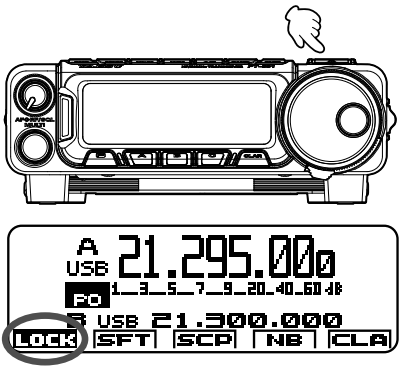
Erasing QMB Data

1. Press the ⑪ [**F**] key to find the "FUNCTION-2" list screen.
2. Rotate the ⑰ **MULTI** function knob to select "QMB".
3. Press the ⑰ **MULTI** function knob to display the "QMB CHANNEL" list screen.
4. Rotate the ⑰ **MULTI** function knob to select the memory channel that you would like to erase.
5. Press and hold the ⑫ [**C**](ERS) key for one second or press the ⑰ **MULTI** function knob, to erase the contents of the selected QMB channel.
6. To exit from QMB mode and return to the VFO mode, press the ⑫ [**A**](**BCK**) key.

DIAL knob Lock

The **DIAL** knob may be locked to prevent accidental frequency change.

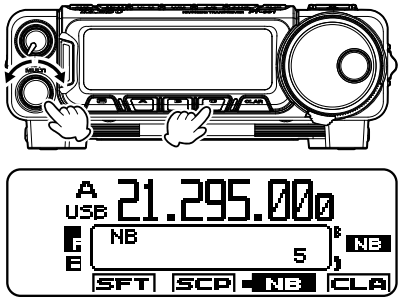
To lock the **DIAL** knob, press the ③ [**PWR/LOCK**] key.
The "LOCK" icon will appear on the LCD.
To unlock the **DIAL** setting, and restore normal tuning, press the ③ [**PWR/LOCK**] key again.



NB (Noise Blanker) (SSB/CW/RTTY/DATA/AM Modes)

The FT-891 includes an effective IF Noise Blanker, which can significantly reduce noise caused by automotive ignition systems.

1. Press the assigned ⑫ [**C**](**NB**) key to turn the Noise Blanker ON/OFF (When turning ON, NB and NB will appear), the blanking level pop-up screen will be displayed.
   NOTE: The noise blanker is most effective on certain pulse type noise, it may not have a pronounced effect on other types of noise.
   ❒ If the "NB" function is not assigned to an ⑫ [**A**], [**B**] or [**C**] key, press the ⑪ [**F**] key repeatedly to find the "FUNCTION-2" list screen. ➠ Rotate the ⑰ **MULTI** function knob to select "NB" ➠ Press and hold the ⑫ [**A**], [**B**] or [**C**] key to assign the function
   ❒ Rotate the ⑰ **MULTI** function knob to select "NB" in the "FUNCTION-1" list screen, and then press the knob, to switch the Noise Blanker function ON/OFF.
2. When The blanking level pop-up screen is displayed, rotate the ⑰ **MULTI** function knob to adjust the blanking level to the point where the offending noise is best reduced or eliminated.
   NOTE: Increasing the noise blanking level may distort the audio.
   To reset the blanking level to the factory default value, press and hold the ⑰ **MULTI** function knob.
3. Press any key, except the ⑫ [**A**], [**B**], [**C**], ⑬ [**CLAR**] keys, or the ⑰ **MULTI** function knob, to save the new setting and return to normal operation.
   ❒ When "NB" is shown (after pressing the ⑫ [**C**](NB) key), rotate the ⑰ **MULTI** function knob to adjust the blanking level. The blanking level may also be adjusted from the "FUNCTION-1" list screen (see page 46).



Clarifier (Offsets the receive frequency on the SSB/CW mode)

The ⑬ [**CLAR**] key and ⑰ **MULTI** function knob are used to offset the receive frequency, the transmit frequency, or both, from the VFO-A frequency setting. A small four digit indication on the display will show the current Clarifier offset. The Clarifier functions on the FT-891 allow offsetting the receive and transmit frequencies (up to ±9.998 kHz), without actually re-tuning, and then activating it by pressing Clarifier ⑬ [**CLAR**] key. This feature is ideal for following a drifting station, or for setting the small frequency offsets sometimes utilized in DX "Split" work.

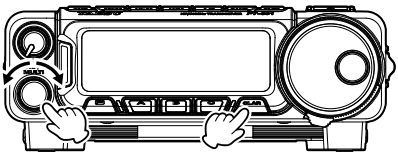
❒ To change the clarifier operation (RX/TX/TRX), utilize Menu mode "**05-18** [**CLAR SELECT**]".The factory default setting is "RX".

❒ The RX clarifier does not change the transmit frequency, but permits slight adjustment of the receiver for improved audio.

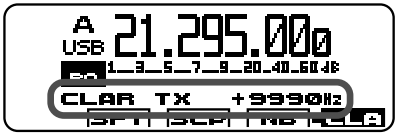
❒ Remember to reset the Clarifier offset to zero when the QSO is completed, so the transmit and the receive frequencies will be combined again.

Here is the technique for utilizing the Clarifier:

1. Press the ⑬ [**CLAR**] key. The programmed offset will be applied to the receive frequency.
2. Rotation of the ⑰ **MULTI** function knob will allow adjustment of the initial offset on the fly. Offsets of up to ±9.998 kHz may be set using the Clarifier.
3. To cancel Clarifier operation, press the ⑬ [**CLAR**] key.
   - ❒ Turning the Clarifier off merely cancels the application of the programmed offset from the receive and/or the transmit frequencies. To clear the Clarifier offset, and reset it to "zero", press and hold the ⑰ **MULTI** function knob.
   - ❒ To change the clarifier operation (RX/TX/TRX), utilize Menu mode "**05-18** [**CLAR SELECT**]".



RX Clarifier

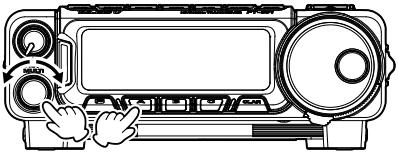


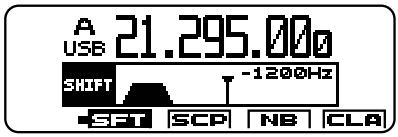
TX Clarifier

TRX Clarifier

IF SHIFT Operation (SSB/CW/RTTY/DATA Modes)

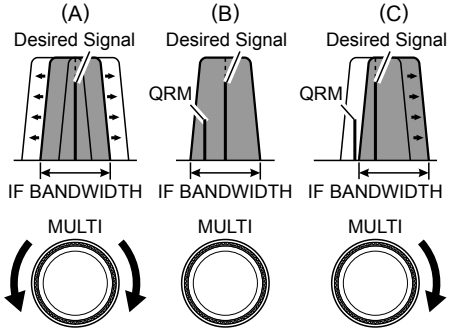
IF SHIFT permits moving the DSP filter passband higher or lower, without changing the pitch of the incoming signal, and thus reduces or eliminates interference. Because the tuned carrier frequency is not varied, there is no need to retune the operating frequency to eliminate the interference. The total passband tuning range for the IF SHIFT system is ±1.2 kHz.





1. Press the assigned ⑫ [**A**](**SFT**) key to activate the IF SHIFT (SFT will appear), the SHIFT adjustment pop-up screen will be displayed.
   - ❒ If the IF SHIFT function is not assigned to an ⑫ [**A**], [**B**] or [**C**] key, press ⑪ [**F**] key repeatedly to find the "FUNCTION-1" list screen. ➠ Rotate the ⑰ **MULTI** function knob to select the "SFT" ➠ Press and hold any of the ⑫ [**A**]/[**B**]/[**C**] keys to assign the IF SHIFT function.
   - ❒ Rotate the ⑰ **MULTI** function knob to select "SFT" in the "FUNCTION-1" list screen, and then press the knob, to switch the IF SHIFT function ON/OFF.
2. Rotate the ⑰ **MULTI** function knob to the left or right to reduce interfering signals.
   NOTE: To reset the IF SHIFT tuning to the factory default value, press and hold the ⑰ **MULTI** function knob.
3. Press any key except the ⑫ [**A**], [**B**], [**C**], ⑬ [**CLAR**] keys, or the ⑰ **MULTI** function knob to save the new setting and return to normal operation.
   - ❒ Press the ⑫ [**A**](SFT) key, while the " SFT " indicator is displayed, and then rotate the ⑰ **MULTI** function knob to adjust the IF SHIFT tuning. The IF SHIFT may also be adjusted by accessing the "FUNCTION-1" list screen (see page 46).

Referring to Figure (A), note the depiction of the IF DSP filter as the thick line, with ⑰ **MULTI** function knob in the 12 o'clock position. In Figure (B), an interfering signal has appeared inside the original passband. In Figure (C), you can see the effect of rotating the ⑰ **MULTI** function knob. The interference level is reduced by moving the filter passband so that the interference is outside of the passband.



Meters

The following function information can be displayed on the meter in the transmit mode.

PO : Displays transmitter output power
ALC : Displays ALC voltage
SWR : Displays Standing Wave Ratio
CMP : Displays the speech processor compression level
IDD : Displays the drain current of the final stage FET transistors

1. Press the ⑪ [**F**] key repeatedly to find the “FUNCTION-2” list screen.
2. Rotate the ⑰ **MULTI** function knob to select the “MTR”.
3. Press the ⑰ **MULTI** function knob to activate the meters function.
4. When the Meter information screen is appeared, rotate and press the ⑰ **MULTI** function knob to select the desired information.
   When the desired information is set, the display will return to “FUNCTION-2” list screen automatically.
5. Press and hold the ⑪ [**F**] key, or rotate the ⑭ **MAIN DIAL**, to return to normal operation.

VOX

The VOX (Voice Operated Xmit) circuit will engage the transmitter automatically when you speak into the microphone.。
Press the ⑪ [**F**] key to find the “FUNCTION-1” list screen. ➠ Rotate the ⑰ **MULTI** function knob to select “VOX”. ➠ Press the ⑰ **MULTI** function knob to switch “VOX” ON or OFF.

Speech Processor

The Speech Processor increases the average power output while operating in the SSB mode. Press the ⑪ [**F**] key repeatedly to find the “FUNCTION-1” list screen. ➠ Rotate the ⑰ **MULTI** function knob to select “PRC”. ➠ Press the ⑰ **MULTI** function knob to display the compression level pop-up screen. ➠ Rotate the ⑰ **MULTI** function knob to adjust the compression level.

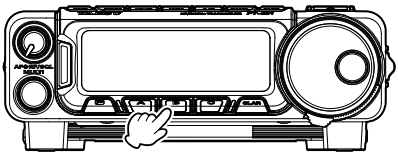
Parametric Microphone Equalizer

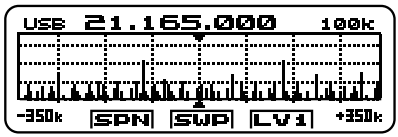
In the SSB and AM transmit modes, the Three-Band Parametric Microphone Equalizer may be used to provide precise, independent control over the low, mid and treble frequency ranges in the voice waveform. Press the ⑪ [**F**] key repeatedly to find the “FUNCTION-2” list screen. ➠ Rotate the ⑰ **MULTI** function knob to select “MEQ”. ➠ Press the ⑰ **MULTI** function knob to switch the microphone equalizer ON or OFF.

Scope

The Scope function provides a spectrum display of the band conditions. Both strong and weak signals can be clearly displayed on the LCD display. In the “Manual mode”, the scope frequency spectrum is scanned one time and displayed. In the “Continuous Sweeping mode”, the scope spectrum is repeatedly swept and displayed. The scope sweep and span may be optimized according to your preferences and purposes.

NOTE: Since the FT-891 has only one receiver the audio will be muted during the Continuous sweeping mode.





1. Press the assigned ⑫ [**B**](**SCP**) key to display the band conditions (spectrum).

   ❒ If the SCOPE function is not assigned to an ⑫ [**A**], [**B**] or [**C**] key, follow the instruction below.

   Press the ⑪ [**F**] key repeatedly to find the “FUNCTION-2” list screen. ➠ Rotate the ⑰ **MULTI** function knob to select “SCP” ➠ Press and hold any of the ⑫ [**A**]/[**B**]/ [**C**] keys to assign this function.

   ❒ Rotate the ⑰ **MULTI** function knob to select “SCP” in the “FUNCTION-2” list screen, and then press the knob, to switch the SCOPE function ON/OFF. The band conditions (spectrum) will appear. Press and hold the ⑪ [**F**] key to return to normal operation.

2. Press, or press and hold the ⑫ [**B**](SCP) key, to sweep in the Manual mode or the Continuous sweep mode.

   Manual mode (default)

   Each time the ⑫ [**B**](**SWP**) key is pressed, a new scan of the spectrum scope is shown on the LCD display, and then the receiver audio returns to the speaker.

   Continuous sweeping mode

   Press and hold the ⑫ [**B**](**SWP**) key for one second. The audio is muted and the spectrum scope is scanned continuously. Press ⑫ [**B**](SWP) key to stop the scanning.

❒ While the Spectrum Scope is activated, press the ⑫ [**A**](SPN) key to change the displayed bandwidth. Available selections are 750 kHz (default), 375 kHz, 150 kHz, 75 kHz, or 37.5 kHz ranges.

❒ While the Spectrum Scope is activated, press the ⑫ [**C**](LV1/LV2/LV3) key to change the reference level.

❒ The sweeping interval may be set in Menu mode “**13-01** [**SCP START CYCLE**]”.

❒ Width of scope display may be set in Menu mode “**13-02** [**SCP SPAN FREQ**]”.

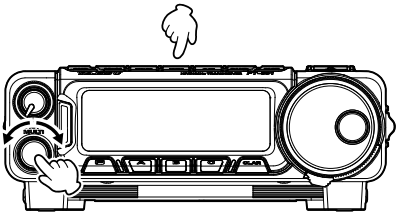
3. Press one of the ⑪ [**F**]/ ⑬ [**CLAR**]/ ⑨ [**M▶V**]/ ⑧ [**V▶M**]/ ⑦ [**V/M**] keys to return to normal operation.

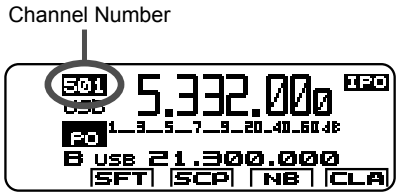
Operation on 60-Meter (5 MHz) Band (U.S. and U.K. Version Only)

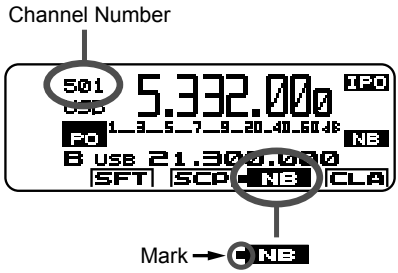
The recently authorized 60-meter band is covered, in the FT-891, by fixed memory channels. These channels are set to USB or CW, and they appear between the "last" PMS channel ("P9U") and the first "regular" memory channel ("M01"):

1. While operating in the VFO mode, press the ⑦ [**V/M**] key to enter the Memory mode.
2. Rotate the ⑰ **MULTI** function knob to select the desired memory channel.
   Memory channels ("501" through "510") are preprogrammed, at the factory, with the permitted frequencies in the 5 MHz band, and the USB or CW mode is automatically selected on these channels.

   NOTE: In each of the following conditions, memory channels may be selected by pressing and then rotating the ⑰ **MULTI** function knob:
   - When the mark is indicated to the left of the function key status icon.
   - When the display of channel number status is "**501**" (example of channel number "501").
3. To exit from 60-meter (5 MHz) operation and return to the VFO mode, just press the ⑦ [**V/M**] or ⑥ [**A/B**] key.







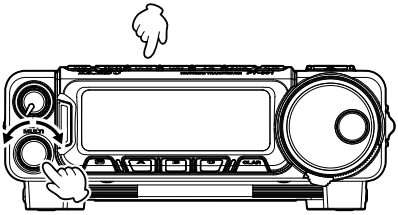
Channel Number	Frequency	
	U.S. Version	U.K. Version
501	5.332000 MHz (SSB)	5.260000 MHz (SSB)
502	5.348000 MHz (SSB)	5.280000 MHz (SSB)
503	5.358500 MHz (SSB)	5.290000 MHz (SSB)
504	5.373000 MHz (SSB)	5.368000 MHz (SSB)
505	5.405000 MHz (SSB)	5.373000 MHz (SSB)
506	5.332000 MHz (CW)	5.400000 MHz (SSB)
507	5.348000 MHz (CW)	5.405000 MHz (SSB)
508	5.358500 MHz (CW)	-
509	5.373000 MHz (CW)	-
510	5.405000 MHz (CW)	-

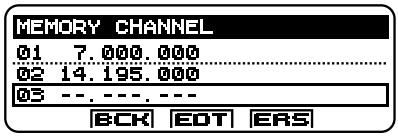
Memory Operation

Most Memory operation will be conducted in the “regular” memory registers. There are 99 memory channels available for storage and recall of your desired essential frequencies.

Normal Memory Storage

1. In the VFO mode, select the frequency, mode, and status, the values you want to have stored.
2. Press the ⑧ **[V►M]** key to display the “MEMORY CHANNEL” list screen, which may be used to find an unused memory channel. Rotate the ⑰ **MULTI** function knob to select the channel number on which you wish to store the current frequency data.
3. Press the ⑧ **[V►M]** key to store the frequency and other data into the selected memory channel.





For details about operation of the following functions, refer to the Advanced Manual (download from the Yaesu website).

Naming a Memory Channel

You may also append an alphanumeric “Tag” (label) to each memory, to aid in recollection of the channel’s use (such as club name, etc.).

Memory Groups

Memory channels may be arranged into as many as six convenient groups, for easier identification and selection.

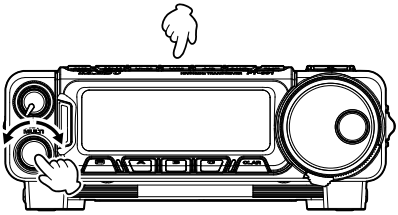
Memory Channel Recall

1. While operating in the VFO mode, press the ⑦ [**V/M**] key to enter the Memory mode.
2. Rotate the ⑰ **MULTI** function knob to select the desired memory channel.

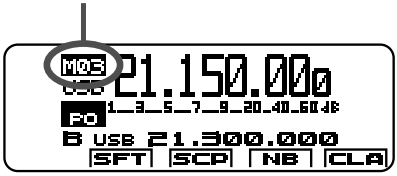
   NOTE: In each of the following conditions, memory channels may be selected by pressing and then rotating the **MULTI** function knob:

   - When the mark is indicated to the left of the function key status icon.

   ❒ While operating on a memory channel, you may tune off of the original memory channel frequency by rotating the DIAL knob; the "Memory Channel Number" will be replaced by one which indicates "MT" (Memory Tune). Press the ⑦ [**V/M**] key to return to the original memory channel frequency.
3. To exit from memory mode and return to the VFO mode, press the ⑦ [**V/M**] or ⑥ [**A/B**] key.

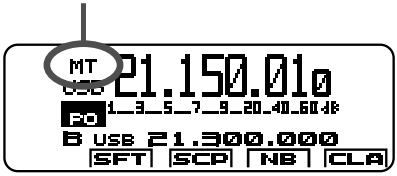


Memory Channel



The example of channel number"M03"

Memory Tune

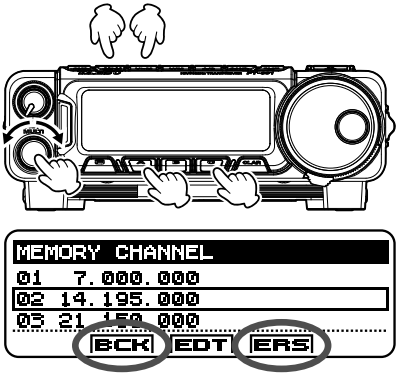


Moving Memory Data to the VFO-A

Data stored on memory channels can easily be copied to VFO-A.

1. Press the ⑨ [**M►V**] or ⑧ [**V►M**] key to display the "MEMORY CHANNEL" list screen.
2. Rotate the **MULTI** function knob to select the desired memory channel.
3. Pressing the ⑨ [**M►V**] key, copies the data from the selected memory to VFO-A. Previous data in VFO-A will be overwritten.

Erasing Memory Channel Data



1. Press the ⑨ [**M►V**] or ⑧ [**V►M**] key to display the "MEMORY CHANNEL" list screen.
2. Rotate the ⑰ **MULTI** function knob to select the memory channel that is to be erased.
   NOTE: The FT-891 cannot erase memory channel "01" (and channels "501" through "510": U.S. version).
3. Press the ⑫ [**C**](**ERS**) key to erase the contents of the selected memory channel.
4. To exit from memory mode and return to the VFO-A mode, press the ⑫ [**A**](**BCK**) key.

Restoring Memory Channel Data

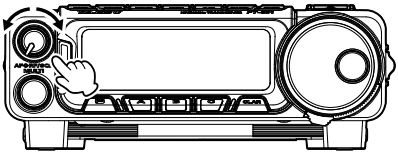
If you make a mistake and wish to restore the memory contents, repeat step (3) above.

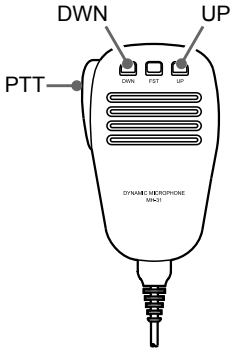
You may scan either the VFO or the memories of the FT-891, and the radio will halt scanning on any frequency with a signal strong enough to open the receiver squelch.

VFO Scanning

1. Set VFO-A to the frequency on which you would like to begin scanning.
2. The ⑯ [**RF/SQL**] knob may be changed from the "RF" Function to the "SQL" Function via Menu mode "**05-05** [**RF/SQL VR**]".
3. Rotate the [**RF/SQL**] knob so that the background noise is just silenced.
4. Press and hold in the microphone [**UP**] or [**DWN**] key for one second to start scanning in the specified direction on the VFO frequency.

   NOTE: Set the "Microphone Automatic Scanning" function to ON or OFF via Menu Mode "**05-15** [**MIC SCAN**]".
5. If the scanner halts on an incoming signal, the decimal point between the "MHz" and "kHz" digits of the frequency display will blink.





- ❒ If the incoming signal disappears, scanning will resume in about five seconds.
- ❒ If the scan has paused on a signal, pressing the microphone [**UP**] or [**DWN**] key, will cause scanning to resume instantly.
- ❒ If the Main Tuning **DIAL** knob is rotated while scanning is in progress, the scanning will continue up or down in frequency according to the direction of the **DIAL** Knob rotation. (in other words, if the dial is rotated to the left when scanning toward a higher frequency, the direction of the scan will reverse.)
- ❒ On the SSB/CW and SSB-based Data modes, the scanner will pause on a received signal, then will step across the signal very slowly, giving you time to stop the scan, if you like. However, In these modes on the VFO, the scanner does not stop.

6. To cancel scanning, press the **PTT** switch.
   - ❒ If you press the microphone **PTT** switch during scanning, the scanner will halt at once. However, pressing the **PTT** switch during scanning will not cause transmission.

Scan Resume Options

The manner in which the scanner resumes after it has paused on a signal may be selected by using Menu mode "**05-16** [**MIC SCAN RESUME**]".

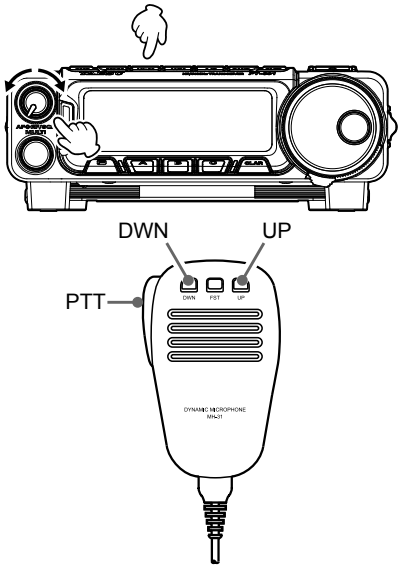
Scanning Operation

Memory Scanning

1. The ⑯ [**RF/SQL**] knob may be changed from the "RF" Function to the "SQL" Function via Menu mode "**05-05** [**RF/SQL VR**]".
2. Set the transceiver to the "Memory" mode by pressing the ⑦ [**V/M**] key, if necessary.
3. Rotate the ⑯ [**RF/SQL**] knob so that the background noise is just silenced.
4. Press and hold in the microphone [**UP**] or [**DWN**] key for one second to start scanning in the specified direction.

   NOTE: Set the "Microphone Automatic Scanning" function to ON or OFF via Menu mode "**05-15** [**MIC SCAN**]".

   ❒ During Memory Group operation, only the channels within the current Memory Group will be scanned.
5. If the scanner halts on an incoming signal, the decimal point between the "MHz" and "kHz" digits of the frequency display will blink.



   ❒ If the incoming signal disappears, scanning will resume in about five seconds.

   ❒ If the scan has paused on a signal, pressing the microphone [**UP**] or [**DWN**] key, will cause scanning to resume instantly.

   ❒ If the Main Tuning **DIAL** knob is rotated while scanning is in progress, the memory channel scanning will continue up or down in accordance with the direction of the **DIAL** Knob rotation. (In other words, if the dial is rotated to the left when scanning toward a higher channel number, the direction of the scan will reverse.)
6. To cancel scanning, press the **PTT** switch.

   ❒ If the microphone **PTT** switch is pressed during scanning, the scanner will halt at once. However, pressing the **PTT** switch during scanning will not cause transmission.

Scan Resume Options

The manner in which the scanner resumes after it has paused on a signal may be selected by using Menu mode "**05-16** [**MIC SCAN RESUME**]".

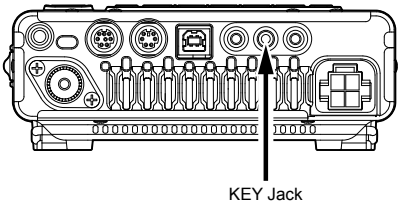
Programmable Memory Scan (PMS)

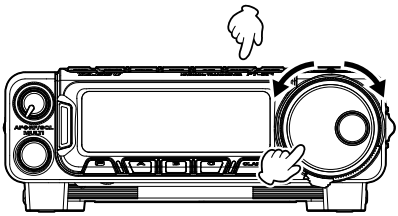
When scanning the dedicated PMS memory channels, only the frequencies within the specified frequency range will be scanned.

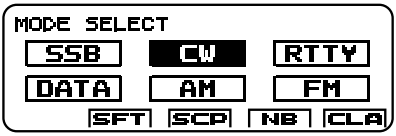
NOTE: For additional details, refer to the Advanced Manual which may be downloaded from the Yaesu website.

Transmission (CW mode)

1. Before starting, connect a key or keyer paddle line to the rear panel KEY jack.
2. Press and hold the ⑤ [**BAND**(**MODE**)] key for one second.
   The "MODE SELECT" screen will appear in the display.
3. Rotate the **DIAL** knob to select the "CW" mode.
4. Press the ⑪ [**F**] key to find the "CW SETTING" list screen.
5. Rotate the ⑰ **MULTI** function knob to select "BK-IN".
6. Press the ⑰ **MULTI** function knob to engage the "break-in" system.
7. When using the keyer paddle, rotate the ⑰ **MULTI** function knob to select "KEYER".
8. Press the ⑰ **MULTI** function knob to engage the built-in Electronic Keyer.
9. Press and hold the ⑪ [**F**] key for one second to exit the "CW SETTING" list screen and resume normal operation.
10. When the key or the keyer paddle is pressed, the transmitter will automatically be engaged.
11. When the key or paddle is released, the receiver audio will return, after a brief delay.







Adjusting the CW delay time

The CW "hang time" (the delay after the last character is sent, until the transceiver returns to the receive mode) can be adjusted via MENU item "**07-09** [**CW BK-IN DELAY**].

Adjusting the Sidetone volume level

The CW sidetone volume level can be adjusted via the "FUNCTION-1" list screen.

NOTE: For additional details, refer to the Advanced Manual which may be downloaded from the Yaesu website.

Adjusting the Keyer Speed

The keyer speed can be adjusted via the "CW SETTING" list screen.

NOTE: For additional details, refer to the Advanced Manual which may be downloaded from the Yaesu website.

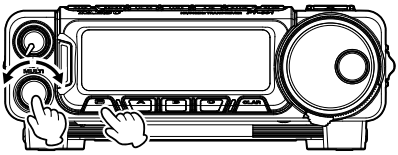
Setting Modes Display

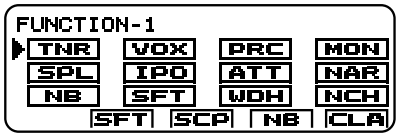
Press the ⑪ [**F**] key momentarily to step through the Setting Modes as follows:

➠ FUNCTION-1 ➠ FUNCTION-2 ➠ CW SETTING ➠

The FM SETTING, the REC SETTING and the ATAS SETTING function screens may be enabled via Menu modes “05-10”, “05-11” or “05-12”. With the factory default setting, These functions are not displayed on the LCD When the ⑪ [**F**] key is pressed.
Once the function is set, it is not usually changed. Press and hold the ⑪ [**F**] key to activate the Menu mode.

Using the Setting Modes





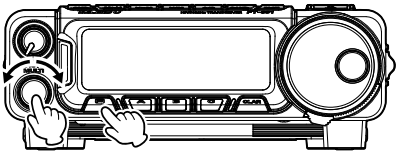
1. Repeatedly press the ⑪ [**F**] key momentarily until the desired function appears.
2. Rotate the ⑰ **MULTI** function knob to select the desired function.
3. Press (or press and hold) the ⑰ **MULTI** function knob to switch the function on or off.
   - ❒ Depending on the function, the pop-up screen appears by switching the function “ON”.
     The setting values may be changed by rotating the **MULTI** function Knob.
   - ❒ While the pop-up screen is displayed, press the ⑰ **MULTI** function knob to close the pop-up screen.
4. Press and hold the ⑪ [**F**] key for one second, or rotate the **DIAL** knob to exit the “Setting Modes” screen and resume normal operation.

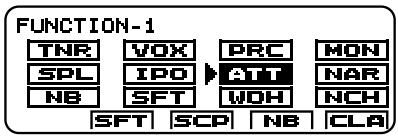
Changing the function assigned to the [A]/[B]/[C] keys

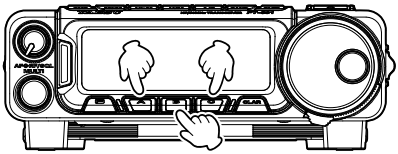
The default setting are:

⑫ [**A**](SFT) key: IF SHIFT function
⑫ [**B**](SCP) key: The SCOPE function
⑫ [**C**](NB) key: Noise Blanker function

1. Repeatedly press the ⑪ [**F**] key momentarily until the desired function appears.
2. Rotate the ⑰ **MULTI** function knob to select the desired function.
3. Press and hold any of the ⑫ [**A**]/[**B**]/[**C**] keys to assign the function.
   The desired function is saved and the display returns to normal operation.



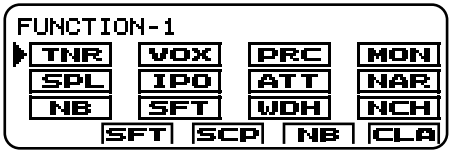




NOTE: Examples of the Function ⑫ [**A**]/[**B**]/[**C**] key display as shown in the case of the Noise Blanker

[NB] : Function “OFF”.
NB : Function “ON”.
NB : Function “ON” and then turn the ⑰ **MULTI** function knob to change the assigned feature setting.

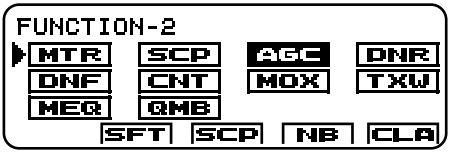
FUNCTION-1



	⑰ MULTI Knob	Function
TNR	**Press**	Enable/Disable the optional FC-40/FC-50 Automatic Antenna tuner or ATAS-120A Auto Active-Tuning Antenna System.
VOX	**Press**	Enable/Disable the VOX (voice-operated transmitter switching system) in the SSB, AM, FM and DATA modes.
PRC	**Press**	• Activate the speech processor for SSB transmissions, the processor level pop-up screen will appear. Rotate the **MULTI** function knob to adjust the processor level (1 - 100), then press the **MULTI** function knob to close the pop-up screen. • Press the **MULTI** function knob to turn the speech processor OFF.
MON	**Press**	• Activate the MONITOR feature, the monitor audio level pop-up screen will appear. Rotate the **MULTI** function knob to adjust the monitor audio level (0 - 100), then press the **MULTI** function knob to close the pop-up screen. • Press the **MULTI** function knob to turn the MONITOR feature OFF.
SPL	**Press**	Enable/Disable Split frequency operation between VFO-A and VFO-B.
	Press and hold	Sets a one-touch +5 kHz offset with respect to the VFO-B frequency.
IPO	**Press**	Enable/Disable the receiver preamplifier, thereby activating Intercept Point Optimization for improved strong signal overload characteristics.
ATT	**Press**	Enable/Disable the receiver front-end attenuator, which will reduce all signals and noise by approximately 12 dB.
NAR	**Press**	Enable/Disable the low-deviation mode.
NB	**Press**	• Activate the receiver IF Noise Blanker, the blanker level pop-up screen will appear. Rotate the **MULTI** function knob to adjust the noise blanker level (0 - 10), then press the **MULTI** function knob to close the pop-up screen. • Press the **MULTI** function knob to turn the Noise Blanker OFF.
SFT	**Press**	• Activate the IF SHIFT feature, the SHIFT adjustment pop-up screen will appear. Rotate the **MULTI** function knob to the left or right to reduce interfering signals, then press the **MULTI** function knob to close the pop-up screen. • Press the **MULTI** function knob to turn the IF SHIFT feature OFF.
WDH	**Press**	• Activate the WIDTH tuning feature, the WIDTH adjustment pop-up screen will appear. Rotate the **MULTI** function knob counter-clockwise to narrow the bandwidth and reduce interference, then press the **MULTI** function knob to close the pop-up screen. • Press the **MULTI** function knob to turn the WIDTH tuning feature OFF.
NCH	**Press**	• Activate the IF NOTCH filter feature, the “null” position adjustment pop-up screen will appear. Rotate the **MULTI** function knob to adjust the “null” position of the Notch filter, then press the **MULTI** function knob to close the pop-up screen. • Press the **MULTI** function knob to turn the IF NOTCH filter feature OFF.

NOTE: For details, refer to the Advanced Manual (download from the Yaesu website).

FUNCTION-2

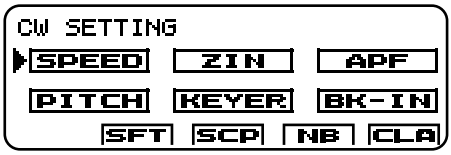


	⑰ MULTI Knob	Function
MTR	**Press**	Rotate the **MULTI** function knob to select the display function of the meter in the transmit mode.
SCP	**Press**	Enable/Disable the Spectrum Scope Monitor feature.
AGC	**Press**	• Activate the receiver AGC system, then rotate the **MULTI** function knob to select the desired receive AGC recovery time constant. • Press the **MULTI** function knob to turn the receiver AGC system OFF.
DNR	**Press**	• Activate the DSP Noise Reduction system, the 15 algorithms pop-up screen will appear. Rotate the **MULTI** function knob to choose one of 15 algorithms that best reduces the noise level, then press the **MULTI** function knob to close the pop-up screen. • Press the **MULTI** function knob turn the DSP Noise Reduction system OFF.
DNF	**Press**	Enable/Disable the DSP Auto Notch Filter.
CNT	**Press**	• Activate the CONTOUR function, the adjustment pop-up screen will appear. Rotate the **MULTI** function knob to achieve the most natural sounding audio reproduction of the incoming signal, then press the **MULTI** function knob to close the pop-up screen. • Press the **MULTI** function knob to turn the CONTOUR function OFF.
MOX	**Press and hold**	Pressing and holding the **MULTI** function knob will engage the transmitter.
TXW	**Press and hold**	During a split operation, to listen on the transmit frequency.
MEQ	**Press**	Enable/Disable the Parametric Microphone Equalizer.
QMB	**Press**	To display the “QMB CHANNEL” list screen.

NOTE: For details, refer to the Advanced Manual (download from the Yaesu website).

CW SETTING

This setting mode is used for the CW mode functions.

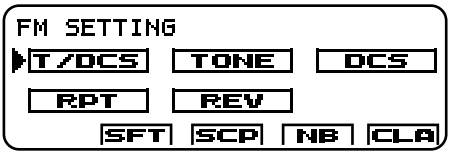


	⑰ MULTI Knob	Function
SPEED	**Press**	Rotate the **MULTI** function knob to adjust the CW sending speed (4 - 60 wpm).
ZIN	**Press**	Automatically zero-in the receive frequency to match the received CW signal.
	Press and hold	The CW tone is output from the speaker.
APF	**Press**	• Activate the receiver APF (Audio Peak Filter) function, the adjustment pop-up screen will appear. Rotate the **MULTI** function knob to set the sound volume to a comfortable level (± 250 Hz), then press the **MULTI** function knob to close the pop-up screen. • Press the **MULTI** function knob to turn the APF (Audio Peak Filter) function OFF.
PITCH	**Press**	Rotate the **MULTI** function knob to adjust the PITCH (300 - 1050 Hz).
KEYER	**Press**	Enable/Disable the built-in Electronic Keyer.
BK-IN	**Press**	Enable/Disable the CW “Semi break-in” operation.

NOTE: For details, refer to the Advanced Manual (download from the Yaesu website).

FM SETTING

This setting mode is used for the FM mode functions.



(This screen may be enabled/disabled via Menu Mode "**05-10** [**FM SETTING**]". Default: Disable)

	⑰ MULTI Knob	Function
T/DCS	**Press**	• Activate the CTCSS or DCS operation on FM mode, the CTCSS/DCS function selection pop-up screen will appear. Rotate the **MULTI** function knob to select the desired CTCSS/DCS function, then press the **MULTI** function knob to close the pop-up screen. • Press the **MULTI** function knob to turn the CTCSS or DCS operation OFF.
TONE	**Press**	Rotate the **MULTI** function knob to select the CTCSS tone frequency (see table below), then press the **MULTI** function knob to close the pop-up screen.
DCS	**Press**	Rotate the **MULTI** function knob to select the DCS code (see table below), then press the **MULTI** function knob to close the pop-up screen.
RPT	**Press**	Rotate the **MULTI** function knob to select the offset direction of the uplink frequency shift (+, – or simplex) during FM repeater operation, then press the **MULTI** function knob to close the pop-up screen.
REV	**Press**	Reverse the transmit and receive frequencies while working through a repeater.

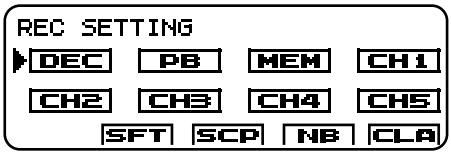
NOTE: For details, refer to the Advanced Manual (download from the Yaesu website).

CTCSS TONE FREQUENCY (Hz)								
67.0	69.3	71.9	74.4	77.0	79.7	82.5	85.4	88.5
91.5	94.8	97.4	100.0	103.5	107.2	110.9	114.8	118.8
123.0	127.3	131.8	136.5	141.3	146.2	151.4	156.7	159.8
162.2	165.5	167.9	171.3	173.8	177.3	179.9	183.5	186.2
189.9	192.8	196.6	199.5	203.5	206.5	210.7	218.1	225.7
229.1	233.6	241.8	250.3	254.1	-	-	-	-

DCS CODE									
023	025	026	031	032	036	043	047	051	053
054	065	071	072	073	074	114	115	116	122
125	131	132	134	143	145	152	155	156	162
165	172	174	205	212	223	225	226	243	244
245	246	251	252	255	261	263	265	266	271
274	306	311	315	325	331	332	343	346	351
356	364	365	371	411	412	413	423	431	432
445	446	452	454	455	462	464	465	466	503
506	516	523	526	532	546	565	606	612	624
627	631	632	654	662	664	703	712	723	731
732	734	743	754	-	-	-	-	-	-

REC SETTING

This setting mode is used for the recording functions.



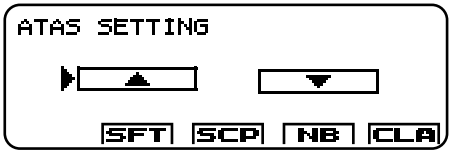
(This screen may be enabled/disabled via Menu Mode "**05-11** [**REC SETTING**]". Default: Disable)

	⑰ MULTI Knob	Function
DEC	**Press**	Decrement (decrease) the current Contest Number by one number (i.e. from #198 to #197, etc.).
PB	**Press**	Enable/Disable automatic transmit activation when playing recorded messages.
MEM	**Press**	Store either a Voice Memory or a Contest Keyer Memory.
CH1	**Press**	Send the CW message which is prerecorded in CW MEMORY 1.
CH2	**Press**	Send the CW message which is prerecorded in CW MEMORY 2.
CH3	**Press**	Send the CW message which is prerecorded in CW MEMORY 3.
CH4	**Press**	Send the CW message which is prerecorded in CW MEMORY 4.
CH5	**Press**	Send the CW message which is prerecorded in CW MEMORY 5.

NOTE: For details, refer to the Advanced Manual (download from the Yaesu website).

ATAS SETTING

This setting mode is used when connecting the Active Tuning Antenna "ATAS-120A".

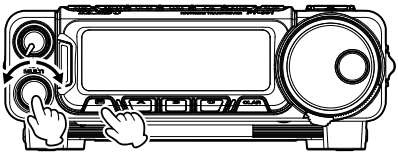


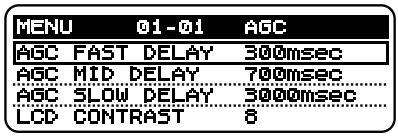
(This screen may be enabled/disabled via Menu Mode "**05-12** [**ATAS SETTING**]". Default: Disable)

	MULTI Knob	Function
▲	**Press and hold**	Raise the tuned frequency (lower the ATAS-120A antenna).
▼	**Press and hold**	Lower the tuned frequency (raise the ATAS-120A antenna).

NOTE: For details, refer to the Advanced Manual (download from the Yaesu website).

The FT-891 Menu mode, already described in parts of many previous chapters, is easy to activate and setup. The Menus may be used to configure many of transceiver parameters, some of which have not been detailed previously. Use the following procedure to activate the Menu mode:





1. Press and hold in the ⑪ **[F]** key for one second to activate the Menu mode.
2. Rotate the ⑰ **MULTI** function knob to select the Menu Item to be adjusted.
3. Press the ⑰ **MULTI** function knob, and then rotate it to adjust the selected Menu item.
4. When the adjustment is satisfactory, press the ⑰ **MULTI** function knob to save the new setting.
5. Press the ⑪ **[F]** key to exit the Menu mode and return to normal operation.

NOTE: For additional details, refer to the Advanced Manual which may be downloaded from the Yaesu website.

Menu / Item			Available Values	Default
AGC				
	01-01	AGC FAST DELAY	20 - 4000 (msec)	300msec
	01-02	AGC MID DELAY	20 - 4000 (msec)	700msec
	01-03	AGC SLOW DELAY	20 - 4000 (msec)	3000msec
DISPLAY				
	02-01	LCD CONTRAST	1 - 15	8
	02-02	DIMMER BACKLIT	1 - 15	8
	02-03	DIMMER LCD	1 - 15	8
	02-04	DIMMER TX/BUSY	1 - 15	8
	02-05	PEAK HOLD	OFF/0.5/1.0/2.0 (sec)	OFF
	02-06	ZIN LED	ENABLE/DISABLE	DISABLE
	02-07	POP-UP MENU	UPPER/LOWER	LOWER
DVS				
	03-01	DVS RX OUT LVL	0 - 100	50
	03-02	DVS TX OUT LVL	0 - 100	50
KEYER				
	04-01	KEYER TYPE	OFF/BUG/ELEKEY-A/ELEKEY-B/ ELEKEY-Y/ACS	ELEKEY-B
	04-02	KEYER DOT/DASH	NOR/REV	NOR
	04-03	CW WEIGHT	2.5 - 4.5	3.0
	04-04	BEACON INTERVAL	OFF/1 - 240 (sec) (1 sec/step) 270 - 690 (sec) (30 sec/step)	OFF
	04-05	NUMBER STYLE	1290/AUNO/AUNT/A2NO/ A2NT/12NO/12NT	1290
	04-06	CONTEST NUMBER	0 - 9999	1
	04-07	CW MEMORY 1	TEXT/MESSAGE	TEXT
	04-08	CW MEMORY 2	TEXT/MESSAGE	TEXT

Menu / Item			Available Values	Default
	04-09	CW MEMORY 3	TEXT/MESSAGE	TEXT
	04-10	CW MEMORY 4	TEXT/MESSAGE	TEXT
	04-11	CW MEMORY 5	TEXT/MESSAGE	TEXT
GENERAL				
	05-01	NB WIDTH	1/3/10 (msec)	3msec
	05-02	NB REJECTION	10/30/50 (dB)	30dB
	05-03	NB LEVEL	0 - 10	5
	05-04	BEEP LEVEL	0 - 100	30
	05-05	RF/SQL VR	RF/SQL	RF
	05-06	CAT RATE	4800/9600/19200/38400 (bps)	4800bps
	05-07	CAT TOT	10/100/1000/3000 (msec)	10ms
	05-08	CAT RTS	ENABLE/DISABLE	ENABLE
	05-09	MEM GROUP	ENABLE/DISABLE	DISABLE
	05-10	FM SETTING	ENABLE/DISABLE	DISABLE
	05-11	REC SETTING	ENABLE/DISABLE	DISABLE
	05-12	ATAS SETTING	ENABLE/DISABLE	DISABLE
	05-13	QUICK SPL FREQ	-20 (kHz) - 0 - 20 (kHz)	5kHz
	05-14	TX TOT	OFF/1 - 30 (min)	OFF (10 min※)
	05-15	MIC SCAN	ENABLE/DISABLE	ENABLE
	05-16	MIC SCAN RESUME	PAUSE/TIME	TIME
	05-17	REF FREQ ADJ	-25 - 0 - 25	0
	05-18	CLAR SELECT	RX/TX/TRX	RX
	05-19	APO	OFF/1/2/4/6/8/10/12 (h)	OFF
	05-20	FAN CONTROL	NORMAL/CONTEST	NORMAL
MODE AM				
	06-01	AM LCUT FREQ	OFF /100 - 1000 (Hz)	OFF
	06-02	AM LCUT SLOPE	6 / 18 (dB/oct)	6dB/oct
	06-03	AM HCUT FREQ	700 - 4000 (Hz) / OFF	OFF
	06-04	AM HCUT SLOPE	6 / 18 (dB/oct)	6dB/oct
	06-05	AM MIC SELECT	MIC/REAR	MIC
	06-06	AM OUT LEVEL	0 - 100	50
	06-07	AM PTT SELECT	DAKY/RTS/DTR	DAKY
MODE CW				
	07-01	CW LCUT FREQ	OFF /100 - 1000 (Hz)	250Hz
	07-02	CW LCUT SLOPE	6 / 18 (dB/oct)	18dB/oct
	07-03	CW HCUT FREQ	700 - 4000 (Hz) / OFF	1200Hz
	07-04	CW HCUT SLOPE	6 / 18 (dB/oct)	18dB/oct
	07-05	CW OUT LEVEL	0 - 100	50
	07-06	CW AUTO MODE	OFF/50M/ON	OFF
	07-07	CW BFO	USB/LSB/AUTO	USB
	07-08	CW BK-IN TYPE	SEMI/FULL	SEMI
	07-09	CW BK-IN DELAY	30 - 3000 (msec)	200msec
	07-10	CW WAVE SHAPE	2/4 (msec)	4msec
	07-11	CW FREQ DISPLAY	FREQ/PITCH	PITCH
	07-12	PC KEYING	OFF/DAKY/RTS/DTR	OFF
	07-13	QSK DELAY TIME	15/20/25/30 (msec)	15msec

※: European Version.

Menu / Item			Available Values	Default
MODE DAT				
	08-01	DATA MODE	PSK/OTHERS	PSK
	08-02	PSK TONE	1000/1500/2000 (Hz)	1000Hz
	08-03	OTHER DISP	-3000 - 0 - 3000 (Hz)	0Hz
	08-04	OTHER SHIFT	-3000 - 0 - 3000 (Hz)	0Hz
	08-05	DATA LCUT FREQ	OFF /100 - 1000 (Hz)	300Hz
	08-06	DATA LCUT SLOPE	6 / 18 (dB/oct)	18dB/oct
	08-07	DATA HCUT FREQ	700 - 4000Hz / OFF	3000Hz
	08-08	DATA HCUT SLOPE	6 / 18 (dB/oct)	18dB/oct
	08-09	DATA IN SELECT	MIC/REAR	REAR
	08-10	DATA PTT SELECT	DAKY/RTS/DTR	DAKY
	08-11	DATA OUT LEVEL	0 - 100	50
	08-12	DATA BFO	USB/LSB	LSB
MODE FM				
	09-01	FM MIC SELECT	MIC/REAR	MIC
	09-02	FM OUT LEVEL	0 - 100	50
	09-03	PKT PTT SELECT	DAKY/RTS/DTR	DAKY
	09-04	RPT SHIFT 28MHz	0 - 1000 (kHz)	100kHz
	09-05	RPT SHIFT 50MHz	0 - 4000 (kHz)	1000kHz
	09-06	DCS POLARITY	Tn-Rn/Tn-Riv/Tiv-Rn/Tiv-Riv	Tn-Rn
MODE RTY				
	10-01	RTTY LCUT FREQ	OFF /100 - 1000 (Hz)	300Hz
	10-02	RTTY LCUT SLOPE	6 / 18 (dB/oct)	18dB/oct
	10-03	RTTY HCUT FREQ	700 - 4000 (Hz) / OFF	3000Hz
	10-04	RTTY HCUT SLOPE	6 / 18 (dB/oct)	18dB/oct
	10-05	RTTY SHIFT PORT	SHIFT/DTR/RTS	SHIFT
	10-06	RTTY POLARITY-R	NOR/REV	NOR
	10-07	RTTY POLARITY-T	NOR/REV	NOR
	10-08	RTTY OUT LEVEL	0 - 100	50
	10-09	RTTY SHIFT FREQ	170/200/425/850 (Hz)	170Hz
	10-10	RTTY MARK FREQ	1275/2125 (Hz)	2125Hz
	10-11	RTTY BFO	USB/LSB	LSB
MODE SSB				
	11-01	SSB LCUT FREQ	OFF /100 - 1000 (Hz)	100Hz
	11-02	SSB LCUT SLOPE	6 / 18 (dB/oct)	6dB/oct
	11-03	SSB HCUT FREQ	700 - 4000 (Hz) / OFF	3000Hz
	11-04	SSB HCUT SLOPE	6 / 18 (dB/oct)	6dB/oct
	11-05	SSB MIC SELECT	MIC/REAR	MIC
	11-06	SSB OUT LEVEL	0 - 100	50
	11-07	SSB BFO	USB/LSB/AUTO	AUTO
	11-08	SSB PTT SELECT	DAKY/RTS/DTR	DAKY
	11-09	SSB TX BPF	100-3000/100-2900/200-2800/300-2700/400-2600	300-2700
RX DSP				
	12-01	APF WIDTH	NARROW/MEDIUM/WIDE	MEDIUM
	12-02	CONTOUR LEVEL	-40 - 0 - 20	-15
	12-03	CONTOUR WIDTH	1 - 11	10
	12-04	IF NOTCH WIDTH	NARROW/WIDE	WIDE

Menu / Item			Available Values	Default
SCOPE				
	13-01	SCP START CYCLE	OFF/3/5/10 (sec)	OFF
	13-02	SCP SPAN FREQ	37.5/75/150/375/750 (kHz)	750kHz
TUNING				
	14-01	QUICK DIAL	50/100/500 (kHz)	500kHz
	14-02	SSB DIAL STEP	2/5/10 (Hz)	10Hz
	14-03	AM DIAL STEP	10/100 (Hz)	10Hz
	14-04	FM DIAL STEP	10/100 (Hz)	100Hz
	14-05	DIAL STEP	2/5/10 (Hz)	5Hz
	14-06	AM CH STEP	2.5/5/9/10/12.5/25 (kHz)	5kHz
	14-07	FM CH STEP	5/6.25/10/12.5/15/20/25 (kHz)	5kHz
TX AUDIO				
	15-01	EQ1 FREQ	OFF/100 - 700	OFF
	15-02	EQ1 LEVEL	-20 - 0 - 10	5
	15-03	EQ1 BWTH	1 - 10	10
	15-04	EQ2 FREQ	OFF/700 - 1500	OFF
	15-05	EQ2 LEVEL	-20 - 0 - 10	5
	15-06	EQ2 BWTH	1 - 10	10
	15-07	EQ3 FREQ	OFF/1500 - 3200	OFF
	15-08	EQ3 LEVEL	-20 - 0 - 10	5
	15-09	EQ3 BWTH	1 - 10	10
	15-10	P-EQ1 FREQ	OFF/100 - 700	200
	15-11	P-EQ1 LEVEL	-20 - 0 - 10	0
	15-12	P-EQ1 BWTH	1 - 10	2
	15-13	P-EQ2 FREQ	OFF/700 - 1500	800
	15-14	P-EQ2 LEVEL	-20 - 0 - 10	0
	15-15	P-EQ2 BWTH	1 - 10	1
	15-16	P-EQ3 FREQ	OFF/1500 - 3200	2100
	15-17	P-EQ3 LEVEL	-20 - 0 - 10	0
	15-18	P-EQ3 BWTH	1 - 10	1
TX GNRL				
	16-01	HF SSB PWR	5 - 100	100
	16-02	HF AM PWR	5 - 40	25
	16-03	HF PWR	5 - 100	100
	16-04	50M SSB PWR	5 - 100	100
	16-05	50M AM PWR	5 - 40	25
	16-06	50M PWR	5 - 100	100
	16-07	SSB MIC GAIN	0 - 100	50
	16-08	AM MIC GAIN	0 - 100	50
	16-09	FM MIC GAIN	0 - 100	50
	16-10	DATA MIC GAIN	0 - 100	50
	16-11	SSB DATA GAIN	0 - 100	50
	16-12	AM DATA GAIN	0 - 100	50
	16-13	FM DATA GAIN	0 - 100	50
	16-14	DATA DATA GAIN	0 - 100	50
	16-15	TUNER SELECT	OFF/EXTERNAL/ATAS/LAMP	OFF
	16-16	VOX SELECT	MIC/DATA	MIC
	16-17	VOX GAIN	0 - 100	50

Menu / Item			Available Values	Default
	16-18	VOX DELAY	30 - 3000 (msec)	500msec
	16-19	ANTI VOX GAIN	0 - 100	50
	16-20	DATA VOX GAIN	0 - 100	50
	16-21	DATA VOX DELAY	30 - 3000 (msec)	100msec
	16-22	ANTI DVOX GAIN	0 - 100	0
	16-23	EMERGENCY FREQ	ENABLE/DISABLE	DISABLE
RESET				
	17-01	RESET	ALL/DATA/FUNC	---
VERSION				
	18-01	MAIN VERSION	---	---
	18-02	DSP VERSION	---	---
	18-03	LCD VERSION	---	---

Specifications

General

Frequency Range:	Tx: 1.8 MHz - 54 MHz (Amateur bands only) Rx: 30 kHz - 56 MHz 1.8 MHz - 54 MHz (Specified performance, Amateur bands only)
Channel Step:	2/5/10 Hz (SSB, CW) 10/100 Hz (AM, FM)
Frequency Stability:	SSB/CW/AM: ±0.5 ppm [14 °F to +122 °F (-10 °C to +50 °C)] FM: ±1 kHz [14 °F to +122 °F (-10 °C to +50 °C)]
Modes of Emission :	A1A (CW), A3E (AM), J3E (LSB, USB), F3E (FM)
Antenna Impedance:	50 Ohms, unbalanced
Supply voltage:	13.8 V DC ±15%, negative ground
Current Consumption (typical):	Rx: 2.0 A (signal present) Tx: 23 A
Operating Temperature Range:	14 °F to +122 °F (-10 °C to +50 °C)
Case Size (W x H x D):	6.1" x 2.0" x 8.6" (155 x 52 x 218 mm) (w/o knobs)
Weight (Approx.):	4.18 lb (1.9 kg)

Transmitter

Power Output:	100 W (40 W AM carrier)
Modulation Type:	J3E (SSB): Balanced, A3E (AM): Low-Level, F3E (FM): Variable Reactance
Maximum Deviation:	±5.0 kHz (Wide) ±2.5 kHz (Narrow)
Spurious Radiation:	Better than -50 dB (1.8 MHz - 30 MHz Amateur bands) Better than -63 dB (50 MHz Amateur bands)
Microphone Impedance:	600 Ohms (200 Ohms to 10 k Ohms)

Receiver

Circuit Type:	SSB/CW/AM: Triple-conversion Superheterodyne		
	FM: Double Conversion Superheterodyne		
Intermediate Frequencies:	SSB/CW/AM: 1st: 69.450 MHz		
	2nd: 450 kHz		
	3rd: 24 kHz		
	FM: 1st: 69.450 MHz		
	2nd: 450 kHz		
Sensitivity:	SSB/CW (S/N 10 dB)		
	0.16 µV (1.8 MHz - 30 MHz)		
	0.16 µV (50 MHz - 54 MHz)		
	AM (S/N 10 dB)		
	5 µV (0.5 MHz - 1.8 MHz)		
	1.6 µV (1.8 MHz - 30 MHz)		
	1.6 µV (50 MHz - 54 MHz)		
	FM (12 dB SINAD)		
	0.35 µV (29 MHz, 50 MHz - 54 MHz)		
Selectivity	Mode	-6 dB	-60 dB
	SSB/CW	2.4 kHz or better	3.6 kHz or less
	CW-N	500 Hz or better	750 Hz or less
	AM	6 kHz or better	15 kHz or less
	FM	12 kHz or better	30 kHz or less (-50dB)
	FM-N	9 kHz or better	25 kHz or less (-50dB)
Maximum AF Output:	2.5 W into 4 ohms with 10% THD		
Audio Output Impedance:	4 Ohms to 16 Ohms (8 Ohms: nominal)		
Conducted Radiation:	Less than 4 nW		

Specifications are subject to change, in the interest of technical improvement, without notice or obligation, and are guaranteed only within the amateur bands.

Symbol placed on the equipment

⎓ Direct current

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- ❒ Increase the separation between the equipment and receiver.
- ❒ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ❒ Consult the dealer or an experienced radio/TV technician for help.

1. Changes or modifications to this device that are not expressly approved by YAESU MUSEN could void the user's authorization to operate this device.
2. This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference including received, interference that may cause undesired operation.
3. The scanning receiver in this equipment is incapable of tuning, or readily being altered, by the User to operate within the frequency bands allocated to the Domestic public Cellular Telecommunications Service in Part 22.

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

DECLARATION BY MANUFACTURER

The Scanner receiver is not a digital scanner and is incapable of being converted or modified to a digital scanner receiver by any user.

WARNING: MODIFICATION OF THIS DEVICE TO RECEIVE CELLULAR RADIOTELEPHONE SERVICE SIGNALS IS PROHIBITED UNDER FCC RULES AND FEDERAL LAW.

CAN ICES-3 (B) / NMB-3 (B)

European Users should note that operation of this unit in Transmit mode requires the operator to have a valid Amateur Radio License from their respective Countries Amateur Radio Licensing Authority for the Frequencies and Transmitter Power levels that this Radio transmits on. Failure to comply may be unlawful and liable for prosecution.

Disposal of your Electronic and Electric Equipment

Products with the symbol (crossed-out wheeled bin) cannot be disposed as household waste. Electronic and Electric Equipment should be recycled at a facility capable of handling these items and their waste by products.
In EU countries, please contact your local equipment supplier representative or service center for information about the waste collection system in your country.

Attention in case of use

This transceiver works on frequencies which are not generally permitted.
As for the actual usage, the user has to possess an amateur radio license.
Usage is allowed only in the frequency bands which are allocated for amateur radios.

List of national codes					
AT	BE	BG	CY	CZ	DE
DK	ES	EE	FI	FR	GB
GR	HR	HU	IE	IT	LT
LU	LV	MT	NL	PL	PT
RO	SK	SI	SE	CH	IS
LI	NO	–	–	–	–

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Winchester SO23 OLB
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Tel: +44 (0)1962 866667
Fax: +44 (0)1962 856801
Email: sales@yaesu.co.uk

Declaration of Conformity

Nr. YUK-DOC-0601-16

We, Yaesu UK Ltd. certify and declare under our sole responsibility that the following equipment complies with the essential requirements of the Directive 1999/5/EC and 2011/65/EU.

Type of Equipment	HF/50MHz Transceiver
Brand Name	YAESU
Model Number	FT-891
Manufacturer	YAESU MUSEN CO. LTD.
Address of Manufacturer	Tennozu Parkside Building, 2-5-8 Higashi-Shinagawa, Shinagawa-ku, Tokyo, 140-0002 Japan

Applicable Standards:
This equipment is tested to and conforms to the essential requirements of directive, as included in following standards:

Health 1999/5/EC Art. 3 (1) (a)	EN 62311:2008
Safety 1999/5/EC Art. 3 (1) (a)	EN 60950-1:2006 + A2:2013
EMC 1999/5/EC Art. 3 (1) (b)	EN 301 489-01 V1.9.2 EN 301 489-15 V1.2.1
Radio Spectrum 1999/5/EC Art. 3 (2)	EN 301 783-02 V1.2.1
ROHS2 2011/65/EU Art. 7 (b)	EN 50581:2012

The technical documentation as required by the Conformity Assessment procedures is kept at the following address:

Company Yaesu UK Ltd
Address Unit 12, Sun Valley Business Park, Winnall Close
Technical Construction file

Winchester, Hampshire UK SO23 0LB
Issued by: Yaesu Musen Co. Ltd, Tokyo Japan
File No: YETA00416
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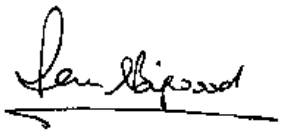
Date: 06-Jun 2016

Signed for and on behalf of Yaesu UK Ltd



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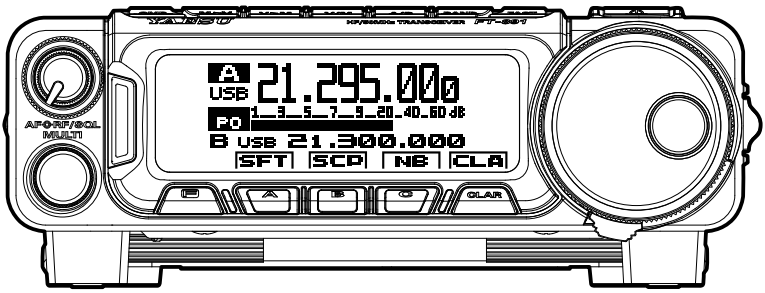
YAESU
The radio

FT-891

Advance Manual

HF/50 MHz TRANSCEIVER



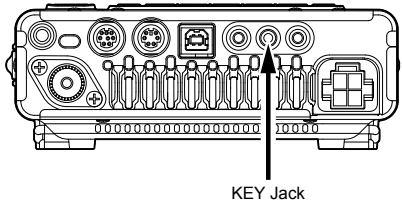
Contents

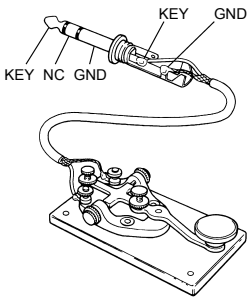
CW Mode Operation

The powerful CW operating capabilities of the FT-891 permit operation using an electronic keyer paddle, a “straight key”, or a computer-based keying device.

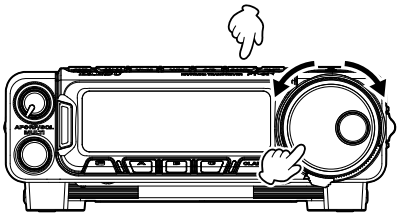
Setup for Straight Key (and Straight Key Emulation) Operation

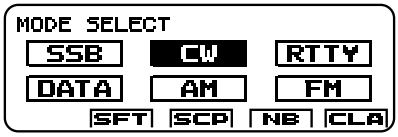
Before starting, connect a key line to the rear panel KEY jack.

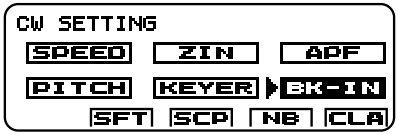




1. Press and hold the [**BAND**(**MODE**)] key for one second.
   The “MODE SELECT” screen will appear in the display.
2. Rotate the **DIAL** knob to select the “CW” mode.
3. Press the [**F**] key repeatedly to find the “CW SETTING” list screen.
4. Rotate the **MULTI** function knob to select “BK-IN”.
5. Press the **MULTI** function knob to engage the “break-in” system.
6. Press and hold the [**F**] key for one second to exit the “CW SETTING” list screen and resume normal operation.
7. When the key is pressed, the transmitter will automatically be engaged.
8. When the key is released, the receiver audio will return, after a brief delay.



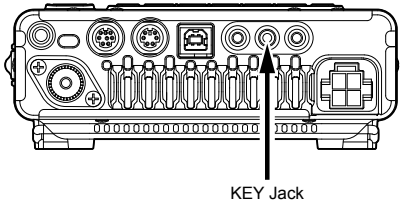


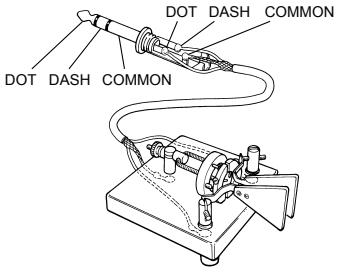


- ❒ The CW sidetone audio level may be adjusted by setting “MONITOR” (see page 47).
- ❒ To enable the keying operation in LSB/USB mode and send the CW signal without switching to CW mode, change Menu item “**07-06** [**CW AUTO MODE**]”.
- ❒ The same frequency may be displayed when switching between SSB mode and CW mode by setting Menu item “**07-01** [**CW FREQ DISPLAY**]”.
- ❒ By connecting the FT-891 to a computer, CW can be operated using free or commercially available software and setting Menu item “**07-12** [**PC KEYING**]”.

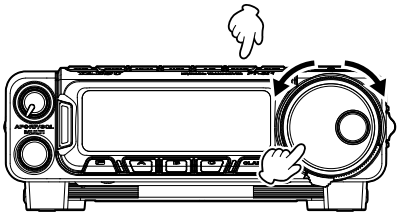
Using the Built-in Electronic Keyer

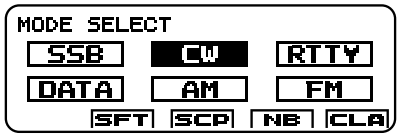
Before starting, connect the cable from your keyer paddle to the rear panel KEY jack.

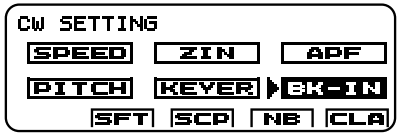




1. Press and hold the [**BAND**(**MODE**)] key for one second.
   The “MODE SELECT” screen will appear in the display.
2. Rotate the **DIAL** knob to select the “CW” mode.
3. Press the [**F**] key repeatedly to find the “CW SETTING” list screen.
4. Rotate the **MULTI** function knob to select “BK-IN”.
5. Press the **MULTI** function knob to engage the “break-in” system.
6. Rotate the **MULTI** function knob to select “KEYER”.
7. Press the **MULTI** function knob to engage the built-in Electronic Keyer.
8. Press and hold the [**F**] key for one second to exit the “CW SETTING” list screen and resume normal operation.
9. When the keyer paddle is pressed, the transmitter will automatically be engaged.
10. When the paddle is released, the receiver audio will return, after a brief delay.







- ❒ The CW sidetone audio level may be adjusted by setting “MONITOR” (see page 47).
- ❒ To enable the keying operation in LSB/USB mode and send the CW signal without switching to CW mode, change Menu item “**07-06** [**CW AUTO MODE**]”.
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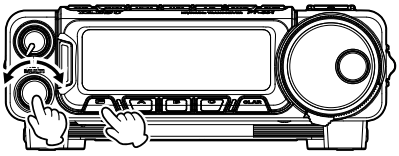
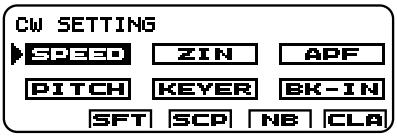
- ❒ By connecting the FT-891 to a computer, CW can be operated using free or commercially available software and setting Menu item “**07-12** [**PC KEYING**]”.

CW Mode Operation

Adjusting the keyer speed

The keyer speed can be adjusted via the “CW SETTING” list screen.





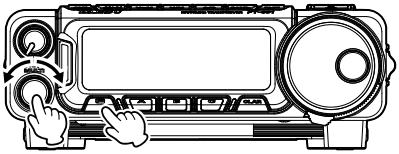
1. Press the [**F**] key repeatedly to find the “CW SETTING” list screen.
2. Rotate the **MULTI** function knob to select “SPEED”.
3. Press the **MULTI** function knob, the keying speed pop-up screen will appear.
4. Rotate the **MULTI** function knob to set the desired sending speed (4 - 60 WPM).
   Default: 20 WPM
5. Press the **MULTI** function knob, then press and hold the [**F**] key for one second to exit the “CW SETTING” list screen and resume normal operation.

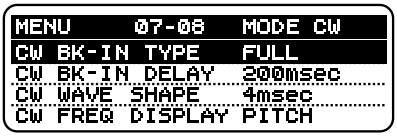
❒ Keyer speed function may be assigned to the [A], [B] or [C] key. Refer to “Changing the function assigned to the [A]/[B]/[C] keys” in the FT-891 Operating Manual.

Full Break-in (QSK) Operation

As shipped from the factory, the FT-891 TX/RX system for CW is configured for “Semi-break-in” operation.

However, this setup may be changed to full break-in (QSK) operation by setting Menu item “**07-08** [**CW BK-IN TYPE**]”. With full break-in QSK, the TX/RX switching is quick enough to hear incoming signals in the spaces between the dots and dashes of your transmission.

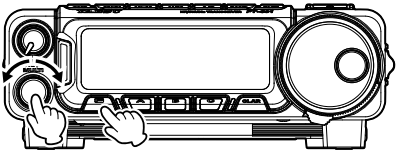


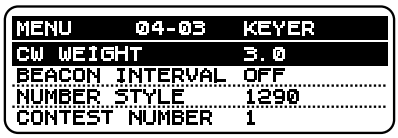


1. Press and hold in the [**F**] key for one second to activate the Menu mode.
2. Rotate the **MULTI** function knob to select Menu Mode “**07-08** [**CW BK-IN TYPE**]”.
3. Press the **MULTI** function knob, and then rotate it to set this menu item to “FULL”.
4. When the adjustment is satisfactory, press the **MULTI** function knob.
5. Press the [**F**] key to save the new setting and exit the Menu mode to normal operation.

Setting the Keyer Weight (Dot/Dash) Ratio

This Menu item may be used to adjust the dot/dash ratio for the built-in Electronic Keyer. The default weighting is 3:1 (a dash is three times longer than a dot).

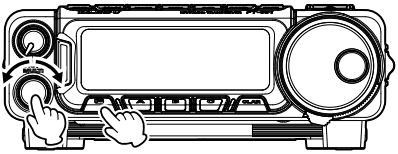


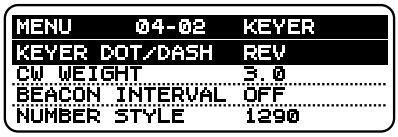


1. Press and hold in the [**F**] key for one second to activate the Menu mode.
2. Rotate the **MULTI** function knob to select Menu Mode "**04-03** [**CW WEIGHT**]".
3. Press the **MULTI** function knob, and then rotate it to set the weight to the desired value. The available adjustment range is a Dot/Dash ratio of 2.5 - 4.5.
   Default: 3.0
4. When the adjustment is satisfactory, press the **MULTI** function knob.
5. Press the [**F**] key to save the new setting and exit the Menu mode to normal operation.

Reversing the Keyer Polarity

For left-handed operators in a contest, for example, the polarity can be reversed easily in the Menu mode without changing the keyer connection (the default setting is "NOR").

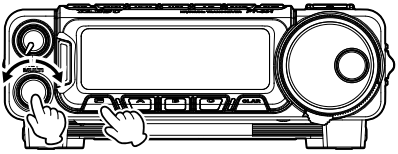


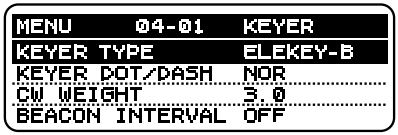


1. Press and hold in the [**F**] key for one second to activate the Menu mode.
2. Rotate the **MULTI** function knob to select Menu Mode "**04-02** [**KEYER DOT/DASH**]".
3. Press the **MULTI** function knob, and then rotate it to select "REV".
4. When the adjustment is satisfactory, press the **MULTI** function knob.
5. Press the [**F**] key to save the new setting and exit the Menu mode to normal operation.

Selecting the Keyer Operating Mode

The configuration of the Electronic Keyer may be customized independently for the rear panel KEY jack of the FT-891. This permits utilization of Automatic Character Spacing (ACS), if desired.



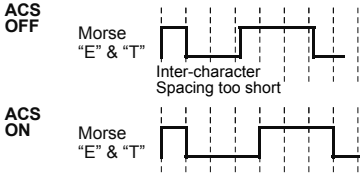


1. Press and hold in the [**F**] key for one second to activate the Menu mode.
2. Rotate the **MULTI** function knob to select Menu Mode "**04-01** [**KEYER TYPE**]".
3. Press the **MULTI** function knob, and then rotate it to set the keyer to the desired mode. The available selections are:

   OFF: The built-in Electronic Keyer is turned off ("straight key" mode).

   BUG: Dots will be generated automatically by the keyer, but dashes must be sent manually.

   ELEKEY-A: A code elements ("Dot" or "Dash") are automatically transmitted upon pressing either side of the paddle.



   ELEKEY-B: Pressing both sides of the paddle transmits the currently generated "Dash" followed by the "Dot" (or reverse order).

   ELEKEY-Y: Pressing both sides of the paddle transmits the currently generated "Dash" followed by the "Dot" (or reverse order). While transmitting the "Dash", the first transmitted "Dot" will not be stored.

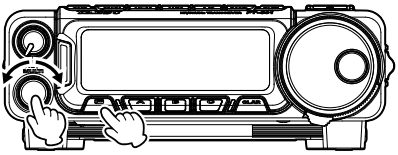
   ACS: Same as "ELEKEY" except that the spacing between characters is precisely set by the keyer to be the same length as a dash (three dots in length).

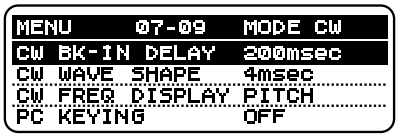
   Default: ELEKEY-B
4. When the Menu selection is satisfactory, press the **MULTI** function knob.
5. Press the [**F**] key to save the new setting and exit the Menu mode to normal operation.

CW Mode Operation

CW Delay Time Setting

During semi-break-in (not QSK) operation, the hang time of the transmitter, after you have finished sending, may be adjusted to a comfortable value consistent with your sending speed. This is the functional equivalent of the "VOX Delay" adjustment used on voice modes, and the delay may be varied anywhere between 30 msec and 3 seconds via Menu item "**07-09** [**CW BK-IN DELAY**]".

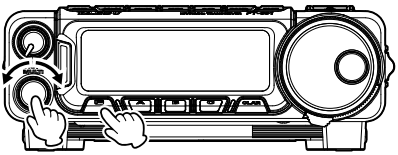


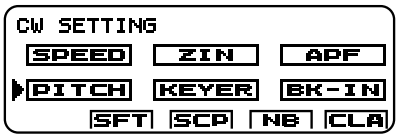


1. Press and hold in the [**F**] key for one second to activate the Menu mode.
2. Rotate the **MULTI** function knob to select Menu Mode "**07-09** [**CW BK-IN DELAY**]".
3. Press the **MULTI** function knob, and then rotate it to adjust the hang time (30 - 3000 msec).
   Default: 200 msec
4. When the adjustment is satisfactory, press the **MULTI** function knob.
5. Press the [**F**] key to save the new setting and exit the Menu mode to normal operation.

CW Pitch Adjustment

The center frequency of the receiver passband may be adjusted to the preferred CW tone. The pitch of the CW carrier offset may be varied between 300 Hz and 1050 Hz, in 10 Hz steps.





1. Press the [**F**] key repeatedly to find the "CW SETTING" list screen.
2. Rotate the **MULTI** function knob to select "PITCH".
3. Press the **MULTI** function knob, the PITCH frequency pop-up screen will appear.
4. Rotate the **MULTI** function knob to adjust the PITCH (300 - 1050 Hz).
   Default: 700 Hz
5. Press the **MULTI** function knob, then press and hold the [**F**] key for one second to exit the "CW SETTING" list screen and resume normal operation.

❒ CW Pitch function may be assigned to the [A], [B] or [C] key. Refer to "Changing the function assigned to the [A]/[B]/[C] keys" in the FT-891 Operating Manual.

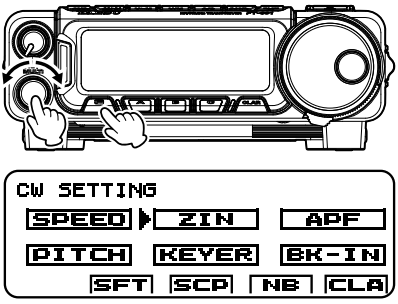
CW Pitch: If the receiver is tuned to an exact "zero beat" on an incoming CW signal, you could not copy it ("Zero beat" implies a 0 Hz tone). Therefore, the receiver is offset several hundred Hz (typically), to produce a beat tone that can be heard. The BFO offset associated with this tuning (that produces the comfortable audio tone) is called the CW Pitch.

CW Spotting (Zero-Beating)

"Spotting" (zeroing in on a received CW station) is a handy technique to ensure you and the other station are precisely on the same frequency.

The Tuning Offset Indicator in the LCD display may also be observed, so that the receiver frequency can be adjusted to center the incoming station on the pitch corresponding to that of the transmitted signal.

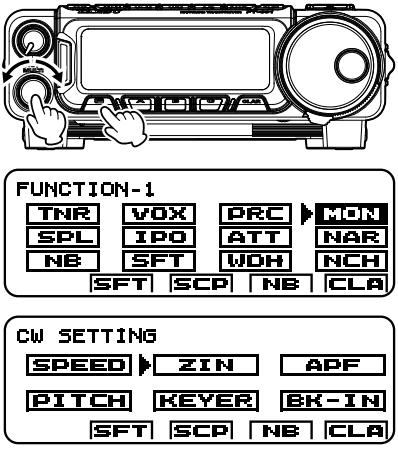
Using the Auto Zeroing System



1. Press the [**F**] key repeatedly to find the "CW SETTING" list screen.
2. Rotate the **MULTI** function knob to select "ZIN".
3. Press the **MULTI** function knob to cause the receiving frequency to zero-in automatically while receiving a CW signal.
4. Press and hold the [**F**] key for one second to exit the "CW SETTING" list screen and resume normal operation.

❒ Auto Zeroing function may be assigned to the [A], [B] or [C] key. Refer to "Changing the function assigned to the [A]/[B]/[C] keys" in the FT-891 Operating Manual.

Using the SPOT System



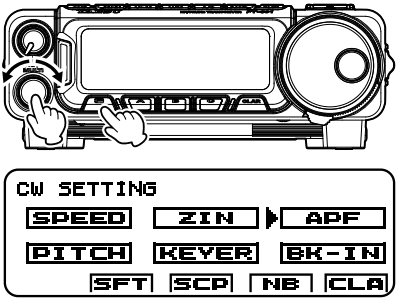
1. Press the [**F**] key repeatedly to find the "FUNCTION-1" list screen.
2. Rotate the **MULTI** function knob to select "MON".
3. Press the **MULTI** function knob to activate the Monitor function, the Monitor level pop-up screen will appear.
4. Rotate the **MULTI** function knob to adjust the Monitor audio volume.
5. Press the **MULTI** function knob.
6. Press the [**F**] key repeatedly to find the "CW SETTING" list screen.
7. Rotate the **MULTI** function knob to select "ZIN".
8. While you are pressing and holding the **MULTI** function knob, the tone is output from the speaker.
9. Press and hold the [**F**] key for one second to exit the "CW SETTING" list screen and resume normal operation.

❒ Spot function may be assigned to the [A], [B] or [C] key. Refer to "Changing the function assigned to the [A]/[B]/[C] keys" in the FT-891 Operating Manual.

CW Mode Operation

❒ The displayed frequency on the CW mode normally reflects the “zero beat” frequency of the offset carrier. That is, when receiving a signal at 14.100.00 MHz with a 700 Hz offset, the “zero beat” frequency of that CW carrier would be 14.100.70 MHz; which is what the FT-891 displays, by default. However, the display may be changed to be identical to what would be seen when listening on the USB mode, by using Menu item “**07-11** [**CW FREQ DISPLAY**]” and setting it to “FREQ” instead of the default “PITCH” setting.

Audio Peak Filter



1. Press the [**F**] key repeatedly to find the “CW SETTING” list screen.
2. Rotate the **MULTI** function knob to select “APF”.
3. Press the **MULTI** function knob, then rotate it to set the “APF” action to a comfortable level (-250 - +250 Hz).

   Default: +250 Hz

   ❒ The APF bandwidth can be selected from NARROW/MEDIUM/WIDE via the Menu item “**12-01** [**APF WIDTH**]”.
4. To cancel the APF action, press the **MULTI** function knob, then press and hold the [**F**] key for one second to exit the “CW SETTING” list screen and resume normal operation.

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

❒ Audio Peak Filter function may be assigned to the [A], [B] or [C] key. Refer to “Changing the function assigned to the [A]/[B]/[C] keys” in the FT-891 Operating Manual.

Contest Memory Keyer

The CW message capability of the FT-891 may be utilized from the Front Control Panel, or the optional FH-2 Remote Control Keypad, which plugs into the rear panel REM/ALC jack.

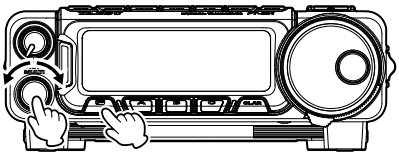
Message Memory

Five CW memory channels, capable of retaining 50 characters each, are provided (the CW memory uses the PARIS standard for characters and word length).

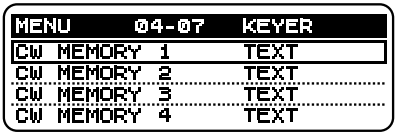
Example: CQ CQ CQ DE W6DXC K (19 characters)

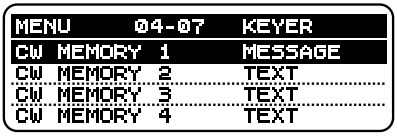
−·−·	−−·−	−·−·	−−·−	−·−·	−−·−	−·· ·	·−−	−····	−··	−··−	−·−·	−·−
(C)	(Q)	(C)	(Q)	(C)	(Q)	(D) (E)	(W)	(6)	(D)	(X)	(C)	(K)

Storing a CW Message into Memory using a Keyer Paddle



1. First, set the message entry method to keyer entry. To activate the Menu mode, press and hold the [**F**] key in for one second.
2. Rotate the **MULTI** function knob to select the CW Memory Register into which you wish to store the message; for now, we are just setting the message entry technique to (Keyer entry).
   "**04-07** [**CW MEMORY 1**]"
   "**04-08** [**CW MEMORY 2**]"
   "**04-09** [**CW MEMORY 3**]"
   "**04-10** [**CW MEMORY 4**]"
   "**04-11** [**CW MEMORY 5**]"





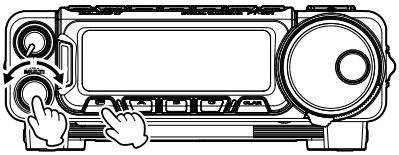
3. Press the **MULTI** function knob briefly, and then rotate it to set the selected CW Memory Register to "MESSAGE". If you want to use a keyer paddle for message entry on all five memories, set Menu items #04-07 to #04-11 to "MESSAGE".
4. Press the **MULTI** function knob to save the new setting.
5. Press the [**F**] key to exit to normal operation.

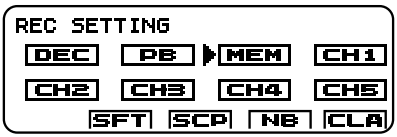
❒ **PARIS Word Length:** By convention among CW and Amateur operators (utilized by ARRL and others), the length of one "word" of CW is defined as the length of the Morse Code characters spelling the word "PARIS". This character (dot/dash/space) length is used for the specific definition of code speed in "words" per minute.

Message Memory Programming from the FT-891 Control Panel (Using a Keyer Paddle)

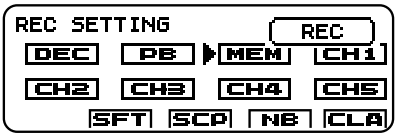
1. Set the operating mode to CW.
2. Set the "BK-IN" feature to "OFF".
3. Turn the internal Electronic Keyer "ON".
4. Press the [**F**] key repeatedly to find the "REC SETTING" list screen.

   NOTE: This screen may be enabled/ disabled via Menu Mode "**05-11** [**REC SETTING**]".





5. Rotate the **MULTI** function knob to select "MEM".
6. Press the **MULTI** function knob. A blinking "REC" icon will appear in the display.
7. Rotate the **MULTI** function knob to select any numbered [**CH1**] through [**CH5**].
8. Press the **MULTI** function knob to begin the memory storage process, and the "REC" icon will glow steadily.



9. Send the desired message using the keyer paddle.

   NOTE: If you do not start keying within ten seconds, the memory storage process will be canceled.

10. Press the **MULTI** function knob once more at the end of the message. Up to 50 characters may be stored in each of the five memories.
11. Press and hold the [**F**] key for one second to exit the "REC SETTING" list screen and resume normal operation.

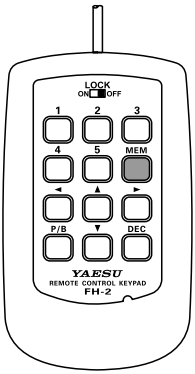
    NOTE: Care must be exercised when sending to ensure that the spaces between letters and words are accurately done; if the timing is off, the spacing may not come out right in the stored message. For ease in setting up the keyer memories, we recommend setting Menu item "**04-01** [**KEYER TYPE**]" to "ACS" (Automatic Character Spacing) while programming the keyer memories.

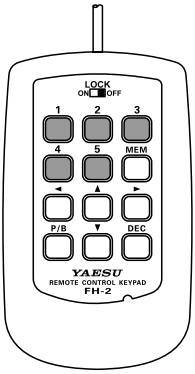
Message Memory Programming with the Optional FH-2 (Using the Keyer Paddle)

1. Set the operating mode to CW.
2. Set the “BK-IN” feature to “OFF”.
3. Turn the internal Electronic Keyer “ON”.
4. Press the [**MEM**] key on the FH-2. A blinking “REC” icon will appear in the display.
5. Press any of the FH-2 keys numbered [**1**] through [**5**] to begin the memory storage process, and the “REC” icon will glow steadily.
6. Send the desired message using the keyer paddle.

   NOTE: If you do not start keying within ten seconds, the memory storage process will be canceled.
7. Press the [**MEM**] key on the FH-2 once more at the end of your message. Up to 50 characters may be stored in each of the five memories.

   NOTE: Care must be exercised when sending to ensure that the spaces between letters and words are accurately done; if the timing is off, the spacing may not come out right in the stored message. For ease in setting up the keyer memories, we recommend setting Menu item “**04-01** [**KEYER TYPE**]” to “ACS” (Automatic Character Spacing) while programming the keyer memories.



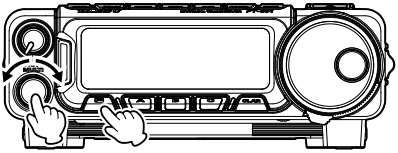


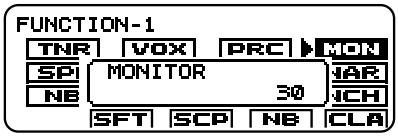
CW Mode Operation

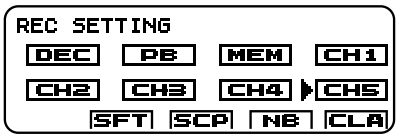
Checking the CW Memory Contents from the FT-891 Front Control Panel

1. Set the operating mode to CW.
2. Set the "BK-IN" feature to "OFF".
3. Press the [**F**] key to find the "FUNCTION-1" list screen.
4. Rotate the **MULTI** function knob to select "MON".
5. Press the **MULTI** function knob, the Monitor level pop-up screen will appear.
6. Rotate the **MULTI** function knob to set the Monitor volume level (0 - 100).
7. Press the **MULTI** function knob or the [**F**] key.
8. Press the [**F**] key to find the "REC SETTING" list screen.

   NOTE: This screen may be enabled/disabled via Menu Mode "**05-11** [**REC SETTING**]".





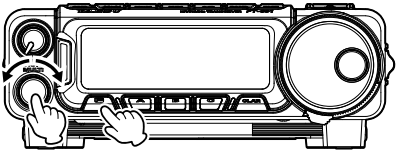


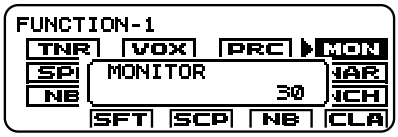
9. Rotate the **MULTI** function knob to select a memory [**CH1**] - [**CH5**] that was previously recorded.
10. Press the **MULTI** function knob to hear the CW message played in the sidetone monitor. No RF energy will be transmitted.
11. Press and hold the [**F**] key for one second to exit the "REC SETTING" list screen and resume normal operation.

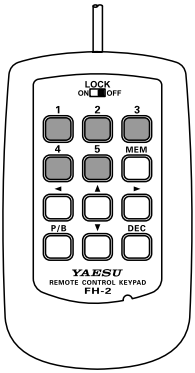
CW Mode Operation

Checking the CW Memory Contents with the Optional FH-2

1. Set the operating mode to CW.
2. Set the “BK-IN” feature to “OFF”.
3. Press the [**F**] key to find the “FUNCTION-1” list screen.
4. Rotate the **MULTI** function knob to select “MON”.
5. Press the **MULTI** function knob, the Monitor level pop-up screen will appear.
6. Rotate the **MULTI** function knob to set the Monitor volume level (0 - 100).
7. Press the **MULTI** function knob or the [**F**] key.
8. Press and hold the [**F**] key for one second to exit the “FUNCTION-1” list screen and resume normal operation.
9. Press the FH-2 [**CH1**] - [**CH5**] key to select a previously recorded memory. The CW message will be played in the sidetone monitor. No RF energy will be transmitted.





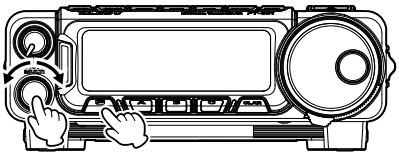


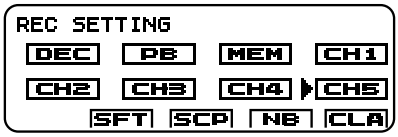
CW Mode Operation

Playback the CW Message On-The-Air using the FT-891 Display Control Panel

1. Set the operating mode to CW.
2. Set the “BK-IN” feature to “ON”.
3. Press the [**F**] key to find the “REC SETTING” list screen.

   NOTE: This screen may be enabled/ disabled via Menu Mode “**05-11** [**REC SETTING**]”.

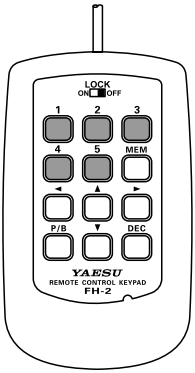




4. Rotate the **MULTI** function knob to select a previously recorded CW memory [**CH1**] - [**CH5**].
5. Press the **MULTI** function knob, the CW message programmed in the selected Memory Register will be transmitted on the air.
6. Press and hold the [**F**] key for one second to exit the “REC SETTING” list screen and resume normal operation.

Playback the CW Message On-The-Air using the Optional FH-2

1. Set the operating mode to CW.
2. Set the “BK-IN” feature to “ON”.
3. Press the FH-2 [**CH1**] - [**CH5**] key, depending on which CW Memory Register message you wish to transmit. The programmed message will be transmitted on the air.



Text Memory

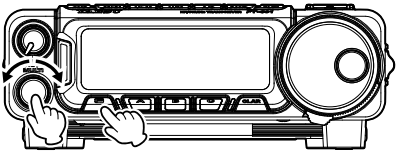
The five channels of CW message memory (up to 50 characters each) may also be programmed using a text-entry technique. This method is somewhat slower than sending the message directly from the keyer paddle, but accuracy of character spacing is ensured. Be sure to enter the character "}" at the end of the text message.

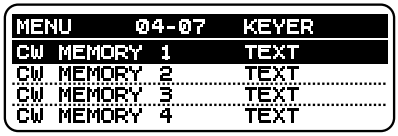
Example 1: CQ CQ CQ DE W6DXC K} (20 characters)

The sequential Contest Number ("Count up") feature is another powerful feature that may be utilized within the CW Memory Keyer by entering the # symbol.

Example 2: 599 10 200 # K} (15 characters)

Text Memory Storage





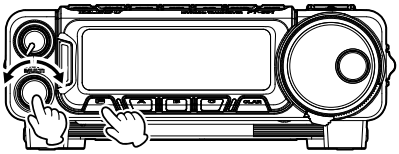
1. Press and hold in the [**F**] key for one second to activate the Menu mode.
2. First, set the message entry method to Text Entry. Rotate the **MULTI** function knob to select the CW Memory Register into which you wish to store the message using the Text Entry method.
   "**04-07** [**CW MEMORY 1**]"
   "**04-08** [**CW MEMORY 2**]"
   "**04-09** [**CW MEMORY 3**]"
   "**04-10** [**CW MEMORY 4**]"
   "**04-11** [**CW MEMORY 5**]"
3. Press the **MULTI** function knob, and then rotate it to set the selected CW Memory Register to "TEXT". If you want to use text message entry on all memories, set all five Menu items (#04-07 to #04-11) to "TEXT".
4. Press the **MULTI** function knob to save the new setting.
5. Press the [**F**] key to exit to normal operation.

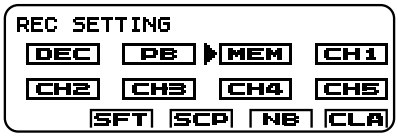
❒ The following texts are programmed to MEMORY 4 and MEMORY 5 as the factory default:
MEMORY 4: DE FT-891 K}
MEMORY 5: R 5NN K}

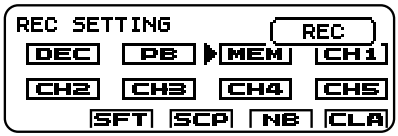
Text Message Programming from the FT-891 Control Panel

1. Set the operating mode to CW.
2. Press the [**F**] key repeatedly, to find the "REC SETTING" list screen.

   NOTE: This screen may be enabled/disabled via Menu Mode "**05-11** [**REC SETTING**]".
3. Rotate the **MULTI** function knob to select "MEM".
4. Press the **MULTI** function knob. A blinking "REC" icon will appear in the display.
5. Rotate the **MULTI** function knob to select any channel [**CH1**] through [**CH5**].
6. Press the **MULTI** function knob. The "CW TEXT" screen will appear.
7. Press the [**B**](**EDT**) key. The text input screen will appear.





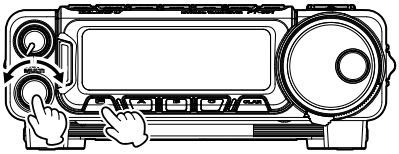


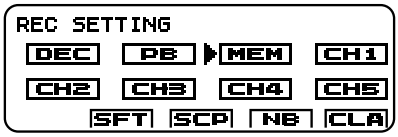
8. Rotate the **MULTI** function knob to select the letters, numbers, or symbols of the desired label, then press the **MULTI** function knob.
9. Press the **MULTI** function knob.
10. Repeat step 8 and 9 to program the remaining letters, numbers, or symbols of the desired text. Up to 50 characters may be stored in each of the five memories.

    ❒ Rotate the **MULTI** function knob to set the cursor position and press the [**B**](**CE**) key to erase and input characters.
11. When text entry is complete, press the [**C**](**ENT**) key.
12. Press the [**A**](**BCK**) key to exit the text input screen.
13. Press and hold the [**F**] key for one second to exit the "REC SETTING" list screen and resume normal operation.

Text Message Programming with the Optional FH-2

1. Set the operating mode to CW.
2. Press the [**MEM**] key on the FH-2. A blinking "REC" icon will appear in the display.
3. Press any of the FH-2 keys numbered [**1**] through [**5**], to select the desired CW Memory Register that you wish to program with text.
4. Press the [**MEM**] key on the FH-2. The text input screen will appear.
5. Rotate the **MULTI** function knob to select the letters, numbers, or symbols of the desired label, then press the **MULTI** function knob.





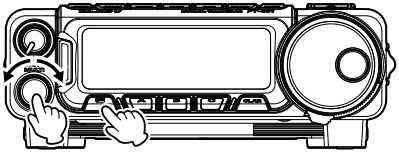
6. Press the **MULTI** function knob.
7. Repeat step 5 and 6 to program the remaining letters, numbers, or symbols of the desired text. Up to 50 characters may be stored in each of the five memories.
   - ❒ Rotate the **MULTI** function knob to set the cursor position and press the [**B**](**CE**) key to erase and input characters.
8. When the message is complete, add the "}" character at the end to signify the termination of the message.
9. When the text entry is complete, press the [**B**](**ENT**) key.
10. Press and hold the FH-2 [**MEM**] key for one second to exit the text input screen and resume normal operation.

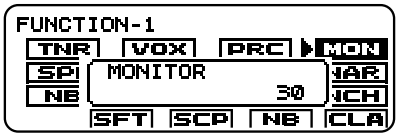
CW Mode Operation

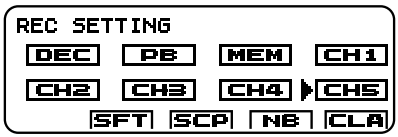
Checking the CW Memory Contents from the FT-891 Front Control Panel

1. Set the operating mode to CW.
2. Set the “BK-IN” feature to “OFF”.
3. Press the [**F**] key repeatedly, to find the “FUNCTION-1” list screen.
4. Rotate the **MULTI** function knob to select “MON”.
5. Press the **MULTI** function knob, the Monitor level pop-up screen will appear.
6. Rotate the **MULTI** function knob to set the Monitor volume level (0 - 100).
7. Press the **MULTI** function knob or the [**F**] key.
8. Press the [**F**] key repeatedly, to find the “REC SETTING” list screen.

   NOTE: This screen may be enabled/ disabled via Menu Mode “**05-11** [**REC SETTING**]”.



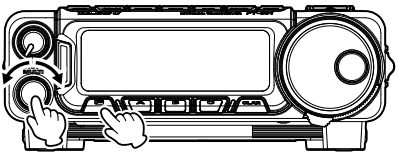


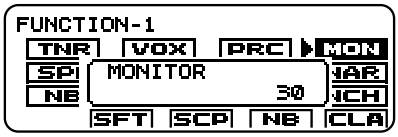


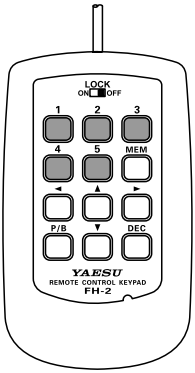
9. Rotate the **MULTI** function knob to select a memory [**CH1**] - [**CH5**] that was previously recorded.
10. Press the **MULTI** function knob to hear the CW message played in the sidetone monitor. No RF energy will be transmitted.
11. Press and hold the [**F**] key for one second to exit the “REC SETTING” list screen and resume normal operation.

Checking the CW Memory Contents with the Optional FH-2

1. Set the operating mode to CW.
2. Set the “BK-IN” feature to “OFF”.
3. Press the [**F**] key repeatedly, to find the “FUNCTION-1” list screen.
4. Rotate the **MULTI** function knob to select “MON”.
5. Press the **MULTI** function knob, the Monitor level pop-up screen will appear.
6. Rotate the **MULTI** function knob to set the Monitor volume level (0 - 100).
7. Press the **MULTI** function knob or the [**F**] key.
8. Press and hold the [**F**] key for one second to exit the “FUNCTION-1” list screen and resume normal operation.
9. Press the FH-2 [**CH1**] - [**CH5**] key to select a previously recorded memory. The CW message will be played in the sidetone monitor. No RF energy will be transmitted.





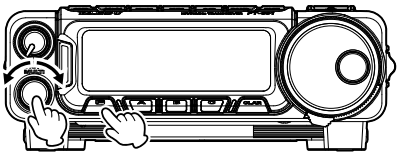


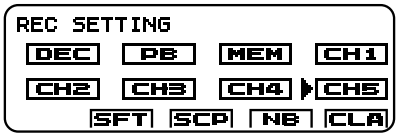
CW Mode Operation

Playback the CW Message On-The-Air using the FT-891 Display Control Panel

1. Set the operating mode to CW.
2. Set the "BK-IN" feature to "ON".
3. Press the [**F**] key repeatedly, to find the "REC SETTING" list screen.

   NOTE: This screen may be enabled/ disabled via Menu Mode "**05-11** [**REC SETTING**]".

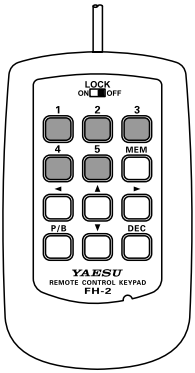




4. Rotate the **MULTI** function knob to select a previously recorded CW memory [**CH1**] - [**CH5**].
5. Press the **MULTI** function knob, the CW message programmed in the selected Memory Register will be transmitted on the air.
6. Press and hold the [**F**] key for one second to exit the "REC SETTING" list screen and resume normal operation.

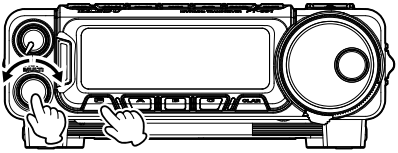
Playback the CW Message On-The-Air using the Optional FH-2

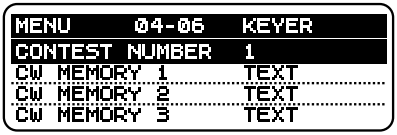
1. Set the operating mode to CW.
2. Set the "BK-IN" feature to "ON".
3. Press the FH-2 [**CH1**] - [**CH5**] key, depending on which CW Memory Register message you wish to transmit. The programmed message will be transmitted on the air.



Contest Number Programming

Use this process when beginning a contest, or if the count becomes out of sync with the contact number in the middle of a contest.



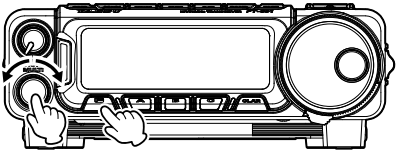


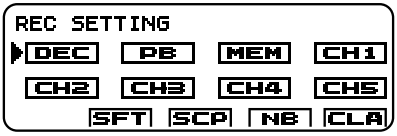
1. Press and hold in the [**F**] key for one second to activate the Menu mode.
2. Rotate the **MULTI** function knob to select Menu Mode "**04-06** [**CONTEST NUMBER**]". The current contest number will appear on the LCD display.
3. Press the **MULTI** function knob, and then rotate it to set the Contest Number to the desired value.
4. Press the **MULTI** function knob to save the new setting.
5. Press the [**F**] key to exit the Menu mode and resume normal operation.

Decrementing the Contest Number

Use this process if the current contest number gets slightly ahead of the actual contact number (in case of a duplicate QSO, for example).

Using the FT-891 Display Control Panel



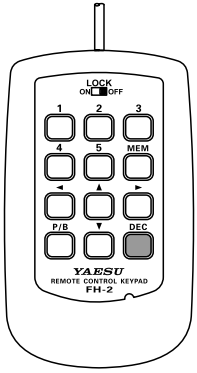


1. Press the [**F**] key repeatedly, to find the "REC SETTING" list screen.

   NOTE: This screen may be enabled/disabled via Menu Mode "**05-11** [**REC SETTING**]".
2. Rotate the **MULTI** function knob to select "DEC".
3. Press the **MULTI** function knob. The current Contest Number will be reduced by one.

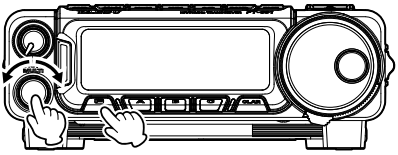
Using the Optional FH-2

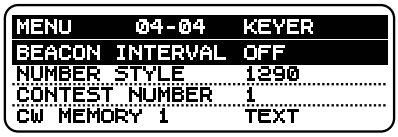
Press the FH-2 [**DEC**] key momentarily. The current Contest Number will be reduced by one. Press the FH-2 [**DEC**] key as many times as necessary to reach the desired number. If it is reduced too far, use the "Contest Number Programming" technique described previously.



Transmitting in the Beacon Mode

In “Beacon” mode, it is possible to repeatedly transmit any message programmed, either via paddle input, or via the “Text” input method. The time delay between message repeats may be set anywhere between 1 and 690 seconds (1 - 240 sec (1 sec/step) or 270 - 690 sec (30 sec/step)) via Menu Mode “**04-04** [**BEACON INTERVAL**]”. To stop the message from repeating in “Beacon” mode, set this Menu Mode to “OFF”.





1. Press and hold in the [**F**] key for one second to activate the Menu mode.
2. Rotate the **MULTI** function knob to select Menu Mode “**04-04** [**BEACON INTERVAL**]”. The current interval time will appear on the LCD display.
3. Press the **MULTI** function knob, and then rotate it to set the interval time to the desired value.
4. Press the **MULTI** function knob to save the new setting.
5. Press the [**F**] key to exit the Menu mode and resume normal operation.

To transmit the message using the FT-891 Display Control Panel:

1. Set the “BK-IN” feature to “ON”
2. Either Full-break-in or Semi-break-in will be engaged, depending on the setting of Menu Mode “**07-08** [**CW BK-IN TYPE**]”.
3. Press the [**F**] key repeatedly, to find the “REC SETTING” list screen.
   NOTE: This screen may be enabled/disabled via Menu Mode “**05-11** [**REC SETTING**]”.
4. Rotate the **MULTI** function knob to select a [**CH1**] - [**CH5**].
5. Press the **MULTI** function knob. Repetitive transmission of the Beacon message will begin.

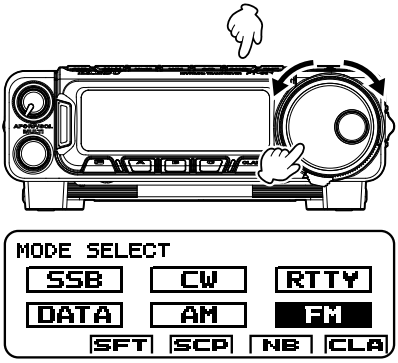
To transmit the message using the Optional FH-2:

1. Set the “BK-IN” feature to “ON”
2. Either Full-break-in or Semi-break-in will be engaged, depending on the setting of Menu Mode “**07-08** [**CW BK-IN TYPE**]”.
3. Press an FH-2 [**1**] - [**5**] key. Repetitive transmission of the Beacon message will begin.

FM Mode Operation

Basic Operation

1. Press and hold the [**BAND**(**MODE**)] key for one second.
   The "MODE SELECT" screen will appear in the display.
2. Rotate the **DIAL** knob to select the "FM" mode.
3. Set the transceiver to the desired frequency.
4. Press the microphone PTT switch to transmit. Speak into the microphone in a normal voice level. Release the PTT switch to return to receive.



❒ Change the **MULTI** function knob frequency step, follow the below procedure:
   1. Press and hold in the [**F**] key for one second.
   2. Rotate the **MULTI** function knob to select Menu Mode "**14-07** [**FM CH STEP**]".
   3. Press the **MULTI** function knob, and then rotate it to select one of the frequency steps in the following order.

      5 kHz, 6.25 kHz, 10 kHz, 12.5 kHz, 15 kHz, 20 kHz, 25 kHz

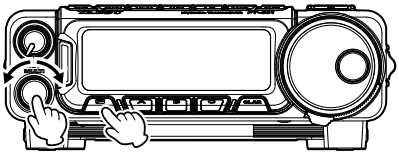
   4. Press the **MULTI** function knob to save the new setting.
   5. Press the [**F**] key to exit the Menu mode and resume normal operation.

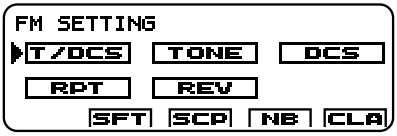
❒ Microphone gain may be adjusted via Menu Mode "**16-09** [**FM MIC GAIN**]". At the factory, a default level has been programmed that should be satisfactory for most situations. To change the microphone gain, follow the below procedure:
   1. Press and hold in the [**F**] key for one second.
   2. Rotate the **MULTI** function knob to select Menu Mode "**16-09** [**FM MIC GAIN**]".
   3. Press the **MULTI** function knob, and then rotate it to adjust the microphone gain.
   4. Press the **MULTI** function knob to save the new setting.
   5. Press the [**F**] key to exit the Menu mode and resume normal operation.

❒ FM is only used in the 28 MHz and 50 MHz Amateur bands covered by the FT-891. Please do not use FM on any other bands.

Repeater Operation

The FT-891 may be utilized on 29 MHz and 50 MHz repeaters.





1. Rotate the **DIAL** to set the FT-891 to the desired repeater output frequency (downlink from the repeater).
2. Press the [**F**] key repeatedly, to find the "FM SETTING" list screen.

   NOTE: This screen may be enabled/disabled via Menu Mode "**05-10** [**FM SETTING**]".
3. Rotate the **MULTI** function knob to select [**T/DCS**], then press the **MULTI** function knob.
4. Rotate the **MULTI** function knob to select the desired CTCSS mode. If the repeater requires an uplink encoding tone, select "CTCSS ENC". To enable both uplink and downlink encode/decode operation, choose "CTCSS ENC/DEC".
5. Press the **MULTI** function knob to save the new setting.
6. Rotate the **MULTI** function knob to select [**TONE**], and then press the **MULTI** function knob.
7. Rotate the **MULTI** function knob to select the desired CTCSS Tone to be used. A total of 50 standard CTCSS tones are provided (see the CTCSS Tone Chart).

CTCSS Tone Frequency (Hz)									
67.0	69.3	71.9	74.4	77.0	79.7	82.5	85.4	88.5	91.5
94.8	97.4	100.0	103.5	107.2	110.9	114.8	118.8	123.0	127.3
131.8	136.5	141.3	146.2	151.4	156.7	159.8	162.2	165.5	167.9
171.3	173.8	177.3	179.9	183.5	186.2	189.9	192.8	196.6	199.5
203.5	206.5	210.7	218.1	225.7	229.1	233.6	241.8	250.3	254.1

8. Press the **MULTI** function knob to save the new setting
9. Rotate the **MULTI** function knob to select [**RPT**], then press the **MULTI** function knob.
10. Rotate the **MULTI** function knob to select the desired repeater shift direction. The selections are:

    "SIMP" (simplex) / "[+]" (plus shift) / "[-]" (minus shift)

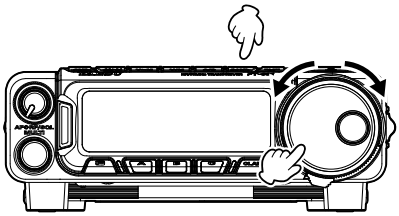
    Where "SIMP" represents "Simplex" operation (not used on a repeater).
11. Press the **MULTI** function knob to save the new setting.
12. Press and hold the [**F**] key for one second to exit the "FM SETTING" list screen and resume normal operation.
13. Press and hold the microphone PTT switch to begin transmitting. You will observe that the transmit frequency is shifted corresponding to the programming set up in the previous steps. Speak into the microphone in a normal voice level. Release the PTT switch to return to the receive mode.

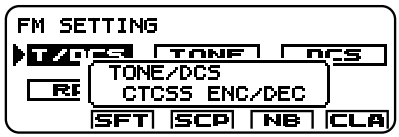
❒ The conventional repeater shift used on 29 MHz is 100 kHz, while on the 50 MHz band the shift may vary between 500 kHz and 1.7 MHz (or more). To program the proper repeater shift, use Menu Mode "**09-04** [**RPT SHIFT 28MHz**]" (28 MHz), and "**09-05** [**RPT SHIFT 50MHz**]" (50 MHz) as appropriate.

Tone Squelch Operation

The “Tone Squelch” may be activated to silence the receiver until an incoming signal modulated with a matching CTCSS tone is received. The receiver squelch will then open only when a signal with the selected CTCSS tone is received.

1. Press and hold the [**BAND**(**MODE**)] key for one second.
   The “MODE SELECT” screen will appear in the display.
2. Rotate the **DIAL** knob to select the “FM” mode.
3. Press the [**F**] key repeatedly, to find the “FM SETTING” list screen.
   NOTE: This screen may be enabled/disabled via Menu Mode “**05-10** [**FM SETTING**]”.
4. Rotate the **MULTI** function knob to select [**T/DCS**], then press the **MULTI** function knob.
5. If CTCSS Tone operation is desired, rotate the **MULTI** function knob to select “CTCSS ENC/DEC”, then press the **MULTI** function knob.





6. Press the **MULTI** function knob to save the new setting.
7. Rotate the **MULTI** function knob to select [**TONE**], and then press the **MULTI** function knob.
8. Rotate the **MULTI** function knob to select the desired CTCSS Tone to be used. A total of 50 standard CTCSS tones are provided (see the CTCSS Tone Chart).

CTCSS Tone Frequency (Hz)									
67.0	69.3	71.9	74.4	77.0	79.7	82.5	85.4	88.5	91.5
94.8	97.4	100.0	103.5	107.2	110.9	114.8	118.8	123.0	127.3
131.8	136.5	141.3	146.2	151.4	156.7	159.8	162.2	165.5	167.9
171.3	173.8	177.3	179.9	183.5	186.2	189.9	192.8	196.6	199.5
203.5	206.5	210.7	218.1	225.7	229.1	233.6	241.8	250.3	254.1

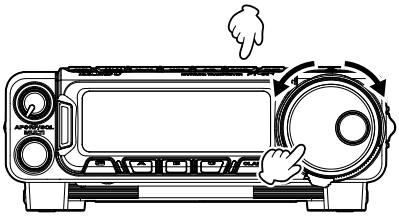
9. Press the **MULTI** function knob to save the new setting.
10. Press and hold the [**F**] key for one second to exit the “FM SETTING” list screen and resume normal operation.

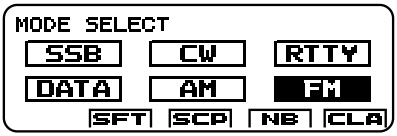
❒ To set the Tone Squelch Operation to “OFF”:

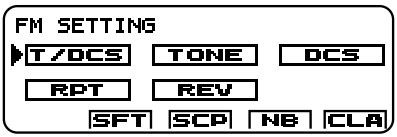
1. Press the [**F**] key repeatedly, to find the “FM SETTING” list screen.
2. Rotate the **MULTI** function knob to select [**T/DCS**], then press the **MULTI** function knob.
3. Press and hold the [**F**] key for one second to exit the “FM SETTING” list screen and resume normal operation.

DCS Operation

The “DCS” may be activated to silence the receiver until an incoming signal modulated with a matching DCS code is received. The receiver squelch will then open only when a signal with the selected DCS code is received.







1. Press and hold the [**BAND**(**MODE**)] key for one second.
   The “MODE SELECT” screen will appear in the display.
2. Rotate the **DIAL** knob to select the “FM” mode.
3. Press the [**F**] key repeatedly, to find the “FM SETTING” list screen.
   NOTE: This screen may be enabled/disabled via Menu Mode “**05-10** [**FM SETTING**]”.
4. Rotate the **MULTI** function knob to select [**T/DCS**], then press the **MULTI** function knob.
5. If DCS operation is desired, rotate the **MULTI** function knob to select “DCS”, then press the **MULTI** function knob.
6. Press the **MULTI** function knob to save the new setting.
7. Rotate the **MULTI** function knob to select [**DCS**], and then press the **MULTI** function knob.
8. Rotate the **MULTI** function knob to select the desired DCS Code to be used. A total of 104 DCS codes are provided (see the DCS Code Chart).

DCS Code														
023	025	026	031	032	036	043	047	051	053	054	065	071	072	073
074	114	115	116	122	125	131	132	134	143	145	152	155	156	162
165	172	174	205	212	223	225	226	243	244	245	246	251	252	255
261	263	265	266	271	274	306	311	315	325	331	332	343	346	351
356	364	365	371	411	412	413	423	431	432	445	446	452	454	455
462	464	465	466	503	506	516	523	526	532	546	565	606	612	624
627	631	632	654	662	664	703	712	723	731	732	734	743	754	-

9. Press the **MULTI** function knob to save the new setting.
10. Press and hold the [**F**] key for one second to exit the “FM SETTING” list screen and resume normal operation.

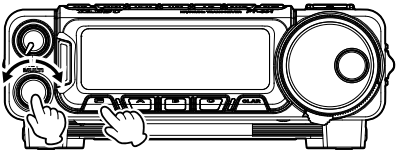
❒ To set the DCS Operation to “OFF”:

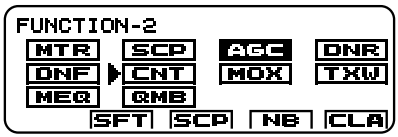
1. Press the [**F**] key repeatedly, to find the “FM SETTING” list screen.
2. Rotate the **MULTI** function knob to select [**T/DCS**], and then press the **MULTI** function knob.
3. Press and hold the [**F**] key for one second to exit the “FM SETTING” list screen and resume normal operation.

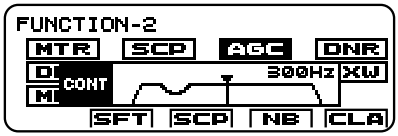
CONTOUR Control Operation

The Contour filter system provides a gentle perturbation of the IF filter passband. The Contour is set to either suppress, or boost specific frequency components, and thus enhance the sound and readability of a received signal.

1. Press the [**F**] key repeatedly, to find the "FUNCTION-2" list screen.
2. Rotate the **MULTI** function knob to select "CNT".
3. Press the **MULTI** function knob, and then rotate it to achieve the most natural sounding audio reproduction of the incoming signal.
4. When the adjustment is completed, press and hold the [**F**] key for one second to exit the "FUNCTION-2" list screen and resume normal operation.





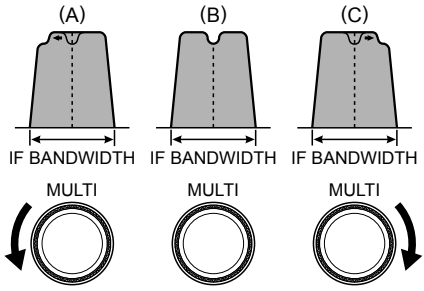


❒ To set the CONTOUR Operation will be set to "OFF":
1. Press the [**F**] key repeatedly, to find the "FUNCTION-2" list screen.
2. Rotate the **MULTI** function knob to select [**CNT**], then press the **MULTI** function knob.
3. Press and hold the [**F**] key for one second to exit the "FUNCTION-2" list screen and resume normal operation.

❒ CONTOUR function may be assigned to the [A], [B] or [C] key. Refer to "Changing the function assigned to the [A]/[B]/[C] keys" in the FT-891 Operating Manual.

❒ The Contour function attenuation and bandwidth can be set in Menu Mode "**12-02** [**CONTOUR LEVEL**]" and "**12-03** [**CONTOUR WIDTH**]" (refer to the instructions on the below).

Refer to Figure (B), this illustrates a "dip" in the center of the Contour filter passband. The Contour filter places a low-Q "notch" in the passband, corresponding to the settings of Menu Mode "**12-02** [**CONTOUR LEVEL**]" and "**12-03** [**CONTOUR WIDTH**]". Counter-clockwise rotation of the **MULTI** function knob causes the notch to move toward a lower frequency within the passband, while clockwise rotation causes the notch to move toward a higher frequency within the passband.

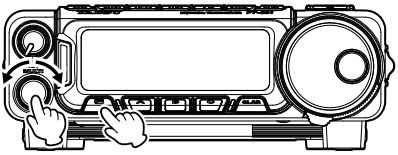


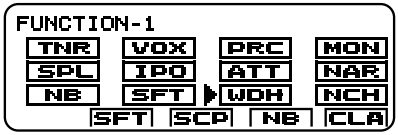
By removing interference or unwanted frequency components of the incoming signal, it is possible to make the desired signal rise out of the background noise/interference, and significantly enhance intelligibility.

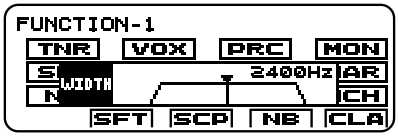
WIDTH (IF DSP Bandwidth) Tuning (SSB/CW/RTTY/DATA Modes)

The IF WIDTH tuning system allows the width of the DSP IF passband to be varied, this may reduce or eliminate interference.

Moreover, the bandwidth may actually be *expanded* from the default setting, this may enhance incoming signal fidelity when interference on the band is low.







1. Press the [**F**] key repeatedly, to find the "FUNCTION-1" list screen.
2. Rotate the **MULTI** function knob to select "WDH".
3. Press the **MULTI** function knob, and then rotate it counter-clockwise to narrow the bandwidth and reduce interference.
   - ❒ To increase the bandwidth, rotate the knob clockwise.
4. When the adjustment is completed, press the **MULTI** function knob.
5. Press and hold the [**F**] key for one second to exit the "FUNCTION-1" list screen and resume normal operation.

❒ To set the IF WIDTH Operation to "OFF":

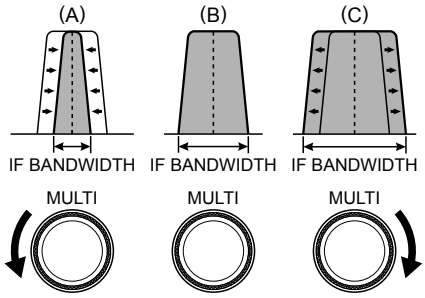
1. Press the [**F**] key repeatedly, to find the "FUNCTION-1" list screen.
2. Rotate the **MULTI** function knob to select "WDH", and then press the **MULTI** function knob.
3. Press and hold the [**F**] key for one second to exit the "FUNCTION-1" list screen and resume normal operation.

❒ WIDTH function may be assigned to the [A], [B] or [C] key. Refer to "Changing the function assigned to the [A]/[B]/[C] keys" in the FT-891 Operating Manual.

Referring to Figure (B), the default bandwidth of the SSB mode is illustrated.

By rotating the **MULTI** function knob to the left, the bandwidth will narrow (see Figure (A)), while rotation of the **MULTI** function knob to the right, will increase the bandwidth as depicted in Figure (C).

The default bandwidths, and total bandwidth adjustment range, will vary according to the operating mode:



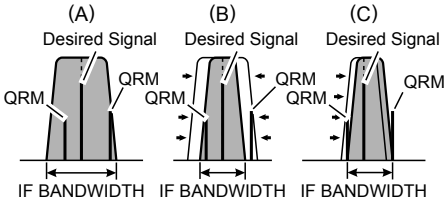
SSB Mode: 1.8 kHz - 3.2 kHz (default: 2.4 kHz).
CW Mode: 500 Hz - 3 kHz (default: 2.4 kHz)
RTTY/DATA (LSB, USB) Modes: 500 Hz - 3 kHz (default: 500 Hz)
AM Mode: Fixed at 9 kHz
FM/DATA-FM Modes: Fixed at 16 kHz

Interference Rejection

Using IF SHIFT and WIDTH Together

The IF SHIFT and Variable IF WIDTH features, together, form a very effective interference fighting filter system.

For example, in Figure (A), interference has appeared on both the high and low sides of the desired signal. By enabling the IF WIDTH Operation, the interference from one side can be eliminated (Figure “B”).

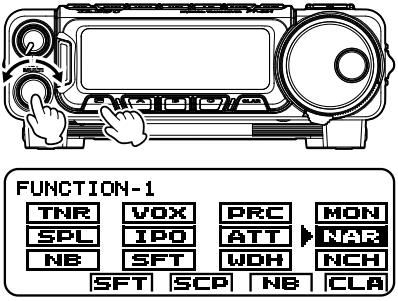


Next, rotate the **MULTI** function knob to re-position the passband (Figure (C)), the interference on the opposite side can be removed, without re-introducing the interference previously eliminated in Figure (B).

❒ The WIDTH and SHIFT features are the primary tools to use for best interference reduction. After narrowing the bandwidth (WIDTH) and/or adjusting the center of the passband (SHIFT), the Contour control may then be activated to provide additional signal-enhancement benefits on the net residual bandwidth. Even more, the IF NOTCH Filter (described later) may also be used, in conjunction with these filter systems, to significant advantage.

NARROW (NAR) One-Touch IF Filter Selection

1. Press the [**F**] key repeatedly, to find the “FUNCTION-1” list screen.
2. Rotate the **MULTI** function knob to select “NAR”.
3. Press the **MULTI** function knob to enable one-touch, selection of the mode-specific, narrow IF DSP filter, that does not require resetting the WIDTH/SHIFT bandwidth control.



4. Pressing the **MULTI** function knob once more returns the bandwidth control to the WIDTH/SHIFT system.

The factory default bandwidths are:

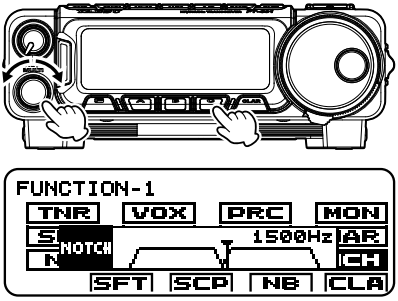
Operating Mode	Enable/Desable the NARROW Function	
	Enable	Desable
SSB	200 Hz - 1.8 kHz* (1.5 kHz)	1.8 - 3.2 kHz* (2.4 kHz)
CW	50 - 500 Hz* (500 Hz)	500 Hz - 3.0 kHz* (2.4 kHz)
RTTY/DATA (LSB, USB)	50 - 500 Hz* (300 Hz)	500 Hz - 3.0 kHz* (500 Hz)
AM	6 kHz	9 kHz
FM/DATA (FM)	9 kHz	16 kHz

*: Depends on the [WIDTH] setting / ( ): Default Bandwidth

❒ NARROW function may be assigned to the [A], [B] or [C] key. Refer to “Changing the function assigned to the [A]/[B]/[C] keys” in the FT-891 Operating Manual.

IF NOTCH Filter Operation (SSB/CW/RTTY/DATA/AM Modes)

The IF NOTCH filter is a highly effective system that can reduce or eliminate an interfering beat note or other carrier signal from inside the receiver passband.



1. Press the [**F**] key repeatedly, to find the "FUNCTION-1" list screen.
2. Rotate the **MULTI** function knob to select "NCH".
3. Press the **MULTI** function knob, and then rotate it to adjust the "null" position of the Notch filter within the receiver passband.
4. When the adjustment is completed, press the **MULTI** function knob.
5. Press and hold the [**F**] key for one second to exit the "FUNCTION-1" list screen and resume normal operation.

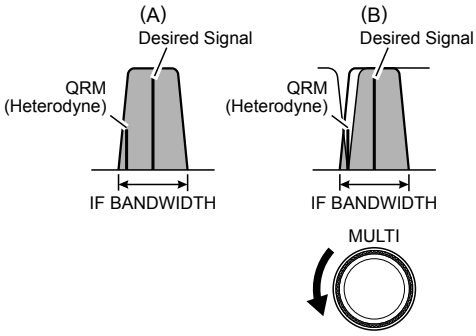
❒ To set the IF NOTCH to "OFF":

1. Press the [**F**] key repeatedly, to find the "FUNCTION-1" list screen.
2. Rotate the **MULTI** function knob to select "NCH", then press the **MULTI** function knob.
3. Press and hold the [**F**] key for one second to exit the "FUNCTION-1" list screen and resume normal operation.

❒ The bandwidth of the NOTCH filter (either narrow or wide) may be adjusted using Menu item "**12-04** [**IF NOTCH WIDTH**]". The factory default setting is "WIDE".

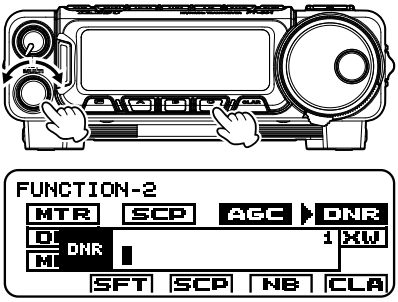
❒ IF NOTCH function may be assigned to the [A], [B] or [C] key. Refer to "Changing the function assigned to the [A]/[B]/[C] keys" in the FT-891 Operating Manual.

The performance of the IF NOTCH filter is illustrated in Figure (A), where the desired signal and the interfering heterodyne are shown within the IF passband. In Figure (B) the notching effect of the IF NOTCH filter is illustrated as the MULTI knob is rotated to eliminate the interfering heterodyne.



Digital Noise Reduction (DNR) Operation

The Digital Noise Reduction (DNR) system is designed to reduce the level of ambient noise found on the HF and 50 MHz bands. The (DNR) system is especially effective during SSB operation. While DNR is activated, rotate the **MULTI** function knob to adjust the DNR level. Any of 15 different noise-reduction algorithms can be selected; each of these algorithms are designed to deal with a different noise profile. You will want to experiment with the DNR system to find the best setting to reduce the noise currently being experienced.



1. Press the [**F**] key repeatedly, to find the "FUNCTION-2" list screen.
2. Rotate the **MULTI** function knob to select "DNR".
3. Press the **MULTI** function knob, and then rotate it to choose one of 15 algorithms that best reduces the noise level.
4. When the adjustment is completed, press the **MULTI** function knob.
5. Press and hold the [**F**] key for one second to exit the "FUNCTION-2" list screen and resume normal operation.

❒ To set the DNR to "OFF":

1. Press the [**F**] key repeatedly, to find the "FUNCTION-2" list screen.
2. Rotate the **MULTI** function knob to select "DNR", then press the **MULTI** function knob.
3. Press and hold the [**F**] key for one second to exit the "FUNCTION-2" list screen and resume normal operation.

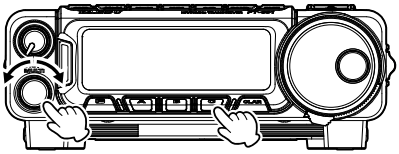
❒ DNR function may be assigned to the [A], [B] or [C] key. Refer to "Changing the function assigned to the [A]/[B]/[C] keys" in the FT-891 Operating Manual.

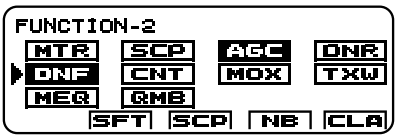
Interference Rejection

Digital NOTCH Filter (DNF) Operation

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

Note: If a very strong interfering carrier is encountered, we recommend using the IF NOTCH filter first, because it is the most effective notching tool in the receiver section.





1. Press the [**F**] key repeatedly, to find the "FUNCTION-2" list screen.
2. Rotate the **MULTI** function knob to select "DNF".
3. Press the **MULTI** function knob.
   The Digital Notch Filter will turn on.
4. Press and hold the [**F**] key for one second to exit the "FUNCTION-2" list screen and resume normal operation.

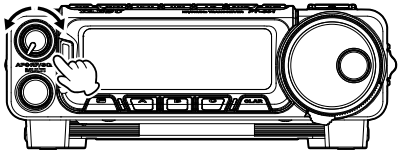
❒ To set the DNF to "OFF":

1. Press the [**F**] key repeatedly, to find the "FUNCTION-2" list screen.
2. Rotate the **MULTI** function knob to select "DNF", then press the **MULTI** function knob.
3. Press and hold the [**F**] key for one second to exit the "FUNCTION-2" list screen and resume normal operation.

❒ DNF function may be assigned to the [A], [B] or [C] key. Refer to "Changing the function assigned to the [A]/[B]/[C] keys" in the FT-891 Operating Manual.

RF Gain (SSB/CW/AM Modes)

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

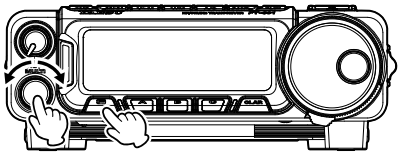


1. The [**RF/SQL**] knob should, initially, be rotated clockwise, so that the minimum S-Meter indication is not deflected. This is the point of maximum sensitivity.
2. Counter-clockwise rotation of the [**RF/SQL**] knob will gradually reduce the RF system gain.

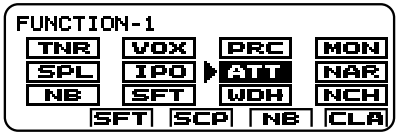
- ❒ As the [**RF/SQL**] knob is rotated counterclockwise to reduce the gain, the minimum S-meter reading will rise. This indicates that the AGC voltage being applied to the receiver is increasing (this causes a reduction in receiver gain).
- ❒ Rotating the [**RF/SQL**] knob control to the fully counter-clockwise position will essentially disable the receiver, as the gain will be greatly reduced.
- ❒ Reception frequently can be optimized by rotating the [**RF/SQL**] knob slightly counter-clockwise to the point where the “stationary” S-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.

ATT (Attenuator)

The Attenuator will reduce all signals (and noise) by 12 dB, and it may be used to make reception more pleasant under extremely noisy conditions.



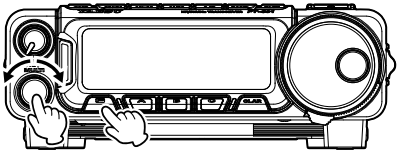
1. Press the [**F**] key repeatedly, to find the “FUNCTION-1” list screen.
2. Rotate the **MULTI** function knob to select “ATT”.
3. Press the **MULTI** function knob.
   The ATT will turn on.

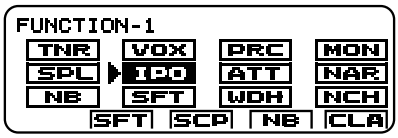


- ❒ To set the ATT to “OFF”:
  1. Press the [**F**] key repeatedly, to find the “FUNCTION-1” list screen.
  2. Rotate the **MULTI** function knob to select “ATT”, then press the **MULTI** function knob.
  3. Press and hold the [**F**] key for one second to exit the “FUNCTION-1” list screen and resume normal operation.
- ❒ The ATT function may be assigned to the [A], [B] or [C] key. Refer to “Changing the function assigned to the [A]/[B]/[C] keys” in the FT-891 Operating Manual.

IPO (Intercept Point Optimization)

The IPO feature allows the operator to optimize the characteristics of the receiver front end according to the current noise level and the strength of incoming signals.





1. Press the [**F**] key repeatedly, to find the "FUNCTION-1" list screen.
2. Rotate the **MULTI** function knob to select "IPO".
3. Press the **MULTI** function knob.
   The IPO will turn on, bypassing the RF preamplifier, yielding direct feed to the first mixer.

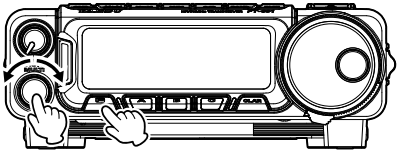
❒ To set the IPO to "OFF":

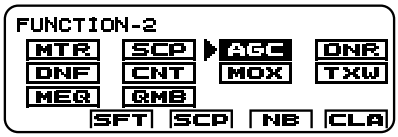
1. Press the [**F**] key repeatedly, to find the "FUNCTION-1" list screen.
2. Rotate the **MULTI** function knob to select "IPO", then press the **MULTI** function knob.
3. Press and hold the [**F**] key for one second to exit the "FUNCTION-1" list screen and resume normal operation.

❒ The IPO function may be assigned to the [A], [B] or [C] key. Refer to "Changing the function assigned to the [A]/[B]/[C] keys" in the FT-891 Operating Manual.

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 after a certain minimum threshold signal strength is achieved.





1. Press the [**F**] key repeatedly, to find the "FUNCTION-2" list screen.
2. Rotate the **MULTI** function knob to select "AGC".
3. Press the **MULTI** function knob, then rotate it to select the desired receiver-recovery time constant.

   ➠ AUTO ➠ FAST ➠ MID ➠ SLOW ➠ ...

❒ Where the "AUTO" setting represents "FAST" on CW/FM/DATA-FM, "MID" on RTTY/DATA-LSB/DATA-USB, and "SLOW" on LSB/USB/AM.

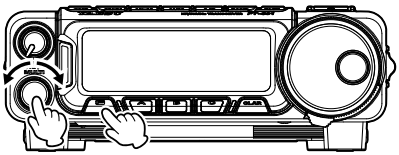
❒ If you disable the AGC by pressing the **MULTI** function knob ("AGC" changes to "AGC"), and the S-meter (which monitors AGC voltage) will cease to function. Depending on the setting of the RF Gain control, incoming signals will probably be distorted when the AGC is turned off.

❒ AGC function may be assigned to the [A], [B] or [C] key. Refer to "Changing the function assigned to the [A]/[B]/[C] keys" in the FT-891 Operating Manual.

Adjustable Receiver Audio Filter

The FT-891 includes an adjustable receiver audio filter, which provides precise, independent control of the low; and upper audio ranges.

1. Press and hold in the [**F**] key for one second to activate the Menu mode.



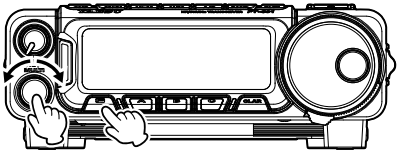
2. Rotate the **MULTI** function knob to find Menu items “06-01” through “06-04” these parameters apply to the adjustment of the receiver audio filter in the AM mode, Menu items “07-01” through “07-04” apply to the adjustment of the RX audio filter in the CW mode, Menu items “08-05” through “08-08” apply to the adjustment of the RX audio filter in the DATA mode, Menu items “10-01” through “10-04” apply to the adjustment of the RX audio filter in the RTTY mode, and Menu items “11-01” through “11-04” apply to the adjustment of the RX audio filter in the SSB mode.
3. Press the **MULTI** function knob, then rotate it to adjust the receiver audio response as desired.
4. Press the **MULTI** function knob to save the new setting.
5. Press the [**F**] key to exit the Menu mode and resume normal operation.

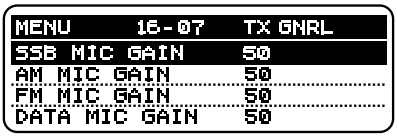
Mode	Menu Item	Available Values
AM	06-01 [AM LCUT FREQ]	OFF/100 - 1000 (Hz)
	06-02 [AM LCUT SLOPE]	6 / 18 (dB/oct)
	06-03 [AM HCUT FREQ]	700 - 4000 (Hz)/OFF
	06-04 [AM HCUT SLOPE]	6 / 18 (dB/oct)
CW	07-01 [CW LCUT FREQ]	OFF/100 - 1000 (Hz)
	07-02 [CW LCUT SLOPE]	6 / 18 (dB/oct)
	07-03 [CW HCUT FREQ]	700 - 4000 (Hz)/OFF
	07-04 [CW HCUT SLOPE]	6 / 18 (dB/oct)
DATA	08-05 [DATA LCUT FREQ]	OFF/100 - 1000 (Hz)
	08-06 [DATA LCUT SLOPE]	6 / 18 (dB/oct)
	08-07 [DATA HCUT FREQ]	700 - 4000 (Hz)/OFF
	08-08 [DATA HCUT SLOPE]	6 / 18 (dB/oct)
RTTY	10-01 [RTTY LCUT FREQ]	OFF/100 - 1000 (Hz)
	10-02 [RTTY LCUT SLOPE]	6 / 18 (dB/oct)
	10-03 [RTTY HCUT FREQ]	700 - 4000 (Hz)/OFF
	10-04 [RTTY HCUT SLOPE]	6 / 18 (dB/oct)
SSB	11-01 [SSB LCUT FREQ]	OFF/100 - 1000 (Hz)
	11-02 [SSB LCUT SLOPE]	6 / 18 (dB/oct)
	11-03 [SSB HCUT FREQ]	700 - 4000 (Hz)/OFF
	11-04 [SSB HCUT SLOPE]	6 / 18 (dB/oct)

Enhancing Transmit Signal Quality

Mic Gain

Adjust the microphone amplifier gain to match the microphone and your voice level.

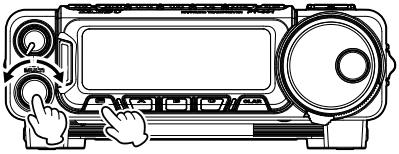




1. Press and hold in the [**F**] key for one second to activate the Menu mode.
2. Rotate the **MULTI** function knob to select Menu Mode "**16-07**", "**16-08**" or "**16-09**".
   16-07: SSB MIC GAIN
   16-08: AM MIC GAIN
   16-09: FM MIC GAIN
3. Press the **MULTI** function knob, and then rotate it to adjust the microphone gain (0 - 100).
   Default: 50
4. When the adjustment is completed, press the **MULTI** function knob to save the new setting.
5. Press the [**F**] key to exit the Menu mode and resume normal operation.

Speech Processor (SSB Mode)

The FT-891 Speech Processor is designed to increase "talk power" by increasing the average power output (via a sophisticated compression technique) and adjusting the audio quality using the menu settings ("**15-10** [**P-EQ1 FREQ**]", "**15-13** [**P-EQ2 FREQ**]", "**15-16** [**P-EQ3 FREQ**]"). The result is improved intelligibility when conditions are difficult.



1. Press the [**F**] key repeatedly, to find the "FUNCTION-1" list screen.
2. Rotate the **MULTI** function knob to select "PRC".
3. Press the **MULTI** function knob, and then rotate it to adjust the compression level (1 - 100).
   Default: 50
4. When the adjustment is completed, press the **MULTI** function knob.
5. Press and hold the [**F**] key for one second to exit the "FUNCTION-1" list screen and resume normal operation.

❒ To set the Speech Processor to "OFF":
   1. Press the [**F**] key repeatedly, to find the "FUNCTION-1" list screen.
   2. Rotate the **MULTI** function knob to select "PRC", then press the **MULTI** function knob.
   3. Press and hold the [**F**] key for one second to exit the "FUNCTION-2" list screen and resume normal operation.

❒ The Speech Processor function may be assigned to the [A], [B] or [C] key. Refer to "Changing the function assigned to the [A]/[B]/[C] keys" in the FT-891 Operating Manual.

Parametric Microphone Equalizer (SSB/AM mode)

The FT-891 includes a unique Three-Band Parametric Microphone Equalizer that provides precise, independent control over the low, mid and treble ranges in the voice waveform. You may utilize one group of settings when the speech processor is off and use an alternate group of settings when the speech processor is on.

❒ The Parametric Equalizer is a unique technique for adjusting the signal quality. The three audio ranges may be adjusted so precisely, it is possible to craft an audio response that provides a natural and pleasant sound that you may not have ever experienced before. Alternately, the effective "talk power" can be significantly enhanced.
The configuration aspects that may be adjusted on the Parametric Equalizer are:

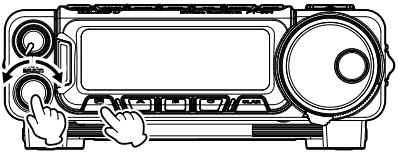
Center Frequency: The center frequency of each of the three bands may be adjusted.

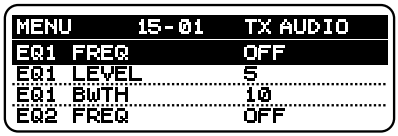
Gain: The amount of enhancement (or suppression) within each band may be adjusted.

Q: The bandwidth over which the equalization is applied may be adjusted.

Setup of the Parametric Microphone Equalizer

1. Set the RF output power to minimum value.
   ❒ We recommend that you connect a dummy load to one of the Antenna jacks, and monitor your signal on a separate receiver, to prevent interference to other users.
   ❒ You will have the best chance of hearing the effects of adjustments if you wear headphones (connected to the separate monitor receiver) while listening to your transmitted signal.
2. To adjust the Parametric Microphone Equalizer while the speech processor is disabled, set the speech processor to "OFF" (see page 38).
   ❒ To adjust the Parametric Microphone Equalizer while the speech processor is engaged, set the speech processor to "ON" (see page 38).
3. Set the MONITOR function to "ON", if you want to listen on the FT-891 internal monitor (see page 47).
4. Press and hold in the [**F**] key for one second to activate the Menu mode.
5. Rotate the **MULTI** function knob to find the "EQ" Menu settings containing Menu items "**15-01**" through "**15-09**"; these parameters pertain to the adjustment of the Parametric Microphone Equalizer when the speech processor is disabled. Menu items "**15-10**" through "**15-18**" pertain to the adjustment of the Parametric Microphone Equalizer when the speech processor is engaged.



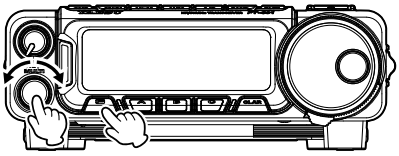


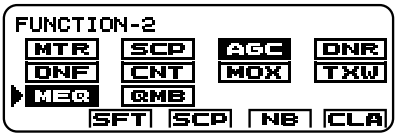
6. Press the **MULTI** function knob, and then rotate it to adjust a particular Menu item.
7. Press and hold the PTT switch, and speak into the microphone while listening to the

effect of the changes you are making. Because the overall effect on the sound will change with each adjustment, make several passes through each adjustment area, to be sure that you achieve the optimum settings.

8. When all adjustments have been completed, Press the **MULTI** function knob to save the new settings.
9. Press the [**F**] key to exit the Menu mode and resume normal operation.

Activating the Parametric Microphone Equalizer





1. Adjust the Mic Gain, as described on page 38.
2. Press the [**F**] key repeatedly, to find the "FUNCTION-2" list screen.
3. Rotate the **MULTI** function knob to select "MEQ".
4. Press the **MULTI** function knob.
   The Parametric Microphone Equalizer will turn on.
5. Press and hold the [**F**] key for one second to exit the "FUNCTION-2" list screen and resume normal operation.

❒ To set the Parametric Microphone Equalizer to "OFF":

1. Press the [**F**] key repeatedly, to find the "FUNCTION-2" list screen.
2. Rotate the **MULTI** function knob to select "MEQ", then press the **MULTI** function knob.
3. Press and hold the [**F**] key for one second to exit the "FUNCTION-2" list screen and resume normal operation.

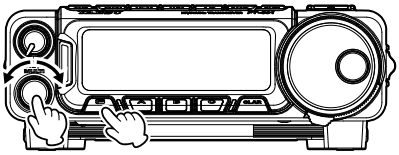
❒ The Parametric Microphone Equalizer function may be assigned to the [A], [B] or [C] key. Refer to "Changing the function assigned to the [A]/[B]/[C] keys" in the FT-891 Operating Manual.

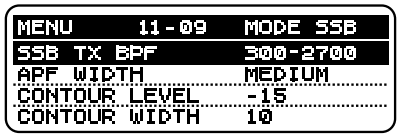
3-Stage Parametric Equalizer Adjustments

	Speech Processor: "OFF"	Speech Processor: "ON"	Available Values
Center Frequency	15-01 [EQ1 FREQ]	15-10 [P-EQ1 FREQ]	OFF/100 - 700 (Hz)
	15-04 [EQ2 FREQ]	15-13 [P-EQ2 FREQ]	OFF/700 - 1500 (Hz)
	15-07 [EQ3 FREQ]	15-16 [P-EQ3 FREQ]	OFF/1500 - 3200 (Hz)
Parametric Gain	15-02 [EQ1 LEVEL]	15-11 [P-EQ1 LEVEL]	(Low) -20 - 0 - 10 (dB)
	15-05 [EQ2 LEVEL]	15-14 [P-EQ2 LEVEL]	(Mid) -20 - 0 - 10 (dB)
	15-08 [EQ3 LEVEL]	15-17 [P-EQ3 LEVEL]	(High) -20 - 0 - 10 (dB)
Q (Bandwidth)	15-03 [EQ1 BWTH]	15-12 [P-EQ1 BWTH]	(Low) 1 - 10
	15-06 [EQ2 BWTH]	15-15 [P-EQ2 BWTH]	(Mid) 1 - 10
	15-09 [EQ3 BWTH]	15-18 [P-EQ3 BWTH]	(High) 1 - 10

Adjusting the SSB Transmitted Bandwidth (SSB Mode)

For SSB transmission, a default bandwidth of 2.4 kHz is available. This bandwidth provides reasonable fidelity along with good talk power, and is the typical bandwidth used for decades for SSB transmission. The transmit bandwidth may be varied by the operator, to provide different levels of fidelity or talk power, according to individual preferences.
Here are the steps to adjust the SSB transmit bandwidth:





1. Press and hold in the [**F**] key for one second to activate the Menu mode.
2. Rotate the **MULTI** function knob to select Menu Mode "**11-09** [**SSB TX BPF**]".
3. Press the **MULTI** function knob, and then rotate it to select the desired bandwidth.
   The available selections are: 100-3000 Hz, 100-2900 Hz, 200-2800 Hz, 300-2700 Hz, 400-2600 Hz. The default is 300-2700 Hz. A wider bandwidth will provide greater fidelity. A narrow bandwidth will compress the available transmitter power into less spectrum, resulting in more "talk power" for DX pile-ups.
4. When the selection is completed, press the **MULTI** function knob to save the new setting.
5. Press the [**F**] key to exit the Menu mode and resume normal operation.

❒ The higher fidelity associated with wide bandwidth will be particularly enjoyable on the low bands during local rag-chew QSOs.

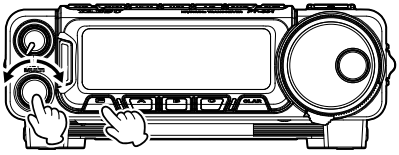
Voice Memory (SSB/AM modes)

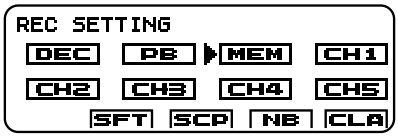
You may utilize the Voice Memory capability of the FT-891 to repeat recorded messages. The Voice Memory system includes five memories capable of storing up to 20 seconds of voice audio each. The maximum that any memory can hold is 20 seconds.

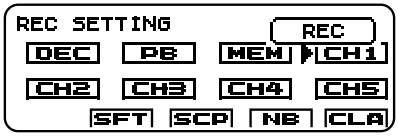
Voice Memory Operation

You may utilize the Voice Memory capability of the FT-891 by operating from either the Control Display, or using the optional FH-2 Remote Control Keypad, which plugs into the rear panel **REM/ALC** jack.

Recording Your Own Voice in Memory from the FT-891 Control Panel







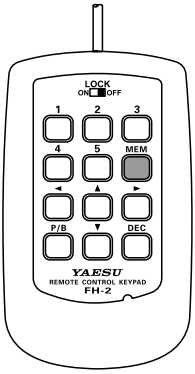
1. Set the operating mode to SSB or AM.
2. Adjust the Mic Gain, as described on page 38.
3. Press the [**F**] key repeatedly, to find the "REC SETTING" list screen.

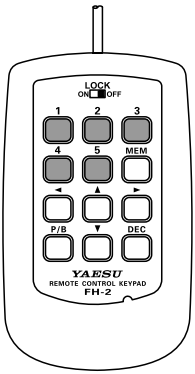
   NOTE: This screen may be enabled/ disabled via Menu Mode "**05-11** [**REC SETTING**]".
4. Rotate the **MULTI** function knob to select "MEM".
5. Press the **MULTI** function knob. A blinking "REC" icon will appear in the display.
6. Rotate the **MULTI** function knob to select any numbered [**CH1**] through [**CH5**], and then press the **MULTI** function knob.
7. Press the microphone PTT switch momentarily. The "REC" icon will glow steadily and recording will begin.
8. Speak into the microphone in a normal voice level to record the message (such as "CQ DX, CQ DX, this is W 6 Delta X-Ray Charlie, W 6 Delta X-Ray Char-lie, Over"). Remember that the time limit for recording any message is 20 seconds.
9. Rotate the **MULTI** function knob to select "MEM", and then press the **MULTI** function knob.

   The message storage process complete.
10. Press and hold the [**F**] key for one second to exit the "REC SETTING" list screen and resume normal operation.

Recording Your Own Voice in Memory with the Optional FH-2

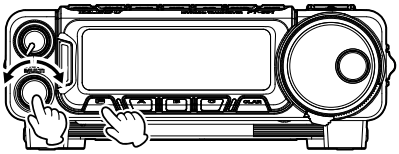
1. Set the operating mode to SSB or AM.
2. Adjust the Mic Gain, as described on page 38.
3. Press the [**MEM**] key on the FH-2. A blinking "REC" icon will appear in the display.
4. Press any of the FH-2 keys numbered [**1**] through [**5**].
5. Press the microphone PTT switch momentarily. The "REC" icon will glow steadily and recording will begin.
6. Speak into the microphone in a normal voice level to record the message (such as "CQ DX, CQ DX, this is W 6 Delta X-Ray Charlie, W 6 Delta X-Ray Char-lie, Over"). Remember that the time limit for recording any message is 20 seconds.
7. Press the [**MEM**] key on the FH-2 to complete the message storage process.

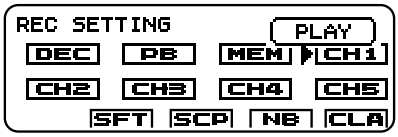




Transmitter Convenience Features

Checking Your Recording from the FT-891 Front Control Panel



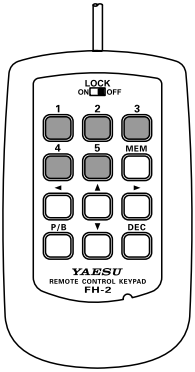


1. Press the [**F**] key repeatedly, to find the "REC SETTING" list screen.

   NOTE: This screen may be enabled/ disabled via Menu Mode "**05-11** [**REC SETTING**]".
2. Rotate the **MULTI** function knob to select a memory [**CH1**] - [**CH5**] that was previously recorded.
3. Press the **MULTI** function knob. The "PLAY" icon will appear in the display and you will hear the contents of the Voice Memory you just recorded.
4. Press and hold the [**F**] key for one second to exit the "REC SETTING" list screen and resume normal operation.

❒ The playback level of the recording may be adjusted via Menu Mode "**03-01** [**DVS RX OUT LVL**]".

Checking Your Recording with the Optional FH-2

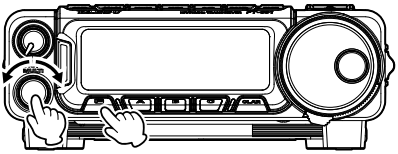


1. Press the FH-2 [**CH1**] - [**CH5**] key to select a previously recorded memory. The "PLAY" icon will appear in the display and you will hear the contents of the Voice Memory you just recorded.

❒ The playback level of the recording may be adjusted via Menu Mode "**03-01** [**DVS RX OUT LVL**]".

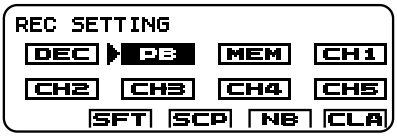
Transmitter Convenience Features

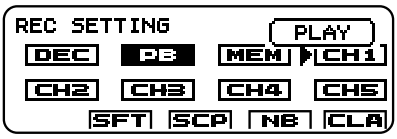
Transmitting the Recorded Message from the FT-891 Front Control Panel



1. Set the operating mode to SSB or AM.
2. Press the [**F**] key repeatedly, to find the "REC SETTING" list screen.

   NOTE: This screen may be enabled/ disabled via Menu Mode "**05-11** [**REC SETTING**]".
3. Rotate the **MULTI** function knob to select "PB", and then press the **MULTI** function knob.
4. Rotate the **MULTI** function knob to select any numbered [**CH1**] through [**CH5**], and then press the **MULTI** function knob. The "PLAY" icon will appear in the display and the message will be transmitted.

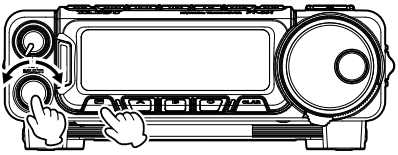




5. Press and hold the [**F**] key for one second to exit the "REC SETTING" list screen and resume normal operation.

❒ The transmit (audio) level of the recording may be adjusted via Menu Mode "**03-02** [**DVS TX OUT LVL**]".

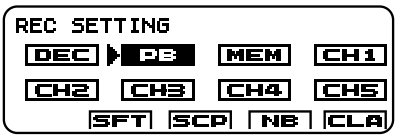
Transmitting the Recorded Message with the Optional FH-2

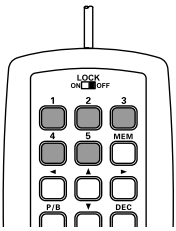


1. Set the operating mode to SSB or AM.
2. Press the [**F**] key repeatedly, to find the "REC SETTING" list screen.

   NOTE: This screen may be enabled/ disabled via Menu Mode "**05-11** [**REC SETTING**]".
3. Rotate the **MULTI** function knob to select "PB", and then press the **MULTI** function knob.
4. Press and hold the [**F**] key for one second to exit the "REC SETTING" list screen and resume normal operation.
5. Press the FH-2 [**CH1**] - [**CH5**] key to select a previously recorded memory. The "PLAY" icon will appear in the display and the message will be transmitted

❒ The playback level of the recording may be adjusted via Menu Mode "**03-02** [**DVS TX OUT LVL**]"..

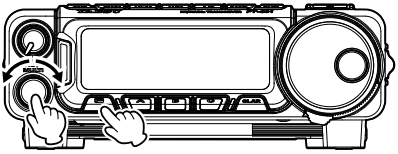


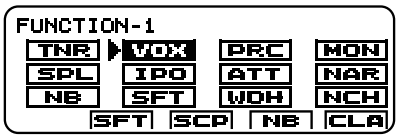


Transmitter Convenience Features

VOX (SSB/AM/FM Modes: Automatic TX/RX Switching using Voice Control)

Instead of using the microphone PTT switch or the "MOX" function to activate the transmitter, the VOX (Voice Operated Transmit) system may be used for hands-free activation of the transmitter, by the voice input to the microphone.





1. Press the [**F**] key repeatedly, to find the "FUNCTION-1" list screen.
2. Rotate the **MULTI** function knob to select "VOX".
3. Press the **MULTI** function knob.
   The VOX function will turn on.
4. Press and hold the [**F**] key for one second to exit the "FUNCTION-1" list screen and resume normal operation.
5. Without pressing the PTT switch, speak into the microphone in a normal voice level. When you start speaking, the transmitter should be activated automatically. When you finish speaking, the transceiver should return to the receive mode (after a short delay).

❒ To set the VOX to "OFF":
   1. Press the [**F**] key repeatedly, to find the "FUNCTION-1" list screen.
   2. Rotate the **MULTI** function knob to select "VOX", then press the **MULTI** function knob.
   3. Press and hold the [**F**] key for one second to exit the "FUNCTION-1" list screen and resume normal operation.

❒ The VOX function may be assigned to the [A], [B] or [C] key. Refer to "Changing the function assigned to the [A]/[B]/[C] keys" in the FT-891 Operating Manual.

❒ The VOX Gain may be adjusted to prevent accidental transmitter activation in a noisy environment. To adjust the VOX Gain:
   1. Press and hold in the [**F**] key for one second to activate the Menu mode.
   2. Rotate the **MULTI** function knob to select Menu Mode "**16-17** [**VOX GAIN**]", and then press the **MULTI** function knob.
   3. While speaking into the microphone, rotate the **MULTI** function knob to the point where the transmitter is quickly activated by your voice, without the back-ground noise causing the transmitter to activate.
   4. When the adjustment is satisfactory, press the **MULTI** function knob to save the setting.
   5. Press the [**F**] key to exit the Menu mode and resume normal operation.

❒ The "Hang-Time" of the VOX system (the transmit/receive delay after the cessation of speech) may also be adjusted via the Menu mode. The default delay is 500 msec. To set a different delay time:
   1. Activate the VOX circuitry, if necessary.
   2. Press and hold in the [**F**] key for one second to activate the Menu mode.
   3. Rotate the **MULTI** function knob to select Menu Mode "**16-18** [**VOX DELAY**]", and then press the **MULTI** function knob.

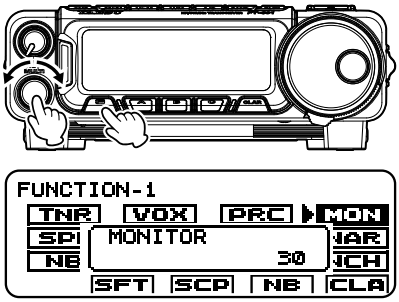
4. Rotate the **MULTI** function knob while saying a brief syllable like “Ah” and listening to the hang time for the desired delay.
5. When you are satisfied with the setting, press the **MULTI** function knob to save the new setting.
6. Press the [**F**] key to exit the Menu mode and resume normal operation.

❒ The Anti-Trip setting adjusts the level of negative receiver audio feedback to the microphone amplifier, to prevent the receiver audio output from activating the transmitter (via the microphone). This setting can also be adjusted via Menu item “**16-19** [**ANTI VOX GAIN**]”.

❒ VOX operation may be engaged on either Voice modes (SSB/AM/FM) or on AFSK-based Data modes. Use Menu item “**16-16** [**VOX SELECT**]” (the selections are “MIC” and “DATA”).

MONITOR (SSB/CW/AM modes)

You may listen to the quality of your transmitted signal using the Monitor feature.



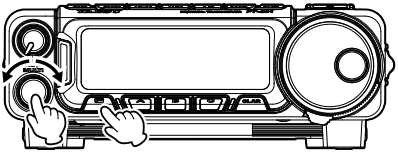
1. Press the [**F**] key repeatedly, to find the “FUNCTION-1” list screen.
2. Rotate the **MULTI** function knob to select “MON”.
3. Press the **MULTI** function knob, the Monitor level pop-up screen will appear.
4. Rotate the **MULTI** function knob to set the Monitor volume level (0 - 100).
   Default: 30
5. When the adjustment is completed, press the **MULTI** function knob.
6. Press and hold the [**F**] key for one second to exit the “FUNCTION-1” list screen and resume normal operation.

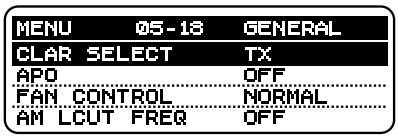
❒ The MONITOR function may be assigned to the [A], [B] or [C] key. Refer to “Changing the function assigned to the [A]/[B]/[C] keys” in the FT-891 Operating Manual.

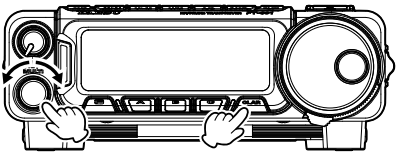
Split Operation Using the TX Clarifier

The TX Clarifier (Offset Tuning) feature may be utilized for split TX/RX operation in "casual" pile-ups, where the split is less than 10 kHz.

1. Press and hold in the [**F**] key for one second to activate the Menu mode.
2. Rotate the **MULTI** function knob to select Menu Mode "**05-18** [**CLAR SELECT**]".
3. Press the **MULTI** function knob, and then rotate it to set this Menu item to "TX" (the default setting is "RX").
4. Press the **MULTI** function knob to save the new setting.
5. Press the [**F**] key to exit the Menu mode and resume normal operation.
6. Press the [**CLAR**] key.







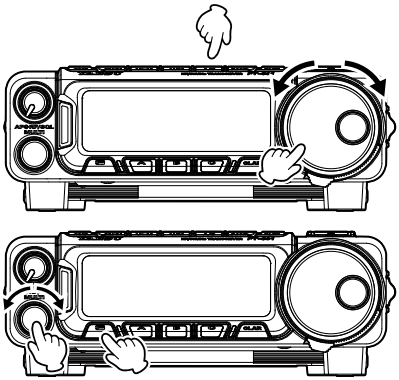
❒ The Clarifier is usually used for receiver offset tuning. However, for DX pile-ups where the DX station is using a split of less than 10 kHz, the TX Clarifier function is also the quickest way to set the transmitter to the desired offset frequency.

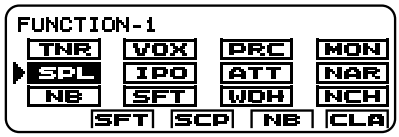
7. Rotate the **MULTI** function knob to set the desired transmitter offset. A maximum split of ±9.998 kHz may be set.
8. To exit from TX Clarifier operation, press the [**CLAR**] key once more.

Split-Frequency Operation

A powerful capability of the FT-891 is its flexibility in Split Frequency operation using the VFO-A and VFO-B frequency registers. This makes the FT-891 especially useful for high-level DX-peditions. The Split operation capability is very clever and easy to use.

1. Rotate the **DIAL** knob to set the desired RX frequency to VFO-A.
2. Press the [**A/B**] key, then rotate the **DIAL** knob to set the desired split TX frequency to VFO-B.
3. Press the [**A/B**] key.
4. Press the [**F**] key repeatedly, to find the "FUNCTION-1" list screen.
5. Rotate the **MULTI** function knob to select "SPL".
6. Press the **MULTI** function knob.
7. Press and hold the [**F**] key for one second to exit the "FUNCTION-1" list screen and resume normal operation.
8. During Split operation, the VFO-A register will be used for reception, while the VFO-B register will be used for transmission.



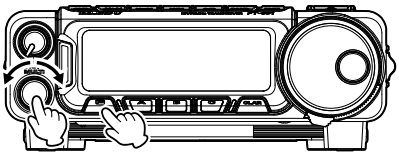


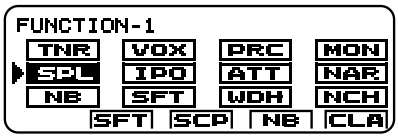
- ❒ During Split operation, pressing the [**A/B**] key will reverse the contents of VFO-A and VFO-B. Press the [**A/B**] key once more to return to the original frequency alignment.
- ❒ During Split operation you may listen to the TX frequency temporarily.
  1. Press the [**F**] key repeatedly, to find the "FUNCTION-2" list screen.
  2. Rotate the **MULTI** function knob to select "TXW".
  3. The transmit frequency on VFO-B may be changed while pressing the **MULTI** function knob during split operations.
  - ❒ TXW function may be assigned to the [A], [B] or [C] key. Refer to "Changing the function assigned to the [A]/[B]/[C] keys" in the FT-891 Operating Manual.
- ❒ During Split operation it is also possible to set VFO-A and VFO-B to different Amateur bands if a multi band antenna is used.
- ❒ SPL function may be assigned to the [A], [B] or [C] key. Refer to "Changing the function assigned to the [A]/[B]/[C] keys" in the FT-891 Operating Manual.

Transmitter Convenience Features

Quick Split Operation

The Quick Split feature allows setting a one-touch offset of +5 kHz compared to the VFO-A frequency, to be applied to the transceiver VFO-B (transmit) frequency.





1. Start with regular transceiver operation on the VFO-A.
2. Press the [**F**] key repeatedly, to find the "FUNCTION-1" list screen.
3. Rotate the **MULTI** function knob to select "SPL".
4. Press and hold the **MULTI** function knob for one second to engage the Quick Split feature, and apply a frequency 5 kHz above the VFO-A frequency to the VFO-B frequency register.
5. Press and hold the **MULTI** function knob for one second to increment the Sub (VFO-B) offset frequency another +5 kHz.

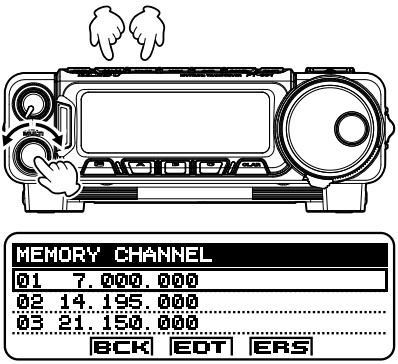
❒ SPL function may be assigned to the [A], [B] or [C] key. Refer to "Changing the function assigned to the [A]/[B]/[C] keys" in the FT-891 Operating Manual.

❒ The offset of VFO-B from VFO-A is programmed via the Menu and is set to +5 kHz at the factory. However, other offsets may be selected using the following procedure:

1. Press and hold in the [**F**] key for one second to activate the Menu mode.
2. Rotate the **MULTI** function knob to select Menu Mode "**05-13** [**QUICK SPL FREQ**]".
3. Press the **MULTI** function knob, and then rotate it to select the desired offset. The available setting range is –20kHz - +20kHz (factory default: +5 kHz).
4. Press the **MULTI** function knob to save the new setting.
5. Press the [**F**] key to exit the Menu mode and resume normal operation.

Checking a Memory Channel Status

Before programming a channel into memory, you can check the current contents of that channel without the danger of over-writing the channel accidentally.



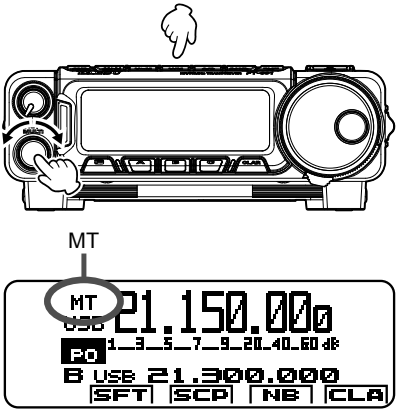
1. Press the [**M►V**] or [**V►M**] key to display the "MEMORY CHANNEL" list screen.
   The data stored in the currently selected memory channel will be displayed on the LCD. However, since you are only checking the contents of the memory channel, the radio will not have moved to the memory channel frequency.
2. Rotate the **MULTI** function knob to select a different memory channel.
3. To exit from the Memory Check mode and return to the VFO-A mode, press the [**A**] (**BCK**) key.

❒ While operating in the VFO mode, using Memory Check, you may store the current VFO frequency into the selected memory by press the [**V►M**] key.

Memory Tune (MT) operation

The frequency may be freely tuned off from any memory channel in "Memory Tune" mode; this is similar to VFO operation.

So long as you do not over-write the contents of the current memory, Memory Tune operation will not alter the contents of the memory channel.



1. While operating in the VFO mode, press the [**V/M**] key to enter the Memory mode.
2. Rotate the **MULTI** function knob to select the memory channel.
3. Rotate the **DIAL** knob; you will now observe that the memory channel frequency is changing. The "Memory Channel Number" will be replaced by one which indicates "MT" (Memory Tune).

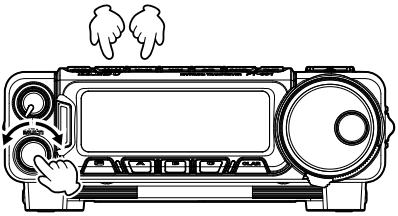
❒ During Memory Tune operation, you may change operating modes, and engage the offset Clarifier, if desired.

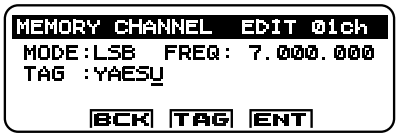
4. Press the [**V/M**] key momentarily to return to the originally memorized frequency of the current memory channel. One more press of the [**V/M**] key will return to VFO operation.

Labeling Memories

An Alphanumeric “Tag” (label) may be appended to each memory channel to aid in recollection of the channel’s use (such as a club name, etc.). To do this:

1. Press the [**M►V**] or [**V►M**] key to display the “MEMORY CHANNEL” list screen.
2. Rotate the **MULTI** function knob to recall the memory channel that you wish to append a label.
3. Press the [**B**](**EDT**) key to display the “MEMORY CHANNEL EDIT” screen.
4. Rotate the **MULTI** function knob to select the letters, numbers, or symbols of the desired label.
5. Press the **MULTI** function knob to move to the next character.
6. Press the **MULTI** function knob, then rotate it to select the next letters, numbers, or symbols.
7. Repeat steps 5 through 6 to program the remaining letters, numbers, or symbols of the desired label. 12 characters may be used in the creation of a label.
8. When the label is completed, press the [**C**] (**ENT**) key to exit the “MEMORY CHANNEL EDIT” screen.
9. To exit from the “MEMORY CHANNEL” list screen and return to the VFO-A mode, press the [**A**](**BCK**) key.





Displaying the memory tag

The frequency and name tag display format can be selected for desired channel.

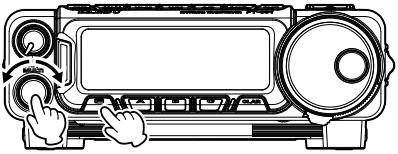
1. Press the [**M►V**] or [**V►M**] key to display the “MEMORY CHANNEL” list screen.
2. Rotate the **MULTI** function knob to recall the desired memory channel.
3. Press the [**B**](**EDT**) key to display the “MEMORY CHANNEL EDIT” screen.
4. Press the [**B**](**TAG**) key to activate the Alpha-Numeric Tag. Repeatedly pressing this key will toggle operation between “Frequency” display and “Tag” display.
5. Press the [**A**](**BCK**) key to exit the “MEMORY CHANNEL EDIT” screen.
6. To exit from the “MEMORY CHANNEL” list screen and return to the VFO-A mode, press the [**A**](**BCK**) key.

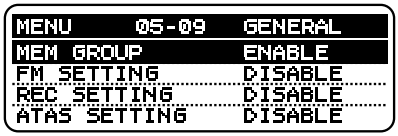
Memory Groups

Memory channels may be arranged into as many as six convenient groups, for easy identification and selection. For example, different memory groups may be designated for AM BC stations, short-wave broadcast stations, contest frequencies, repeater frequencies, PMS limits, or any other groupings you might like.

Each memory group is capable of holding up to 20 memory channels (except Memory Group 1 is fixed to19 memory channels).

Memory Group Assignment





1. Press and hold in the [**F**] key for one second to activate the Menu mode.
2. Rotate the **MULTI** function knob to select Menu Mode "**05-09** [**MEM GROUP**]".
3. Press the **MULTI** function knob, and then rotate it to set this Menu item to "ENABLE" (the default setting is "DISABLE").
4. Press the **MULTI** function knob to save the new setting.
5. Press the [**F**] key to exit. Operation will now be restricted to the six Memory Groups.

❒ To cancel Memory Group operation, repeat steps 1 through 5 above, choosing "DISABLE" in step 3.

❒ To avoid confusion, note that the PMS memory group and the PMS memories "P1L" through "P9U" will be so designated.

Group Number	Memory Channel Number
GROUP 1	01 - 19
GROUP 2	20 - 39
GROUP 3	40 - 59
GROUP 4	60 - 79
GROUP 5	80 - 99
GROUP 6	P1L/P1U - P9L/P9U
GROUP 7*	501 - 510 (501 - 507**)

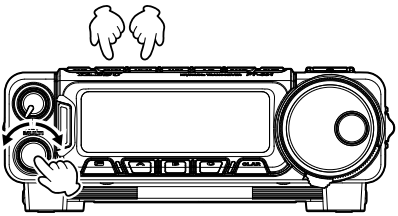
*: USA and UK version only. **: UK Version.

Choosing the Desired Memory Group

If desired, just the memories within a particular Memory Group may be recalled.

1. Press the [**M►V**] or [**V►M**] key to display the “MEMORY CHANNEL” list screen.
2. Press the [**A**](**GRP**) key, then rotate it to select the desired memory group.
3. Press the **MULTI** function knob to exit the “MEMORY CHANNEL” list screen and return to the Memory mode.
4. Rotate the **MULTI** function knob to select the desired Memory Channel within the Selected Memory Group.

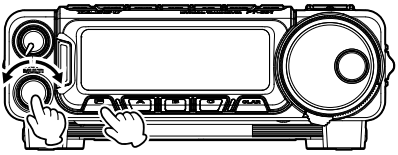
❒ If no channels have been assigned to a particular Memory Group, that Group cannot be accessed.

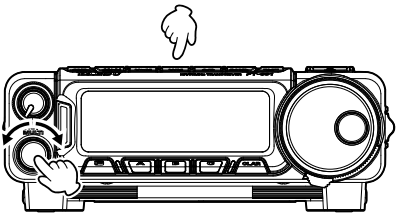


Operation on Alaska Emergency Frequency: 5167.5 kHz (U.S. Version Only)

Section 97.401(d) of the regulations governing amateur radio in the United States permit emergency amateur communications on the spot frequency of 5167.5 kHz by stations in (or within 92.6 km of) the state of Alaska. This frequency is only to be used when the immediate safety of human life and/or property are threatened, and is never to be used for routine communications.

The FT-891 includes the capability for transmission and reception on 5167.5 kHz under such emergency conditions via the Menu system. To activate this feature:





1. Press and hold in the [**F**] key for one second to activate the Menu mode.
2. Rotate the **MULTI** function knob to select Menu Mode "**16-23** [**EMERGENCY FREQ**]".
3. Press the **MULTI** function knob, and then rotate it to set this Menu item to "ENABLE" (the default setting is "DISABLE").
4. Press the **MULTI** function knob to save the new setting.
5. Press the [**F**] key to exit the Menu mode and resume normal operation.
   Emergency communication on this spot frequency is now possible.
6. While operating in the VFO mode, press the [**V/M**] key to enter the Memory mode.
7. Rotate the **MULTI** function knob to select the emergency channel ("EMG"), which is found between channels "510" and "M01").

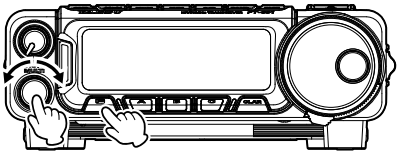
❒ If you wish to disable operation capability on the Alaska Emergency Frequency, repeat the above procedures, but set the Menu Mode "**16-23** [**EMERGENCY FREQ**]" to "DISABLE" in step 3.

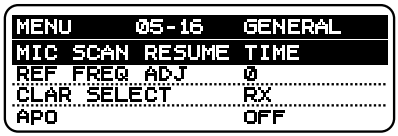
❒ In an emergency, note that a half-wave dipole cut for this frequency should be approximately 45'3" on each leg (90'6" total length). Emergency operation on 5167.5 kHz is shared with the Alaska-Fixed Service. This transceiver is not authorized for operation, under the FCC Part 87, for aeronautical communications.

Scan Resume Options

The manner in which the scanner resumes after it has paused on a signal may be selected by using Menu Mode "**05-16** [**MIC SCAN RESUME**]". The default "TIME" (5 sec) setting will cause the scanner to resume scanning after five seconds; however the scan setting may be changed to resume only after the received signal has dropped out.

To choose the Scan-Resume mode:



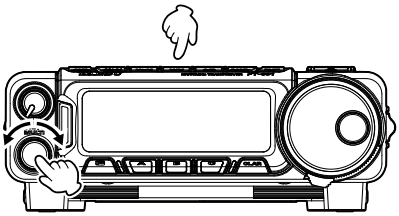


1. Press and hold in the [**F**] key for one second to activate the Menu mode.
2. Rotate the **MULTI** function knob to select Menu Mode "**05-16** [**MIC SCAN RESUME**]".
3. Press the **MULTI** function knob, and then rotate it to select the desired Scan-Resume mode.
   PAUSE: During automatic scanning, the scanner will hold until the signal disappears.
   TIME: If the signal does not disappear within five seconds, the scanner will resume scanning for the next active channel (frequency). If there is no signal, the scanner continues scanning automatically.
4. Press the **MULTI** function knob to save the new setting.
5. Press the [**F**] key to exit the Menu mode and resume normal operation.

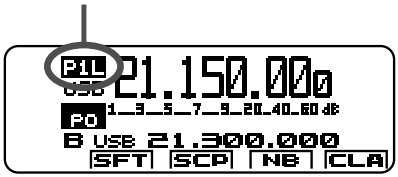
PMS (Programmable Memory Scanning)

To limit scanning (and manual tuning) within a particular frequency range, the Programmable Memory Scanning (PMS) feature utilizes nine special-purpose memory pairs ("P1L/P1U" through "P9L/P9U"). The PMS feature is especially useful in helping you to observe any operating sub-band limits, which apply to your Amateur license class.

1. Store the Lower and Upper tuning/scanning limit frequencies into the memory pair "P1L" and "P1U", respectively, or any other "L/U" pair of memories in the special PMS memory register.
2. Press the [**V/M**] key to enter the "Memory" mode.
3. Rotate the **MULTI** function knob to select memory channel "P1L" or "P1U".
4. Turn the **DIAL** knob slightly (to activate memory tuning). Tuning and scanning are now limited to the range within the P1L/P1U limits until the [**V/M**] key is pressed again to return to the memory channel.



Memory Channel



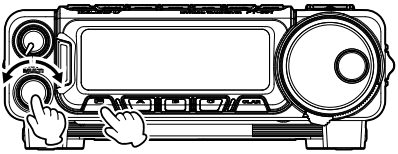
5. Press and hold in the microphone [**UP**] or [**DWN**] key for one second to start scanning in the specified direction.
6. To cancel scanning, press the [**V/M**] key.
7. One more press of the [**V/M**] key momentarily to display the "MEMORY CHANNEL" list screen.

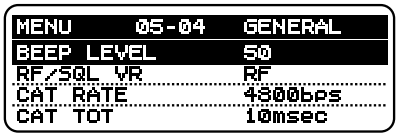
- ❒ If the scanner halts on an incoming signal, the decimal point between the "MHz" and "kHz" digits of the frequency display will blink.
- ❒ If the incoming signal disappears, scanning will resume in about five seconds.
- ❒ On the SSB/CW and SSB-based Data modes, the scanner will pause on a received signal, then will step across the signal very slowly, giving you time to stop the scan, if you like. However, in these modes on the VFO, the scanner does not stop.
- ❒ If the scan has paused on a signal, pressing the microphone [**UP**] or [**DWN**] key will cause scanning to resume instantly.
- ❒ If the **DIAL** knob is rotated while scanning is in progress, the scanning will continue up or down in frequency according to the direction of the **DIAL** Knob rotation. (in other words, if the dial is rotated to the left when scanning toward a higher frequency, the direction of the scan will reverse.)
- ❒ If the microphone PTT button is pressed during scanning, the scanner will halt at once. Pressing the PTT button during scanning will not cause transmission.

Miscellaneous Setting

Beep Level

The beep sound volume level may also be adjusted.

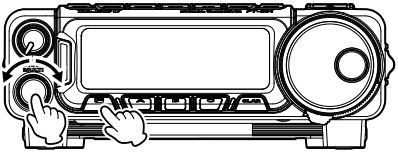


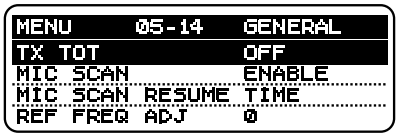


1. Press and hold in the [**F**] key for one second to activate the Menu mode.
2. Rotate the **MULTI** function knob to select Menu Mode "**05-04** [**BEEP LEVEL**]".
3. Press the **MULTI** function knob, and then rotate it to adjust the beep sound volume level (0 - 100).
   Default: 30
4. Press the **MULTI** function knob to save the new setting.
5. Press the [**F**] key to exit the Menu mode and resume normal operation.

TOT (Time-Out Timer)

The "Time-Out Timer" (TOT) shuts off the transmitter after continuously transmitting for the programmed time.



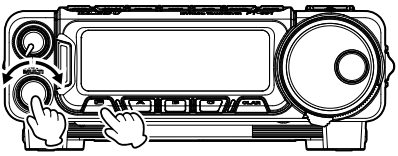


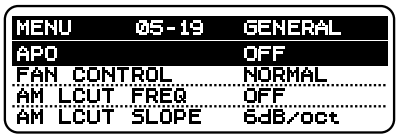
1. Press and hold in the [**F**] key for one second to activate the Menu mode.
2. Rotate the **MULTI** function knob to select Menu Mode "**05-14** [**TX TOT**]".
3. Press the **MULTI** function knob, and then rotate it to select the TOT countdown time (OFF/1 - 30 min).
   Default: OFF (10 min: European Version.)
4. Press the **MULTI** function knob to save the new setting.
5. Press the [**F**] key to exit the Menu mode and resume normal operation.

Miscellaneous Setting

APO (Automatic Power Off)

The APO feature helps conserve battery life by automatically turning the transceiver off after a user-defined period of time within which there has been no dial or key activity.



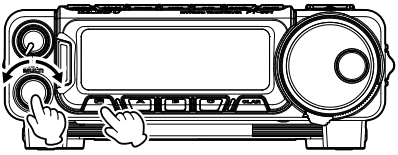


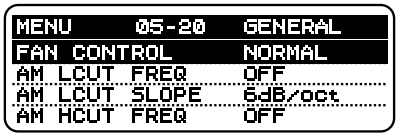
1. Press and hold in the [**F**] key for one second to activate the Menu mode.
2. Rotate the **MULTI** function knob to select Menu Mode "**05-19** [**APO**]".
3. Press the **MULTI** function knob, and then rotate it to select the desired time period after which the radio will automatically shut down (OFF/1/2/4/6/8/10/12 h).

   Default: OFF
4. Press the **MULTI** function knob to save the new setting.
5. Press the [**F**] key to exit the Menu mode and resume normal operation.

FAN Control

The cooling fan can be set to operate for two different temperature conditions.





1. Press and hold in the [**F**] key for one second to activate the Menu mode.
2. Rotate the **MULTI** function knob to select Menu Mode "**05-20** [**FAN CONTROL**]".
3. Press the **MULTI** function knob, and then rotate it to select the desired condition.

   NORMAL: The cooling fan operates *only* when the temperature becomes high.

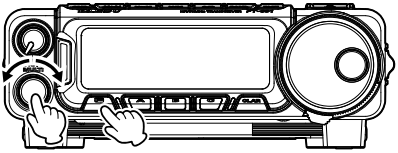
   CONTEST: The cooling fan starts to operate as the temperature begins to rise.

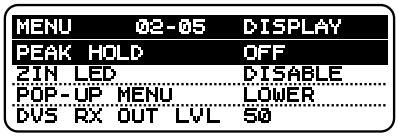
   Default: NORMAL
4. Press the **MULTI** function knob to save the new setting.
5. Press the [**F**] key to exit the Menu mode and resume normal operation.

Miscellaneous Setting

Meter Peak Hold

Sets the time duration the maximum value reading is shown on the meter (peak hold).

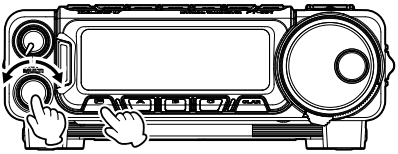


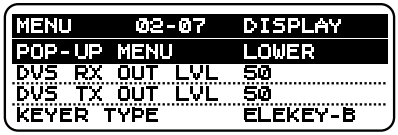


1. Press and hold in the [**F**] key for one second to activate the Menu mode.
2. Rotate the **MULTI** function knob to select Menu Mode "**02-05** [**PEAK HOLD**]".
3. Press the **MULTI** function knob, and then rotate it to select the meter peak hold time (OFF/0.5/1.0/2.0 seconds).
   Default: OFF
4. Press the **MULTI** function knob to save the new setting.
5. Press the [**F**] key to exit the Menu mode and resume normal operation.

POP-UP Menu

Set the position (Lower or Upper) of the pop-up window on the display screen.



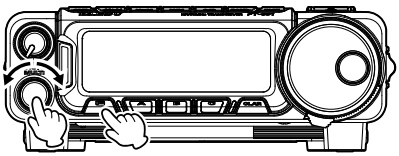


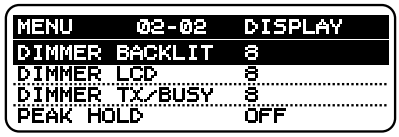
1. Press and hold in the [**F**] key for one second to activate the Menu mode.
2. Rotate the **MULTI** function knob to select Menu Mode "**02-07** [**POP-UP MENU**]".
3. Press the **MULTI** function knob, and then rotate it to set the display position (Lower or Upper) of the pop-up window.
4. Press the **MULTI** function knob to save the new setting.
5. Press the [**F**] key to exit the Menu mode and resume normal operation.

Miscellaneous Setting

Key Lamp Dimmer

The Key lamp illumination level may also be adjusted.



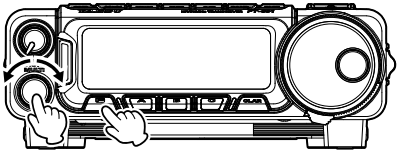


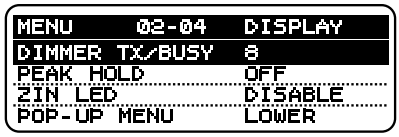
1. Press and hold in the [**F**] key for one second to activate the Menu mode.
2. Rotate the **MULTI** function knob to select Menu Mode "**02-02** [**DIMMER BACKLIT**]".
3. Press the **MULTI** function knob, and then rotate it to adjust the Key lamp illumination for a comfortable brightness level. The change may be observed as the knob is adjusted (1 - 15).

   Default: 8
4. Press the **MULTI** function knob to save the new setting.
5. Press the [**F**] key to exit the Menu mode and resume normal operation.

TX/BUSY Indicator Dimmer

The TX/BUSY indicator illumination level may also be adjusted using the Menu Mode.





1. Press and hold in the [**F**] key for one second to activate the Menu mode.
2. Rotate the **MULTI** function knob to select Menu Mode "**02-04** [**DIMMER TX/BUSY**]".
3. Press the **MULTI** function knob, and then rotate it to adjust the TX/BUSY indicator illumination for a comfortable brightness level. The change may be observed as the knob is adjusted (1 - 15).

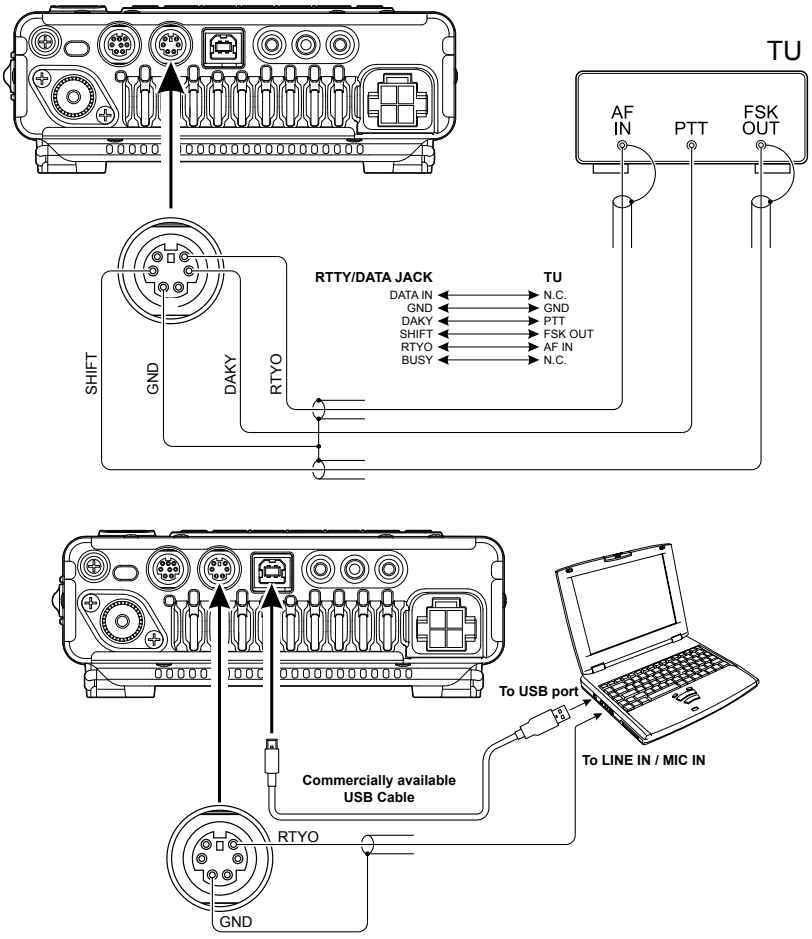
   Default: 8
4. Press the **MULTI** function knob to save the new setting.
5. Press the [**F**] key to exit the Menu mode and resume normal operation.

Example of Connecting RTTY Communications device

Connecting to the TU (Terminal Unit)

Connect the RTTY communications TU (Terminal Unit) to the rear panel RTTY/DATA terminal. Be sure to read the instruction manual of the TU device before connecting it.

❒ Adjust the RTTY data output level using Menu Mode "**10-08** [**RTTY OUT LEVEL**]".

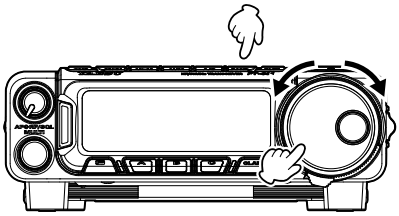


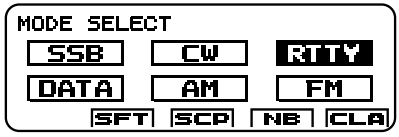
RTTY (Radio Teletype) Operation

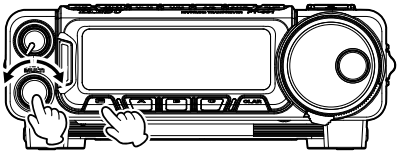
Connecting to your Computer

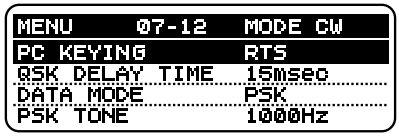
- ❒ Install the RTTY application software and driver on your computer in advance.
- ❒ RTTY communication application (YAESU does not provide technical support for the use or operation of the application.)
- ❒ Virtual COM port driver (Visit the Yaesu website "http://www.yaesu.com/" to download the designated driver and Installation Manual.)

1. Use a commercially available USB cable to connect the USB jack on the rear panel of the FT-891 and the computer.
2. Press and hold the [**BAND**(**MODE**)] key for one second.
   The "MODE SELECT" screen will appear in the display.
3. Rotate the **DIAL** knob to select the "RTTY" mode.
4. Press and hold in the [**F**] key for one second to activate the Menu mode.
5. Rotate the **MULTI** function knob to select Menu Mode "**07-12** [**PC KEYING**]".
6. Press the **MULTI** function knob, and then rotate it to set this Menu item to "RTS" or "DTR".
7. Press the **MULTI** function knob to save the new setting.
8. Press the [**F**] key to exit the Menu mode and resume normal operation.









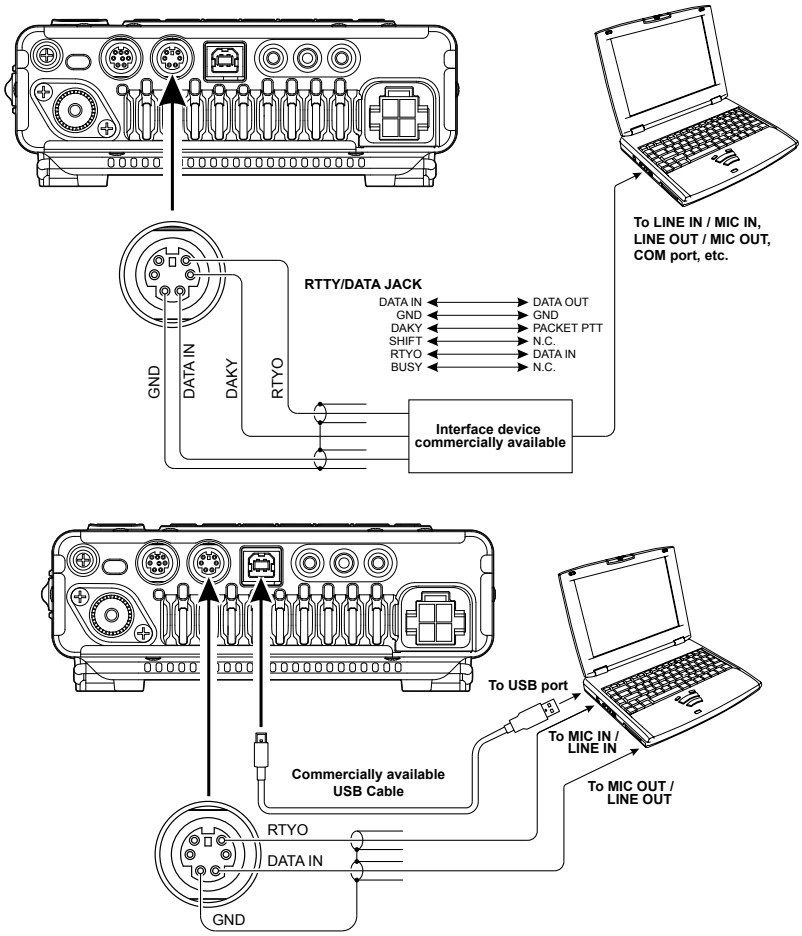
❒ "RTS" and "DTR" will be set as shown below.

		RTTY-PTT	RTTY-SHIFT
Menu item "**07-12** [**PC KEYING**]"	RTS	RTS	DTR
	DTR	DTR	RTS

9. RTTY-PTT and RTTY-SHIFT operations can be set from the Standard-COM port of the virtual COM port. On the computer, open Device Manager from the Control Panel to check the COM port number and set each item of the RTTY communication application.

Example of DATA Communications device

Use commercial or free computer software for PSK data communications. See the illustration below for connecting the FT-891 transceiver to a computer. Be sure to read the instruction manual of the interface device to be connected to the radio and computer.

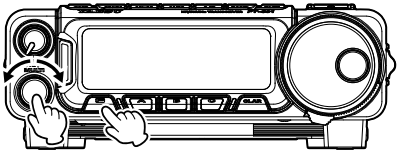


❒ The FT-891 allows for PSK, Olivia, Contestia, etc. digital modes to be sent by the Data method or SSB. The conventional method is to use USB, except RTTY, however the Data method allows for more accurate carrier frequency control, which is helpful in a Contest or DX environment.

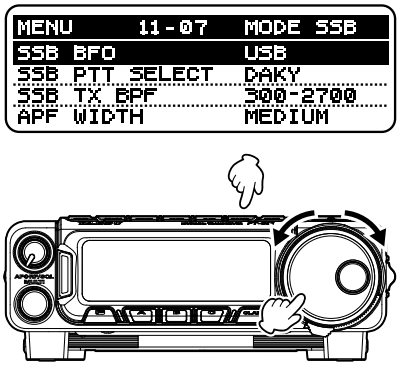
DATA (PSK) Operation

DATA-AFSK (PSK, OLIVIA, CONTESTIA, RTTY etc.)

FT-891 Settings



1. Press and hold in the [**F**] key for one second to activate the Menu mode.
2. Rotate the **MULTI** function knob to select Menu Mode "**11-07** [**SSB BFO**]".
3. Press the **MULTI** function knob, and then rotate it to set this Menu item to "USB".
4. Press the **MULTI** function knob to save the new setting.
5. Press the [**F**] key to exit the Menu mode and resume normal operation.
   - ❒ USB is the conventional mode for AFSK transmission on all bands, however some users may be using LSB.
6. Press and hold the [**BAND**(**MODE**)] key for one second.
   The "MODE SELECT" screen will appear in the display.
7. Rotate the **DIAL** knob to select the "SSB" mode.
8. Press and hold in the [**F**] key for one second to activate the Menu mode.
9. Rotate the **MULTI** function knob to select Menu Mode "**11-08** [**SSB PTT SELECT**]".
10. Press the **MULTI** function knob, and then rotate it to set this Menu item to "RTS".
11. Press the **MULTI** function knob to save the new setting.



12. Press the [**F**] key to exit the Menu mode and resume normal operation.

❒ All other SSB and DATA settings remain at their default.

Connect a USB Cable from the FT-891 USB port and your computer

❒ Before connecting the USB cable you must down load the Virtual COM port driver. The Drivers can be found on the FT-891 FILES page at the Yaesu Web page, "http://www.yaesu.com/". Once the Drivers have been installed connect the USB cable to the computer and then to the radio. At your computer's Device Manager you will find a Standard Driver and Enhanced Driver installed.

Computer Settings

COM PORT

Check the Com Port assignments in the Computer Device Manager to be sure the Enhanced and Standard Drivers are installed. Make a note of the Com Port numbers assigned.

Software Settings

❒ There are many good Data Mode Operating Software programs available on the internet. Each of these programs will have their own Setup instructions. The following general information is common to most software application setup:

COM PORT Settings

To start set the Com Port setting to the Enhanced Driver. If there is a problem switch to the Standard Driver.

PTT Settings

Set the PTT to RTS on DTR off.

Soundcard

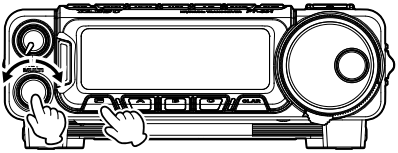
At the software Soundcard Volume setting, increase the volume to about 70% to start.

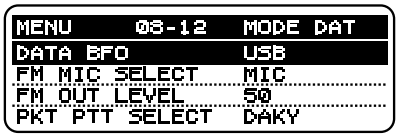
❒ If the soundcard volume setting is too low, the radio will not switch to Transmit.

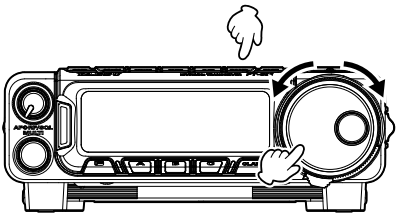
DATA (PSK) Operation

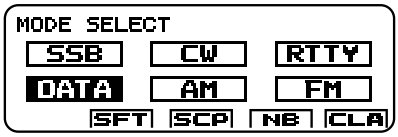
DATA MODE (PSK, OLIVIA, CONTESTIA, RTTY etc.)

FT-891 Settings









1. Press and hold in the [**F**] key for one second to activate the Menu mode.
2. Rotate the **MULTI** function knob to select Menu Mode "**08-12** [**DATA BFO**]".
3. Press the **MULTI** function knob, and then rotate it to set this Menu item to "USB".
   - ❒ USB is the conventional mode for Digital (not RTTY) transmission on all bands, however some users may be using LSB.
4. Press and hold the [**BAND**(**MODE**)] key for one second.
   The "MODE SELECT" screen will appear in the display.
5. Rotate the **DIAL** knob to select the "DATA" mode.
6. Press and hold in the [**F**] key for one second to activate the Menu mode.
7. Rotate the **MULTI** function knob to find Menu Mode "**08-01**", "**08-02**", "**08-09**" or "**08-10**".
8. Press the **MULTI** function knob, and then rotate it to set these Menu item as shown below.

Menu Function	Setting
08-01 [**DATA MODE**]	PSK
08-02 [**PSK TONE**]	Adjust for desired center frequency.
08-09 [**DATA IN SELECT**]	MIC
08-10 [**DATA PTT SELECT**]	RST

9. Press the **MULTI** function knob to save the new settings.
10. Press the [**F**] key to exit the Menu mode and resume normal operation.

❒ All other SSB and DATA settings remain at their default.

Connect a USB Cable from the FT-891 USB port to the computer

❒ Before connecting the USB cable, you must down load the Virtual COM port driver. The Drivers can be found on the FT-891 FILES page at the Yaesu Web page, "http://www.yaesu.com/". Once the Drivers have been installed, connect the USB cable to the computer and then to the radio. In the computer Device Manager you will find the Standard Driver and the Enhanced Driver installed.

DATA (PSK) Operation

Computer Settings

COM PORT

Check the Com Port assignments on the computer Device Manager to be sure the Enhanced and Standard Drivers are installed . Make a note of the Com Port numbers assigned.

Software Settings

❒ There are many good Data Mode Operating Software programs available on the internet. Each of these programs will have their own Setup instructions. The following general information is common to most software application setup:

COM PORT Settings

To start set the Com Port setting to the Enhanced Driver. If there is a problem switch to the Standard Driver.

PTT Settings

Set the PTT to RTS on DTR off.

Soundcard

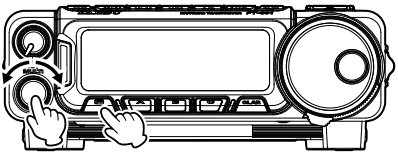
At the software Soundcard Volume setting increase the volume to about 70% to start.

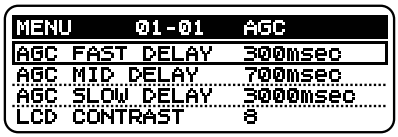
❒ If the soundcard volume setting is too low, the radio will not switch to Transmit.

Menu Mode

The FT-891 Menu mode, already described in parts of many previous chapters, is easy to activate and setup. The Menus may be used to configure many of transceiver parameters, some of which have not been detailed previously. Use the following procedure to activate the Menu mode:

1. Press and hold in the [**F**] key for one second to activate the Menu mode.
2. Rotate the **MULTI** function knob to select the Menu Item to be adjusted.
3. Press the **MULTI** function knob, and then rotate it to adjust the selected Menu item.
4. When the adjustment is satisfactory, press the **MULTI** function knob to save the new settings.
5. Press the [**F**] key to exit the Menu mode and resume normal operation.





Menu / Item			Available Values	Default
AGC				
	01-01	AGC FAST DELAY	20 - 4000 (msec)	300msec
	01-02	AGC MID DELAY	20 - 4000 (msec)	700msec
	01-03	AGC SLOW DELAY	20 - 4000 (msec)	3000msec
DISPLAY				
	02-01	LCD CONTRAST	1 - 15	8
	02-02	DIMMER BACKLIT	1 - 15	8
	02-03	DIMMER LCD	1 - 15	8
	02-04	DIMMER TX/BUSY	1 - 15	8
	02-05	PEAK HOLD	OFF/0.5/1.0/2.0 (sec)	OFF
	02-06	ZIN LED	ENABLE/DISABLE	DISABLE
	02-07	POP-UP MENU	UPPER/LOWER	LOWER
DVS				
	03-01	DVS RX OUT LVL	0 - 100	50
	03-02	DVS TX OUT LVL	0 - 100	50
KEYER				
	04-01	KEYER TYPE	OFF/BUG/ELEKEY-A/ELEKEY-B/ ELEKEY-Y/ACS	ELEKEY-B
	04-02	KEYER DOT/DASH	NOR/REV	NOR
	04-03	CW WEIGHT	2.5 - 4.5	3.0
	04-04	BEACON INTERVAL	OFF/1 - 240 (sec) (1 sec/step) 270 - 690 (sec) (30 sec/step)	OFF
	04-05	NUMBER STYLE	1290/AUNO/AUNT/A2NO/ A2NT/12NO/12NT	1290
	04-06	CONTEST NUMBER	0 - 9999	1
	04-07	CW MEMORY 1	TEXT/MESSAGE	TEXT
	04-08	CW MEMORY 2	TEXT/MESSAGE	TEXT
	04-09	CW MEMORY 3	TEXT/MESSAGE	TEXT
	04-10	CW MEMORY 4	TEXT/MESSAGE	TEXT
	04-11	CW MEMORY 5	TEXT/MESSAGE	TEXT

Menu Mode

Menu / Item			Available Values	Default
GENERAL				
	05-01	NB WIDTH	1/3/10 (msec)	3msec
	05-02	NB REJECTION	10/30/50 (dB)	30dB
	05-03	NB LEVEL	0 - 10	5
	05-04	BEEP LEVEL	0 - 100	30
	05-05	RF/SQL VR	RF/SQL	RF
	05-06	CAT RATE	4800/9600/19200/38400 (bps)	4800bps
	05-07	CAT TOT	10/100/1000/3000 (msec)	10ms
	05-08	CAT RTS	ENABLE/DISABLE	ENABLE
	05-09	MEM GROUP	ENABLE/DISABLE	DISABLE
	05-10	FM SETTING	ENABLE/DISABLE	DISABLE
	05-11	REC SETTING	ENABLE/DISABLE	DISABLE
	05-12	ATAS SETTING	ENABLE/DISABLE	DISABLE
	05-13	QUICK SPL FREQ	-20 (kHz) - 0 - 20 (kHz)	5kHz
	05-14	TX TOT	OFF/1 - 30 (min)	OFF (10 min※)
	05-15	MIC SCAN	ENABLE/DISABLE	ENABLE
	05-16	MIC SCAN RESUME	PAUSE/TIME	TIME
	05-17	REF FREQ ADJ	-25 - 0 - 25	0
	05-18	CLAR SELECT	RX/TX/TRX	RX
	05-19	APO	OFF/1/2/4/6/8/10/12 (h)	OFF
	05-20	FAN CONTROL	NORMAL/CONTEST	NORMAL
MODE AM				
	06-01	AM LCUT FREQ	OFF /100 - 1000 (Hz)	OFF
	06-02	AM LCUT SLOPE	6 / 18 (dB/oct)	6dB/oct
	06-03	AM HCUT FREQ	700 - 4000 (Hz) / OFF	OFF
	06-04	AM HCUT SLOPE	6 / 18 (dB/oct)	6dB/oct
	06-05	AM MIC SELECT	MIC/REAR	MIC
	06-06	AM OUT LEVEL	0 - 100	50
	06-07	AM PTT SELECT	DAKY/RTS/DTR	DAKY
MODE CW				
	07-01	CW LCUT FREQ	OFF /100 - 1000 (Hz)	250Hz
	07-02	CW LCUT SLOPE	6 / 18 (dB/oct)	18dB/oct
	07-03	CW HCUT FREQ	700 - 4000 (Hz) / OFF	1200Hz
	07-04	CW HCUT SLOPE	6 / 18 (dB/oct)	18dB/oct
	07-05	CW OUT LEVEL	0 - 100	50
	07-06	CW AUTO MODE	OFF/50M/ON	OFF
	07-07	CW BFO	USB/LSB/AUTO	USB
	07-08	CW BK-IN TYPE	SEMI/FULL	SEMI
	07-09	CW BK-IN DELAY	30 - 3000 (msec)	200msec
	07-10	CW WAVE SHAPE	2/4 (msec)	4msec
	07-11	CW FREQ DISPLAY	FREQ/PITCH	PITCH
	07-12	PC KEYING	OFF/DAKY/RTS/DTR	OFF
	07-13	QSK DELAY TIME	15/20/25/30 (msec)	15msec
MODE DAT				
	08-01	DATA MODE	PSK/OTHERS	PSK
	08-02	PSK TONE	1000/1500/2000 (Hz)	1000Hz
	08-03	OTHER DISP	-3000 - 0 - 3000 (Hz)	0Hz

※: European Version.

Menu / Item			Available Values	Default
	08-04	OTHER SHIFT	-3000 - 0 - 3000 (Hz)	0Hz
	08-05	DATA LCUT FREQ	OFF /100 - 1000 (Hz)	300Hz
	08-06	DATA LCUT SLOPE	6 / 18 (dB/oct)	18dB/oct
	08-07	DATA HCUT FREQ	700 - 4000Hz / OFF	3000Hz
	08-08	DATA HCUT SLOPE	6 / 18 (dB/oct)	18dB/oct
	08-09	DATA IN SELECT	MIC/REAR	REAR
	08-10	DATA PTT SELECT	DAKY/RTS/DTR	DAKY
	08-11	DATA OUT LEVEL	0 - 100	50
	08-12	DATA BFO	USB/LSB	LSB
MODE FM				
	09-01	FM MIC SELECT	MIC/REAR	MIC
	09-02	FM OUT LEVEL	0 - 100	50
	09-03	PKT PTT SELECT	DAKY/RTS/DTR	DAKY
	09-04	RPT SHIFT 28MHz	0 - 1000 (kHz)	100kHz
	09-05	RPT SHIFT 50MHz	0 - 4000 (kHz)	1000kHz
	09-06	DCS POLARITY	Tn-Rn/Tn-Riv/Tiv-Rn/Tiv-Riv	Tn-Rn
MODE RTY				
	10-01	RTTY LCUT FREQ	OFF /100 - 1000 (Hz)	300Hz
	10-02	RTTY LCUT SLOPE	6 / 18 (dB/oct)	18dB/oct
	10-03	RTTY HCUT FREQ	700 - 4000 (Hz) / OFF	3000Hz
	10-04	RTTY HCUT SLOPE	6 / 18 (dB/oct)	18dB/oct
	10-05	RTTY SHIFT PORT	SHIFT/DTR/RTS	SHIFT
	10-06	RTTY POLARITY-R	NOR/REV	NOR
	10-07	RTTY POLARITY-T	NOR/REV	NOR
	10-08	RTTY OUT LEVEL	0 - 100	50
	10-09	RTTY SHIFT FREQ	170/200/425/850 (Hz)	170Hz
	10-10	RTTY MARK FREQ	1275/2125 (Hz)	2125Hz
	10-11	RTTY BFO	USB/LSB	LSB
MODE SSB				
	11-01	SSB LCUT FREQ	OFF /100 - 1000 (Hz)	100Hz
	11-02	SSB LCUT SLOPE	6 / 18 (dB/oct)	6dB/oct
	11-03	SSB HCUT FREQ	700 - 4000 (Hz) / OFF	3000Hz
	11-04	SSB HCUT SLOPE	6 / 18 (dB/oct)	6dB/oct
	11-05	SSB MIC SELECT	MIC/REAR	MIC
	11-06	SSB OUT LEVEL	0 - 100	50
	11-07	SSB BFO	USB/LSB/AUTO	AUTO
	11-08	SSB PTT SELECT	DAKY/RTS/DTR	DAKY
	11-09	SSB TX BPF	100-3000/100-2900/200-2800/300-2700/400-2600	300-2700
RX DSP				
	12-01	APF WIDTH	NARROW/MEDIUM/WIDE	MEDIUM
	12-02	CONTOUR LEVEL	-40 - 0 - 20	-15
	12-03	CONTOUR WIDTH	1 - 11	10
	12-04	IF NOTCH WIDTH	NARROW/WIDE	WIDE
SCOPE				
	13-01	SCP START CYCLE	OFF/3/5/10 (sec)	OFF
	13-02	SCP SPAN FREQ	37.5/75/150/375/750 (kHz)	750kHz

Menu / Item			Available Values	Default
TUNING				
	14-01	QUICK DIAL	50/100/500 (kHz)	500kHz
	14-02	SSB DIAL STEP	2/5/10 (Hz)	10Hz
	14-03	AM DIAL STEP	10/100 (Hz)	10Hz
	14-04	FM DIAL STEP	10/100 (Hz)	100Hz
	14-05	DIAL STEP	2/5/10 (Hz)	5Hz
	14-06	AM CH STEP	2.5/5/9/10/12.5/25 (kHz)	5kHz
	14-07	FM CH STEP	5/6.25/10/12.5/15/20/25 (kHz)	5kHz
TX AUDIO				
	15-01	EQ1 FREQ	OFF/100 - 700	OFF
	15-02	EQ1 LEVEL	-20 - 0 - 10	5
	15-03	EQ1 BWTH	1 - 10	10
	15-04	EQ2 FREQ	OFF/700 - 1500	OFF
	15-05	EQ2 LEVEL	-20 - 0 - 10	5
	15-06	EQ2 BWTH	1 - 10	10
	15-07	EQ3 FREQ	OFF/1500 - 3200	OFF
	15-08	EQ3 LEVEL	-20 - 0 - 10	5
	15-09	EQ3 BWTH	1 - 10	10
	15-10	P-EQ1 FREQ	OFF/100 - 700	200
	15-11	P-EQ1 LEVEL	-20 - 0 - 10	0
	15-12	P-EQ1 BWTH	1 - 10	2
	15-13	P-EQ2 FREQ	OFF/700 - 1500	800
	15-14	P-EQ2 LEVEL	-20 - 0 - 10	0
	15-15	P-EQ2 BWTH	1 - 10	1
	15-16	P-EQ3 FREQ	OFF/1500 - 3200	2100
	15-17	P-EQ3 LEVEL	-20 - 0 - 10	0
	15-18	P-EQ3 BWTH	1 - 10	1
TX GNRL				
	16-01	HF SSB PWR	5 - 100	100
	16-02	HF AM PWR	5 - 40	25
	16-03	HF PWR	5 - 100	100
	16-04	50M SSB PWR	5 - 100	100
	16-05	50M AM PWR	5 - 40	25
	16-06	50M PWR	5 - 100	100
	16-07	SSB MIC GAIN	0 - 100	50
	16-08	AM MIC GAIN	0 - 100	50
	16-09	FM MIC GAIN	0 - 100	50
	16-10	DATA MIC GAIN	0 - 100	50
	16-11	SSB DATA GAIN	0 - 100	50
	16-12	AM DATA GAIN	0 - 100	50
	16-13	FM DATA GAIN	0 - 100	50
	16-14	DATA DATA GAIN	0 - 100	50
	16-15	TUNER SELECT	OFF/EXTERNAL/ATAS/LAMP	OFF
	16-16	VOX SELECT	MIC/DATA	MIC
	16-17	VOX GAIN	0 - 100	50
	16-18	VOX DELAY	30 - 3000 (msec)	500msec
	16-19	ANTI VOX GAIN	0 - 100	50
	16-20	DATA VOX GAIN	0 - 100	50

Menu / Item			Available Values	Default
	16-21	DATA VOX DELAY	30 - 3000 (msec)	100msec
	16-22	ANTI DVOX GAIN	0 - 100	0
	16-23	EMERGENCY FREQ	ENABLE/DISABLE	DISABLE
RESET				
	17-01	RESET	ALL/DATA/FUNC	---
VERSION				
	18-01	MAIN VERSION	---	---
	18-02	DSP VERSION	---	---
	18-03	LCD VERSION	---	---

01-01 AGC FAST DELAY

Function: Sets the AGC-FAST DELAY voltage decay characteristics.
Available Values: 20 - 4000msec (20msec/step)
Default: 300msec
Description: Sets the AGC voltage decay characteristics in 20 msec steps after the input signal level becomes lower than the AGC detection level and the HOLD time is over.

01-02 AGC MID DELAY

Function: Sets the AGC-MID DELAY voltage decay characteristics.
Available Values: 20 - 4000msec (20msec/step)
Default: 700msec
Description: Sets the AGC voltage decay characteristics in 20 msec steps after the input signal level becomes lower than the AGC detection level and the HOLD time is over.

01-03 AGC SLOW DELAY

Function: Sets the AGC-SLOW DELAY voltage decay characteristics.
Available Values: 20 - 4000msec (20msec/step)
Default: 3000msec
Description: Sets the AGC voltage decay characteristics in 20 msec steps after the input signal level becomes lower than the AGC detection level and the HOLD time is over.

02-01 LCD CONTRAST

Function: Sets the display contrast level.
Available Values: 1 - 15
Default: 8

02-02 DIMMER BACKLIT

Function: Sets the key LED brightness level.
Available Values: 1 - 15
Default: 8
Description: Sets the brightness level of the key LED. The effect of the changes may be observed as the brightness level is adjusted. The higher the setting, the brighter the illumination becomes.

02-03 DIMMER LCD

Function: Sets the LCD display brightness level.
Available Values: 1 - 15
Default: 8
Description: Sets the brightness level of the LCD display. The effect of the changes may be observed as the brightness level is adjusted. The higher the setting, the brighter the illumination becomes.

02-04 DIMMER TX/BUSY

Function: Sets the TX/BUSY Indicator brightness level.
Available Values: 1 - 15
Default: 8
Description: Sets the brightness level of the TX/BUSY Indicator. The effect of the changes may be observed as the brightness level is adjusted. The higher the setting, the brighter the illumination becomes.

02-05 PEAK HOLD

Function: Sets the meter peak hold.
Available Values: OFF/0.5/1.0/2.0 (sec)
Default: OFF
Description: Sets the time length the maximum value reading is shown on the meter (peak hold).
OFF: Disables the peak hold function.
0.5/1.0/2.0: Holds the maximum value for the time length that is set.

02-06 ZIN LED

Function: Enables/Disables the zero in indicator (TX/BUSY indicator).
Available Values: ENABLE/DISABLE
Default: DISABLE

02-07 POP-UP MENU

Function: Set the display position of the pop-up screen.
Available Values: UPPER/LOWER
Default: LOWER

03-01 DVS RX OUT LEVE

Function: Sets the voice memory monitoring level.
Available Values: 0 - 100
Default: 50
Description: You can adjust the voice memory monitoring level. The higher the setting, the higher the out-put level becomes.

03-02 DVS TX OUT LVL

Function: Sets the microphone output level for the voice memory.
Available Values: 0 - 100
Default: 50
Description: The microphone output level may be adjusted to the operators own voice and preference. For example, the output level may be set differently between the microphone and the voice memory. The higher the setting, the higher the output level becomes.

04-01 KEYER TYPE

Function: Switches the keyer operation.
Available Values: OFF/BUG/ELEKEY-A/ELEKEY-B/ELEKEY-Y/ACS
Default: ELEKEY-B
Description: Switches the keyer operation.

- **OFF:** Disables the keyer function.
- **BUG:** Functions as a “BUG key”. Only the “Dot” side is automatically generated (the “Dash” side is generated manually).
- **ELEKEY-A:** A code elements (“Dot” or “Dash”) are automatically transmitted upon pressing either side of the paddle.
- **ELEKEY-B:** Pressing both sides of the paddle transmits the currently generated “Dash” followed by the “Dot” (or reverse order).
- **ELEKEY-Y:** Pressing both sides of the paddle transmits the currently generated “Dash” followed by the “Dot” (or reverse order). While transmitting the “Dash”, the first transmitted “Dot” will not be stored.
- **ACS:** Same as “ELEKEY” except that the spacing between characters is precisely set by the keyer to be the same length as a dash (three dots in length).

04-02 KEYER DOT/DASH

Function: Reverses the connections of the CW paddle key jack.
Available Values: NOR/REV
Default: NOR
Description: Reverses the connections of the CW paddle.

- **NOR:** Press the right side of the paddle to transmit the “Dot” signal and press the left side of the paddle to transmit the “Dash” signal.
- **REV:** Press the left side of the paddle to transmit the “Dash” signal and press the right side of the paddle to transmit the “Dot” signal.

04-03 CW WEIGHT

Function: Adjusts the keyer CW weight.
Available Values: 2.5 - 4.5
Default: 3.0
Description: Sets the “Dot”:“Dash” ratio for the built-in electronic keyer.

04-04 BEACON INTERVAL

Function: Sets the interval time between repeats of the beacon message.
Available Values: OFF/1 - 240 (sec) (1 sec/step) 270 - 690 (sec) (30 sec/step)
Default: OFF
Description: Sets the interval time between repeats of the beacon message. A message (message memory/text memory) registered in the contest memory keyer, may be transmitted as a CW Beacon message. If you do not want the message to repeat in a beacon mode, set this item to "OFF".

04-05 NUMBER STYLE

Function: Selects the contest number "Cut" format for an embedded contest number.
Available Values: 1290/AUNO/AUNT/A2NO/A2NT/12NO/12NT
Default: 1290
Description: Abbreviates numbers "One", "Two", "Nine" and "Zero" using Morse code when sending the contest number.

- **1290:** Does not abbreviate the contest number.
- **AUNO:** Abbreviates to "A" for "One", "U" for "Two", "N" for "Nine", and "O" for "Zero".
- **AUNT:** Abbreviates to "A" for "One", "U" for "Two", "N" for "Nine", and "T" for "Zero".
- **A2NO:** Abbreviates to "A" for "One", "N" for "Nine", and "O" for "Zero". Does not abbreviate number "Two".
- **A2NT:** Abbreviates to "A" for "One", "N" for "Nine", and "T" for "Zero". Does not abbreviate number "Two".
- **12NO:** Abbreviates to "N" for "Nine", and "O" for "Zero". Does not abbreviate numbers "One" and "Two".
- **12NT:** Abbreviates to "N" for "Nine", and "T" for "Zero". Does not abbreviate numbers "One" and "Two".

04-06 CONTEST NUMBER

Function: Enters the contest number using Morse code.
Available Values: 0 - 9999
Default: 1
Description: Enters the contest number using Morse code (see page 23).

04-07 CW MEMORY 1

Function: Selects the registration method for the contest memory keyer "CW MEMORY 1".
Available Values: TEXT/MESSAGE
Default: TEXT
Description: Selects how to register text to the contest memory keyer "CW MEMORY 1".

- **TEXT:** Use the optional FH-2 or the **MULTI** function knob to enter text (see page 17).
- **MESSAGE:** Use the keyer to register text to the contest memory keyer (see page 11).

04-08 CW MEMORY 2

Function: Selects the registration method for the contest memory keyer "CW MEMORY 2".
Available Values: TEXT/MESSAGE
Default: TEXT
Description: Selects how to register text to the contest memory keyer "CW MEMORY 2".

TEXT: Use the optional FH-2 or the **MULTI** function knob to enter text (see page 17).

MESSAGE: Use the keyer to register text to the contest memory keyer (see page 11).

04-09 CW MEMORY 3

Function: Selects the registration method for the contest memory keyer "CW MEMORY 3".
Available Values: TEXT/MESSAGE
Default: TEXT
Description: Selects how to register text to the contest memory keyer "CW MEMORY 3".

TEXT: Use the optional FH-2 or the **MULTI** function knob to enter text (see page 17).

MESSAGE: Use the keyer to register text to the contest memory keyer (see page 11).

04-10 CW MEMORY 4

Function: Selects the registration method for the contest memory keyer "CW MEMORY 4".
Available Values: TEXT/MESSAGE
Default: TEXT
Description: Selects how to register text to the contest memory keyer "CW MEMORY 4".

TEXT: Use the optional FH-2 or the **MULTI** function knob to enter text (see page 17).

MESSAGE: Use the keyer to register text to the contest memory keyer (see page 11).

04-11 CW MEMORY 5

Function: Selects the registration method for the contest memory keyer "CW MEMORY 5".
Available Values: TEXT/MESSAGE
Default: TEXT
Description: Selects how to register text to the contest memory keyer "CW MEMORY 5".

TEXT: Use the optional FH-2 or the **MULTI** function knob to enter text (see page 17).

MESSAGE: Use the keyer to register text to the contest memory keyer (see page 11).

05-01 NB WIDTH

Function: Sets the duration of the noise blanking pulse to match various types of noise compatible with the noise blanker function.
Available Values: 1/3/10 (msec)
Default: 3msec
Description: Reduces long duration noise as well as pulse noise by changing the setting.

05-02 NB REJECTION

Function: Selects the level of noise attenuation.
Available Values: 10/30/50 (dB)
Default: 30dB

05-03 NB LEVEL

Function: Sets the noise blanker level.
Available Values: 0 - 10
Default: 5
Description: Sets the noise blanker level to reduce pulse noise such as noise caused by automotive ignition systems. The higher the setting, the higher the noise blanker level becomes.

05-04 BEEP LEVEL

Function: Sets the beep level.
Available Values: 0 - 100
Default: 30
Description: Sets the beep sound volume level. The higher the setting, the louder the sound becomes.

05-05 RF/SQL VR

Function: Select the operation mode of the RF/SQL knob.
Available Values: RF/SQL VR
Default: RF

05-06 CAT RATE

Function: Sets the baud rate for a CAT command input.
Available Values: 4800/9600/19200/38400 (bps)
Default: 4800bps
Description: Sets the baud rate for a CAT command input.

05-07 CAT TOT

Function: Sets the Time-Out Timer for a CAT command input.
Available Values: 10/100/1000/3000 (msec)
Default: 10ms
Description: Sets the Time-Out Timer countdown time for a CAT command input.

05-08 CAT RTS

Function: Configures the CT RTS port setting.
Available Values: ENABLE/DISABLE
Default: ENABLE
Description: Monitors the computer using the RTS signal.
ENABLE: Monitors the computer status using the RTS signal.
DISABLE: Disables the monitoring function.

05-09 MEM GROUP

Function: Sets the memory group function.
Available Values: ENABLE/DISABLE
Default: DISABLE
Description: Set this setting to “ENABLE” to divide the memory channels into 6 groups.

05-10 FM SETTING

Function: Sets the “FM SETTING” screen.
Available Values: ENABLE/DISABLE
Default: DISABLE

05-11 REC SETTING

Function: Sets the “REC SETTING” screen.
Available Values: ENABLE/DISABLE
Default: DISABLE

05-12 ATAS SETTING

Function: Sets the “ATAS SETTING” screen.
Available Values: ENABLE/DISABLE
Default: DISABLE

05-13 QUICK SPL FREQ

Function: Selects the amount of frequency offset when the Quick Split feature is enabled.
Available Values: -20 (kHz) - 0 - 20 (kHz)
Default: 5kHz
Description: Sets the amount of frequency offset when the Quick Split feature is enabled.

05-14 TX TOT

Function: Sets the Time-Out Timer countdown time.
Available Values: OFF/1 - 30 (min)
Default: OFF (10 min for European Version)
Description: Forces the transceiver to return to receiving mode after continuous transmission of the programmed time.

05-15 MIC SCAN

Function: Sets the microphone automatic scanning function to ON or OFF.
Available Values: ENABLE/DISABLE
Default: ENABLE
Description: Selects the operation of the [**UP**]/[**DWN**] keys on the microphone.

ENABLE (ON): Starts scanning automatically by pressing and holding the [**UP**] or [**DWN**] key for 1 second or more (Scanning continues even after releasing the key). To stop scanning, press the [**UP**] or [**DWN**] key again briefly or press the **PTT** switch to transmit.

DISABLE (OFF): Scans only while pressing and holding the [**UP**]/[**DWN**] button. To stop scanning, release the key.

05-16 MIC SCAN RESUME

Function: Sets the Scan Resume function.
Available Values: PAUSE/TIME
Default: TIME
Description: Sets the Scan Resume function (in AM/FM mode).

PAUSE: During automatic scanning, the scanner will hold until the signal disappears.

TIME: If the signal does not disappear within five seconds, the scanner will resume scanning for the next active channel (frequency). If there is no signal, the scanner continues scanning automatically.

05-17 REF FREQ ADJ

Function: Adjusts the reference oscillator.
Available Values: -25 - 0 - 25
Default: 0
Description: The frequency may be calibrated when connecting a frequency counter to the transceiver, or when receiving a standard frequency such as WWV or WWVH.

05-18 CLAR SELECT

Function: Selects the clarifier operation
Available Values: RX/TX/TRX
Default: RX
Description: Selects the clarifier operation when the [**CLAR**] key is pressed.

RX: Functions as the RX clarifier which changes only the receiver frequency without changing transmit frequency.

TX: Functions as the TX clarifier which changes only the transmit frequency without changing the receiver frequency.

TRX: Functions as the TRX clarifier which changes the transmit frequency and the receiver frequency simultaneously.

05-19 APO

Function: Select the Auto Power Off time (time before power goes off).
Available Values: OFF/1/2/4/6/8/10/12 (h)
Default: OFF

05-20 FAN CONTROL

Function: The cooling fan can be set to operate for two different temperature conditions.
Available Values: NORMAL/CONTEST
Default: NORMAL

06-01 AM LCUT FREQ

Function: Sets the low-frequency cutoff audio filter in AM mode.
Available Values: OFF /100 - 1000 (Hz)
Default: OFF
Description: This is the low-frequency cutoff audio filter in AM mode. The cutoff frequency can be set at 50 Hz increments between 100 Hz and 1000 Hz.

06-02 AM LCUT SLOPE

Function: Sets the slope of the low-frequency cutoff audio filter in AM mode.
Available Values: 6 / 18 (dB/oct)
Default: 6dB/oct
Description: Selects the slope of the low-frequency cut-off audio filter in AM mode.

06-03 AM HCUT FREQ

Function: Sets the high-frequency cutoff audio filter in AM mode.
Available Values: 700 - 4000 (Hz) / OFF
Default: OFF
Description: This is the high-frequency cutoff audio filter in AM mode. The cutoff frequency can be set at 50 Hz increments between 700 Hz and 4000 Hz.

06-04 AM HCUT SLOPE

Function: Sets the slope of the high-frequency cutoff audio filter in AM mode.
Available Values: 6 / 18 (dB/oct)
Default: 6dB/oct
Description: Selects the slope of the high-frequency cut-off audio filter in AM mode.

06-05 AM MIC SELECT

Function: Selects the microphone input jack for AM mode.
Available Values: MIC/REAR
Default: MIC
Description: Selects the microphone input jack to be used in AM mode.

- **MIC:** Audio is input from the MIC jack on the front panel.
- **REAR:** Disables the microphone circuit on the front panel and inputs audio/data from the RTTY/DATA jack on the rear panel.

06-06 AM OUT LEVEL

Function: Sets the level of the receive AM signal output from the RTTY/DATA jack.
Available Values: 0 - 100
Default: 50

06-07 AM PTT SELECT

Function: Sets the PTT control for the AM transmit signal.
Available Values: DAKY/RTS/DTR
Default: DAKY
Description: Selects the PTT control method for the AM transmit.

- **DAKY:** Controls the AM transmit signal from the RTTY/DATA jack (pin 3) on the rear panel.
- **DTR:** Controls the AM transmit signal from the USB virtual COM/DTR ports.
- **RTS:** Controls the AM transmit signal from the USB virtual COM/RTS ports.

07-01 CW LCUT FREQ

Function: Sets the low-frequency cutoff audio filter in CW mode.
Available Values: OFF /100 - 1000 (Hz)
Default: 250Hz
Description: This is the low-frequency cutoff audio filter in CW mode. The cutoff frequency can be set at 50 Hz increments between 100 Hz and 1000 Hz.

07-02 CW LCUT SLOPE

Function: Sets the slope of the low-frequency cutoff audio filter in CW mode.
Available Values: 6 / 18 (dB/oct)
Default: 18dB/oct
Description: Selects the slope of the low-frequency cutoff audio filter in CW mode.

07-03 CW HCUT FREQ

Function: Sets the high-frequency cutoff audio filter in CW mode.
Available Values: 700 - 4000 (Hz) / OFF
Default: 1200Hz
Description: This is the high-frequency cutoff audio filter in CW mode.
The cutoff frequency can be set at 50 Hz increments between 700 Hz and 4000 Hz.

07-04 CW HCUT SLOPE

Function: Sets the slope of the high-frequency cutoff audio filter in CW mode.
Available Values: 6 / 18 (dB/oct)
Default: 18dB/oct
Description: Selects the slope of the high-frequency cutoff audio filter in CW mode.

07-05 CW OUT LEVEL

Function: Sets the level of the CW signal output from the RTTY/DATA jack.
Available Values: 0 - 100
Default: 50

07-06 CW AUTO MODE

Function: Enables/disables CW keying while operating on SSB.
Available Values: OFF/50M/ON
Default: OFF
Description: **OFF:** Disables CW keying while operating on SSB.
50M: Enables CW keying while operating SSB on 50 MHz (but not HF).
ON: Enables CW keying while operating SSB on all TX bands.

07-07 CW BFO

Function: Sets the CW carrier oscillator injection side for the CW mode.
Available Values: USB/LSB/AUTO
Default: USB
Description: **USB:** Injects the CW carrier oscillator on the USB side.
LSB: Injects the CW carrier oscillator on the LSB side.
AUTO: Injects the CW carrier oscillator on the LSB side while operating on the 7 MHz band and below, and the USB side while operating on the 10 MHz band and up.

07-08 CW BK-IN TYPE

Function: Sets the CW brake-in function.
Available Values: SEMI/FULL
Default: SEMI
Description: Selects the CW brake-in function.
SEMI: A brief delay is provided after the CW keying operation, before the transceiver returns to receive mode.
The receiver recovery time may be changed using Menu Mode "**07-09** [**CW BK-IN DELAY**]".
FULL: The transceiver immediately returns to receive mode after every CW key-up (QSK mode).

07-09 CW BK-IN DELAY

Function: Sets the CW delay time.
Available Values: 30 - 3000 (msec)
Default: 200msec
Description: In semi break-in mode, this setting determines the delay time before returning to receive mode after the CW keying operation.
The delay time can be changed in 10 msec steps between 30 msec and 3000 msec.

07-10 CW WAVE SHAPE

Function: Selects the CW carrier wave-form shape (rise/fall times).
Available Values: 2/4 (msec)
Default: 4msec
Description: Sets the rise and fall times of the keying envelope in CW mode (transmit waveform).

07-11 CW FREQ DISPLAY

Function: Sets the PITCH frequency offset.
Available Values: FREQ/PITCH
Default: PITCH
Description: Sets the displayed frequency offset when switching the transceiver mode between SSB and CW.

FREQ: Displays the same frequency in CW mode as in SSB mode without any offset added.

PITCH: Displays the frequency in CW mode with the pitch offset added. When CW BFO is set to USB, the displayed frequency will be increased and when CW BFO is set to LSB, the displayed frequency will be decreased with pitch offset added.

07-12 PC KEYING

Function: Sets the RTTY/DATA jack for keying.
Available Values: OFF/DAKY/RTS/DTR
Default: OFF
Description: **OFF:** Disables keying from DATA PTT (pin 3) of the RTTY/DATA jack.

DAKY: Controls the transmit from the RTTY/DATA jack (pin 3) on the rear panel.

RTS: Controls the transmit from the USB virtual COM/RTS ports.

DTR: Controls the transmit from the USB virtual COM/DTR ports.

07-13 QSK DELAY TIME

Function: Sets the time delay before transmitting the keying signal.
Available Values: 15/20/25/30 (msec)
Default: 15msec
Description: The delay time in QSK mode before transmitting the CW signal may be set in 5 msec steps.

08-01 DATA MODE

Function: Selects the operating scheme in DATA mode.
Available Values: PSK/OTHERS
Default: PSK
Description: Selects the operating scheme (PSK or OTHERS) in DATA mode.

08-02 PSK TONE

Function: Set the PSK tone.
Available Values: 1000/1500/2000 (Hz)
Default: 1000Hz
Description: Selects the PSK tone frequency.

08-03 OTHER DISP

Function: Sets the displayed frequency offset in DATA mode.
Available Values: -3000 - 0 - 3000 (Hz)
Default: 0Hz
Description: Sets the displayed frequency offset in DATA mode. The frequency can be set in steps of 10 Hz.

08-04 OTHER SHIFT

Function: Sets the carrier point in DATA mode.
Available Values: -3000 - 0 - 3000 (Hz)
Default: 0Hz
Description: Sets the carrier point in DATA mode. The frequency can be set in steps of 10 Hz.

08-05 DATA LCUT FREQ

Function: Sets the low-frequency cutoff audio filter in DATA mode.
Available Values: OFF /100 - 1000 (Hz)
Default: 300Hz
Description: This is the low-frequency cutoff audio filter in DATA mode.
The cutoff frequency can be set at 50 Hz increments between 100 Hz and 1000 Hz.

08-06 DATA LCUT SLOPE

Function: Sets the slope of the low-frequency cutoff audio filter in DATA mode.
Available Values: 6 / 18 (dB/oct)
Default: 18dB/oct
Description: Selects the slope setting of the low-frequency cutoff audio filter in DATA mode.

08-07 DATA HCUT FREQ

Function: Sets the high-frequency cutoff audio filter in DATA mode.
Available Values: 700 - 4000Hz / OFF
Default: 3000Hz
Description: This is the high-frequency cutoff audio filter in DATA mode.
The cutoff frequency can be set at 50 Hz increments between 700 Hz and 4000 Hz.

08-08 DATA HCUT SLOPE

Function: Sets the slope of the high-frequency cutoff audio filter in DATA mode.
Available Values: 6 / 18 (dB/oct)
Default: 18dB/oct
Description: Selects the slope setting of the high-frequency cutoff audio filter in DATA mode.

08-09 DATA IN SELECT

Function: Selects the input jack for DATA mode.
Available Values: MIC/REAR
Default: REAR
Description: Selects the input jack to be used in DATA mode.
MIC: Inputs signals from the MIC jack on the front panel.
REAR: Inputs signals from the RTTY/DATA jack on the rear panel.

08-10 DATA PTT SELECT

Function: Sets the PTT control during the sending/receiving of data.
Available Values: DAKY/RTS/DTR
Default: DAKY
Description: Selects the PTT control method during the sending/receiving of data.
DAKY: Controls the transmit from the RTTY/DATA jack (pin 3) on the rear panel.
DTR: Controls the transmit from the USB virtual COM/DTR ports.
RTS: Controls the transmit from the USB virtual COM/RTS ports.

08-11 DATA OUT LEVEL

Function: Sets the output level during the sending/receiving of data (PSK31, SSTV, etc.).
Available Values: 0 - 100
Default: 50
Description: Sets the output level during the sending/receiving of data (PSK31, SSTV, etc.). The higher the setting, the higher the output level becomes.

08-12 DATA BFO

Function: Sets the DATA carrier oscillator injection side for the DATA mode.
Available Values: USB/LSB
Default: LSB
Description: **USB:** Injects the DATA carrier oscillator on the USB side.
LSB: Injects the DATA carrier oscillator on the LSB side.

09-01 FM MIC SELECT

Function: Selects the microphone input jack for FM mode.
Available Values: MIC/REAR
Default: MIC
Description: Selects the microphone input jack to be used in FM mode.

- **MIC:** Inputs from the MIC jack on the front panel.
- **REAR:** Disables the microphone circuit on the front panel and inputs from the RTTY/DATA jack on the rear panel.

09-02 FM OUT LEVEL

Function: Sets the level of the FM receiving signal output from the RTTY/DATA jack.
Available Values: 0 - 100
Default: 50

09-03 PKT PTT SELECT

Function: Sets the PTT control for the FM signal.
Available Values: DAKY/RTS/DTR
Default: DAKY
Description: Selects the PTT control method for the FM signal.

- **DAKY:** Controls the transmit from the RTTY/DATA jack (pin 3) on the rear panel.
- **RTS:** Controls the transmit from the USB virtual COM/RTS ports.
- **DTR:** Controls the transmit from the USB virtual COM/DTR ports.

09-04 RPT SHIFT 28MHz

Function: Sets the RPT offset frequency on the 28 MHz band.
Available Values: 0 - 1000 (kHz)
Default: 100kHz
Description: Sets the repeater offset frequency on the 28 MHz band.

09-05 RPT SHIFT 50MHz

Function: Sets the RPT offset frequency on the 50 MHz band.
Available Values: 0 - 4000 (kHz)
Default: 1000kHz
Description: Sets the repeater offset frequency on the 50 MHz band.

09-06 DCS POLARITY

Function: Selects the DCS code polarity.
Available Values: Tn-Rn/Tn-Riv/Tiv-Rn/Tiv-Riv
Default: Tn-Rn
Description: When using the DCS function, the transceiver can transmit/receive the DCS code with the phase reversed.
Tn-Rn: Transmit (in phase), receive (in phase)
Tn-Riv: Transmit (in phase), receive (reverse phase)
Tiv-Rn: Transmit (reverse phase), receive (in phase)
Tiv-Riv: Transmit (reverse phase), receive (reverse phase)

10-01 RTTY LCUT FREQ

Function: Sets the low-frequency cutoff audio filter in RTTY mode.
Available Values: OFF /100 - 1000 (Hz)
Default: 300Hz
Description: This is the low-frequency cutoff audio filter in RTTY mode.
The cutoff frequency can be set at 50 Hz increments between 100 Hz and 1000 Hz.

10-02 RTTY LCUT SLOPE

Function: Sets the slope of the low-frequency cutoff audio filter in RTTY mode.
Available Values: 6 / 18 (dB/oct)
Default: 18dB/oct
Description: Selects the slope setting of the low-frequency cutoff audio filter in RTTY mode.

10-03 RTTY HCUT FREQ

Function: Sets the high-frequency cutoff audio filter in RTTY mode.
Available Values: 700 - 4000 (Hz) / OFF
Default: 3000Hz
Description: This is the high-frequency cutoff audio filter in RTTY mode.
The cutoff frequency can be set at 50 Hz increments between 700 Hz and 4000 Hz.

10-04 RTTY HCUT SLOPE

Function: Sets the slope of the high-frequency cutoff audio filter in RTTY mode.
Available Values: 6 / 18 (dB/oct)
Default: 18dB/oct
Description: Selects the slope setting of the high-frequency cutoff audio filter in RTTY mode.

10-05 RTTY SHIFT PORT

Function: Sets the SHIFT input jack for RTTY mode.
Available Values: SHIFT/DTR/RTS
Default: SHIFT
Description: Selects the SHIFT input jack for RTTY mode.
SHIFT: Inputs from the RTTY/DATA jack (pin 4) on the rear panel.
DTR: Controls the signal from the USB virtual COM/DTR ports.
RTS: Controls the signal from the USB virtual COM/RTS ports.

10-06 RTTY POLARITY-R

Function: Sets the shift direction for receiving in RTTY mode.
Available Values: NOR/REV
Default: NOR
Description: Sets the shift direction for receiving in RTTY mode.
NOR: The space frequency will be lower than the mark frequency.
REV: The mark frequency will be lower than the space frequency.

10-07 RTTY POLARITY-T

Function: Sets the shift direction for transmitting in RTTY mode.
Available Values: NOR/REV
Default: NOR
Description: Sets the shift direction for transmitting in RTTY mode.
NOR: The space frequency will be lower than the mark frequency.
REV: The mark frequency will be lower than the space frequency.

10-08 RTTY OUT LEVEL

Function: Sets the output level during the sending/receiving of data in RTTY mode.
Available Values: 0 - 100
Default: 50
Description: Sets the data output level during the sending/receiving of data in RTTY mode. The higher the setting, the higher the output level becomes.

10-09 RTTY SHIFT FREQ

Function: Sets the shift width for RTTY mode.
Available Values: 170/200/425/850 (Hz)
Default: 170Hz
Description: Sets the shift width for RTTY mode.

10-10 RTTY MARK FREQ

Function: Sets the mark frequency for RTTY mode.
Available Values: 1275/2125 (Hz)
Default: 2125Hz
Description: Sets the mark frequency for RTTY mode.

10-11 RTTY BFO

Function: Sets the RTTY carrier oscillator injection side for the RTTY mode.
Available Values: USB/LSB
Default: LSB
Description: **USB:** Injects the RTTY carrier oscillator on the USB side.
LSB: Injects the RTTY carrier oscillator on the LSB side.

11-01 SSB LCUT FREQ

Function: Sets the low-frequency cutoff audio filter in SSB mode.
Available Values: OFF /100 - 1000 (Hz)
Default: 100Hz
Description: This is the low-frequency cutoff audio filter in SSB mode.
The cutoff frequency can be set at 50 Hz increments between 100 Hz and 1000 Hz.

11-02 SSB LCUT SLOPE

Function: Sets the slope of the low-frequency cutoff audio filter in SSB mode.
Available Values: 6 / 18 (dB/oct)
Default: 6dB/oct
Description: Selects the slope setting of the low-frequency cutoff audio filter in SSB mode.

11-03 SSB HCUT FREQ

Function: Sets the high-frequency cutoff audio filter in SSB mode.
Available Values: 700 - 4000 (Hz) / OFF
Default: 3000Hz
Description: This is the high-frequency cutoff audio filter in SSB mode.
The cutoff frequency can be set at 50 Hz increments between 700 Hz and 4000 Hz.

11-04 SSB HCUT SLOPE

Function: Sets the slope of the high-frequency cutoff audio filter in SSB mode.
Available Values: 6 / 18 (dB/oct)
Default: 6dB/oct
Description: Selects the slope setting of the high-frequency cutoff audio filter in SSB mode.

11-05 SSB MIC SELECT

Function: Selects the microphone input jack for SSB mode.
Available Values: MIC/REAR
Default: MIC
Description: Selects the microphone input jack to be used in SSB mode.
MIC: Inputs from the MIC jack on the front panel.
REAR: Disables the microphone circuit on the front panel and inputs from the RTTY/DATA jack on the rear panel.

11-06 SSB OUT LEVEL

Function: Sets the level of the SSB receiving signal output from the RTTY/DATA jack.
Available Values: 0 - 100
Default: 50

11-07 SSB BFO

Function: Sets the SSB carrier oscillator injection side for the SSB mode.
Available Values: USB/LSB/AUTO
Default: AUTO
Description: **USB:** Injects the SSB carrier oscillator on the USB side.
LSB: Injects the SSB carrier oscillator on the LSB side.
AUTO: Injects the SSB carrier oscillator on the LSB side while operating on the 7 MHz band and below, and the USB side while operating on the 10 MHz band and up.

11-08 SSB PTT SELECT

Function: Sets the PTT transmit control for the SSB signal.
Available Values: DAKY/RTS/DTR
Default: DAKY
Description: Selects the PTT transmit control method for the SSB signal.
DAKY: Controls the transmit signal from the RTTY/DATA jack (pin 3) on the rear panel.
DTR: Controls the transmit signal from the USB virtual COM/DTR ports.
RTS: Controls the transmit signal from the USB virtual COM/RTS ports.

11-09 SSB TX BPF

Function: Sets the frequency characteristics of the DSP band-pass filter for transmitting in SSB mode.
Available Values: 100-3000/100-2900/200-2800/300-2700/400-2600
Default: 300-2700 Hz
Description: Selects the frequency characteristics setting of the DSP band-pass filter when transmitting in SSB mode.

12-01 APF WIDTH

Function: Sets the bandwidth of the audio peak filter.
Available Values: NARROW/MEDIUM/WIDE
Default: MEDIUM
Description: In CW mode the APF peak center frequency is set according to the CW PITCH frequency and the chosen APF bandwidth value. In order to listen to the desired signal comfortably, select one of the three bandwidths of the peak filter.

12-02 CONTOUR LEVEL

Function: Adjusts the GAIN of the CONTOUR circuit.
Available Values: -40 - 0 - 20
Default: -15
Description: Sets level of the attenuation or the gain of the CONTOUR circuit.

12-03 CONTOUR WIDTH

Function: Sets the bandwidth (“Q”) of the CONTOUR circuit.
Available Values: 1 - 11
Default: 10
Description: Sets the bandwidth (WIDTH) of the CONTOUR circuit.

12-04 IF NOTCH WIDTH

Function: Sets the attenuation bandwidth characteristic of the DSP IF notch filter on the VFO-A.
Available Values: NARROW/WIDE
Default: WIDE
Description: Selects the attenuation bandwidth characteristic setting of the DSP IF notch filter to “NARROW” or “WIDE”.

13-01 SCP START CYCLE

Function: Selects the sweep interval of the Spectrum Scope feature.
Available Values: OFF/3/5/10 (sec)
Default: OFF
Description: The scope spectrum is repeatedly swept according the set interval.

13-02 SCP SPAN FREQ

Function: Sets the bandwidth of the spectrum scope sweeping.
Available Values: 37.5/75/150/375/750 (kHz)
Default: 750kHz
Description: Sets the bandwidth (SPAN) of the spectrum scope.

14-01 QUICK DIAL

Function: Setting of the MULTI function knob tuning speed in the SSB, CW, RTTY and DATA mode.
Available Values: 50/100/500 (kHz)
Default: 500kHz

14-02 SSB DIAL STEP

Function: Setting of the **DIAL** knob tuning speed in the SSB mode.
Available Values: 2/5/10 (Hz)
Default: 10Hz

14-03 AM DIAL STEP

Function: Setting of the **DIAL** knob tuning speed in the AM mode.
Available Values: 10/100 (Hz)
Default: 10Hz

14-04 FM DIAL STEP

Function: Setting of the **DIAL** knob tuning speed in the FM mode.
Available Values: 10/100 (Hz)
Default: 100Hz

14-05 DIAL STEP

Function: Setting of the **DIAL** knob tuning speed.
Available Values: 2/5/10 (Hz)
Default: 5Hz

14-06 AM CH STEP

Function: Selects the tuning steps for the **MULTI** function knob and the microphone's [UP]/[DWN] keys in the AM mode.
Available Values: 2.5/5/9/10/12.5/25 (kHz)
Default: 2.5kHz

14-07 FM CH STEP

Function: Selects the tuning steps for the **MULTI** function knob and the microphone's [UP]/[DWN] keys in the FM mode.
Available Values: 5/6.25/10/12.5/15/20/25 (kHz)
Default: 5kHz

15-01 EQ1 FREQ

Function: Sets the center frequency of the low range for the 3 band parametric microphone equalizer.
Available Values: OFF/100 - 700
Default: OFF
Description: Selects the center frequency setting of the low range of the 3 band parametric microphone equalizer between "100 Hz" and "700 Hz".

15-02 EQ1 LEVEL

Function: Sets the gain for the low range of the 3 band parametric microphone equalizer.
Available Values: -20 - 0 - 10
Default: 5
Description: Adjusts the gain for the low range of the 3 band parametric microphone equalizer between "-20 dB" and "+10 dB".

15-03 EQ1 BWTH

Function: Sets the width variation (“Q”) for the low range of the 3 band parametric microphone equalizer.

Available Values: 1 - 10

Default: 10

Description: Selects the value of the width (Q) for the low range for the 3 band parametric microphone equalizer between “1” and “10”.

15-04 EQ2 FREQ

Function: Sets the center frequency for the middle range of the 3 band parametric microphone equalizer.

Available Values: OFF/700 - 1500

Default: OFF

Description: Selects the center frequency setting for the middle range of the 3 band parametric microphone equalizer between “700 Hz” and “1500 Hz”.

15-05 EQ2 LEVEL

Function: Sets the gain for the middle range of the 3 band parametric microphone equalizer.

Available Values: -20 - 0 - 10

Default: 5

Description: Selects the gain setting for the middle range of the 3 band parametric microphone equalizer between “-20 dB” and “+10 dB”.

15-06 EQ2 BWTH

Function: Sets the width variation (“Q”) for the middle range of the 3 band parametric microphone equalizer.

Available Values: 1 - 10

Default: 10

Description: Selects the width (“Q”) for the middle range of the 3 band parametric microphone equalizer between “1” and “10”.

15-07 EQ3 FREQ

Function: Sets the center frequency for the high range of the 3 band parametric microphone equalizer.

Available Values: OFF/1500 - 3200

Default: OFF

Description: Selects the center frequency setting for the high range of the 3 band parametric microphone equalizer between “1500 Hz” and “3200 Hz”.

15-08 EQ3 LEVEL

Function: Sets the gain for the high range of the 3 band parametric microphone equalizer.
Available Values: -20 - 0 - 10
Default: 5
Description: Selects the gain setting for the high range of the 3 band parametric microphone equalizer between “-20 dB” and “+10 dB”.

15-09 EQ3 BWTH

Function: Selects the width setting (“Q”) for the high range of the 3 band parametric microphone equalizer.
Available Values: 1 - 10
Default: 10
Description: Selects the width (“Q”) setting for the high range of the 3 band parametric microphone equalizer between “1” and “10”.

15-10 P-EQ1 FREQ

Function: Sets the center frequency of the low range for the 3 band parametric microphone equalizer when the speech processor is activated.
Available Values: OFF/100 - 700
Default: 200
Description: Activates when the speech processor is “ON”. Adjusts the center frequency for the low range of the 3 band parametric microphone equalizer between “100 Hz” and “700 Hz”.

15-11 P-EQ1 LEVEL

Function: Selects the gain setting for the low range of the 3 band parametric microphone equalizer when the speech processor is activated.
Available Values: -20 - 0 - 10
Default: 0
Description: Activates when the speech processor is “ON”and sets the gain for the low range of the 3 band parametric microphone equalizer between “-20 dB” and “+10 dB”.

15-12 P-EQ1 BWTH

Function: Selects the width (“Q”) for the low range of the 3 band parametric microphone equalizer when the speech processor is activated.
Available Values: 1 - 10
Default: 2
Description: Activates when the speech processor is “ON” and sets the width (“Q”) for the low range of the 3 band parametric microphone equalizer between “1” and “10”.

15-13 P-EQ2 FREQ

Function: Selects the center frequency for the middle range of the 3 band parametric microphone equalizer when the speech processor is activated.

Available Values: OFF/700 - 1500

Default: 800

Description: Selects the center frequency for the middle range of the 3 band parametric microphone equalizer between “700 Hz” and “1500 Hz” when the speech processor is activated.

15-14 P-EQ2 LEVEL

Function: Sets the gain for the middle range of the 3 band parametric microphone equalizer when the speech processor is activated.

Available Values: -20 - 0 - 10

Default: 0

Description: Selects the gain setting for the middle range of the 3 band parametric microphone equalizer between “-20 dB” and “+10 dB” when the speech processor is activated.

15-15 P-EQ2 BWTH

Function: Sets the width (“Q”) for the middle range of the 3 band parametric microphone equalizer when the speech processor is activated.

Available Values: 1 - 10

Default: 1

Description: Activates when the speech processor is “ON”, and selects the width (“Q”) setting for the middle range of the 3 band parametric microphone equalizer between “1” and “10”.

15-16 P-EQ3 FREQ

Function: Sets the center frequency for the high range of the 3 band parametric microphone equalizer when the speech processor is activated.

Available Values: OFF/1500 - 3200

Default: 2100

Description: Activates when the speech processor is “ON”, and selects the center frequency setting for the high range of the 3 band parametric microphone equalizer between “1500 Hz” and “3200 Hz”.

15-17 P-EQ3 LEVEL

Function: Sets the gain for the high range of the 3 band parametric microphone equalizer when the speech processor is activated.

Available Values: -20 - 0 - 10

Default: 0

Description: Activates when the speech processor is “ON”, and selects the gain setting for the high range of the 3 band parametric microphone equalizer between “-20 dB” and “+10 dB”.

15-18 P-EQ3 BWTH

Function: Sets the width (“Q”) for the high range of the 3 band parametric microphone equalizer when the speech processor is activated.

Available Values: 1 - 10

Default: 1

Description: Activates when the speech processor is “ON”, and sets the width (‘Q”) for the high range of the 3 band parametric microphone equalizer between “1” and “10”.

16-01 HF SSB PWR

Function: Sets the transmit RF power output of the SSB on HF band.

Available Values: 5 - 100

Default: 100

16-02 HF AM PWR

Function: Sets the transmit RF power output of the AM on HF band.

Available Values: 5 - 40

Default: 25

16-03 HF PWR

Function: Sets the transmit RF power output of the HF band.

Available Values: 5 - 100

Default: 100

Description: Adjusts the setting of the HF bands transmitter power output.

16-04 50M SSB PWR

Function: Sets the transmit RF power output of the SSB on 50 MHz.

Available Values: 5 - 100

Default: 100

16-05 50M AM PWR

Function: Sets the transmit RF power output of the AM on 50 MHz.

Available Values: 5 - 40

Default: 25

16-06 50M PWR

Function: Sets the transmit RF power output of the 50 MHz band.

Available Values: 5 - 100

Default: 100

Description: Adjusts the setting of the 50 MHz bands transmitter power output.

16-07 SSB MIC GAIN

Function: Sets the microphone gain level for the SSB mode.

Available Values: 0 - 100

Default: 30

16-08 AM MIC GAIN

Function: Sets the microphone gain level for the AM mode.
Available Values: 0 - 100
Default: 30

16-09 FM MIC GAIN

Function: Sets the microphone gain level for the FM mode.
Available Values: 0 - 100
Default: 50

16-10 DATA MIC GAIN

Function: Sets the data input level from the TNC to the AFSK modulator.
Available Values: 0 - 100
Default: 50

16-11 SSB DATA GAIN

Function: Sets the level of the AM signal input when "**11-05** [**SSB MIC SELECT**]" is set to "REAR".
Available Values: 0 - 100
Default: 50

16-12 AM DATA GAIN

Function: Sets the level of the AM signal input when "**06-05** [**AM MIC SELECT**]" is set to "REAR".
Available Values: 0 - 100
Default: 50

16-13 FM DATA GAIN

Function: Sets the level of the AM signal input when "**09-01** [**FM MIC SELECT**]" is set to "REAR".
Available Values: 0 - 100
Default: 50

16-14 DATA DATA GAIN

Function: Sets the level of the AM signal input when "**08-09** [**DATA IN SELECT**]" is set to "REAR".
Available Values: 0 - 100
Default: 50

16-15 TUNER SELECT

Function: Sets the functions of the antenna tuner.
Available Values: OFF/EXTERNAL/ATAS/LAMP
Default: OFF
Description: Selects the antenna tuner to be used or sets the connections for a linear amplifier.

EXTERNAL: Select this item when using the external antenna tuner (the optional FC-50, FC-40, etc.).

ATAS: Select this item when using the Auto active tuning antenna system ATAS-120A.

LAMP: Select this item when connecting the linear amplifier to the TUN/LIN jack on the rear panel.

OFF: Select this item when not using the antenna tuner or the linear amplifier.

16-16 VOX SELECT

Function: Selects the function of the VOX operation.
Available Values: MIC/DATA
Default: MIC
Description: Selects the function of the VOX operation.

MIC: Operates via input from the MIC jack (microphone).

DATA: Operates via input from the RTTY/DATA jack.

16-17 VOX GAIN

Function: Sets the VOX gain.
Available Values: 0 - 100
Default: 50
Description: Sets the operation sensitivity of the VOX circuit. “1” represents the minimum sensitivity and “100” represents the maximum sensitivity. The VOX operation sensitivity may be adjusted while transmitting the signal.

16-18 VOX DELAY

Function: Sets the VOX delay time.
Available Values: 30 - 3000 (msec)
Default: 500msec
Description: While operating VOX, the recovery time (delay time) before returning to receive mode from transmit mode may be set at 10 msec intervals. The delay time may be adjusted while transmitting the signal.

16-19 ANTI VOX GAIN

Function: Sets the VOX anti-trip.
Available Values: 0 - 100
Default: 50
Description: The sensitivity of the anti-trip circuit may be adjusted so that the VOX circuit does not accidently engage due to the sounds from the transceiver speaker. Increase the anti-trip value to the point that sounds from the transceiver speaker do not engage the transmitter while using VOX operation.

16-20 DATA VOX GAIN

Function: Sets the VOX GAIN while operating VOX during the sending/receiving of data (PSK31, RTTY, etc.).
Available Values: 0 - 100
Default: 50
Description: Set the data input VOX gain to the point that the data signal reliably engages the transmitter, and also releases the transmit when there is no data signal.

16-21 DATA VOX DELAY

Function: Sets the VOX DELAY time while operating VOX during the sending/receiving of data (PSK31, RTTY, etc.).
Available Values: 30 - 3000 (msec)
Default: 100msec

16-22 ANTI DVOX GAIN

Function: Sets the data VOX ant-trip.
Available Values: 0 - 100
Default: 0
Description: The sensitivity of the anti-trip circuit may be adjusted so that the VOX circuit does not accidently engage due to the received data while operating VOX. Increase the setting to a value that the VOX circuit does not engage due to the received data (the higher the value the greater the operation sensitivity).

16-23 EMERGENCY FREQ

Function: Enables TX/RX operation on the Alaska Emergency Channel, 5167.5kHz.
Available Values: ENABLE/DISABLE
Default: DISABLE
Description: When this Menu Item is set to ENABLE, the spot frequency of 5167.5 kHz will be enabled.
The Alaska Emergency Channel will be fount between the PMS memory channel “P9U” and the memory channel “01”.
Important: The use of this frequency is restricted to stations operating in or near Alaska, and only for emergency purposes (never for routine operations).
See §97.401(c) of the FCC regulations.

17-01 RESET

Function: Resetting the transceiver settings.
Available Values: ALL/DATA/FUNC
Default: ---
Description: **ALL:** Use this procedure to restore all settings to their original factory defaults. All Memories will be cleared by this procedure.

DATA: Use this procedure to reset (clear) the previously stored Memory channels, without affecting any configuration changes you may have made to the Menu settings.

FUNC: Use this procedure to restore Menu and Programmable Multi Function [A]/[B]/[C] key settings to their factory defaults, without affecting the programmed memories.

18-01 MAIN VERSION

Function: Displays the Main software version.

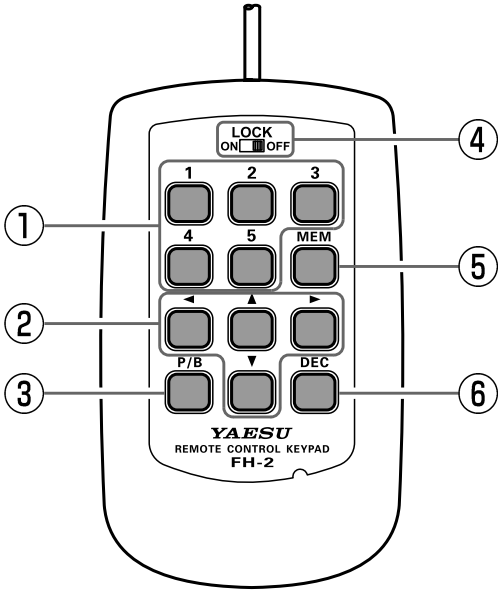
18-02 DSP VERSION

Function: Displays the DSP software version.

18-03 LCD VERSION

Function: Displays the LCD software version.

Optional FH-2 Remote Control Switches



① Voice Memory: 5 Memory Channels for the Memory Keyer

In the case of Voice Memory, up to 20 seconds of audio may be stored on each channel. "MESSAGE Memory" and "TEXT Memory" are available for the Contest Memory Keyer. Each "MESSAGE Memory" channel is capable of retaining a 50-character CW message using the PARIS standard for characters and word length. Each "TEXT Memory" channel is capable of retaining a maximum of 50 characters.

② Cursor Buttons

The cursor may be moved in 2 different directions (right/left). Usually, these buttons are used for tuning the VFO frequency. Press the [▲]/[▼] buttons to change the frequency in the same increments as the microphone [**UP**]/[**DWN**] switches. Press the [◀]/[▶] buttons to change the frequency by 100 kHz steps.

③ [P/B] button

When entering CW text, a space may be inserted where the cursor is flashing.

④ [LOCK] button

The FH-2 key buttons may be locked by setting this switch to "ON".

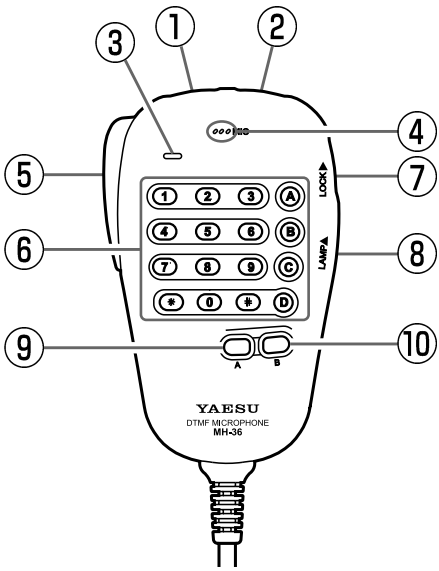
⑤ [MEM] button

Press this button to store either a Voice Memory, or a Contest Keyer Memory.

⑥ [DEC] button

When utilizing the sequential contest number capability of the Contest Keyer, press this button to decrement (decrease) the current Contest Number by one digit (i.e. to back up from #198 to #197, etc.).

Optional MH-36E8J Microphone Switches



① **DWN key**
Press the **DWN** (Down) key to scan the frequency downward.

② **UP key**
Press the **UP** key to scan the frequency upward.

③ **DTMF Indicator**
When the DTMF is transmitted, this indicator glows red.

④ **Microphone**
Speak into the microphone in a normal tone of voice with the microphone 5 cm away from your mouth.

⑤ **PTT Switch**
Switches transmit/receive.
Press to transmit and release to receive.

⑥ **DTMF keypad**
Press a key button while holding the PTT switch to transmit a DTMF tone.

⑦ **LOCK Switch**
Slide upward to lock the microphone controls and buttons.

⑧ **LAMP Switch**
Slide upward to illuminate the keypad.

⑨ **A key**
This activates an accessory function. Activates the “FAST” mode when used with the FT-891.

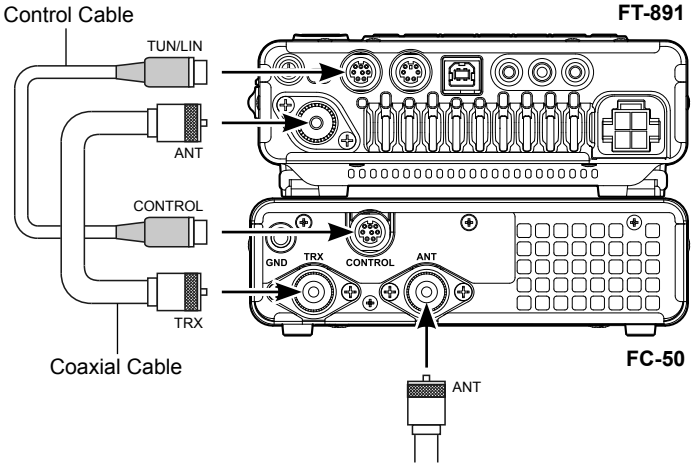
⑩ **B key**
This activates a second accessory function. This button has no function when used with the FT-891.

FC-50 External Automatic Antenna Tuner

The optional FC-50 Automatic Antenna Tuner provides automatic tuning of a coaxial line so as to present a nominal 50 Ω impedance to the FT-891's HF/50 MHz antenna port. Please see the FC-50 Installation Manual for detailed information.

Interconnections to FT-891

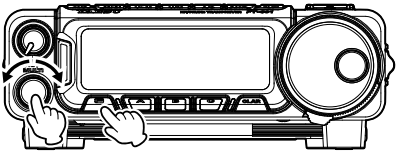
Connect the cables from the FC-50 to the ANT and TUN/LIN jacks on the rear panel of the FT-891 Transceiver.

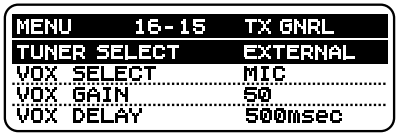


Setup the FT-891

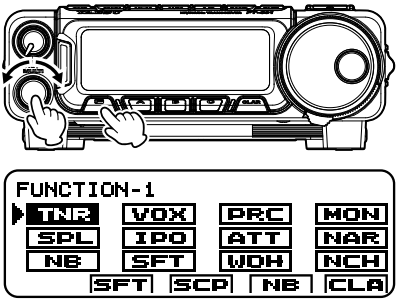
Before operation can begin, the FT-891 microprocessor must be setup to accommodate the FC-50 automatic tuner. This is done using the Menu Mode:

1. Press and hold in the [**F**] key for one second to activate the Menu mode.
2. Rotate the **MULTI** function knob to select Menu Mode "**16-15** [**TUNER SELECT**]".
3. Press the **MULTI** function knob, and then rotate it to set this Menu item to "EXTERNAL".
4. Press the **MULTI** function knob to save the new setting.
5. Press the [**F**] key to exit the Menu mode and resume normal operation.
6. Turn the FT-891 POWER switch OFF.





Operation



1. Press the [**F**] key repeatedly to find the "FUNCTION-1" list screen.
2. Rotate the **MULTI** function knob to select "TNR".
3. Press and hold the **MULTI** function knob for one second to begin automatic tuning. The transmitter will be engaged, and the "WAIT" will blink while tuning is in progress.
4. Tuning will stop automatically when a low SWR is achieved. You may Press the **MULTI** function knob while tuning is in progress, to cancel the automatic tuning.

❒ To set the Antenna Tuner Function to "OFF":

1. Press the [**F**] key repeatedly, to find the "FUNCTION-1" list screen.
2. Rotate the **MULTI** function knob to select "TNR", and then press the **MULTI** function knob.
3. Press and hold the [**F**] key for one second to exit the "FUNCTION-1" list screen and resume normal operation.

❒ Antenna Tuner function may be assigned to the [A], [B] or [C] key. Refer to "Changing the function assigned to the [A]/[B]/[C] keys" in the FT-891 Operating Manual.

❒ The carrier signal transmits continuously while tuning is in progress. Please monitor the operating frequency before beginning the tuning process. Be sure you are not interfering with others who may already be using the frequency.

❒ It is normal to hear the sound of the relays while tuning is in progress.

❒ If the impedance cannot be matched by the FC-50 better than 1.5:1, and the "Hi-SWR" icon appear, the microprocessor will not retain the tuning data for that frequency, as the FC-50 presumes that you will want to adjust or repair your antenna system to correct the high SWR condition.

FC-40 External Automatic Antenna Tuner (for Wire Antenna)

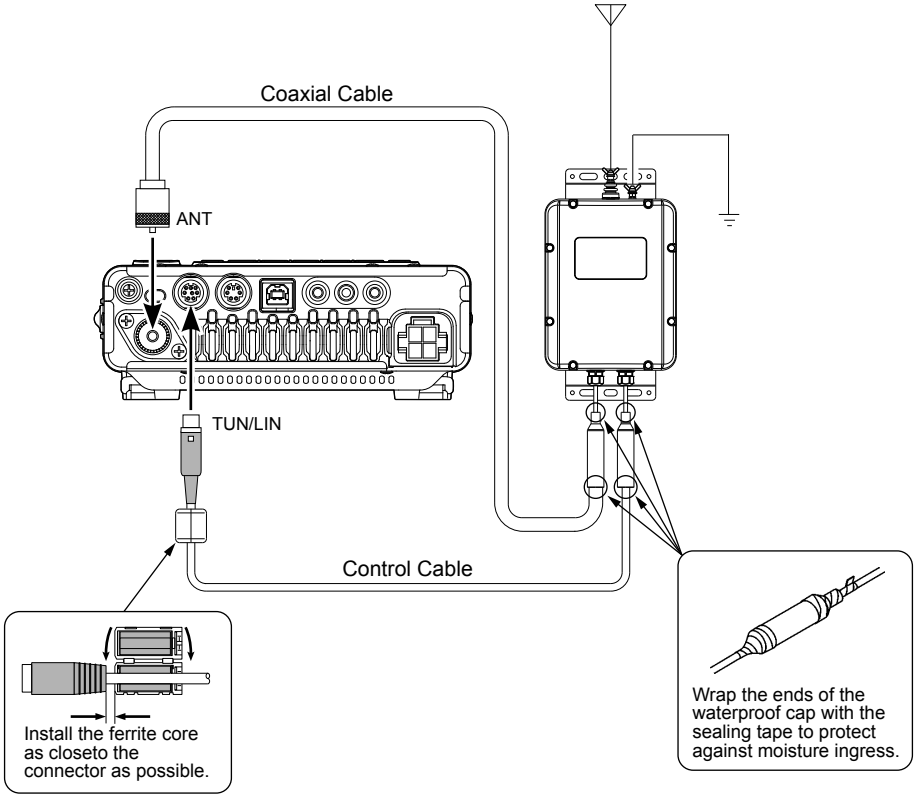
The FC-40 makes use of the control circuitry built into the transceiver, which allows the operator to control and monitor automatic operation of the FC-40, which mounts near the antenna feed point. The FC-40 uses specially selected, thermally stable components, and is housed in a waterproof case to withstand severe environmental conditions with high reliability.

A carefully-chosen combination of solid-state switching components and high-speed relays allows the FC-40 to match a wide variety of antennas to within a 2:1 SWR on any amateur band frequency (160 through 6 meters), typically in less than eight seconds. Transmitter power required for matching may be as little as 4 - 60 Watts, and matching settings are automatically stored in memory for instant recall when the same frequency range is selected later.

Please see the FC-40 Operating Manual for detailed information.

Interconnections to FT-891

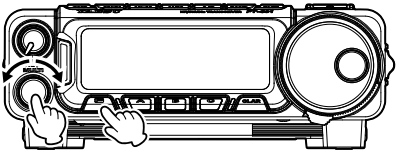
After mounting the FC-40, connect the cables from the FC-40 to the ANT and TUN/LIN jacks on the rear panel of the FT-891 Transceiver.



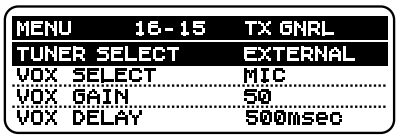
FC-40 External Automatic Antenna Tuner (for Wire Antenna)

Setup the FT-891

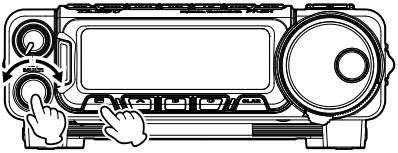
Before operation can begin, the FT-891 microprocessor must be setup to accommodate the FC-40 automatic tuner. This is done using the Menu Mode:



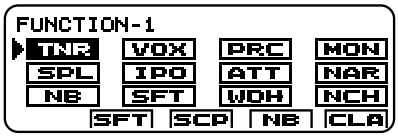
1. Press and hold in the [**F**] key for one second to activate the Menu mode.
2. Rotate the **MULTI** function knob to select Menu Mode "**16-15** [**TUNER SELECT**]".
3. Press the **MULTI** function knob, and then rotate it to set this Menu item to "EXTERNAL".
4. Press the **MULTI** function knob to save the new setting.
5. Press the [**F**] key to exit the Menu mode and resume normal operation.
6. Turn the FT-891 POWER switch OFF.



Operation



1. Press the [**F**] key repeatedly to find the "FUNCTION-1" list screen.
2. Rotate the **MULTI** function knob to select "TNR".
3. Press and hold the **MULTI** function knob for one second to begin automatic tuning. The transmitter will be engaged, and the "WAIT" will blink while tuning is in progress.
4. Tuning will stop automatically when a low SWR is achieved. You may Press the **MULTI** function knob while tuning is in progress, to cancel the automatic tuning.



❒ To set the Antenna Tuner Function to "OFF":

1. Press the [**F**] key repeatedly, to find the "FUNCTION-1" list screen.
2. Rotate the **MULTI** function knob to select "TNR", and then press the **MULTI** function knob.
3. Press and hold the [**F**] key for one second to exit the "FUNCTION-1" list screen and resume normal operation.

❒ Antenna Tuner function may be assigned to the [A], [B] or [C] key. Refer to "Changing the function assigned to the [A]/[B]/[C] keys" in the FT-891 Operating Manual.

❒ The carrier signal transmits continuously while tuning is in progress. Please monitor the operating frequency before beginning the tuning process. Be sure you are not interfering with others who may already be using the frequency.

❒ It is normal to hear the sound of the relays while tuning is in progress.

❒ If the impedance cannot be matched by the FC-40 better than 2:1, and the "Hi-SWR" icon appear, the microprocessor will not retain the tuning data for that frequency, as the FC-40 presumes that you will want to adjust or repair your antenna system to correct the high SWR condition.

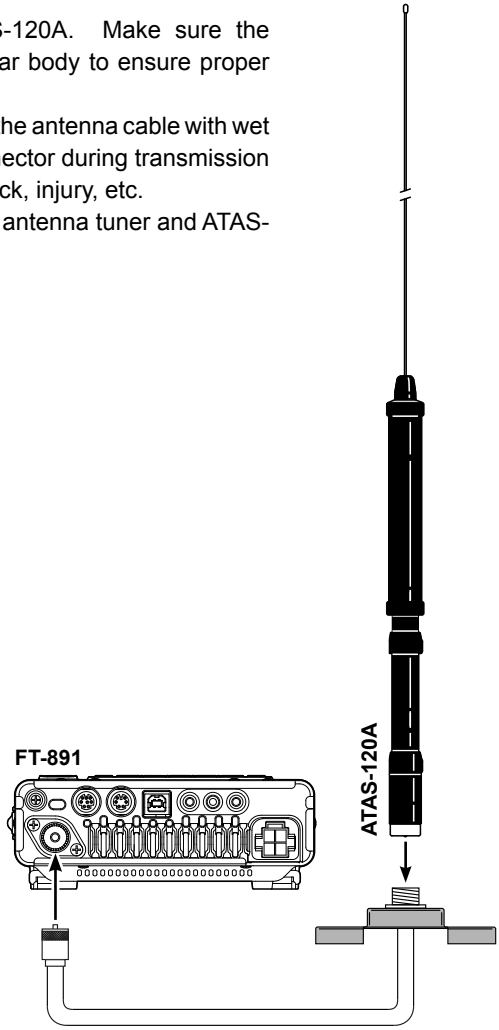
Auto Active-Tuning Antenna System (ATAS-120A) Operation

ATAS-120A is a multi-band auto-tuning antenna that can be used in the amateur bands from the HF band to the UHF band (7/14/21/28(29) /50/144/430).
Using the active tuning mechanism, tuning can be carried out automatically by the control signal from FT-891. Please refer to the ATAS-120A Operating Manual for the assembly and installation of ATAS-120A.

Interconnections to FT-891

Connect "ATAS-120A" to the ANT terminal of FT-891 with a coaxial cable as shown in the diagram below.

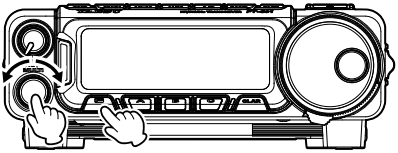
- ❒ Turn off the external power supply switch and the FT-891 power supply switch first before connecting the cables.
- ❒ Grounding is required for the ATAS-120A. Make sure the antenna base is in contact with the car body to ensure proper grounding.
- ❒ Do not plug or unplug the connector of the antenna cable with wet hands. Do not plug or unplug the connector during transmission as well. This may result in electric shock, injury, etc.
- ❒ The unit cannot be used with both the antenna tuner and ATAS-120A connected.

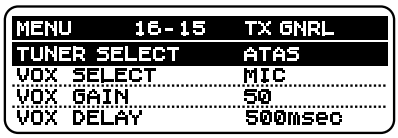


Auto Active-Tuning Antenna System (ATAS-120A) Operation

Setup the FT-891

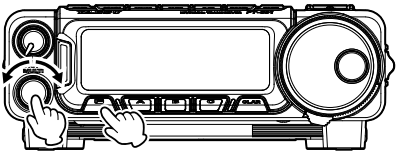
Before operation can begin, the FT-891 microprocessor must be setup to accommodate the ATAS-120A Auto Active-Tuning Antenna. This is done using the Menu Mode:

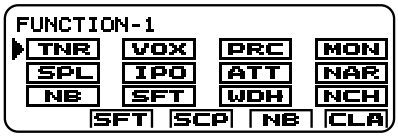




1. Press and hold in the [**F**] key for one second to activate the Menu mode.
2. Rotate the **MULTI** function knob to select Menu Mode "**16-15** [**TUNER SELECT**]".
3. Press the **MULTI** function knob, and then rotate it to set this Menu item to "ATAS".
4. Press the **MULTI** function knob to save the new setting.
5. Press the [**F**] key to exit the Menu mode and resume normal operation.
   The "ATS" icon will appear in the display.
6. Turn the FT-891 POWER switch OFF.

Tuning Operation





1. Press the [**F**] key repeatedly to find the "FUNCTION-1" list screen.
2. Rotate the **MULTI** function knob to select "TNR".
3. Press the **MULTI** function knob to begin automatic tuning. The transmitter will be engaged, and the "ATS" icon will blink while tuning is in progress.
4. Tuning will stop automatically when a low SWR is achieved. You may Press the **MULTI** function knob while tuning is in progress, to cancel the automatic tuning.

❒ Antenna Tuner function may be assigned to the [A], [B] or [C] key. Refer to "Changing the function assigned to the [A]/[B]/[C] keys" in the FT-891 Operating Manual.

❒ Check the grounding and installation conditions if "Hi-SWR" icon appear (tuning cannot be carried out).

❒ As transmit signals are emitted during tuning, take note not to interfere with any communication that is already in progress on the frequency.

Manual Tuning

Carry out the tuning of the ATAS-120A manually.

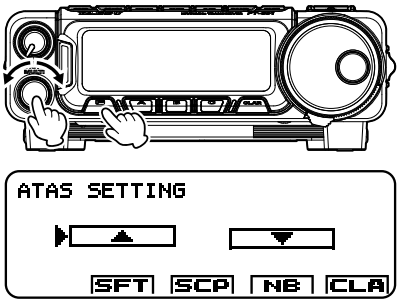
Manual tuning with the MH-31A8J

1. Press and hold the PTT switch on the microphone to transmit.
2. Press (press and hold) the [UP] or [DWN] key on the microphone to adjust the antenna until the meter indicates the minimum SWR.

Manual tuning from the FT-891 Control Panel

1. Press the [**F**] key repeatedly to find the "ATAS SETTING" list screen.

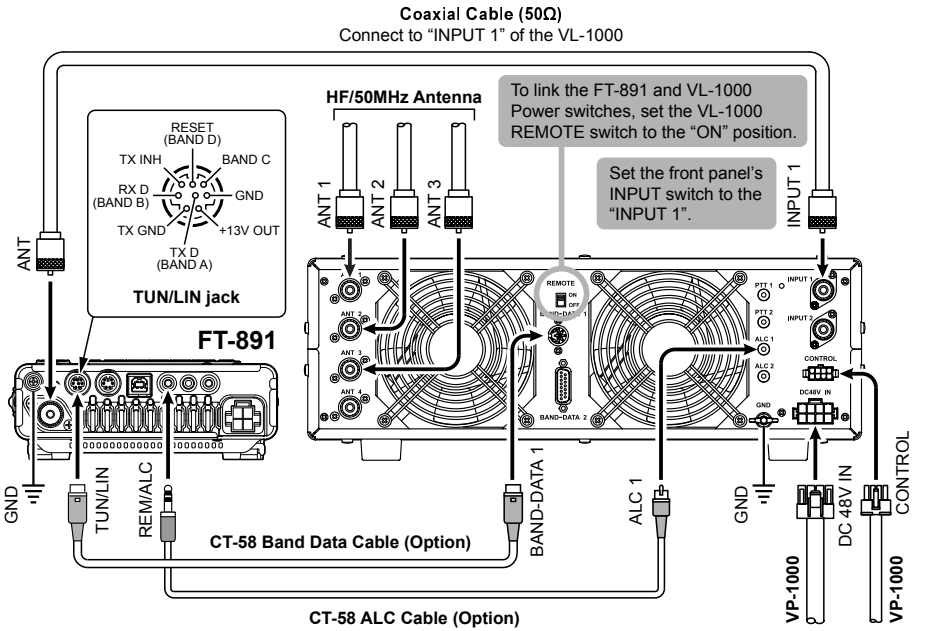
   NOTE: This screen may be enabled/disabled via Menu Mode "**05-12** [**ATAS SETTING**]".
2. Press and hold the PTT switch on the microphone to transmit.
3. Rotate the **MULTI** function knob to select [▲] or [▼], and then press (press and hold) the **MULTI** function knob to adjust the antenna until the meter indicates the minimum SWR.



VL-1000 Linear Amplifier Interconnections

Be sure that both the FT-891 and VL-1000 are turned off, and then follow the installation recommendations contained in the illustration.

- ❒ Refer to the VL-1000 Operating Manual for details regarding amplifier operation.
- ❒ Do not attempt to connect or disconnect coaxial cables when your hands are wet.
- ❒ Set the Menu item "**16-15** [**TUNER SELECT**]" to "LAMP".
- ❒ Since the ALC cable is connected to the REM/ALC jack, the optional FH-2 cannot be connected.



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YAESU
The radio

FT-891

CAT Operation

Reference Book

YAESU MUSEN CO., LTD.

CAT (Computer Aided Transceiver) Operation

Overview

The CAT (Computer Aided Transceiver) System in the **FT-891** transceiver provides control of frequency, VFO, memory, and other settings such as dual-channel memories and diversity reception using an external personal computer. This allows multiple control operations to be fully automated with single mouse clicks, or keystroke operations on the computer keyboard.

Using the USB Cable (Refer to figure 1)

Note: A USB driver is required for remote control from a computer. Download the driver from the Yaesu website (http://www.yaesu.com).

The **FT-891** transceiver has a built-in USB to Dual UART Bridge, allowing direct connection from the rear-panel USB jack to the USB jack of your computer without the need of any external boxes.

You will need a USB cable to connect to the USB jack on your computer.

YAESU MUSEN does not produce CAT System operating software due to the wide variety of personal computers and operating systems in use today. However, the information provided in this chapter explains the serial data structure and opcodes used by the CAT system. This information, along with the short programming examples, is intended to help you start writing programs on your own. As you become more familiar with CAT operation, you can customize programs for your operating needs and utilize the full operating potential of this system.

Connection

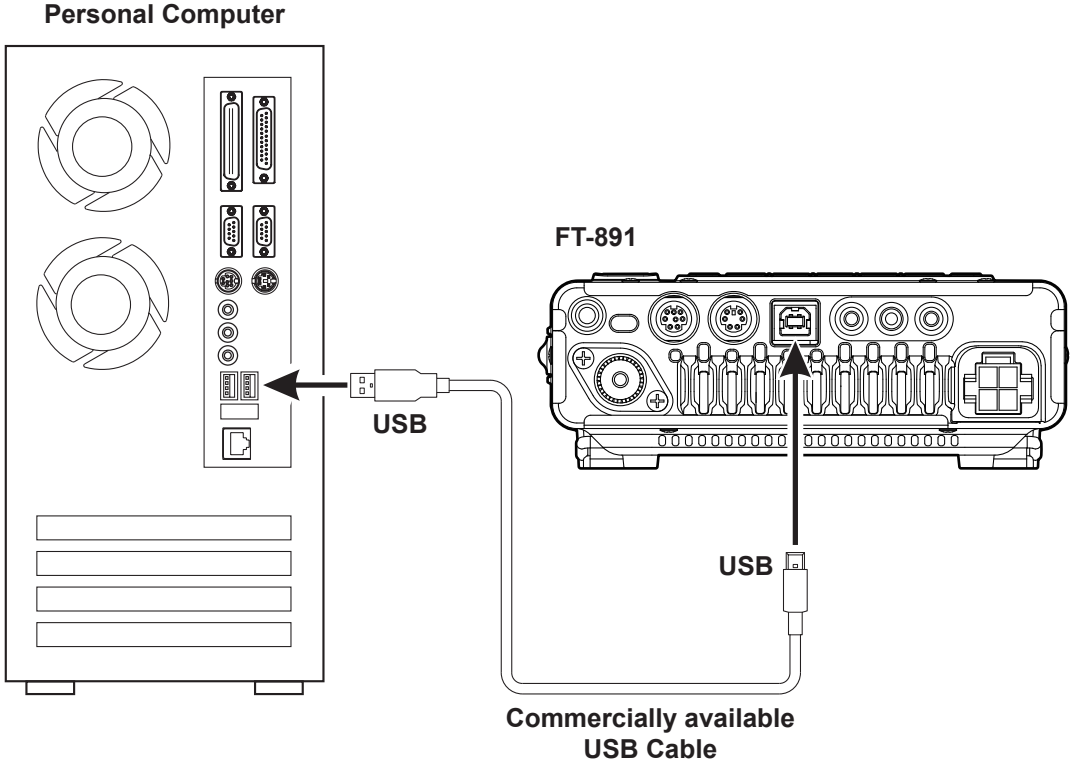

Figure 1

CAT (Computer Aided Transceiver) Operation

Control Command

A computer control command is composed of an alphabetical command, various parameters, and the terminator that signals the end of the control command.

Example:
Set the VFO-A frequency to 14.250000 MHz.

FA	**014250000**	**;**
↑	↑	↑
Command	Parameter	Terminator

There are three commands for the **FT-891** as shown below:

Set command: Set a particular condition (to the **FT-891**)

Read command: Reads an answer (from the **FT-891**)

Answer command: Transmits a condition (from the **FT-891**)

For example, note the following case of the FA command (Set the VFO-A frequency):

- To set the VFO-A frequency to 14.250000 MHz, the following command is sent from the computer to the transceiver:
  "**FA014250000;**" (Set command)
- To read the VFO-A frequency, the following command is sent from the computer to the transceiver:
  "**FA;**" (Read command)
- When the Read command above has been sent, the following command is returned to the computer:
  "**FA014250000;**" (Answer command)

Alphabetical Commands

A command consists of 2 alphabetical characters.

You may use either lower or upper case characters. The commands available for this transceiver are listed in the "PC Control Command Tables" on the following pages.

Parameters

Parameters are used to specify information necessary to implement the desired command.

The parameters to be used for each command are predetermined. The number of digits assigned to each parameter is also predetermined. Refer to the "Control Command List" and the "Control Command Tables" to configure the appropriate parameters.

When configuring parameters, be careful not to make the following mistakes.

For example,
when the correct parameter is "**IS0+1000**" (IF SHIFT):

IS01000;
Not enough parameters specified (No direction (+) given for the IF shift)

IS0+100;
Not enough digits (Only three frequency digits given)

IS0_+_1000;
Unnecessary characters between parameters

IS0+10000;
Too many digits (Five frequency digits given)

Note: If a particular parameter is not applicable to the **FT-891**, the parameter digits should be filled using any character except the ASCII control codes (00 to 1Fh) and the terminator (**;**).

Terminator

To signal the end of a command, it is necessary to use a semicolon (**;**). The digit where this special character must appear differs depending on the command used.

CAT (Computer Aided Transceiver) Operation

Command	Function	Set	Read	Ans.	AI
AB	VFO-A TO VFO-B	O	X	X	X
AC	ANTENNA TUNER CONTROL	O	O	O	O
AG	AF GAIN	O	O	O	O
AI	AUTO INFORMATION	O	O	O	X
AM	VFO-A TO MEMORY CHANNEL	O	X	X	X
BA	VFO-B TO VFO-A	O	X	X	X
BC	AUTO NOTCH	O	O	O	O
BD	BAND DOWN	O	X	X	X
BI	BREAK-IN	O	O	O	O
BP	MANUAL NOTCH	O	O	O	O
BS	BAND SELECT	O	X	X	X
BU	BAND UP	O	X	X	X
BY	BUSY	X	O	O	O
CF	CLAR	O	O	O	O
CH	CHANNEL UP/DOWN	O	X	X	X
CN	CTCSS/DCS NUMBER	O	O	O	O
CO	CONTOUR	O	O	O	O
CS	CW SPOT	O	O	O	O
CT	CTCSS	O	O	O	O
DA	DIMMER	O	O	O	X
DN	DOWN	O	X	X	X
ED	ENCORDER DOWN	O	X	X	X
EK	ENT KEY	O	X	X	X
EU	ENCORDER UP	O	X	X	X
EX	MENU	O	O	O	O
FA	FREQUENCY VFO-A	O	O	O	X
FB	FREQUENCY VFO-B	O	O	O	X
FS	FAST STEP	O	O	O	O
GT	AGC FUNCTION	O	O	O	O
ID	IDENTIFICATION	X	O	O	X
IF	INFORMATION	X	O	O	O
IS	IF-SHIFT	O	O	O	O
KM	KEYER MEMORY	O	O	O	X
KP	KEY PITCH	O	O	O	O
KR	KEYER	O	O	O	O
KS	KEY SPEED	O	O	O	O
KY	CW KEYING	O	X	X	X
LK	LOCK	O	O	O	O
LM	LOAD MESSAGE	O	O	O	X
MA	MEMORY CHANNEL TO VFO-A	O	X	X	X
MC	MEMORY CHANNEL	O	O	O	X
MD	MODE	O	O	O	O
MG	MIC GAIN	O	O	O	O
ML	MONITOR LEVEL	O	O	O	O
MR	MEMORY READ	X	O	O	X
MS	METER SW	O	O	O	O
MT	MEMORY WRITE & TAG	O	X	X	X
MW	MEMORY WRITE	O	X	X	X
MX	MOX SET	O	O	O	O
NA	NARROW	O	O	O	O
NB	NOISE BLANKER	O	O	O	O
NL	NOISE BLANKER LEVEL	O	O	O	O
NR	NOISE REDUCTION	O	O	O	O
OI	OPPOSITE BAND NFORMATION	X	O	O	O
OS	OFFSET (Repeater Shift)	O	O	O	O
PA	PRE-AMP (IPO)	O	O	O	O
PB	PLAY BACK	O	O	O	X
PC	POWER CONTROL	O	O	O	O
PL	SPEECH PROCESSOR LEVEL	O	O	O	O

Command	Function	Set	Read	Ans.	AI
PR	SPEECH PROCESSOR	O	O	O	O
PS	POWER SWITCH	O	O	O	X
QI	QMB STORE	O	X	X	X
QR	QMB RECALL	O	X	X	X
QS	QUICK SPLIT	O	X	X	X
RA	RF ATTENUATOR	O	O	O	O
RC	CLAR CLEAR	O	X	X	X
RD	CLAR DOWN	O	X	X	X
RG	RF GAIN	O	O	O	O
RI	RADIO INFORMATION	X	O	O	O
RL	NOISE REDUCTION LEVEL	O	O	O	O
RM	READ METER	X	O	O	O
RS	RADIO STATUS	X	O	O	O
RU	CLAR UP	O	X	X	X
SC	SCAN	O	O	O	O
SD	SEMI BREAK-IN DELAY TIME	O	O	O	O
SH	WIDTH	O	O	O	O
SM	S METER	X	O	O	X
SQ	SQUELCH LEVEL	O	O	O	O
ST	SPLIT	O	O	O	O
SV	SWAP VFO	O	X	X	X
TS	TXW	O	O	O	O
TX	TX SET	O	O	O	O
UL	UNLOCK	X	O	O	O
UP	UP	O	X	X	X
VD	VOX DELAY TIME	O	O	O	O
VG	VOX GAIN	O	O	O	O
VM	[V/M] KEY FUNCTION	O	X	X	X
VX	VOX	O	O	O	O
ZI	ZERO IN	O	X	X	X

CAT (Computer Aided Transceiver) Operation

AB	VFO-A TO VFO-B									
Set	1	2	3	4	5	6	7	8	9	10
	A	**B**	;							
Read	1	2	3	4	5	6	7	8	9	10
Answer	1	2	3	4	5	6	7	8	9	10

AC	ANTENNA TUNER CONTROL									
Set	1	2	3	4	5	6	7	8	9	10
	A	**C**	P1	P2	P3	;				
Read	1	2	3	4	5	6	7	8	9	10
	A	**C**	;							
Answer	1	2	3	4	5	6	7	8	9	10
	A	**C**	P1	P2	P3	;				

P1 0: (Fixed)
P2 0: (Fixed)
P3 0: Tuner "OFF"
1: Tuner "ON"
2: Tuning Start

AG	AF GAIN									
Set	1	2	3	4	5	6	7	8	9	10
	A	**G**	P1	P2	P2	P2	;			
Read	1	2	3	4	5	6	7	8	9	10
	A	**G**	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10
	A	**G**	P1	P2	P2	P2	;			

P1 0: (Fixed)
P2 000 - 255

AI	AUTO INFORMATION									
Set	1	2	3	4	5	6	7	8	9	10
	A	**I**	P1	;						
Read	1	2	3	4	5	6	7	8	9	10
	A	**I**	;							
Answer	1	2	3	4	5	6	7	8	9	10
	A	**I**	P1	;						

P1 0: Auto Information "OFF"
1: Auto Information "ON"

This parameter is set to "0" (OFF) automatically when the transceiver is turned "OFF".

AM	VFO-A TO MEMORY CHANNEL									
Set	1	2	3	4	5	6	7	8	9	10
	A	**M**	;							
Read	1	2	3	4	5	6	7	8	9	10
Answer	1	2	3	4	5	6	7	8	9	10

BA	VFO-B TO VFO-A									
Set	1	2	3	4	5	6	7	8	9	10
	B	**A**	;							
Read	1	2	3	4	5	6	7	8	9	10
Answer	1	2	3	4	5	6	7	8	9	10

BC	AUTO NOTCH									
Set	1	2	3	4	5	6	7	8	9	10
	B	**C**	P1	P2	;					
Read	1	2	3	4	5	6	7	8	9	10
	B	**C**	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10
	B	**C**	P1	P2	;					

P1 0: (Fixed)
P2 0: Auto Notch "OFF"
1: Auto Notch "ON"

BD	BAND DOWN									
Set	1	2	3	4	5	6	7	8	9	10
	B	**D**	P1	;						
Read	1	2	3	4	5	6	7	8	9	10
Answer	1	2	3	4	5	6	7	8	9	10

P1 0: (Fixed)

CAT (Computer Aided Transceiver) Operation

BI — BREAK-IN

	1	2	3	4	5	6	7	8	9	10
Set	B	I	P1	;						
Read	B	I	;							
Answer	B	I	P1	;						

P1 0: Break-in "OFF"
1: Break-in "ON"

BP — MANUAL NOTCH

	1	2	3	4	5	6	7	8	9	10
Set	B	P	P1	P2	P3	P3	P3	;		
Read	B	P	P1	P2	;					
Answer	B	P	P1	P2	P3	P3	P3	;		

P1 0: (Fixed)
P2 0: Manual NOTCH "ON/OFF"
1: Manual NOTCH LEVEL
P3 P2=0
000: "OFF"
001: "ON"
P2=1
001 - 320
(NOTCH Frequency : x 10 Hz)

BS — BAND SELECT

	1	2	3	4	5	6	7	8	9	10
Set	B	S	P1	P1	;					
Read										
Answer										

P1 00: 1.8 MHz
01: 3.5 MHz
02: -
03: 7 MHz
04: 10 MHz
05: 14 MHz
06: 18 MHz
07: 21 MHz
08: 24.5 MHz
09: 28 MHz
10: 50 MHz
11: GEN
12: MW

BU — BAND UP

	1	2	3	4	5	6	7	8	9	10
Set	B	U	P1	;						
Read										
Answer										

P1 0: (Fixed)

BY — BUSY

	1	2	3	4	5	6	7	8	9	10
Set										
Read	B	Y	;							
Answer	B	Y	P1	P2	;					

P1 0: RX BUSY "OFF"
1: RX BUSY "ON"
P2 0: (Fixed)

CF — CLAR

	1	2	3	4	5	6	7	8	9	10
Set	C	F	P1	P2	P3	;				
Read	C	F	P1	;						
Answer	C	F	P1	P2	P3	;				

P1 0: (Fixed)
P2 0: CLAR "OFF"
1: CLAR "ON"
P3 0: (Fixed)

CH — CHANNEL UP/DOWN

	1	2	3	4	5	6	7	8	9	10
Set	C	H	P1	;						
Read										
Answer										

P1 0: Memory Channel "UP"
1: Memory Channel "DOWN"

CN — CTCSS TONE FREQUENCY

	1	2	3	4	5	6	7	8	9	10
Set	C	N	P1	P2	P3	P3	P3	;		
Read	C	N	P1	P2	;					
Answer	C	N	P1	P2	P3	P3	P3	;		

P1 0: (Fixed)
P2 0: CTCSS
1: DCS
P3 P2=0 000 - 049: Tone Frequency Number (See Table 1, page 6)
P2=1 000 - 103: DCS Code Number (See Table 2, page6)

CAT (Computer Aided Transceiver) Operation

CO	CONTOUR									
Set	1	2	3	4	5	6	7	8	9	10
	C	**O**	P1	P2	P3	P3	P3	P3	;	
Read	1	2	3	4	5	6	7	8	9	10
	C	**O**	P1	P2	;					
Answer	1	2	3	4	5	6	7	8	9	10
	C	**O**	P1	P2	P3	P3	P3	P3	;	

P1 0: (Fixed)
P2 0: CONTOUR "ON/OFF"
1: CONTOUR FREQ
2: APF "ON/OFF"
3: APF FREQ
P3 P2=0 0000: CONTOUR "OFF"
0001: CONTOUR "ON"
P2=1 0010 - 3200
(CONTOUR Frequency:10 - 3200 Hz)
P2=2 0000: APF "OFF"
0001: APF "ON"
P2=3 0000 - 0050 (APF Frequency: -250 - 250 Hz)

CS	CW SPOT									
Set	1	2	3	4	5	6	7	8	9	10
	C	**S**	P1	;						
Read	1	2	3	4	5	6	7	8	9	10
	C	**S**	;							
Answer	1	2	3	4	5	6	7	8	9	10
	C	**S**	P1	;						

P1 0: OFF
1: ON

CT	CTCSS									
Set	1	2	3	4	5	6	7	8	9	10
	C	**T**	P1	P2	;					
Read	1	2	3	4	5	6	7	8	9	10
	C	**T**	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10
	C	**T**	P1	P2	;					

P1 0: (Fixed)
P2 0: CTCSS "OFF"
1: CTCSS ENC/DEC "ON"
2: CTCSS ENC "ON"
3: DCS "ON"

Table 1 (CTCSS Tone Chart)

000	67.0 Hz	009	91.5 Hz	018	123.0 Hz	027	162.2 Hz	036	189.9 Hz	045	229.1 Hz
001	69.3 Hz	010	94.8 Hz	019	127.3 Hz	028	165.5 Hz	037	192.8 Hz	046	233.6 Hz
002	71.9 Hz	011	97.4 Hz	020	131.8 Hz	029	167.9 Hz	038	196.6 Hz	047	241.8 Hz
003	74.4 Hz	012	100.0 Hz	021	136.5 Hz	030	171.3 Hz	039	199.5 Hz	048	250.3 Hz
004	77.0 Hz	013	103.5 Hz	022	141.3 Hz	031	173.8 Hz	040	203.5 Hz	049	254.1 Hz
005	79.7 Hz	014	107.2 Hz	023	146.2 Hz	032	177.3 Hz	041	206.5 Hz	-	-
006	82.5 Hz	015	110.9 Hz	024	151.4 Hz	033	179.9 Hz	042	210.7 Hz	-	-
007	85.4 Hz	016	114.8 Hz	025	156.7 Hz	034	183.5 Hz	043	218.1 Hz	-	-
008	88.5 Hz	017	118.8 Hz	026	159.8 Hz	035	186.2 Hz	044	225.7 Hz	-	-

Table 2 (DCS Code Chart)

000	023	015	074	030	165	045	261	060	356	075	462	090	627
001	025	016	114	031	172	046	263	061	364	076	464	091	631
002	026	017	115	032	174	047	265	062	365	077	465	092	632
003	031	018	116	033	205	048	266	063	371	078	466	093	654
004	032	019	122	034	212	049	271	064	411	079	503	094	662
005	036	020	125	035	223	050	274	065	412	080	506	095	664
006	043	021	131	036	225	051	306	066	413	081	516	096	703
007	047	022	132	037	226	052	311	067	423	082	523	097	712
008	051	023	134	038	243	053	315	068	431	083	526	098	723
009	053	024	143	039	244	054	325	069	432	084	532	099	731
010	054	025	145	040	245	055	331	070	445	085	546	100	732
011	065	026	152	041	246	056	332	071	446	086	565	101	734
012	071	027	155	042	251	057	343	072	452	087	606	102	743
013	072	028	156	043	252	058	346	073	454	088	612	103	754
014	073	029	162	044	255	059	351	074	455	089	624	-	-

DA	DIMMER									
Set	1	2	3	4	5	6	7	8	9	10
	D	**A**	P1	P1	P2	P2	P3	P3	P4	P4
	11	12	13	14	15	16	17	18	19	20
	;									
Read	1	2	3	4	5	6	7	8	9	10
	D	**A**	;							
Answer	1	2	3	4	5	6	7	8	9	10
	D	**A**	P1	P1	P2	P2	P3	P3	P4	P4
	11	12	13	14	15	16	17	18	19	20
	;									

P1 01 - 15: LCD Contrast Level
P2 01 - 15: Dimmer Backligt Level
P3 00 - 15: Dimmer LCD Level
P4 00 - 15: Dimmer TX/BUSY Level

CAT (Computer Aided Transceiver) Operation

DN	**MIC DWN**									
Set	1	2	3	4	5	6	7	8	9	10
	D	**N**	;							
Read	1	2	3	4	5	6	7	8	9	10
Answer	1	2	3	4	5	6	7	8	9	10

ED	**ENCORDER DOWN**									
Set	1	2	3	4	5	6	7	8	9	10
	E	**D**	P1	P2	P2	;				
Read	1	2	3	4	5	6	7	8	9	10
Answer	1	2	3	4	5	6	7	8	9	10

P1 0: MAIN ENCORDER
8: MULTI FUNCTION KNOB
P2 01 - 99: Steps

EK	**ENT KEY**									
Set	1	2	3	4	5	6	7	8	9	10
	E	**K**	;							
Read	1	2	3	4	5	6	7	8	9	10
Answer	1	2	3	4	5	6	7	8	9	10

EU	**ENCORDER UP**									
Set	1	2	3	4	5	6	7	8	9	10
	E	**U**	P1	P2	P2	;				
Read	1	2	3	4	5	6	7	8	9	10
Answer	1	2	3	4	5	6	7	8	9	10

P1 0: MAIN ENCORDER
8: MULTI FUNCTION KNOB
P2 01 - 99: Steps

EX	**MENU**									
Set	1	2	3	4	5	6	7	~	n-1	n
	E	**X**	P1	P1	P1	P1	P2	~	P2	**;**
Read	1	2	3	4	5	6	7	8	9	10
	E	**X**	P1	P1	P1	P1	;			
Answer	1	2	3	4	5	6	7	~	n-1	n
	E	**X**	P1	P1	P1	P1	P2	~	P2	**;**

P1 : 0101 - 1803 (MENU Number)
P2 : Parameter (See Table below)

P1	Function	P2	Digits
0101	AGC FAST DELAY	20 - 4000 (msec) (P2= 0020 - 4000, 20 msec/step)	4
0102	AGC MID DELAY	20 - 4000 (msec) (P2= 0020 - 4000, 20 msec/step)	4
0103	AGC SLOW DELAY	20 - 4000 (msec) (P2= 0020 - 4000, 20 msec/step)	4
0201	LCD CONTRAST	01 - 15	2
0202	DIMMER BACKLIT	01 - 15	2
0203	DIMMER LCD	01 - 15	2
0204	DIMMER TX/BUSY	01 - 15	2
0205	PEAK HOLD	0: OFF 1: 0.5 sec 2: 1.0 sec 3: 2.0 sec	1
0206	ZIN LED	0: DISABLE 1: ENABLE	1
0207	POP-UP MENU	0: UPPER 1: LOWER	1
0301	DVS RX OUT LVL	000 - 100 (P2= 000 - 100)	3
0302	DVS TX OUT LVL	000 - 100 (P2= 000 - 100)	3
0401	KEYER TYPE	0: OFF 1: BUG 2: ELEKEY-A 3: ELEKEY-B 4: ELEKEY-Y 5: ACS	1
0402	KEYER DOT/DASH	0: NOR 1: REV	1
0403	CW WEIGHT	2.5 - 4.5 (P2= 25 - 45)	2
0404	BEACON INTERVAL	OFF/1 - 690 sec (P2= 000 - 690, 000: OFF)	3
0405	NUMBER STYLE	0: 1290 1: AUNO 2: AUNT 3: A2NO 4: A2NT 5: 12NO 6: 12NT	1
0406	CONTEST NUMBER	0000 - 9999	4
0407	CW MEMORY 1	0: TEXT 1: MESSAGE	1
0408	CW MEMORY 2	0: TEXT 1: MESSAGE	1
0409	CW MEMORY 3	0: TEXT 1: MESSAGE	1
0410	CW MEMORY 4	0: TEXT 1: MESSAGE	1
0411	CW MEMORY 5	0: TEXT 1: MESSAGE	1
0501	NB WIDTH	0: 1 msec 1: 3 msec 2: 10 msec	1
0502	NB REJECTION	0: 10 dB 1: 30 dB 2: 50 dB	1
0503	NB LEVEL	0 - 10 (P2= 00 - 10)	2
0504	BEEP LEVEL	0 - 100 (P2= 000 - 100)	3
0505	RF/SQL VR	0: RF 1: SQL	1
0506	CAT RATE	0: 4800 bps 1: 9600 bps 2: 19200 bps 3: 38400 bps	1
0507	CAT TOT	0: 10 msec 1: 100 msec 2: 1000 msec 3: 3000 msec	1
0508	CAT RTS	0: DISABLE 1: ENABLE	1

CAT (Computer Aided Transceiver) Operation

P1	Function	P2	Digits
0509	MEM GROUP	0: DISABLE 1: ENABLE	1
0510	FM SETTING	0: DISABLE 1: ENABLE	1
0511	REC SETTING	0: DISABLE 1: ENABLE	1
0512	ATAS SETTING	0: DISABLE 1: ENABLE	1
0513	QUICK SPL FREQ	-20 kHz - +00 (or -00) - +20 kHz (P2= -20 - +00 or -00 - +20)	3
0514	TX TOT	00 - 30 min (P2= 00 - 30, 00: OFF)	2
0515	MIC SCAN	0: DISABLE 1: ENABLE	1
0516	MIC SCAN RESUME	0: PAUSE 1: TIME	1
0517	REF FREQ ADJ	-25 - +00 (or -00) - +25 (P2= -25 - +00 or -00 - +25)	3
0518	CLAR SELECT	0: RX 1: TX 2: TRX	1
0519	APO	0: OFF 1: 1 h 2: 2 h 3: 4 h 4: 6 h 5: 8 h 6: 10 h 7: 12 h	1
0520	FAN CONTROL	0: NORMAL 1: CONTEST	1
0601	AM LCUT FREQ	00: OFF 01: 100 Hz - 19: 1000 Hz (50 Hz steps)	2
0602	AM LCUT SLOPE	0: 6 dB/oct 1: 18 dB/oct	1
0603	AM HCUT FREQ	00: OFF 01: 700 Hz - 67: 4000 Hz (50 Hz steps)	2
0604	AM HCUT SLOPE	0: 6 dB/oct 1: 18 dB/oct	1
0605	AM MIC SELECT	0: MIC 1: REAR	1
0606	AM OUT LEVEL	0 - 100 (P2= 000 - 100)	3
0607	AM PTT SELECT	0: DAKY 1: RTS 2: DTR	1
0701	CW LCUT FREQ	00: OFF 01: 100 Hz - 19: 1000 Hz (50 Hz steps)	2
0702	CW LCUT SLOPE	0: 6 dB/oct 1: 18 dB/oct	1
0703	CW HCUT FREQ	00: OFF 01: 700 Hz - 67: 4000 Hz (50 Hz steps)	2
0704	CW HCUT SLOPE	0: 6 dB/oct 1: 18 dB/oct	1
0705	CW OUT LEVEL	0 - 100 (P2= 000 - 100)	3
0706	CW AUTO MODE	0: OFF 1: 50M 2: ON	1
0707	CW BFO	0: USB 1: LSB 2: AUTO	1
0708	CW BK-IN TYPE	0: SEMI 1: FULL	1
0709	CW BK-IN DELAY	30 - 3000 msec (P2= 0030 - 3000) (10 msec/step)	4
0710	CW WAVE SHAPE	1: 2 msec 2: 4 msec	1
0711	CW FREQ DISPLAY	0: FREQ 1: PITCH	1
0712	PC KEYING	0: OFF 1: DAKY 2: RTS 3: DTR	1
0713	QSK DELAY TIME	0: 15 msec 1: 20 msec 2: 25 msec 3: 30 msec	1
0801	DATA MODE	0: PSK 1: OTHERS	1
0802	PSK TONE	0: 1000 Hz 1: 1500 Hz 2: 2000 Hz	1
0803	OTHER DISP	-3000 Hz - 0 - +3000 Hz (P2= -3000 - -0000 or +0000 - +3000) (10 Hz/steps)	5
0804	OTHER SHIFT	-3000 Hz - 0 - +3000 Hz (P2= -3000 - -0000 or +0000 - +3000) (10 Hz/steps)	5
0805	DATA LCUT FREQ	00: OFF 01: 100 Hz - 19: 1000 Hz (50 Hz steps)	2
0806	DATA LCUT SLOPE	0: 6 dB/oct 1: 18 dB/oct	1
0807	DATA HCUT FREQ	00: OFF 01: 700 Hz - 67: 4000 Hz (50 Hz steps)	2
0808	DATA HCUT SLOPE	0: 6 dB/oct 1: 18 dB/oct	1
0809	DATA IN SELECT	0: MIC 1: REAR	1
0810	DATA PTT SELECT	0: DAKY 1: RTS 2: DTR	1
0811	DATA OUT LEVEL	0 - 100 (P2= 000 - 100)	3
0812	DATA BFO	0: USB 1: LSB	1
0901	FM MIC SELECT	0: MIC 1: REAR	1
0902	FM OUT LEVEL	0 - 100 (P2= 000 - 100)	3
0903	PKT PTT SELECT	0: DAKY 1: RTS 2: DTR	1
0904	RPT SHIFT 28MHz	0 - 1000 kHz (P2= 0000 - 1000) (10 kHz/step)	4
0905	RPT SHIFT 50MHz	0 - 4000 kHz (P2= 0000 - 4000) (10 kHz/step)	1
0906	DCS POLARITY	0: Tn-Rn 1: Tn-Riv 2: Tiv-Rn 3: Tiv-Riv	1
1001	RTTY LCUT FREQ	00: OFF 01: 100 Hz - 19: 1000 Hz (50 Hz steps)	2
1002	RTTY LCUT SLOPE	0: 6 dB/oct 1: 18 dB/oct	1
1003	RTTY HCUT FREQ	00: OFF 01: 700 Hz - 67: 4000 Hz (50 Hz steps)	2
1004	RTTY HCUT SLOPE	0: 6 dB/oct 1: 18 dB/oct	1
1005	RTTY SHIFT PORT	0: SHIFT 1: DTR 2: RTS	1
1006	RTTY POLARITY-R	0: NOR 1: REV	1
1007	RTTY POLARITY-T	0: NOR 1: REV	1
1008	RTTY OUT LEVEL	0 - 100 (P2= 000 - 100)	3
1009	RTTY SHIFT FREQ	0: 170 Hz 1: 200 Hz 2: 425 Hz 3: 850 Hz	1
1010	RTTY MARK FREQ	0: 1275 Hz 1: 2125 Hz	1
1011	RTTY BFO	0: USB 1: LSB	1
1101	SSB LCUT FREQ	00: OFF 01: 100 Hz - 19: 1000 Hz (50 Hz steps)	2
1102	SSB LCUT SLOPE	0: 6 dB/oct 1: 18 dB/oct	1
1103	SSB HCUT FREQ	00: OFF 01: 700 Hz - 67: 4000 Hz (50 Hz steps)	2
1104	SSB HCUT SLOPE	0: 6 dB/oct 1: 18 dB/oct	1
1105	SSB MIC SELECT	0: MIC 1: REAR	1
1106	SSB OUT LEVEL	0 - 100 (P2= 000 - 100)	3
1107	SSB BFO	0: USB 1: LSB 2: AUTO	1
1108	SSB PTT SELECT	0: DAKY 1: RTS 2: DTR	1
1109	SSB TX BPF	0: 100-3000 1: 100-2900 2: 200-2800 3: 300-2700 4: 400-2600	1
1201	APF WIDTH	0: NARROW 1: MEDIUM 2: WIDE	1
1202	CONTOUR LEVEL	-40 - 0 - +20 (P2= -40 - -00 or +00 - +20)	3
1203	CONTOUR WIDTH	01 - 11	2
1204	IF NOTCH WIDTH	0: NARROW 1: WIDE	1
1301	SCP START CYCLE	0: OFF 1: 3 sec 2: 5 sec 3: 10 sec	1
1302	SCP SPAN FREQ	0: 37.5 kHz 1: 75 kHz 2: 150 kHz 3: 375 kHz 4: 750 kHz	1
1401	QUICK DIAL	0: 50 kHz 1: 100 kHz 2: 500 kHz	1
1402	SSB DIAL STEP	0: 2 Hz 1: 5 Hz 2: 10 Hz	1
1403	AM DIAL STEP	0: 10 Hz 1: 100 Hz	1
1404	FM DIAL STEP	0: 10 Hz 1: 100 Hz	1
1405	DIAL STEP	0: 2 Hz 1: 5 Hz 2: 10 Hz	1
1406	AM CH STEP	0: 2.5 kHz 1: 5 kHz 2: 9 kHz 3: 10 kHz 4: 12.5 kHz 5: 25 kHz	1

CAT (Computer Aided Transceiver) Operation

P1	Function	P2	Digits
1407	FM CH STEP	0: 5 kHz 1: 6.25 kHz 2: 10 kHz 3: 12.5 kHz 4: 15 kHz 5: 20 kHz 6: 25 kHz	1
1501	EQ1 FREQ	00: OFF 01: 100 Hz 02: 200 Hz 03: 300 Hz 04: 400 Hz 05: 500 Hz 06: 600 Hz 07: 700 Hz	2
1502	EQ1 LEVEL	-20 - 0 - +10 (P2= -20 - -00 or +00 - +10)	3
1503	EQ1 BWTH	01 - 10	2
1504	EQ2 FREQ	00: OFF 01: 700 Hz 02: 800 Hz 03: 900 Hz 04: 1000Hz 05: 1100 Hz 06: 1200 Hz 07: 1300 Hz 08: 1400 Hz 09: 1500 Hz	2
1505	EQ2 LEVEL	-20 - 0 - +10 (P2= -20 - -00 or +00 - +10)	3
1506	EQ2 BWTH	01 - 10	2
1507	EQ3 FREQ	00: OFF 01: 1500 Hz 02: 1600 Hz 03: 1700 Hz 04: 1800 Hz 05: 1900 Hz 06: 2000 Hz -18: 3200 Hz	2
1508	EQ3 LEVEL	-20 - 0 - +10 (P2= -20 - -00 or +00 - +10)	3
1509	EQ3 BWTH	01 - 10	2
1510	P-EQ1 FREQ	00: OFF 01: 100 Hz 02: 200 Hz 03: 300 Hz 04: 400 Hz 05: 500 Hz 06: 600 Hz 07: 700 Hz	2
1511	P-EQ1 LEVEL	-20 - 0 - +10 (P2= -20 - -00 or +00 - +10)	3
1512	P-EQ1 BWTH	01 - 10	2
1513	P-EQ2 FREQ	00: OFF 01: 700 Hz 02: 800 Hz 03: 900 Hz 04: 1000Hz 05: 1100 Hz 06: 1200 Hz 07: 1300 Hz 08: 1400 Hz 09: 1500 Hz	2
1514	P-EQ2 LEVEL	-20 - 0 - +10 (P2= -20 - -00 or +00 - +10)	3
1515	P-EQ2 BWTH	01 - 10	2
1516	P-EQ3 FREQ	00: OFF 01: 1500 Hz 02: 1600 Hz 03: 1700 Hz 04: 1800 Hz 05: 1900 Hz 06: 2000 Hz -18: 3200 Hz	2
1517	P-EQ3 LEVEL	-20 - 0 - +10 (P2= -20 - -00 or +00 - +10)	3
1518	P-EQ3 BWTH	01 - 10	2
1601	HF SSB PWR	5 - 100 (P2= 005 - 100)	3
1602	HF AM PWR	5 - 40 (P2= 005 - 040)	3
1603	HF PWR	5 - 100 (P2= 005 - 100)	3
1604	50M SSB PWR	5 - 100 (P2= 005 - 100)	3
1605	50M AM PWR	5 - 40 (P2= 005 - 040)	3
1606	50M PWR	5 - 100 (P2= 005 - 100)	3
1607	SSB MIC GAIN	0 - 100 (P2= 000 - 100)	3
1608	AM MIC GAIN	0 - 100 (P2= 000 - 100)	3
1609	FM MIC GAIN	0 - 100 (P2= 000 - 100)	3
1610	DATA MIC GAIN	0 - 100 (P2= 000 - 100)	3
1611	SSB DATA GAIN	0 - 100 (P2= 000 - 100)	3
1612	AM DATA GAIN	0 - 100 (P2= 000 - 100)	3
1613	FM DATA GAIN	0 - 100 (P2= 000 - 100)	3
1614	DATA DATA GAIN	0 - 100 (P2= 000 - 100)	3
1615	TUNER SELECT	0: OFF 1: EXTERNAL 2: ATAS 3: LAMP	1
1616	VOX SELECT	0: MIC 1: DATA	1
1617	VOX GAIN	0 - 100 (P2= 000 - 100)	3
1618	VOX DELAY	30 - 3000 msec (P2= 0030 - 3000) (10 msec/step)	4
1619	ANTI VOX GAIN	0 - 100 (P2= 000 - 100)	3
1620	DATA VOX GAIN	0 - 100 (P2= 000 - 100)	3
1621	DATA VOX DELAY	30 - 3000 msec (P2= 0030 - 3000)	4
1622	ANTI DVOX GAIN	0 - 100 (P2= 000 - 100)	3
1623	EMERGENCY FREQ	0: DISABLE 1: ENABLE	1
1701	RESET	0: ALL 1: DATA 2: FUNC	1
1801	MAIN VERSION	0000 - 9999 (V01-23 = 0123)	4
1802	DSP VERSION	0000 - 9999 (V01-23 = 0123)	4
1803	LCD VERSION	0000 - 9999 (V01-23 = 0123)	4

FA	**FREQUENCY VFO-A**										
Set	1	2	3	4	5	6	7	8	9	10	P1 000030000 - 056000000 (Hz)
	F	**A**	P1	P1	P1	P1	P1	P1	P1	P1	
	11	12	13	14	15	16	17	18	19	20	
	P1	;									
Read	1	2	3	4	5	6	7	8	9	10	
	F	**A**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	F	**A**	P1	P1	P1	P1	P1	P1	P1	P1	
	11	12	13	14	15	16	17	18	19	20	
	P1	;									

FB	**FREQUENCY VFO-B**										
Set	1	2	3	4	5	6	7	8	9	10	P1 000030000 - 056000000 (Hz)
	F	**B**	P1	P1	P1	P1	P1	P1	P1	P1	
	11	12	13	14	15	16	17	18	19	20	
	P1	;									
Read	1	2	3	4	5	6	7	8	9	10	
	F	**B**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	F	**B**	P1	P1	P1	P1	P1	P1	P1	P1	
	11	12	13	14	15	16	17	18	19	20	
	P1	;									

CAT (Computer Aided Transceiver) Operation

FS — FAST STEP

	1	2	3	4	5	6	7	8	9	10
Set	F	S	P1	;						
Read	F	S	;							
Answer	F	S	P1	;						

P1 0: VFO-A FAST Key "OFF"
1: VFO-A FAST Key "ON"

GT — AGC FUNCTION

	1	2	3	4	5	6	7	8	9	10
Set	G	T	P1	P2	;					
Read	G	T	P1	;						
Answer	G	T	P1	P3	;					

P1 0: (Fixed)
P2 0: AGC "OFF"
1: AGC "FAST"
2: AGC "MID"
3: AGC "SLOW"
4: AGC "AUTO"
P3 0: AGC "OFF"
1: AGC "FAST"
2: AGC "MID"
3: AGC "SLOW"
4: AGC "AUTO-FAST"
5: AGC "AUTO-MID"
6: AGC "AUTO-SLOW"

ID — IDENTIFICATION

	1	2	3	4	5	6	7	8	9	10
Set										
Read	I	D	;							
Answer	I	D	P1	P1	P1	P1	;			

P1 0650: FT-891

IF — INFORMATION

	1	2	3	4	5	6	7	8	9	10
Set										
Read	I	F	;							
Answer	I	F	P1	P1	P1	P2	P2	P2	P2	P2
	11	12	13	14	15	16	17	18	19	20
	P2	P2	P2	P2	+/-	P3	P3	P3	P3	P4
	21	22	23	24	25	26	27	28	29	30
	P5	P6	P7	P8	P9	P9	P10	;		

P1 001 - 099 (Regular Memory Channel)
P1L - P9U (PMS)
501 - 510 (5 MHz, U.S. and U.K. version only)
EMG (Emergency)
P2 VFO-A Frequency (Hz)
P3 Clarifier Direction +: Plus Shift, -: Minus Shift
Clarifier Offset: 0000 - 9999 (Hz)
P4 0: CLAR "OFF" 1: CLAR "ON"
P5 0: (Fixed)
P6 MODE 1: SSB (SSB BFO) 2: SSB (SSB BFO) 3: CW 4: FM 5: AM
6: RTTY (RTTY BFO) 7: CW (CW BFO) 8: DATA (DATA BFO)
9: RTTY (RTTY BFO) A: - B: FM-N C: DATA (DATA BFO)
D: AM-N
P7 0: VFO 1: Memory 2: Memory Tune 3: - 4: - 5: PMS
P8 0: CTCSS "OFF" 1: CTCSS ENC/DEC 2: CTCSS ENC
P9 00: (Fixed)
P10 0: Simplex 1: Plus Shift 2: Minus Shift

IS — IF-SHIFT

	1	2	3	4	5	6	7	8	9	10
Set	I	S	P1	P2	-/+	P3	P3	P3	P3	;
Read	I	S	P1	;						
Answer	I	S	P1	P2	-/+	P3	P3	P3	P3	;

P1 0:(Fixed)
P2 0: OFF
1: ON
P3 0 ~ 1200 Hz (20 Hz steps)

KM — KEYER MEMORY

	1	2	3	4	5	6	7	~	53	n
Set	K	M	P1	P2	P2	P2	P2	~	P2	;
Read	K	M	P1	;						
Answer	K	M	P1	P2	P2	P2	P2	~	P2	;

P1 1 - 5 : Keyer Memory Channel Number
P2 Message Characters (up to 50 characters)

KP — KEY PITCH

	1	2	3	4	5	6	7	8	9	10
Set	K	P	P1	P1	;					
Read	K	P	;							
Answer	K	P	P1	P1	;					

P1 00: 300 Hz - 75: 1050 Hz (10Hz steps)

CAT (Computer Aided Transceiver) Operation

KR	KEYER										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: KEYER "OFF" 1: KEYER "ON"
	K	**R**	P1	;							
Read	1	2	3	4	5	6	7	8	9	10	
	K	**R**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	K	**R**	P1	;							

KS	KEY SPEED										
Set	1	2	3	4	5	6	7	8	9	10	P1 004 - 060 (WPM)
	K	**S**	P1	P1	P1	;					
Read	1	2	3	4	5	6	7	8	9	10	
	K	**S**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	K	**S**	P1	P1	P1	;					

KY	CW KEYING										
Set	1	2	3	4	5	6	7	8	9	10	P1 1: Keyer Memory "1" Playback 6: Message Keyer "1" Playback 2: Keyer Memory "2" Playback 7: Message Keyer "2" Playback 3: Keyer Memory "3" Playback 8: Message Keyer "3" Playback 4: Keyer Memory "4" Playback 9: Message Keyer "4" Playback 5: Keyer Memory "5" Playback A: Message Keyer "5" Playback
	K	**Y**	P1	;							
Read	1	2	3	4	5	6	7	8	9	10	
Answer	1	2	3	4	5	6	7	8	9	10	

LK	LOCK										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: VFO DIAL Lock "OFF" 1: VFO DIAL Lock "ON"
	L	**K**	P1	;							
Read	1	2	3	4	5	6	7	8	9	10	
	L	**K**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	L	**K**	P1	;							

LM	LOAD MESSAGE										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: DVS P2 0: DVS (Recording Stop) 1: DVS (CH "1" Recording Start/Stop) 2: DVS (CH "2" Recording Start/Stop) 3: DVS (CH "3" Recording Start/Stop) 4: DVS (CH "4" Recording Start/Stop) 5: DVS (CH "5" Recording Start/Stop)
	L	**M**	P1	P2	;						
Read	1	2	3	4	5	6	7	8	9	10	
	L	**M**	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	L	**M**	P1	P2	;						

MA	MEMORY CHANNEL TO VFO-A										
Set	1	2	3	4	5	6	7	8	9	10	
	M	**A**	;								
Read	1	2	3	4	5	6	7	8	9	10	
Answer	1	2	3	4	5	6	7	8	9	10	

MC	MEMORY CHANNEL										
Set	1	2	3	4	5	6	7	8	9	10	P1 001 - 099: Regular Memory Channel P1L - P9U (PMS)
	M	**C**	P1	P1	P1	;					
Read	1	2	3	4	5	6	7	8	9	10	
	M	**C**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	M	**C**	P1	P1	P1	;					

MD	OPERATING MODE										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: MAIN RX P2 MODE 1: SSB (SSB BFO)* 2: SSB (SSB BFO)* 3: CW (CW BFO)* 4: FM 5: AM 6: RTTY (RTTY BFO)* 7: CW (CW BFO)* 8: DATA (DATA BFO)* 9: RTTY (RTTY BFO)* A: - B: FM-N C: DATA (DATA BFO)* D: AM-N *The BFO of each MODE depends on the BFO setting of MENU MODE. See the EX command and the following parameters on page 7 to 9. 1107: SSB BFO, 0707: CW BFO, 0812: DATA BFO, 1011: RTTY BFO
	M	**D**	P1	P2	;						
Read	1	2	3	4	5	6	7	8	9	10	
	M	**D**	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	M	**D**	P1	P2	;						

CAT (Computer Aided Transceiver) Operation

MG — MIC GAIN

	1	2	3	4	5	6	7	8	9	10
Set	**M**	**G**	P1	P1	P1	;				
Read	1	2	3	4	5	6	7	8	9	10
	M	**G**	;							
Answer	1	2	3	4	5	6	7	8	9	10
	M	**G**	P1	P1	P1	;				

P1 000 - 100

ML — MONITOR LEVEL

	1	2	3	4	5	6	7	8	9	10
Set	**M**	**L**	P1	P2	P2	P2	;			
Read	1	2	3	4	5	6	7	8	9	10
	M	**L**	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10
	M	**L**	P1	P2	P2	P2	;			

P1 0: MONI "ON/OFF"
1: MONI Level
P2 P1=0
000: MONI "OFF"
001: MONI "ON"
P1=1
000 - 100

MR — MEMORY CHANNEL READ

	1	2	3	4	5	6	7	8	9	10
Set										
Read	1	2	3	4	5	6	7	8	9	10
	M	**R**	P0	P0	P0	;				
Answer	1	2	3	4	5	6	7	8	9	10
	M	**R**	P1	P1	P1	P2	P2	P2	P2	P2
	11	12	13	14	15	16	17	18	19	20
	P2	P2	P2	P2	+/-	P3	P3	P3	P3	P4
	21	22	23	24	25	26	27	28	29	30
	P5	P6	P7	P8	P9	P9	P10	;		

P0/1 001 - 099 (Regular Memory Channel)
P1L - P9U (PMS)
501 - 510 (5 MHz, U.S. and U.K. version only)
EMG (Emergency)
P2 VFO-A Frequency (Hz)
P3 Clarifier Direction +: Plus Shift, -: Minus Shift
Clarifier Offset: 0000 - 9999 (Hz)
P4 0: CLAR "OFF" 1: CLAR "ON"
P5 0: (Fixed)
P6 MODE 1:LSB 2: USB 3: CW 4: FM 5: AM 6: RTTY-LSB 7: CW-R
8: DATA-LSB 9: RTTY-USB A: - B: FM-N C: DATA-USB
D: AM-N
P7 0: VFO 1: Memory
P8 0: CTCSS "OFF" 1: CTCSS ENC/DEC 2: CTCSS ENC
P9 00: (Fixed)
P10 0: Simplex 1: Plus Shift 2: Minus Shift

MS — METER SW

	1	2	3	4	5	6	7	8	9	10
Set	**M**	**S**	P1	;						
Read	1	2	3	4	5	6	7	8	9	10
	M	**S**	;							
Answer	1	2	3	4	5	6	7	8	9	10
	M	**S**	P1	;						

P1 0: COMP
1: ALC
2: PO
3: SWR
4: ID

MT — MEMORY WRITE & TAG

	1	2	3	4	5	6	7	8	9	10
Set	**M**	**T**	P1	P1	P1	P2	P2	P2	P2	P2
	11	12	13	14	15	16	17	18	19	20
	P2	P2	P2	P2	+/-	P3	P3	P3	P3	P4
	21	22	23	24	25	26	27	28	29	30
	P5	P6	P7	P8	P9	P9	P10	P11	P12	P12
	31	32	33	34	35	36	37	38	39	40
	P12	P12	P12	P12	P12	P12	P12	P12	P12	P12
	41									
	;									
Read	1	2	3	4	5	6	7	8	9	10
	M	**T**	P0	P0	P0	;				
Answer	1	2	3	4	5	6	7	8	9	10
	M	**T**	P1	P1	P1	P2	P2	P2	P2	P2
	11	12	13	14	15	16	17	18	19	20
	P2	P2	P2	P2	+/-	P3	P3	P3	P3	P4
	21	22	23	24	25	26	27	28	29	30
	P5	P6	P7	P8	P9	P9	P10	P11	P12	P12
	31	32	33	34	35	36	37	38	39	40
	P12	P12	P12	P12	P12	P12	P12	P12	P12	P12
	41									
	;									

P1 001 - 099 (Regular Memory Channel)
P1L - P9U (PMS)
P2 Frequency (Hz)
P3 Clarifier Direction +: Plus Shift, -: Minus Shift
Clarifier Offset: 0000 - 9999 (Hz)
P4 0: CLAR "OFF" 1: CLAR "ON"
P5 0: (Fixed)
P6 MODE 1: LSB 2: USB 3: CW 4: FM 5: AM 6: RTTY-LSB 7: CW-R
8: DATA-LSB 9: RTTY-USB A: - B: FM-N C: DATA-USB
D: AM-N
P7 0: (Fixed)
P8 0: CTCSS "OFF" 1: CTCSS ENC/DEC 2: CTCSS ENC
P9 00: (Fixed)
P10 0: Simplex 1: Plus Shift 2: Minus Shift
P11 0: TAG "OFF" 1: TAG "ON"
P12 TAG Characters (up to 12 characters) (ASCII)

CAT (Computer Aided Transceiver) Operation

MW — MEMORY CHANNEL WRITE

	1	2	3	4	5	6	7	8	9	10
Set	**M**	**W**	P1	P1	P1	P2	P2	P2	P2	P2
	11	12	13	14	15	16	17	18	19	20
	P2	P2	P2	P2	+/-	P3	P3	P3	P3	P4
	21	22	23	24	25	26	27	28	29	30
	P5	P6	P7	P8	P9	P9	P10	;		
Read	1	2	3	4	5	6	7	8	9	10
Answer	1	2	3	4	5	6	7	8	9	10

P1 001 - 099 (Regular Memory Channel)
P1L - P9U (PMS)
P2 Frequency (Hz)
P3 Clarifier Direction +: Plus Shift, -: Minus Shift
Clarifier Offset: 0000 - 9999 (Hz)
P4 0: CLAR "OFF" 1: CLAR "ON"
P5 0: (Fixed)
P6 MODE 1: LSB 2: USB 3: CW 4: FM 5: AM 6: RTTY-LSB 7: CW-R
8: DATA-LSB 9: RTTY-USB A: - B: FM-N C: DATA-USB
D: AM-N
P7 0: (Fixed)
P8 0: CTCSS "OFF" 1: CTCSS ENC/DEC 2: CTCSS ENC
P9 00: (Fixed)
P10 0: Simplex 1: Plus Shift 2: Minus Shift

MX — MOX SET

	1	2	3	4	5	6	7	8	9	10
Set	**M**	**X**	P1	;						
Read	1	2	3	4	5	6	7	8	9	10
	M	**X**	;							
Answer	1	2	3	4	5	6	7	8	9	10
	M	**X**	P1	;						

P1 0: MOX "OFF"
1: MOX "ON"

NA — NARROW

	1	2	3	4	5	6	7	8	9	10
Set	**N**	**A**	P1	P2	;					
Read	1	2	3	4	5	6	7	8	9	10
	N	**A**	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10
	N	**A**	P1	P2	;					

P1 0: (Fixed)
P2 0: OFF
1: ON

NB — NOISE BLANKER STATUS

	1	2	3	4	5	6	7	8	9	10
Set	**N**	**B**	P1	P2	;					
Read	1	2	3	4	5	6	7	8	9	10
	N	**B**	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10
	N	**B**	P1	P2	;					

P1 0: (Fixed)
P2 0: Noise Blanker "OFF"
1: Noise Blanker "ON"

NL — NOISE BLANKER LEVEL

	1	2	3	4	5	6	7	8	9	10
Set	**N**	**L**	P1	P2	P2	P2	;			
Read	1	2	3	4	5	6	7	8	9	10
	N	**L**	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10
	N	**L**	P1	P2	P2	P2	;			

P1 0: (Fixed)
P2 000 - 010

NR — NOISE REDUCTION

	1	2	3	4	5	6	7	8	9	10
Set	**N**	**R**	P1	P2	;					
Read	1	2	3	4	5	6	7	8	9	10
	N	**R**	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10
	N	**R**	P1	P2	;					

P1 0: (Fixed)
P2 0: Noise Reduction "OFF"
1: Noise Reduction "ON"

CAT (Computer Aided Transceiver) Operation

OI — OPPOSITE BAND INFORMATION

	1	2	3	4	5	6	7	8	9	10
Set										
Read	**O**	**I**	;							
Answer	**O**	**I**	P1	P1	P1	P2	P2	P2	P2	P2
	11	12	13	14	15	16	17	18	19	20
	P2	P2	P2	P2	+/-	P3	P3	P3	P3	P4
	21	22	23	24	25	26	27	28	29	30
	P5	P6	P7	P8	P9	P9	P10	;		

P1 001 - 099 (Regular Memory Channel)
P1L - P9U (PMS)
501 - 510 (5 MHz, U.S. and U.K. version only)
EMG (Emergency)
P2 VFO-B Frequency (Hz)
P3 Clarifier Direction +: Plus Shift, -: Minus Shift
Clarifier Offset: 0000 - 9999 (Hz)
P4 0: CLAR "OFF" 1: CLAR "ON"
P5 0: (Fixed)
P6 MODE 1: SSB (SSB BFO) 2: SSB (SSB BFO) 3: CW 4: FM 5: AM
6: RTTY (RTTY BFO) 7: CW (CW BFO) 8: DATA (DATA BFO)
9: RTTY (RTTY BFO) A: - B: FM-N C: DATA (DATA BFO)
D: AM-N
P7 0: VFO 1: Memory 2: Memory Tune 3: Quick Memory Bank (QMB)
4: QMB-MT 5: PMS 6: HOME
P8 0: CTCSS "OFF" 1: CTCSS ENC/DEC 2: CTCSS ENC
P9 00: (Fixed)
P10 0: Simplex 1: Plus Shift 2: Minus Shift

OS — OFFSET (REPEATER SHIFT)

	1	2	3	4	5	6	7	8	9	10
Set	**O**	**S**	P1	P2	;					
Read	**O**	**S**	P1	;						
Answer	**O**	**S**	P1	P2	;					

P1 0: (Fixed)
P2 0: Simplex
1: Plus Shift
2: Minus Shift
*: This command can be activated only with an FM mode.

PA — PRE-AMP (IPO)

	1	2	3	4	5	6	7	8	9	10
Set	**P**	**A**	P1	P2	;					
Read	**P**	**A**	P1	;						
Answer	**P**	**A**	P1	P2	;					

P1 0:(Fixed)
P2 0: IPO
1: AMP

PB — PLAY BACK

	1	2	3	4	5	6	7	8	9	10
Set	**P**	**B**	P1	P2	;					
Read	**P**	**B**	P1	;						
Answer	**P**	**B**	P1	P2	;					

P1 0: DVS P2 0: DVS (Playback Stop)
1: DVS (CH "1" Playback Start)
2: DVS (CH "2" Playback Start)
3: DVS (CH "3" Playback Start)
4: DVS (CH "4" Playback Start)
5: DVS (CH "5" Playback Start)

PC — POWER CONTROL

	1	2	3	4	5	6	7	8	9	10
Set	**P**	**C**	P1	P1	P1	;				
Read	**P**	**C**	;							
Answer	**P**	**C**	P1	P1	P1	;				

P1 005 -100

PL — SPEECH PROCESSOR LEVEL

	1	2	3	4	5	6	7	8	9	10
Set	**P**	**L**	P1	P1	P1	;				
Read	**P**	**L**	;							
Answer	**P**	**L**	P1	P1	P1	;				

P1 000 -100

PR — SPEECH PROCESSOR

	1	2	3	4	5	6	7	8	9	10
Set	**P**	**R**	P1	P2	;					
Read	**P**	**R**	P1	;						
Answer	**P**	**R**	P1	P2	;					

P1 0: Speech Processor
1: Parametric Microphone Equalizer
P2 0: "OFF"
1: "ON"

CAT (Computer Aided Transceiver) Operation

PS	POWER SWITCH										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: POWER "OFF" 1: POWER "ON" This command requires dummy data be initially sent. Then after one second and before two seconds the command is sent.
	P	**S**	P1	;							
Read	1	2	3	4	5	6	7	8	9	10	
	P	**S**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	P	**S**	P1	;							

QI	QMB STORE										
Set	1	2	3	4	5	6	7	8	9	10	
	Q	**I**	;								
Read	1	2	3	4	5	6	7	8	9	10	
Answer	1	2	3	4	5	6	7	8	9	10	

QR	QMB RECALL										
Set	1	2	3	4	5	6	7	8	9	10	
	Q	**R**	;								
Read	1	2	3	4	5	6	7	8	9	10	
Answer	1	2	3	4	5	6	7	8	9	10	

QS	QUICK SPLIT										
Set	1	2	3	4	5	6	7	8	9	10	
	Q	**S**	;								
Read	1	2	3	4	5	6	7	8	9	10	
Answer	1	2	3	4	5	6	7	8	9	10	

RA	RF ATTENUATOR										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: (Fixed) P2 0: OFF 1: ON
	R	**A**	P1	P2	;						
Read	1	2	3	4	5	6	7	8	9	10	
	R	**A**	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	R	**A**	P1	P2	;						

RC	CLAR CLEAR										
Set	1	2	3	4	5	6	7	8	9	10	
	R	**C**	;								
Read	1	2	3	4	5	6	7	8	9	10	
Answer	1	2	3	4	5	6	7	8	9	10	

RD	CLAR DOWN										
Set	1	2	3	4	5	6	7	8	9	10	P1 0000 - 9999 (Hz)
	R	**D**	P1	P1	P1	P1	;				
Read	1	2	3	4	5	6	7	8	9	10	
Answer	1	2	3	4	5	6	7	8	9	10	

RG	RF GAIN										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: (Fixed) P2 000 - 030
	R	**G**	P1	P2	P2	P2	;				
Read	1	2	3	4	5	6	7	8	9	10	
	R	**G**	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	R	**G**	P1	P2	P2	P2	;				

CAT (Computer Aided Transceiver) Operation

RI	RADIO INFORMATION									
Set	1	2	3	4	5	6	7	8	9	10
Read	1	2	3	4	5	6	7	8	9	10
	R	**I**	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10
	R	**I**	P1	P2	;					

P1 0: Hi-SWR 3: REC 4: PLAY
A: TX LED B: RX LED
P2 0: OFF
1: ON

RL	NOISE REDUCTION LEVEL									
Set	1	2	3	4	5	6	7	8	9	10
	R	**L**	P1	P2	P2	;				
Read	1	2	3	4	5	6	7	8	9	10
	R	**L**	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10
	R	**L**	P1	P2	P2	;				

P1 0: (Fixed)
P2 01 - 15

RM	READ METER									
Set	1	2	3	4	5	6	7	8	9	10
Read	1	2	3	4	5	6	7	8	9	10
	R	**M**	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10
	R	**M**	P1	P2	P2	P2	;			

P1 0: Depends on the front panel METER 4: ALC
1: S 5: PO
2: Depends on the front panel METER 6: SWR
(PO / COMP / ALC / SWR / ID) 7: ID
3: COMP
P2 0 - 255

RS	RADIO STATUS									
Set	1	2	3	4	5	6	7	8	9	10
Read	1	2	3	4	5	6	7	8	9	10
	R	**S**	;							
Answer	1	2	3	4	5	6	7	8	9	10
	R	**S**	P1	;						

P1 0: NORMAL MODE
1: MENU MODE

RU	RX CLARIFIER PLUS OFFSET									
Set	1	2	3	4	5	6	7	8	9	10
	R	**U**	P1	P1	P1	P1	;			
Read	1	2	3	4	5	6	7	8	9	10
Answer	1	2	3	4	5	6	7	8	9	10

P1 0000 - 9999 (Hz)

SC	SCAN									
Set	1	2	3	4	5	6	7	8	9	10
	S	**C**	P1	;						
Read	1	2	3	4	5	6	7	8	9	10
	S	**C**	;							
Answer	1	2	3	4	5	6	7	8	9	10
	S	**C**	P1	;						

P1 0: Scan “OFF”
1: Scan “ON” (UP ward)
2: Scan “ON” (DOWN ward)

SD	CW BREAK-IN DELAY TIME									
Set	1	2	3	4	5	6	7	8	9	10
	S	**D**	P1	P1	P1	P1	;			
Read	1	2	3	4	5	6	7	8	9	10
	S	**D**	;							
Answer	1	2	3	4	5	6	7	8	9	10
	S	**D**	P1	P1	P1	P1	;			

P1 0030 - 3000 msec

SH	WIDTH									
Set	1	2	3	4	5	6	7	8	9	10
	S	**H**	P1	P2	P3	P3	;			
Read	1	2	3	4	5	6	7	8	9	10
	S	**H**	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10
	S	**H**	P1	P2	P3	P3	;			

P1 0: (Fixed)
P2 0: OFF
1: ON
P3 00 (See Table below)

CAT (Computer Aided Transceiver) Operation

Command	Bandwidth					
P3	SSB (Narrow)	SSB (Wide)	CW (Narrow)	CW (Wide)	RTTY/PSK (Narrow)	RTTY/PSK (Wide)
00 (Default)	1500 Hz	2400 Hz	500 Hz	2400 Hz	300 Hz	500 Hz
01	200 Hz	-	50 Hz	-	50 Hz	-
02	400 Hz	-	100 Hz	-	100 Hz	-
03	600 Hz	-	150 Hz	-	150 Hz	-
04	850 Hz	-	200 Hz	-	200 Hz	-
05	1100 Hz	-	250 Hz	-	250 Hz	-
06	1350 Hz	-	300 Hz	-	300 Hz	-
07	1500 Hz	-	350 Hz	-	350 Hz	-
08	1650 Hz	-	400 Hz	-	400 Hz	-
09	1800 Hz	1800 Hz	450 Hz	-	450 Hz	-
10	-	1950 Hz	500 Hz	500 Hz	500 Hz	500 Hz
11	-	2100 Hz	-	800 Hz	-	800 Hz
12	-	2200 Hz	-	1200 Hz	-	1200 Hz
13	-	2300 Hz	-	1400 Hz	-	1400 Hz
14	-	2400 Hz	-	1700 Hz	-	1700 Hz
15	-	2500 Hz	-	2000 Hz	-	2000 Hz
16	-	2600 Hz	-	2400 Hz	-	2400 Hz
17	-	2700 Hz	-	3000 Hz	-	3000 Hz
18	-	2800 Hz	-	-	-	-
19	-	2900 Hz	-	-	-	-
20	-	3000 Hz	-	-	-	-
21	-	3200 Hz	-	-	-	-

SM	**S-METER READING**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: (Fixed) P2 000 - 255
Read	1	2	3	4	5	6	7	8	9	10	
	S	**M**	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	S	**M**	P1	P2	P2	P2	;				

SQ	**SQUELCLH LEVEL**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: (Fixed) P2 000 - 100
	S	**Q**	P1	P2	P2	P2	;				
Read	1	2	3	4	5	6	7	8	9	10	
	S	**Q**	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	S	**Q**	P1	P2	P2	P2	;				

ST	**SPLIT**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: SPLIT “OFF” 1: SPLIT “ON” 2: SPLIT “ON” + 5 kHz up
	S	**T**	P1	;							
Read	1	2	3	4	5	6	7	8	9	10	
	S	**T**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	S	**T**	P1	;							

SV	**SWAP VFO**									
Set	1	2	3	4	5	6	7	8	9	10
	S	**V**	;							
Read	1	2	3	4	5	6	7	8	9	10
Answer	1	2	3	4	5	6	7	8	9	10

TS	**TXW**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: TXW “OFF” 1: TXW “ON”
	T	**S**	P1	;							
Read	1	2	3	4	5	6	7	8	9	10	
	T	**S**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	T	**S**	P1	;							

CAT (Computer Aided Transceiver) Operation

TX	**TX SET**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: RADIO TX "OFF" CAT TX "OFF" 1: RADIO TX "OFF" CAT TX "ON" 2: RADIO TX "ON" CAT TX "OFF" (Answer)
	T	**X**	P1	;							
Read	1	2	3	4	5	6	7	8	9	10	
	T	**X**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	T	**X**	P1	;							

UL	**PLL UNLOCK STATUS**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: PLL "Lock" 1: PLL "Unlock"
Read	1	2	3	4	5	6	7	8	9	10	
	U	**L**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	U	**L**	P1	;							

UP	**UP**										
Set	1	2	3	4	5	6	7	8	9	10	
	U	**P**	;								
Read	1	2	3	4	5	6	7	8	9	10	
Answer	1	2	3	4	5	6	7	8	9	10	

VD	**VOX DELAY TIME**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0030 - 3000 msec (10 msec multiples)
	V	**D**	P1	P1	P1	P1	;				
Read	1	2	3	4	5	6	7	8	9	10	
	V	**D**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	V	**D**	P1	P1	P1	P1	;				

VG	**VOX GAIN**										
Set	1	2	3	4	5	6	7	8	9	10	P1 000 - 100
	V	**G**	P1	P1	P1	;					
Read	1	2	3	4	5	6	7	8	9	10	
	V	**G**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	V	**G**	P1	P1	P1	;					

VM	**VFO-A TO MEMORY CHANNEL**										
Set	1	2	3	4	5	6	7	8	9	10	
	V	**M**	;			;					
Read	1	2	3	4	5	6	7	8	9	10	
Answer	1	2	3	4	5	6	7	8	9	10	

VX	**VOX STATUS**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: VOX "OFF" 1: VOX "ON"
	V	**X**	P1	;		;					
Read	1	2	3	4	5	6	7	8	9	10	
	V	**X**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	V	**X**	P1	;							

ZI	**ZERO IN**										
Set	1	2	3	4	5	6	7	8	9	10	(CW AUTO ZERO IN Function)
	Z	**I**	;			;					
Read	1	2	3	4	5	6	7	8	9	10	
Answer	1	2	3	4	5	6	7	8	9	10	

YAESU
The radio

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1909-C

12/26/22

FT-891 Firmware Update Information

The latest versions are listed below with the release dates.

- **MAIN Firmware Version 01-10 (12/26/22)**
- **DSP Firmware Version 02-05 (12/26/22)**
- **Panel Firmware Version 01-01 (9/06/17)**

*If you already have the above listed firmware versions, it is not necessary to update the FT-891 again.

There are three different firmware installations. Each one must be followed carefully. Installing the wrong type firmware may cause difficulties. Check your radio before installing firmware to be sure which updates are needed. **Please read the FT-891 Firmware Upgrade Manual before proceeding.**

Before installing new firmware, please verify your current version firmware with the following procedure:

How to Confirm the Current Firmware Version of the transceiver

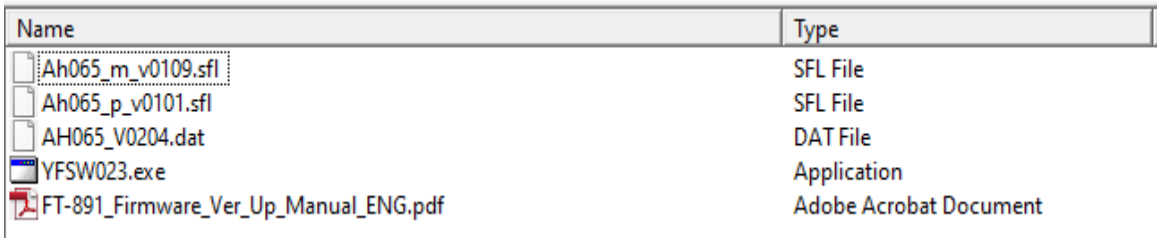
MAIN, DSP, and LCD(Panel) firmware are available for FT-891 transceiver. Check the firmware version, and perform firmware updates when needed.

1. Press and hold the **[PWR/LOCK]** key to turn the transceiver ON.
2. Press and hold the **[F]** key to activate the Menu mode.
3. Rotate the MULTI function knob to select Menu Mode "**18-01 [MAIN VERSION]**", "**18-02 [DSP VERSION]**" or "**18-03 [LCD VERSION]**".
   The firmware versions will be displayed on the LCD screen.

(This image & version is for illustration only)

Download the FT-891 data and [**FT-891_Firmware_Update_2022_12.zip**] from the following website:
https://www.yaesu.com/indexVS.cfm?cmd=DisplayProducts&ProdCatID=102&encProdID=DF4DB262968932E999EAF928B5B6A1A7&DivisionID=65&isArchived=0

The zip file contains all of the current software versions. Please verify which version software is already on your radio before updating. If you have each of the listed versions, you do not need to update the radio again.



Name	Type
Ah065_m_v0109.sfl	SFL File
Ah065_p_v0101.sfl	SFL File
AH065_V0204.dat	DAT File
YFSW023.exe	Application
FT-891_Firmware_Ver_Up_Manual_ENG.pdf	Adobe Acrobat Document

Please read the FT-891 Firmware Upgrade Manual before proceeding!

Implements improvements

MAIN Firmware Version 01-10 (12/26/22)
DSP Firmware Version 02-05 (12/26/22)

1. Update due to manufacturing process (no change in transceiver behavior).

We hope this new firmware will increase your enjoyment of your FT-891. Thank you for choosing Yaesu radios. If you have any problems or questions, please contact Yaesu Amateur Tech Support amateurtech@yaesu.com.

Best regards,

FT-891
Firmware Update Manual

Use this software on a personal computer to update the firmware of the FT-891 transceiver after connecting it to the personal computer.

Important

Before downloading the software, please read the “Important Notes” carefully.
Downloading or installing this software will signify your agreement with the stipulations of the “Important Notes”.
“Transceiver” is used hereafter to refer to the Yaesu FT-891 transceiver.

CAUTION!
Be sure to confirm the model and the version of your transceiver before starting the update.
Writing incorrect firmware to the transceiver may cause abnormal operation or failure.

Important Notes

- All responsibility for the use of this software lies with the customer. Yaesu Musen Co., LTD cannot be held responsible in any way for damage or loss which may be incurred by the customer as a result of using this software.
- Copyrights and all other intellectual property rights for the software, as well as the software manual, are the property of YAESU MUSEN CO., LTD.
- The revision, modification, reverse engineering, or decompiling of this software is prohibited. Redistribution, transfer, and resale of downloaded files are also prohibited.
- Downloaded files are for personal use only.
- If you cannot perform the firmware update yourself, please consult with one of our sales sites or service centers.

System Requirements (Operating Environment)

Supported Operating Systems

- Microsoft® Windows® 11
- Microsoft® Windows® 10
- Microsoft® Windows® 8.1

CPU

CPU which satisfies OS (operating system) requirements

RAM (System Memory)

Sufficient RAM (system memory) to meet or exceed the OS (operating system) requirements

HDD (Hard Disk)

HDD (hard disk) with capacity to meet or exceed the OS (operating system) requirements
In addition to having sufficient free space for the OS to operate, the program requires 20Mbyte or more of free space.

Necessary PC interface

USB port (USB1.1/USB2.0)
Do not connect the USB cable to the personal computer and the FT-891 until after the “virtual COM port driver” installation is completed, because the wrong driver may inadvertently be installed.

USB Driver (for Performing Version Updates via the USB Port)

Install the FT-891 virtual COM port driver on the personal computer before beginning the firmware update process.
Please see “**FT-891 USB Driver (Virtual COM Port Driver)**” on the Yaesu Website for details (http://www.yaesu.com/).

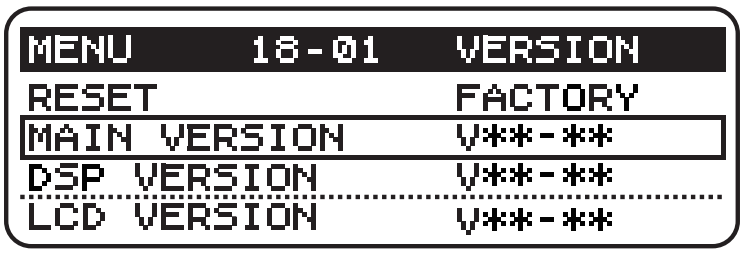
Cables

USB cable (type A to B)
Please have a commercially available cable ready.

How to Confirm the Current Firmware Version of the transceiver

MAIN, DSP, and LCD(Panel) firmware are available for FT-891 transceiver. Check the firmware version, and perform firmware updates when needed.

1. Press and hold the [**PWR/LOCK]** key to turn the transceiver **ON**.
2. Press and hold the [**F**] key to activate the Menu mode.
3. Rotate the MULTI function knob to select Menu Mode "**18-01** [**MAIN VERSION**]", "**18-02** [**DSP VERSION**]" or "**18-03** [**LCD VERSION**]".
   The firmware versions will be displayed on the LCD screen.



Regarding this Firmware

Before beginning the firmware update process, install the FT-891 virtual COM port driver on the personal computer.

See "**FT-891 USB Driver (Virtual COM Port Driver)**" on the Yaesu Website for details (http://www.yaesu.com/).

If the FT-891 virtual COM port driver has already been installed on the personal computer, skip this step and proceed with the following firmware update steps respectively:

How to Update the MAIN Firmware (see page 4)

Downloading the MAIN Firmware

Transfer Software: YFSW023

Firmware: AH065_M_V****.SFL

How to Update the DSP Firmware (see page 7)

Downloading the DSP Firmware

Transfer Software: YFSW023

Firmware: AH065_V****.dat

How to Update the LCD(Panel) Firmware (see page 10)

Downloading the LCD(Panel) Firmware

Transfer Software: YFSW023

Firmware: AH065_P_V****.SFL

How to Reset the Transceiver after updating the firmware (All Reset)

CAUTION!

The transceiver needs all settings to be reset immediately after updating the firmware.
Resetting the transceiver will clear all memories.
Please make a note of the memories (memory channel settings, etc) before updating firmware.

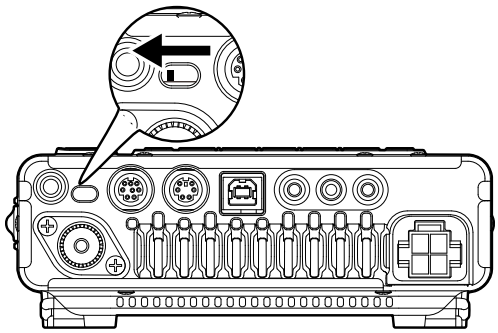
All Reset

1. Press and hold in the [**F**] key for one second to activate the Menu mode.
2. Rotate the **MULTI function** knob to select Menu Mode "**17-01** [**RESET**]".
3. Press the **MULTI function** knob, and then rotate the **MULTI function** knob to select "**ALL**".
4. Press and hold the **MULTI function** knob to reset and automatically restart the transceiver.

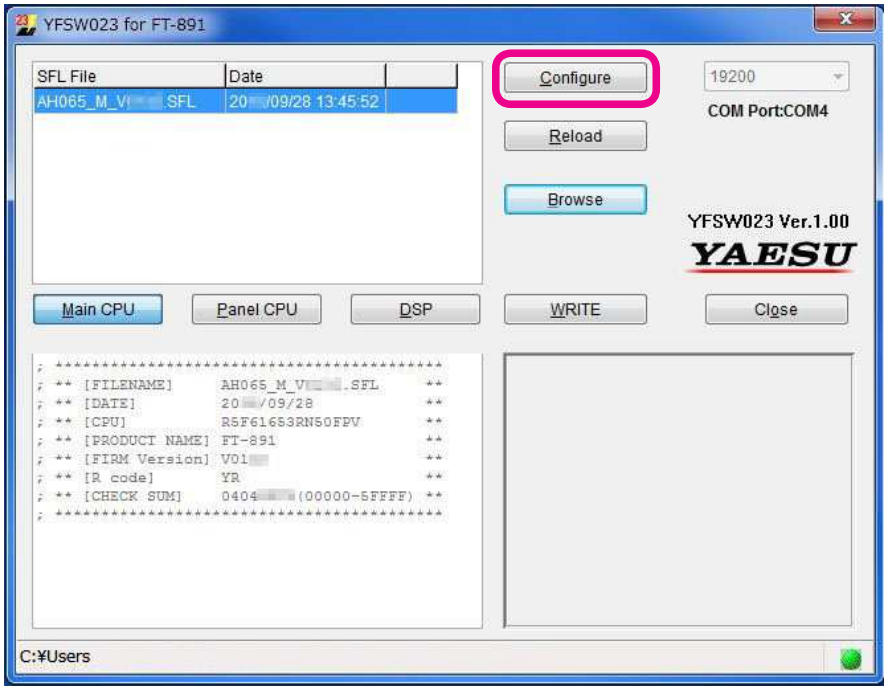
How to Update the MAIN Firmware

Preparation: Download the **YFSW023** transfer software, and the **AH065_M_V****.SFL** firmware, to the same folder on the PC, and Unzip the downloaded zip file.

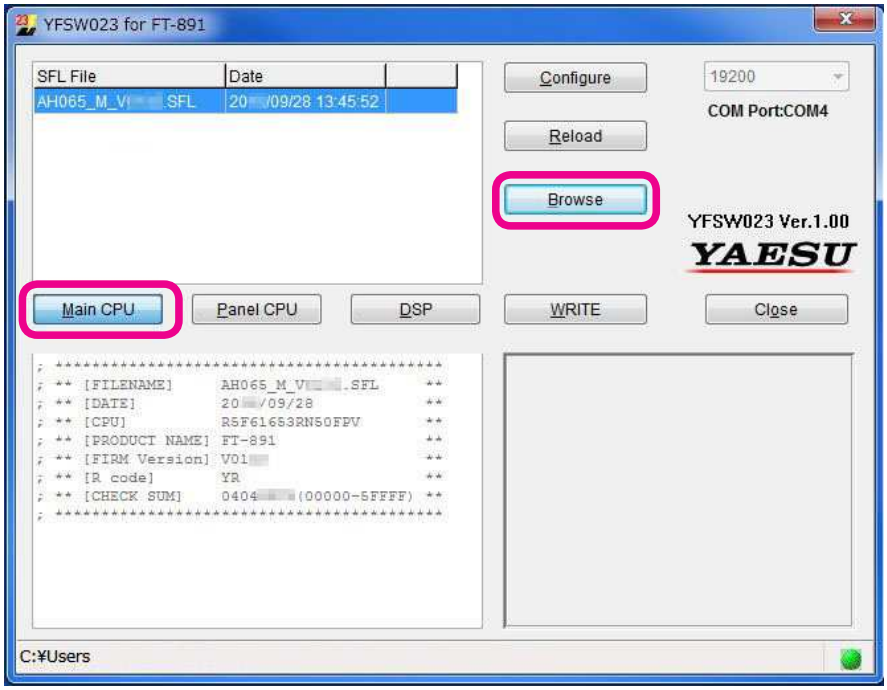
1. Confirm that the transceiver is turned **OFF**, and then disconnect the DC power cord, and all other cables from the transceiver unit.
2. Use a standard, commercially available USB cable, to connect the transceiver USB terminal and the PC USB port.
   (The FT-891 virtual COM port driver must be installed on the PC before connecting the USB cable.)
3. Move the programming slide switch (located on the rear panel of the transceiver) toward the left side (use a pin).



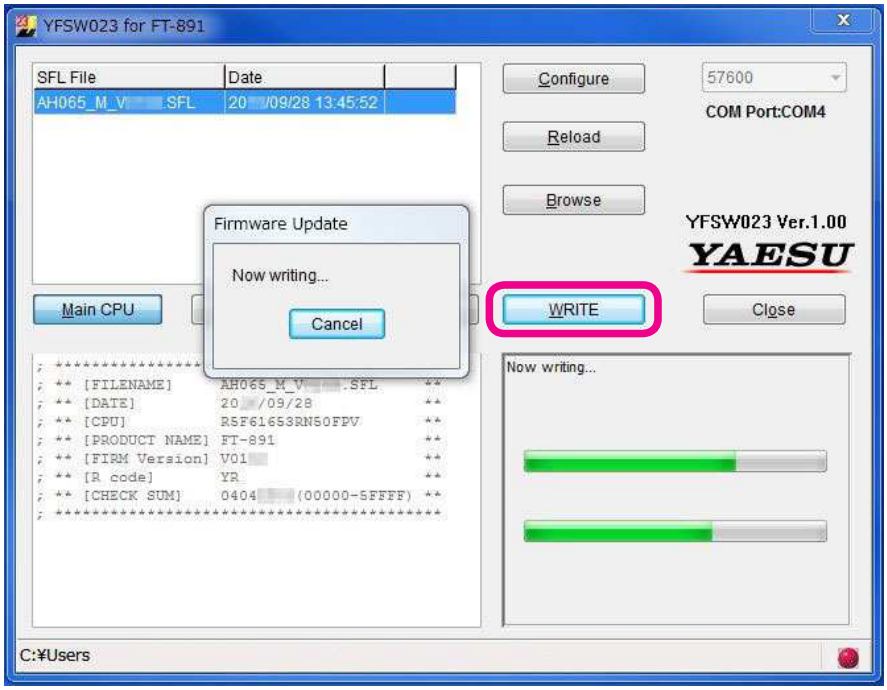
4. Confirm that the external power supply is turned **OFF**, and then connect the DC power cord to the transceiver.
5. Turn the external power supply **ON**.
   This puts the transceiver into programming mode (the display will be blank).
   NOTE: **Do not touch the transceiver POWER switch.**
6. Execute the **YFSW023** transfer software on the PC.
7. Click the [**Configure**] button on the YFSW023 transfer software screen, and set the COM port number.
   (Use an Enhanced COM port when using a USB cable. Please see "**FT-891 Virtual COM Port Driver**" on the Yaesu Website for details (http://www.yaesu.com/)).



8. Click the [**Browse**] button on the YFSW023 transfer software screen, and then select the folder that contains the previously downloaded, SFL transfer firmware file.
9. Click the [**Main CPU**] button on the YFSW023 transfer software screen.
   Only the MAIN firmware file will be displayed.

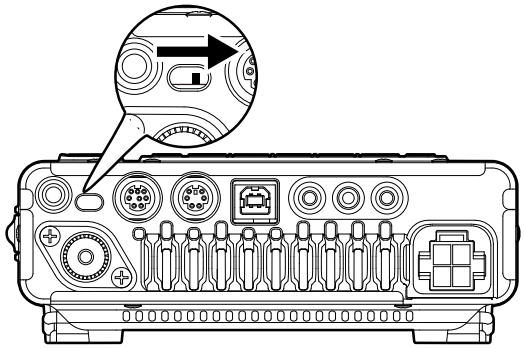


10. Click the [**WRITE**] button on the YFSW023 transfer software screen.
    The firmware transfer process will begin.



11. hen the update is successful, the following screen will appear. Then click the [**OK**] button.

12. Click the [**Close**] button on the transfer software screen.
13. Turn the external power supply **OFF**.
14. Move the programming switch (located on the rear panel of the transceiver) toward the right side (use a pin).



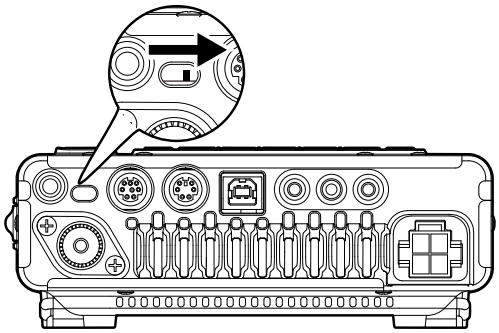
15. Disconnect the USB cable from the transceiver and the personal computer.
16. Turn the external power supply **ON**.
17. Press and hold the [**PWR/LOCK**] key to turn the transceiver **ON**.
18. Reset the transceiver.
    For details, **see "How to Update the MAIN Firmware" on page 4**.
19. Confirm the updated Firmware Version of the transceiver
    For details, **see "How to Confirm the Current Firmware Version of the transceiver" on page 2**.

If there is a problem during the updating process, turn the transceiver OFF, turn the external power supply OFF, and disconnect the DC cable from the transceiver. Then close the YFSW023 transfer software, and try the complete update process again.

How to Update the DSP Firmware

Preparation: Download the **YFSW023** transfer software, and the **AH065_V****.dat** firmware, to the same folder on the PC, and Unzip the downloaded zip file.

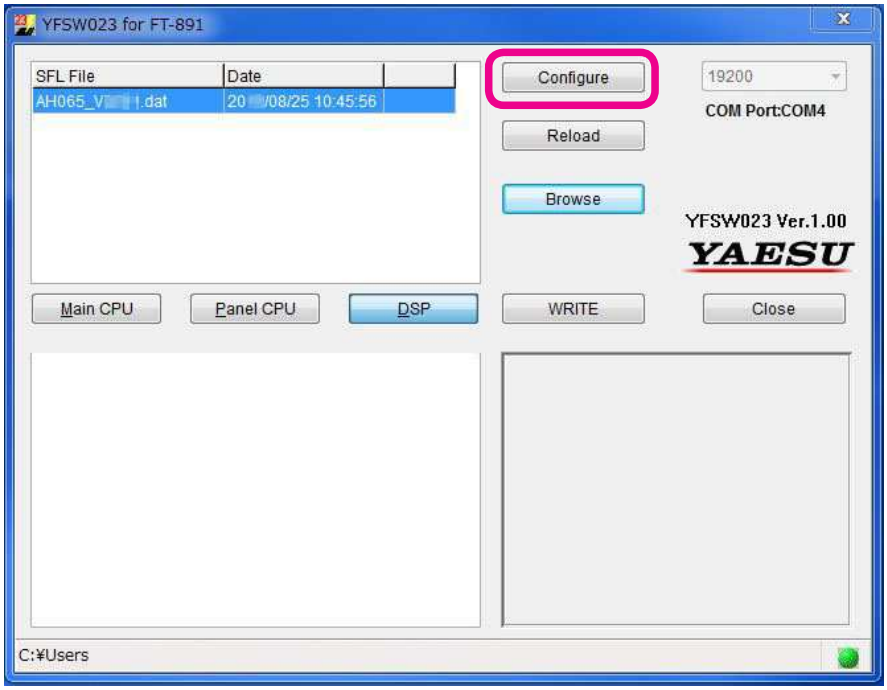
1. Confirm that the transceiver is turned **OFF**. Then disconnect the DC power cord, and all other cables from the transceiver.
2. Use a standard, commercially available USB cable, to connect the transceiver USB terminal and the PC USB port.
   (The FT-891 virtual COM port driver must be installed before connecting the USB cable.)
3. Confirm that the programming slide switch (located on the rear panel of the transceiver) is set to the right side.



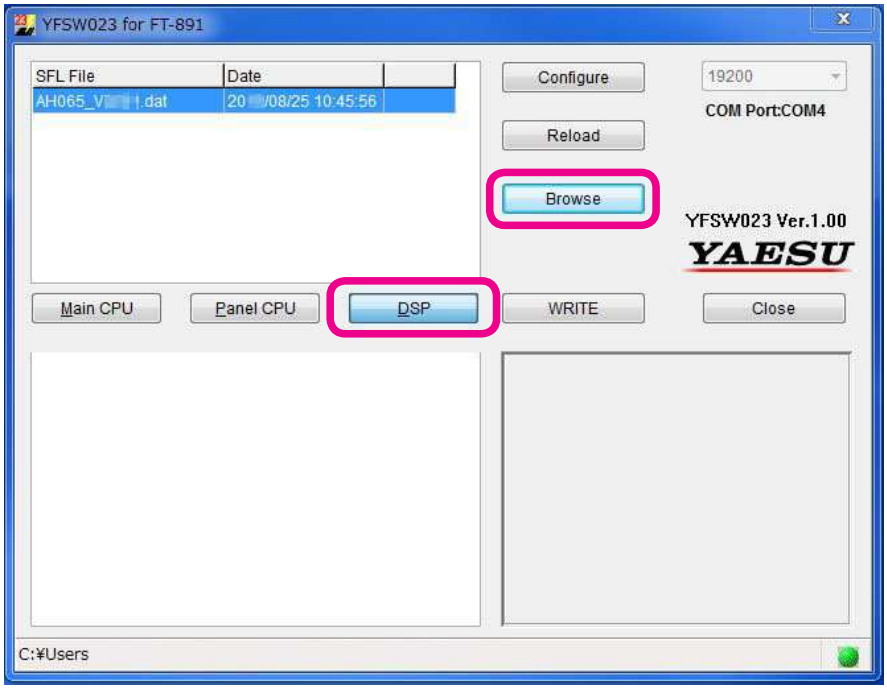
4. Confirm that the external power supply is turned **OFF**, and then connect the DC power cord to the transceiver.
5. Turn the external power supply **ON**.
6. Press and hold the [**PWR/LOCK**] key while pressing the [**F**] + [**C**] keys on the transceiver main panel, to turn the transceiver **ON** in the DSP programming mode.
   The below message will appear on the transceiver display.

7. Execute the **YFSW023** transfer software on the PC.

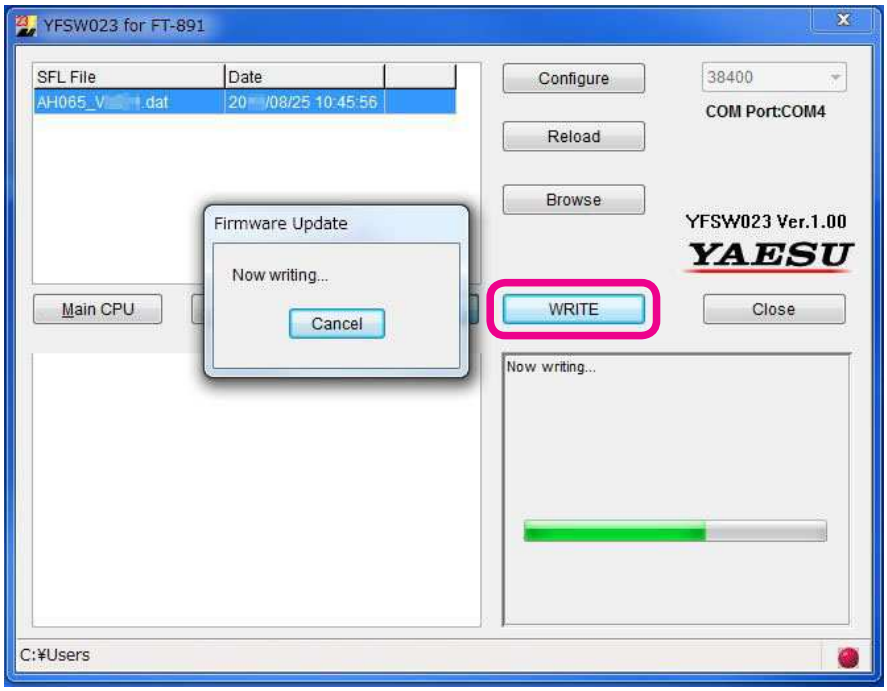
8. Click the [**Configure**] button on the YFSW023 transfer software screen, and then set the COM port number.
   (Select an Enhanced COM port when using a USB cable. Please see “FT-891 Virtual COM Port Driver” on the Yaesu Website for details (http://www.yaesu.com/)).



9. Click the [**Browse**] button on the YFSW023 transfer software screen. Then select the folder that contains the previously downloaded transfer firmware (dat file).
10. Click the [**DSP**] button on the YFSW023 transfer software screen.
    Only the dat firmware file will be displayed.



11. Click the [**WRITE**] button on the YFSW023 transfer software screen.
    The firmware transfer process will begin.



12. When the update is successful, the following screen will display. Then click the [**OK**] button.

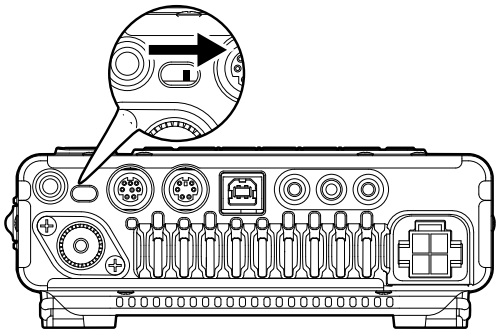
13. Click the [**Close**] button on the transfer software screen.
14. Press and hold the [**PWR/LOCK**] key to turn the transceiver **OFF**.
15. Turn the external power supply **OFF**.
16. Disconnect the USB cable from the transceiver and the personal computer.
17. Turn the external power supply **ON**.
18. Press and hold the [**PWR/LOCK**] key to turn the transceiver **ON**.
19. Reset the transceiver.
    For details, **see "How to Reset the Transceiver after updating the firmware (All Reset)" on page 3**.
20. Confirm the updated Firmware Version of the transceiver
    For details, **see "How to Confirm the Current Firmware Version of the transceiver" on page 2**.

If there is a problem during the updating process, turn the transceiver OFF, turn the external power supply OFF, and disconnect the DC cable from the transceiver. Then close the YFSW023 transfer software, and try the complete update process again.

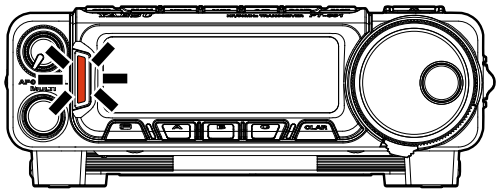
How to Update the LCD(Panel) Firmware

Preparation: Download the **YFSW023** transfer software and the **AH065_P_V****.SFL** firmware to the same folder on the PC, and Unzip the downloaded zip file.

1. Confirm that the transceiver is turned **OFF**. Then disconnect the DC power cord and all other cables from the transceiver.
2. Use a standard, commercially available USB cable, to connect the transceiver USB terminal and the PC USB port.
   (The FT-891 virtual COM port driver must be installed before connecting the USB cable).
3. Confirm that the programming slide switch (located on the rear panel of the transceiver) is set to the right side.

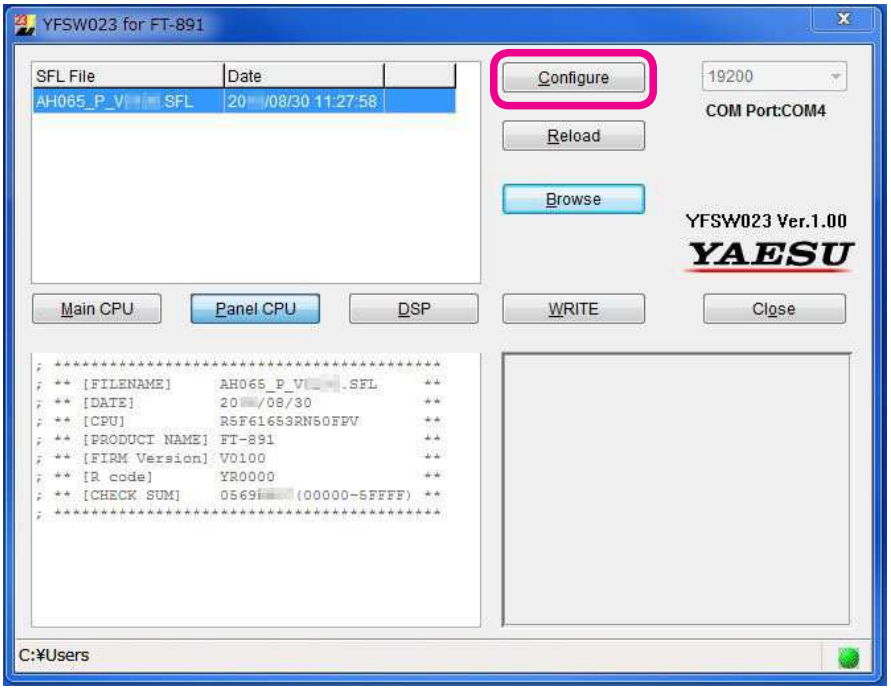


4. Confirm that the external power supply is turned **OFF**, and then connect the DC power cord to the transceiver.
5. Turn the external power supply **ON**.
6. Press and hold the [**PWR/LOCK**] key while pressing the [**BAND**] + [**FAST**] keys on the transceiver main panel, to turn the transceiver **ON** in the LCD(Panel) Firmware programming mode.
   The TX/BUSY Indicator on the transceiver will glow orange.

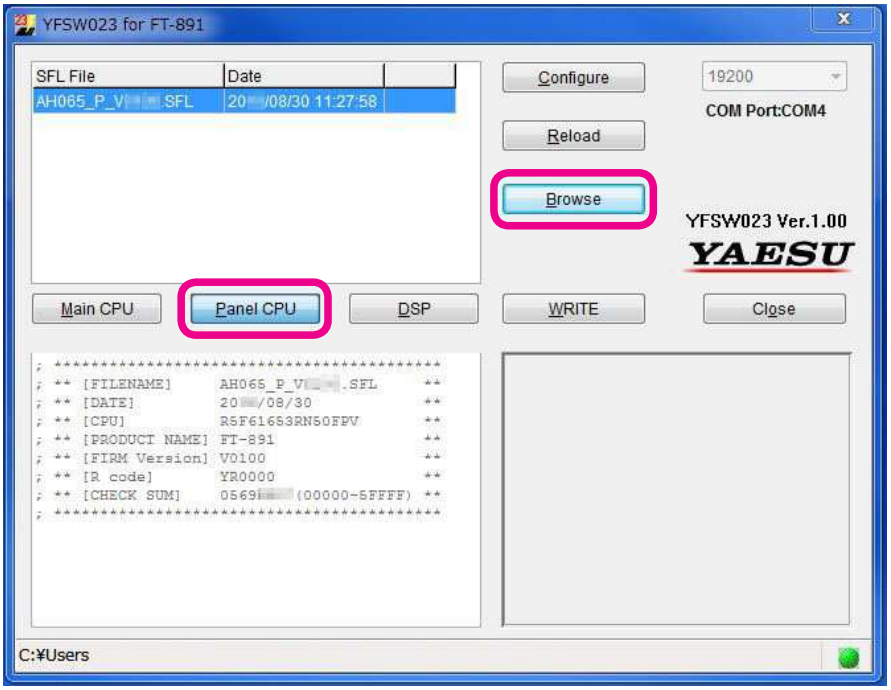


7. Execute the **YFSW023** transfer software on the PC.

8. Click the [**Configure**] button on the **YFSW023** transfer software screen and then set the COM port number.
   (Select an Enhanced COM port when using a USB cable. Please see “FT-891 Virtual COM Port Driver” on the Yaesu Website for details (http://www.yaesu.com/)).

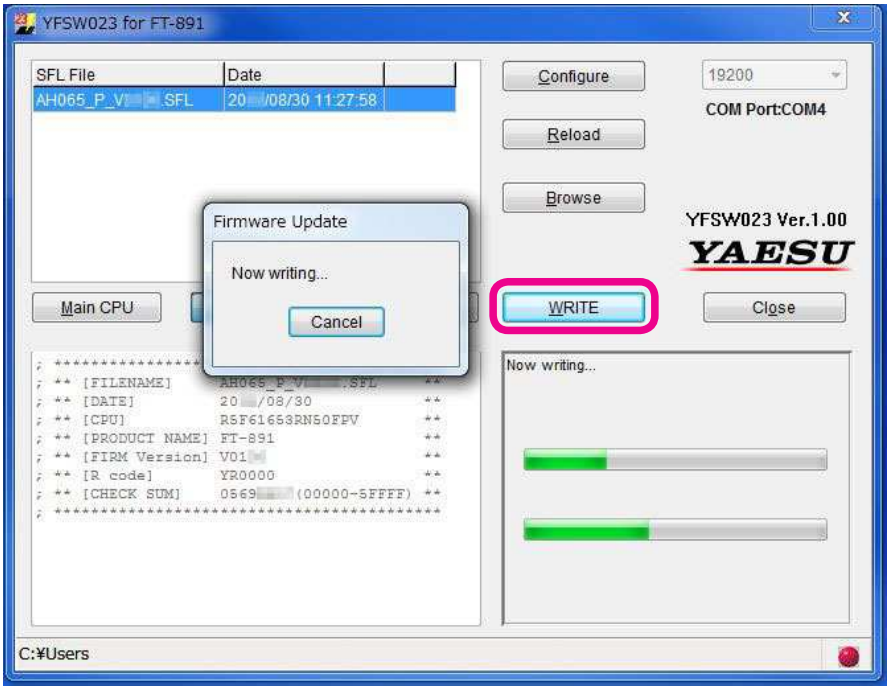


9. Click the [**Browse**] button on the YFSW023 transfer software screen. Then select the folder that contains the previously downloaded transfer firmware (SFL file).
10. Click the [**Panel CPU**] button on the YFSW023 transfer software screen.
    Only the LCD(Panel) firmware file will be displayed.



11. Click the [**WRITE**] button on the YFSW023 transfer software screen.

The firmware transfer process will begin.



12. When the update is successful, the following screen will be displayed. Then click the [**OK**] button.

13. Click the [**Close**] button on the transfer software screen.
14. Press and hold the [**PWR/LOCK**] key to turn the transceiver **OFF**.
15. Turn the external power supply **OFF**.
16. Disconnect the USB cable from the transceiver and the personal computer.
17. Turn the external power supply **ON**.
18. Press and hold the [**PWR/LOCK**] key to turn the transceiver **ON**.
19. Reset the transceiver.
    For details, see **"How to Reset the Transceiver after updating the firmware (All Reset)" on page 3**.
20. Confirm the updated Firmware Version of the transceiver
    For details, see **"How to Confirm the Current Firmware Version of the transceiver" on page 2**.

If there is a problem during the updating process, turn the transceiver OFF, turn the external power supply OFF, and disconnect the DC cable from the transceiver. Then close the YFSW023 transfer software, and try the complete update process again.

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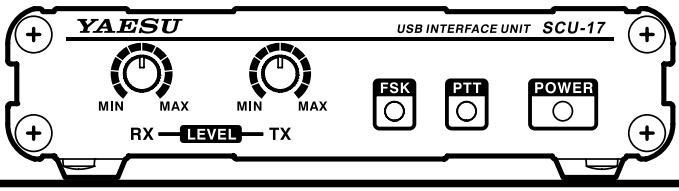
SCU-17 USB INTERFACE UNIT

Instruction Manual



Introduction

The SCU-17 interface unit may be used for CAT control of the transceiver with a computer via a USB connection; and for communications using SSTV, RTTY and PSK digital modes.

Note: YAESU does not produce CAT, SSTV, RTTY and PSK System operating software, due to the wide variety of personal computers, operating systems, and applications in use today.

- ❒ The SCU-17 provides CAT communication through the USB terminal when a PC does not have an RS-232C connection.
- ❒ The SCU-17 is equipped with a USB audio system device, so the TX and RX audio system signals are accessible to the SCU-17 through the USB cable. Therefore, the supplied USB cable is the only connection needed between the SCU-17 and PC.
- ❒ The SCU-17 is equipped with a two-channel USB serial device and enables the various transmission modes and the CAT communication simultaneously.
- ❒ The SCU-17 operates from the USB bus power; you do not need to prepare an external power supply.
- ❒ For RF isolation, the SCU-17 is designed with photo relays for the PTT/FSK terminals. AF transformers are used in the AUDIO IN/OUT lines to provide excellent ground isolation.
- ❒ The SCU-17 is equipped with the TX and RX audio controls on the front panel, for convenient level adjustment.
- ❒ LED indicators on the SCU-17 front panel monitor the PTT and FSK control. The operating conditions may be quickly confirmed.
- ❒ When using the SCU-17 to perform TX control, the transceiver may switch to transmit mode when the computer is started.

Safety Precautions (Be Sure to Read)

Be sure to read the safety precautions of Operating Manual of the compatible transceiver to use this product safely.

Virtual COM port driver Installation

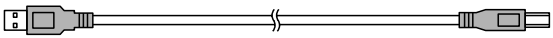
Install the virtual COM port driver on the personal computer before using the SCU-17 USB interface unit.
Please see the USB Driver (Virtual COM Port Driver) on the Yaesu Website for details refer to (http://www.yaesu.com/) in the FTDX1200 product files section.

Note: Do not connect the USB cable and SCU-17 to your personal computer until after the "virtual COM port driver" installation is completed, because an incorrect driver may be installed.

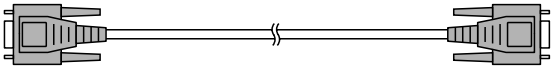
- ❒ For assistance with the software port configuration, refer to "How to Confirm the Installation, and the COM Port Number" in the "Virtual COM port Driver Installation Manual".
- ❒ For information on port configuration for commercial and free computer software, refer to the manual for the software being used.
- ❒ When using the USB cable to supply TX and RX audio signals, set the Sound Card (input and output) settings to "USB Audio CODEC".
- ❒ When using the USB cable for computer TX control, the transceiver may switch to transmit mode when the computer is started, etc.
- ❒ YAESU does not provide technical support for the use or operation of commercial or free computer software.

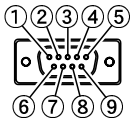
Accessories

USB cable (Type “A” male to Type “B” male) ..... 1 pc



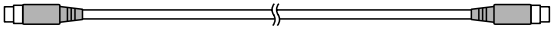
RS-232C cable (female to female, Straight Type) ..... 1 pc





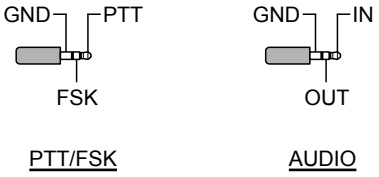
① N/A
② SERIAL IN
③ SERIAL OUT
④ N/A
⑤ GND
⑥ N/A
⑦ RTS
⑧ CTS
⑨ NC

Connection cable (MDIN6P - MDIN6P) ..... 1 pc



① DATA OUT
② GND
③ DATA PTT
④ FSK OUT
⑤ DATA IN
⑥ SQL IN

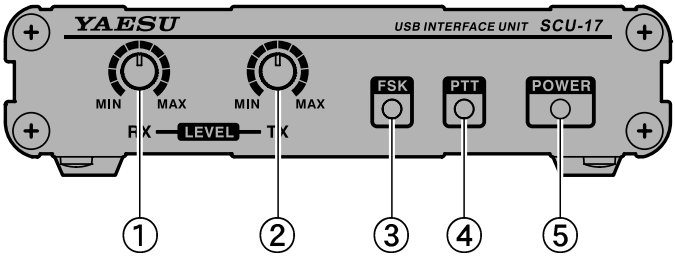
3.5 mm Stereo plug ..... 2 pcs



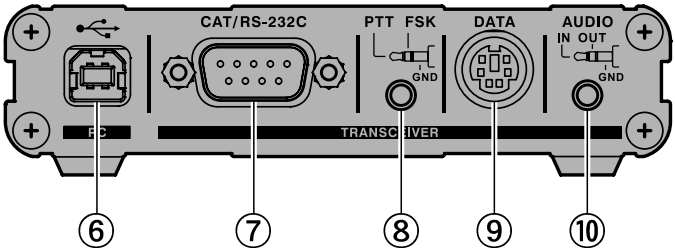
Instruction manual

Controls & Connections

Front Panel



Rear Panel



① RX audio level control knob
This knob adjusts the RX audio level.

② TX audio level control knob
This knob adjusts the TX audio level.

③ FSK Indicator
This indicator illuminates when the Mark frequency is shifted.

④ TX Indicator
This indicator illuminates during transmission.

⑤ POWER Indicator

⑥ USB Connector
Connect to a computer from this jack using the supplied USB cable.

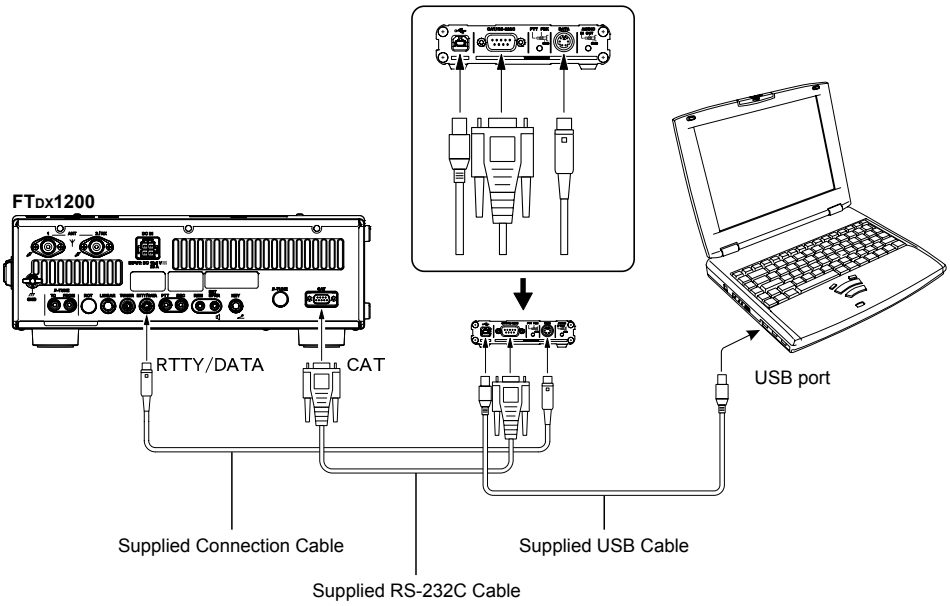
⑦ CAT/RS-232C Jack
This 9-pin serial DB-9 jack allows CAT communication of the transceiver.
Connect a supplied RS-232C cable here and to the transceiver.

⑧ 3.5 mm stereo Jack (PTT/FSK)
This 3-conductor, 3.5 mm stereo jack is used for PTT/FSK. For RF isolation, these terminals are designed with photo relays.

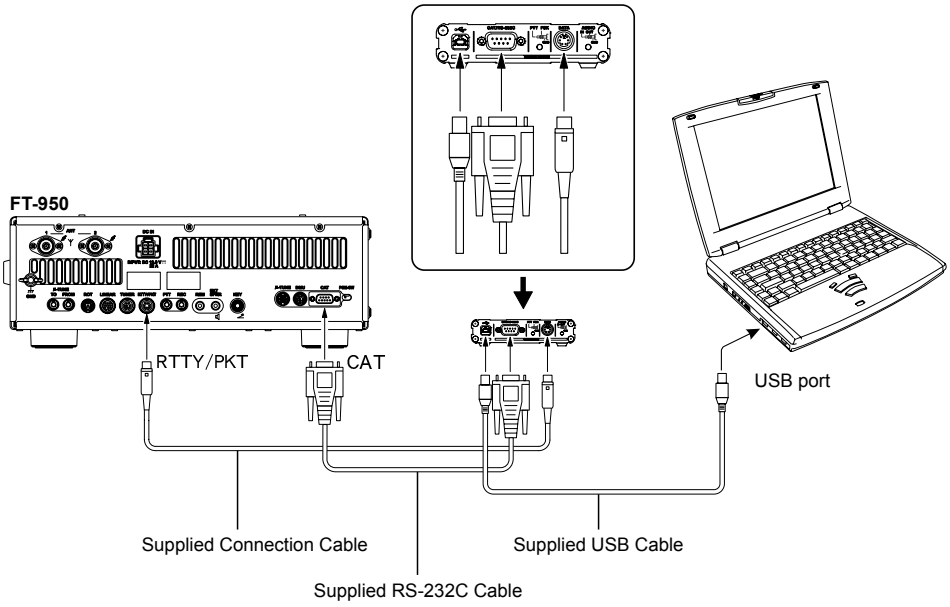
⑨ DATA Jack
This 6-pin (MDIN6P) jack allows DATA communication of the transceiver.

⑩ 3.5 mm stereo Jack (Audio IN/OUT)
This 3-conductor, 3.5 mm stereo jack is used for Audio IN/OUT. For RF isolation, AF transformers are used in the AUDIO IN/OUT lines.
This Jack is equipped with an attenuator that is applied to the audio output.
See page 15 for details about attenuation.

FTDX1200

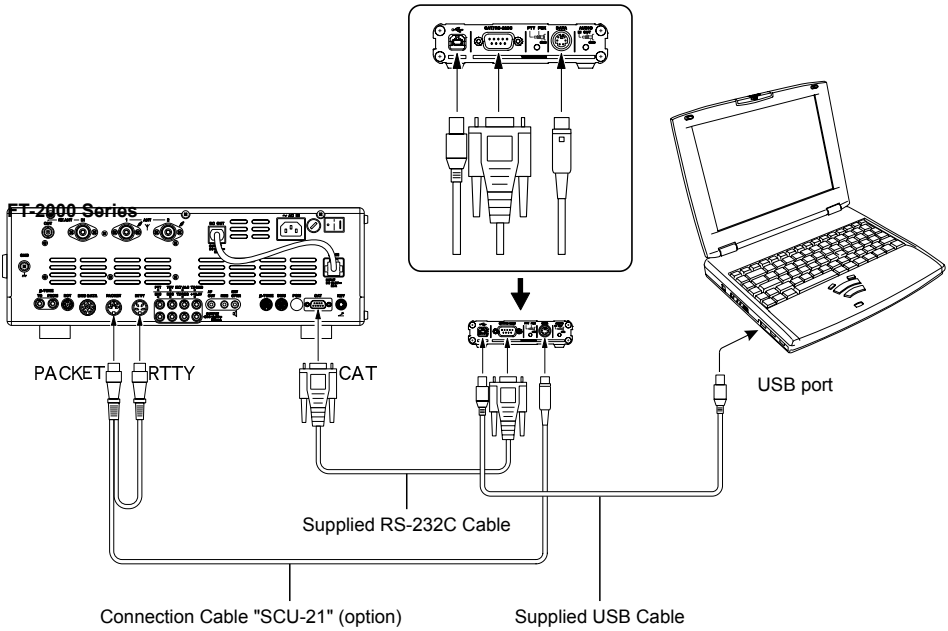


FT-950

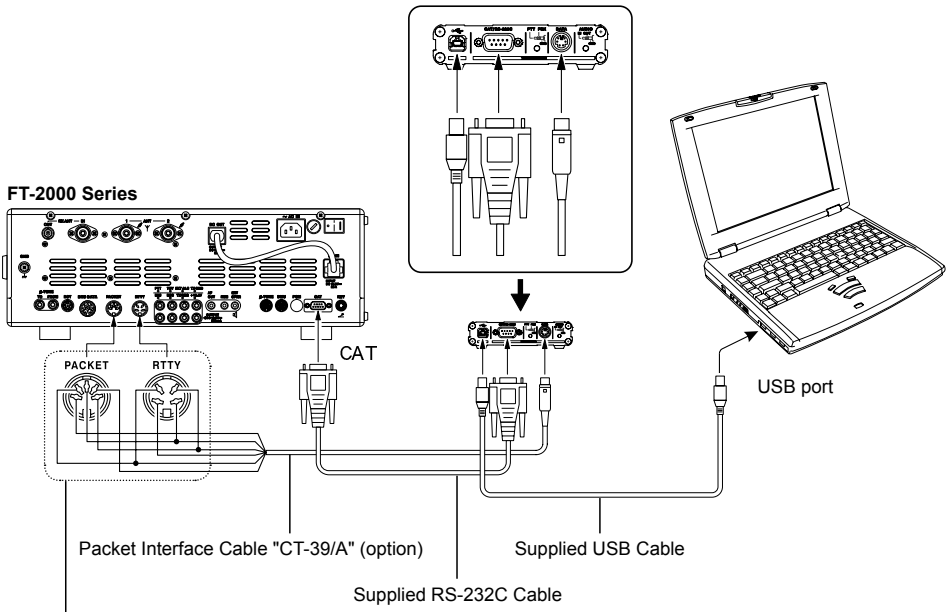


System Setup

FT-2000 Series / SCU-21

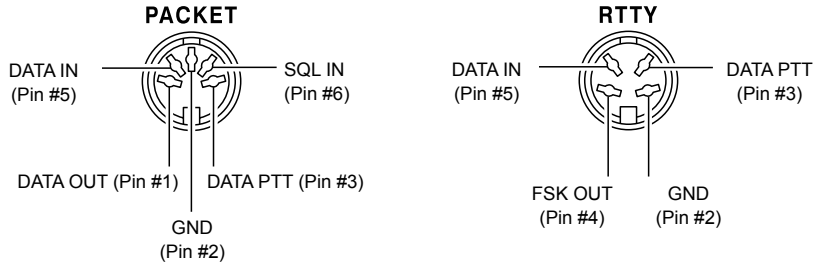


FT-2000 Series / CT-39/A



SCU-17 DATA Jack Pin #	CT-39	CT-39A
#1	Black	Brown
#2	Brown	Red
#3	Red	Orange
#4	Orange*	Yellow
#5	Yellow	Green
#6	Green	Blue
Shell	Shield (BLK)	

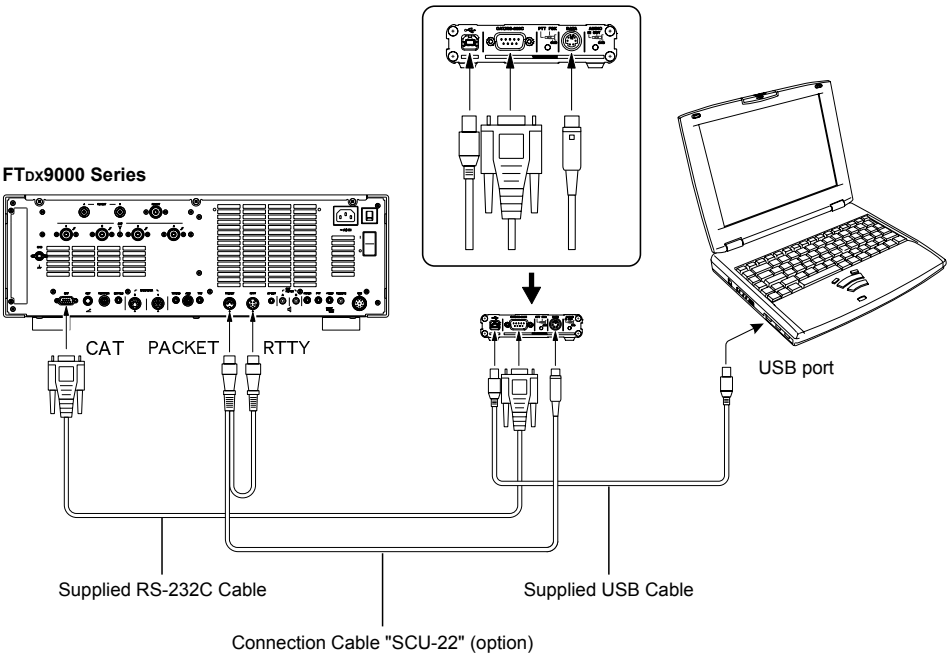
* : The CT-39 orange wire may be white



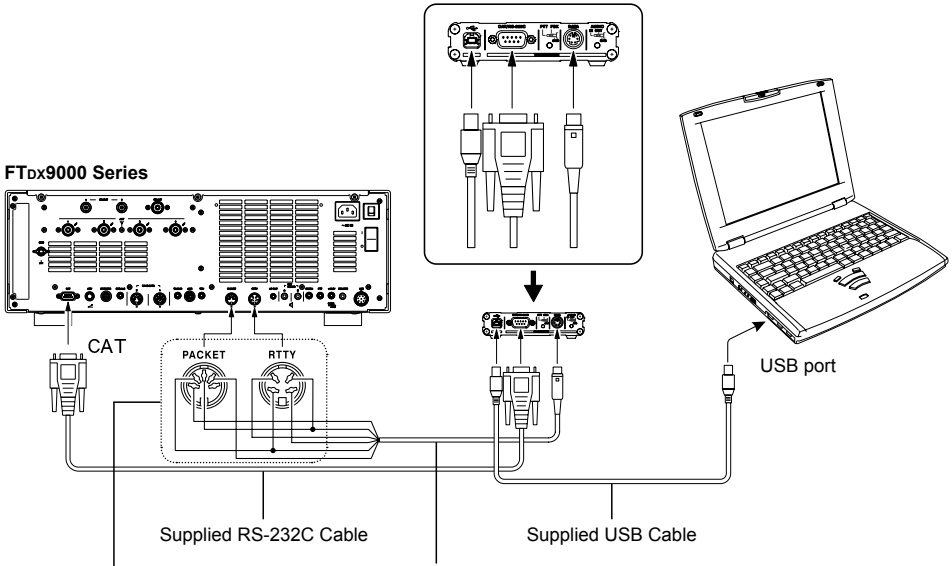
(as viewed from rear panel)

System Setup

FTDX9000 Series / SCU-22

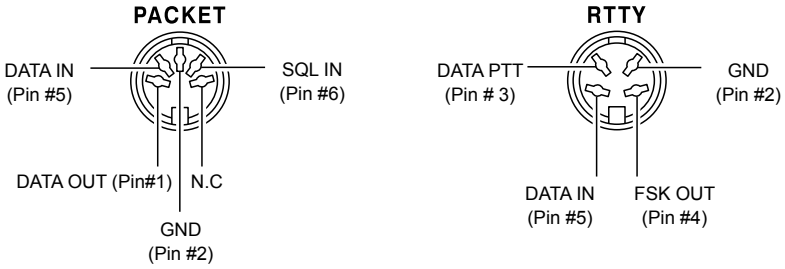


FTDX9000 Series / CT-39/A



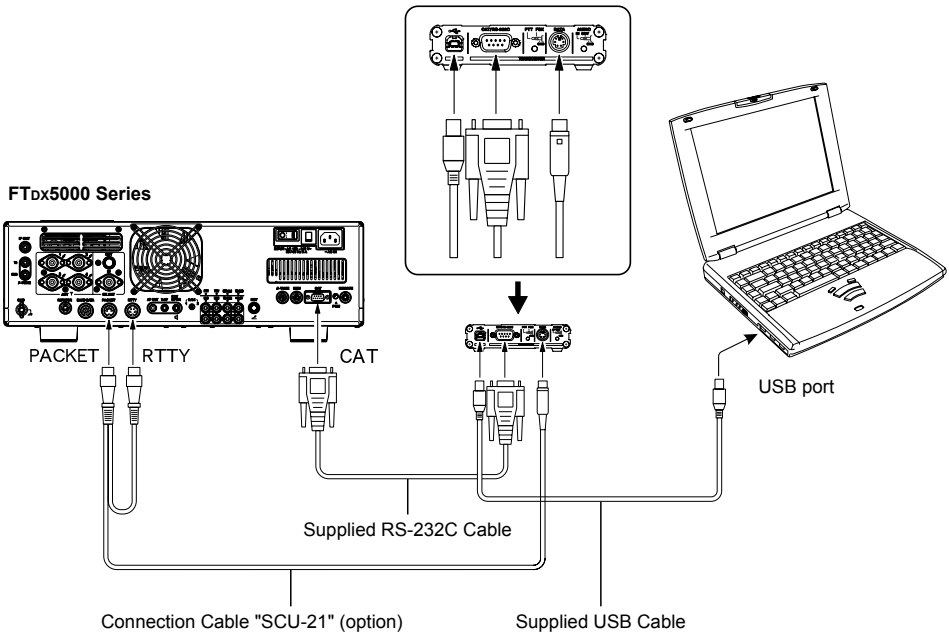
SCU-17 DATA Jack Pin #	CT-39	CT-39A
#1	Black	Brown
#2	Brown	Red
#3	Red	Orange
#4	Orange*	Yellow
#5	Yellow	Green
#6	Green	Blue
Shell	Shield (BLK)	

* : The CT-39 orange wire may be white

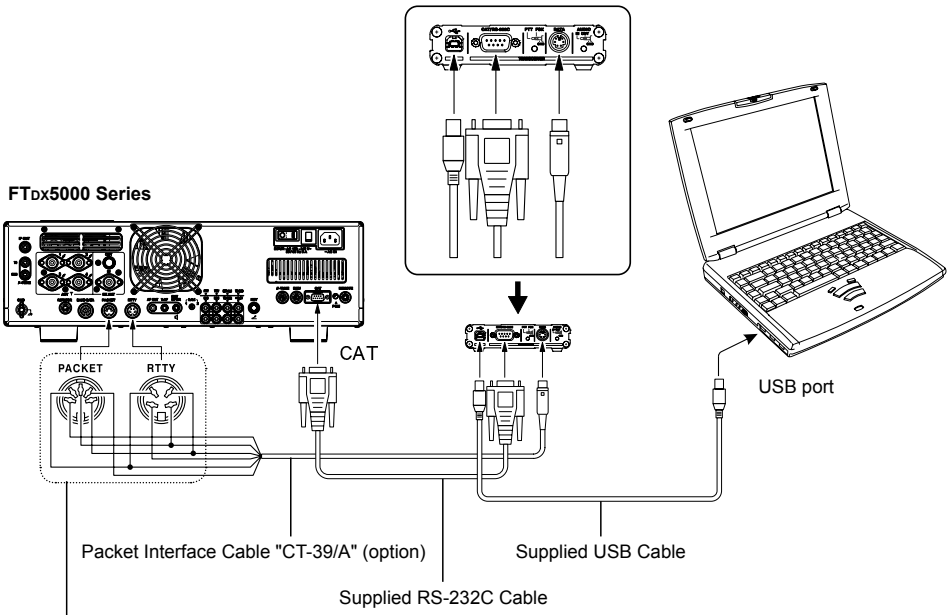


(as viewed from rear panel)

FTDX5000 Series / SCU-21

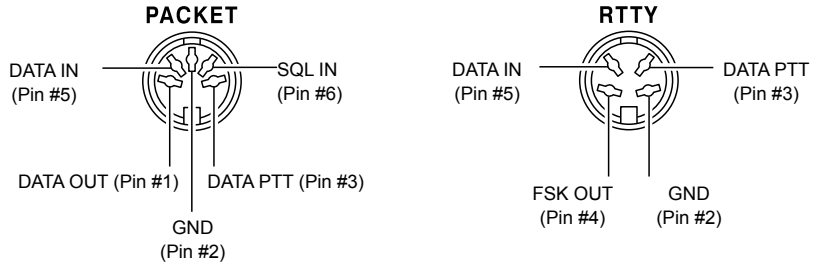


FTDX5000 Series / CT-39/A



SCU-17 DATA Jack Pin #	CT-39	CT-39A
#1	Black	Brown
#2	Brown	Red
#3	Red	Orange
#4	Orange*	Yellow
#5	Yellow	Green
#6	Green	Blue
Shell	Shield (BLK)	

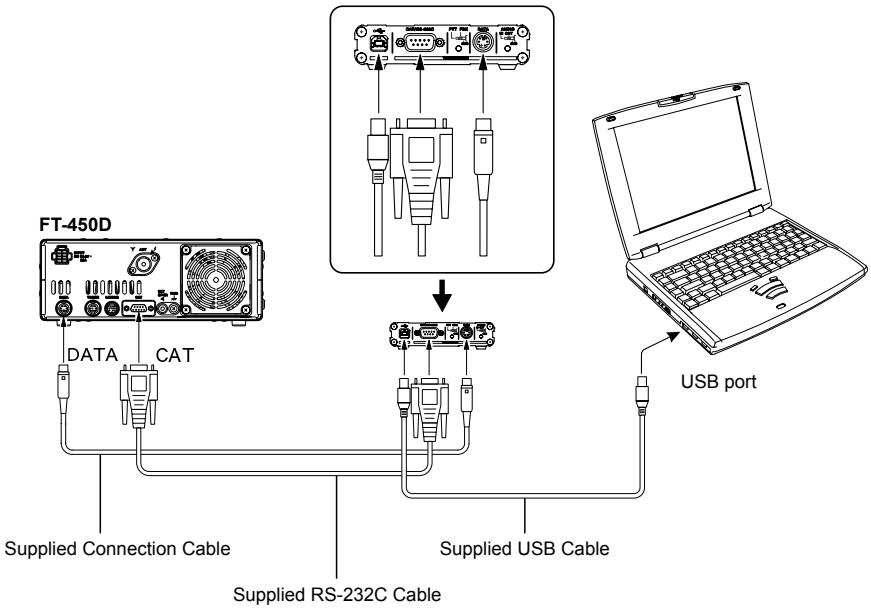
* : The CT-39 orange wire may be white



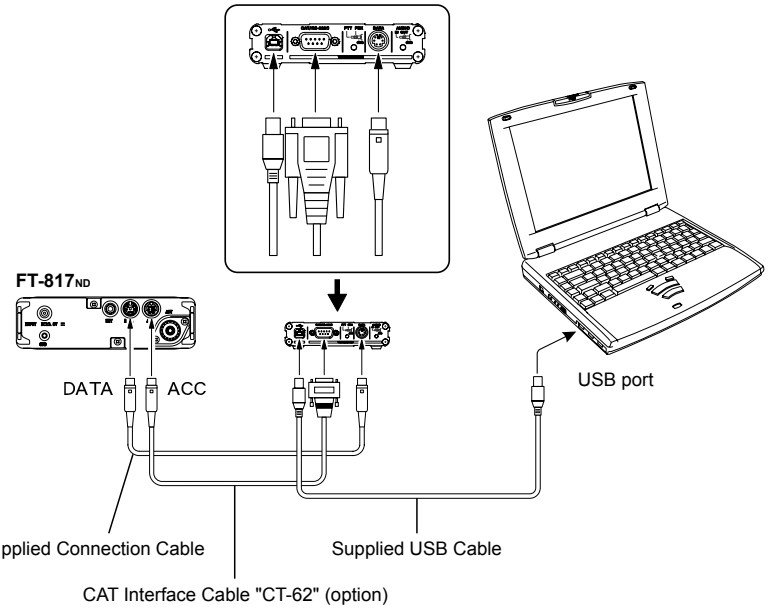
(as viewed from rear panel)

System Setup

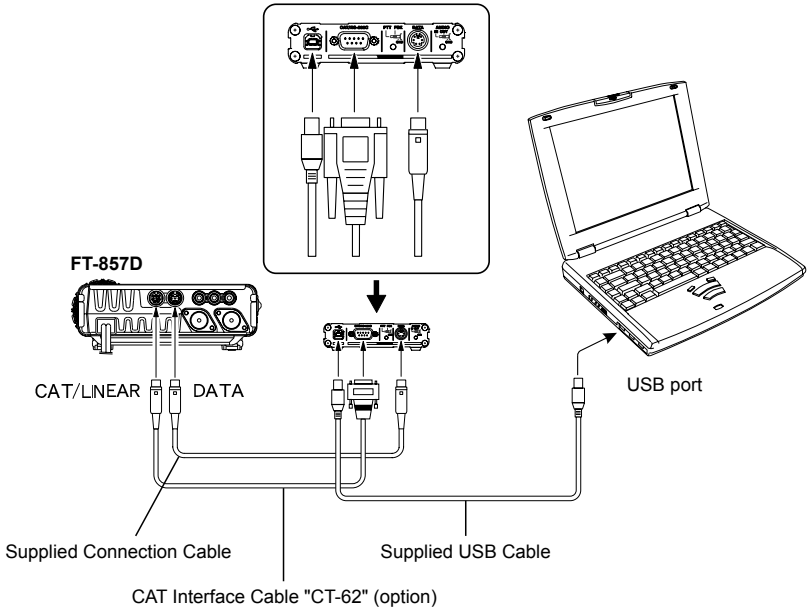
FT-450D



FT-817ND

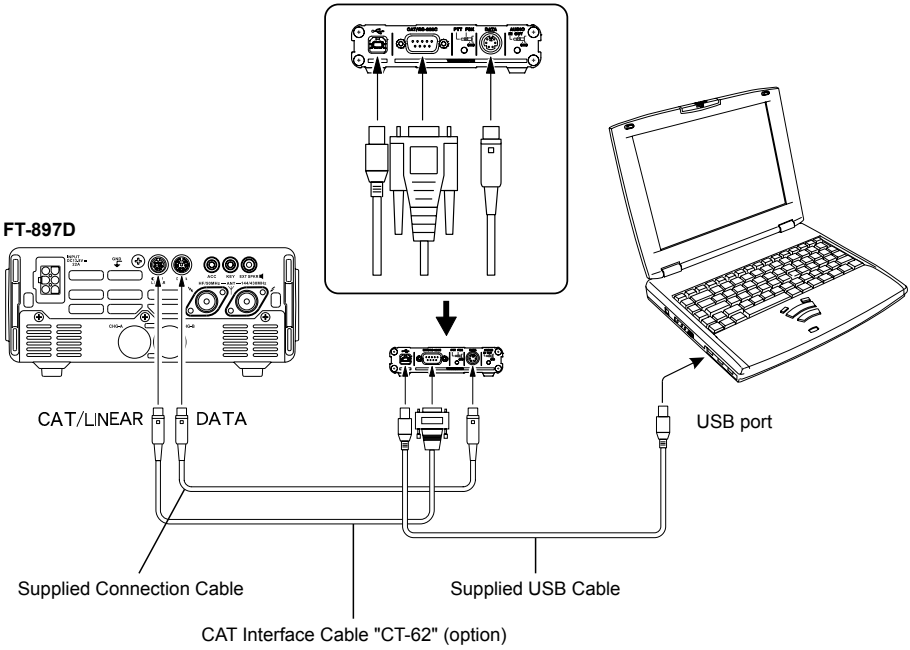


FT-857D

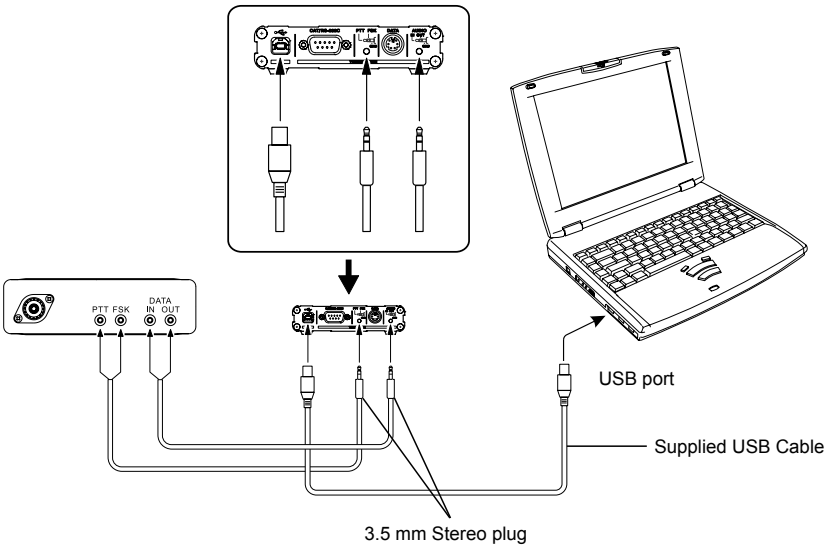

FT-857D
CAT/LINEAR
DATA
USB port
Supplied Connection Cable
Supplied USB Cable
CAT Interface Cable "CT-62" (option)

System Setup

FT-897D



Interfacing to other transceivers



PTT/FSK control and Attenuator Setting

The PTT/FSK setting may be changed and the audio output attenuator may be enabled by changing the configuration of an internal switch and a jumper.

1. Disconnect all the cables from the SCU-17.
2. Referring to Figure 1, remove the 4 screws attaching the top case, then remove the top case.
3. Refer to Figure 2 for the location of switch (S1001) and jumper (J1006).
4. Set the switch (S1001) and jumper (J1006).
   S1001: PTT/FSK control setting
   J1006: Attenuator setting to the audio output of the Audio IN/OUT jack.
5. Replace the top case, using the 4 screws removed in step (2) above.
6. Reconnect the cables to the SCU-17.

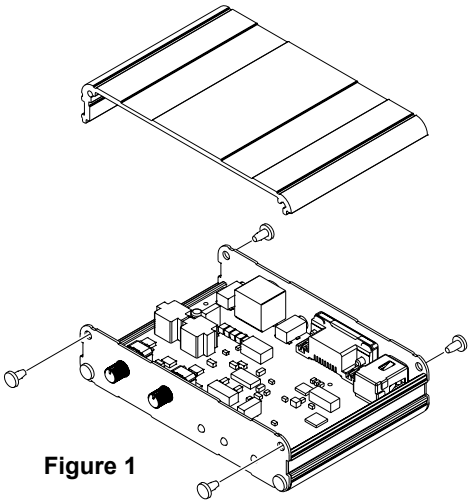


Figure 1

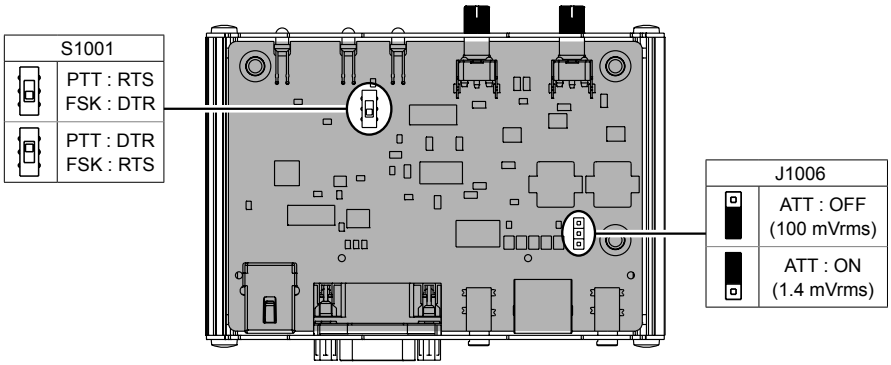


Figure 2

Specifications

Supply Voltage:	DC 5.0 V ±5%, Negative Ground
Current Consumption:	130 mA
Data Jack:	PTT: Maximum output +25 V, 50 mA (open collector)
	FSK: Maximum output +25 V, 50 mA (open collector)
	DATA-IN: 100 mVrms @ 10 k Ohms
	DATA-OUT: 100 mVrms @ 600 Ohms
FSK/PTT Jack:	PTT: Maximum output +30 V, 250 mA (open drain)
	FSK: Maximum output +30 V, 250 mA (open drain)
AUDIO Jack:	AUDIO-IN: 100 mVrms @ 600 Ohms
	AUDIO-OUT: 100 mVrms @ 600 Ohms
CAT/RS-232C Jack:	RS-232C voltage level
USB Connector:	USB 1.1 or USB 2.0, USB bus power
Case Size:	4.37" (W) x 1.0" (H) x 2.91" (D) (111 x 25.4 x 74.0 mm)
Weight (approx.):	8.1 oz (230 g)

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions; (1) this device may not cause harmful interference, and (2) this device must accept any interference including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- ❒ Increase the separation between the equipment and receiver.
- ❒ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ❒ Consult the dealer or an experienced radio/TV technician for help.

Disposal of Electrical and Electronic Equipment

Products with the symbol (crossed-out wheeled bin) cannot be disposed of as household waste. Electronic and Electrical Equipment should be recycled at a facility capable of handling these items and their waste by products.
Please contact a local equipment supplier representative or service center for information about the waste collection system in your country.

特徴 / 準備

特徴

SCU-17 は、無線機の CAT 通信、SSTV、RTTY、PSK などの各種送信制御を USB ケーブルで接続したパソコンで行うことができるインターフェースユニットです。

- ❒ RS-232C の端子がないパソコンでも USB 端子を用いて CAT 通信を行うことができます。
- ❒ USB オーディオデバイスを搭載し、送信および受信オーディオ信号は USB ケーブルにて通信されますので、SCU-17 とパソコンの接続は、付属の USB ケーブルだけで接続可能です。
- ❒ 2チャンネルの USB シリアルデバイスを搭載している為、CAT 通信と同時に各種の送信制御を行うことが可能です。
- ❒ USB バスパワーにて動作しますので、外部電源は不要です。
- ❒ RF インターフェア対策の為、フォトリレーを使用した PTT/FSK 端子および、オーディオラインにトランスを使用し、GND アイソレーションされている AUDIO IN/OUT 端子を備えています。
- ❒ 送信および受信オーディオレベルの調整用ボリュームをフロントパネルに配置しましたので、各レベル調整を容易に行うことができます。
- ❒ PTT および、FSK コントロールのモニター用 LED インジケータをフロントパネルに配置しましたので、一目で動作状態を確認することができます。

準備

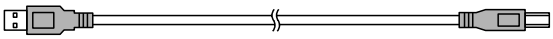
SCU-17 を使用するには、使用するパソコンに、あらかじめ仮想 COM ポートドライバーをインストールする必要があります。
SCU-17 に仮想 COM ポートドライバーは付属していませんので、当社ホームページ (http://www.yaesu.com/jp/amateur_index/driver/GetStart.html) の「SCU-17　USB インターフェースユニット　仮想 COM ポートドライバー」掲載ページよりダウンロードしてください。

【ご注意】

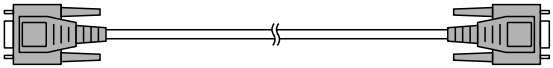
- 仮想 COM ポートドライバーのインストールが完了するまでは、SCU-17 とパソコンとを USB ケーブルで接続しないで下さい。仮想 COM ポートドライバーをインストールしないで SCU-17 とパソコンとを接続した場合、誤ったドライバーがインストールされて正しく動作しなくなる恐れがあります。
- 無線機の電源が入っている状態でパソコンを起動すると、無線機が一瞬、送信状態になることがあります。このような場合には、パソコンを起動してから無線機の電源を入れてください。また、ご使用のソフトと無線機の送信制御を“RTS”で行うように設定することで改善する場合があります。
- SCU-17 を使用して無線機の通信制御を行うためのソフトのサポートは行っていません。
- ご使用の無線機に付属装置（本機）を接続して、SSTV、RTTY、PSK などのモードを運用する時は、変更申請（届出）が必要になる場合があります。
  また、技術基準適合証明設備でない設備の変更申請には、JARD またはティエスエス（TSS）株式会社による保証認定が必要になります。

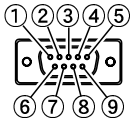
付属品

・USB ケーブル（A-B タイプ）. 1



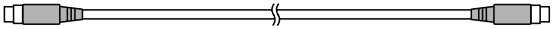
・RS-232C ケーブル（メス－メス、ストレートタイプ）. 1





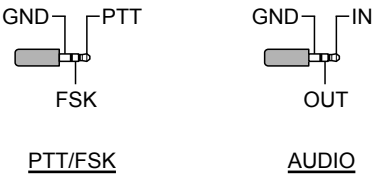
① N/A
② SERIAL IN
③ SERIAL OUT
④ N/A
⑤ GND
⑥ N/A
⑦ RTS
⑧ CTS
⑨ NC

・コネクションケーブル（Mini-Din 6pin ― Mini-Din 6pin）. 1



① DATA OUT
② GND
③ DATA PTT
④ FSK OUT
⑤ DATA IN
⑥ SQL IN

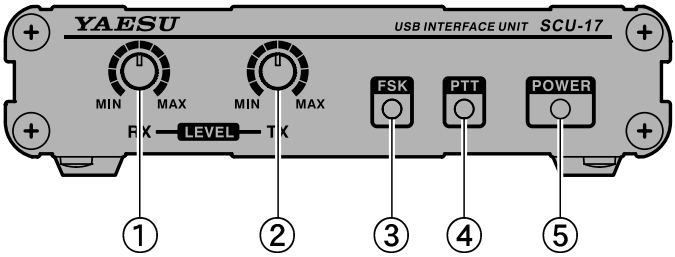
・3.5 φ ステレオプラグ 2



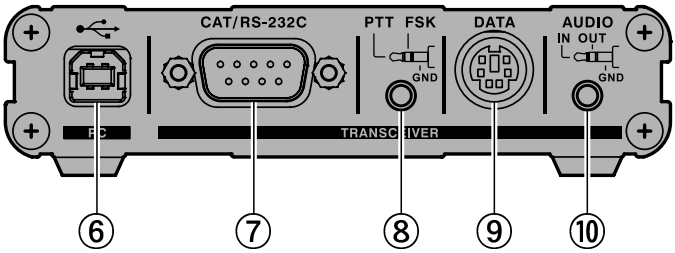
・取扱説明書

各部の説明

フロントパネル



リアパネル



① 受信レベル調整ツマミ
受信オーディオレベルの調整を行うツマミです。

② 送信レベル調整ツマミ
送信オーディオレベルの調整を行うツマミです。

③ FSK インジケータ
マーク周波数が、あらかじめ設定してある周波数分シフトした際に点灯するインジケータです。

④ TX インジケータ
送信時に赤く点灯するインジケータです。

⑤ POWER インジケータ

⑥ USB 端子
付属の USB ケーブルを使用して、パソコンの USB 端子と接続します。

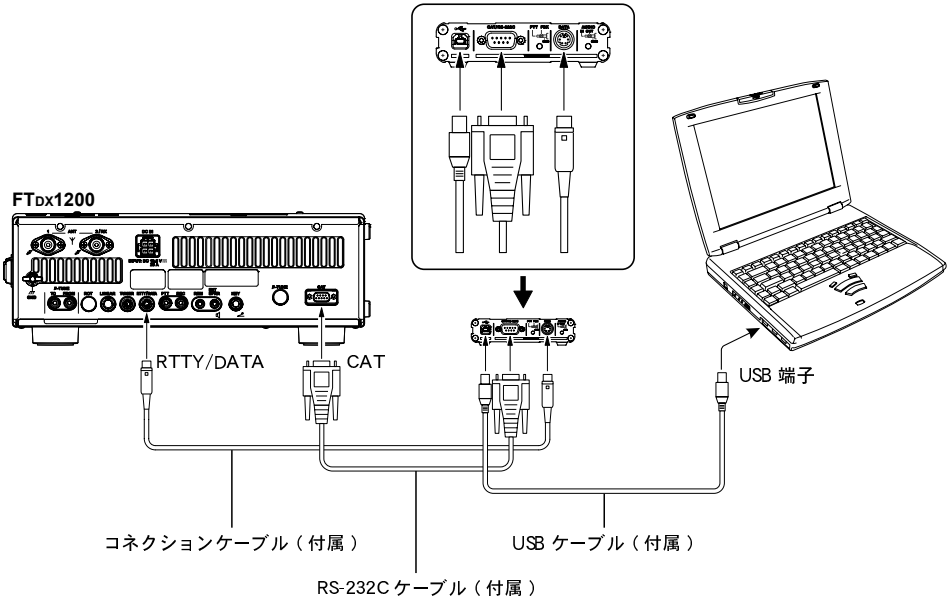
⑦ CAT/RS-232C 端子
付属の RS-232C ケーブルを使用して、無線機の CAT/RS-232C 端子と接続します。

⑧ 3.5-mm ステレオジャック（PTT/FSK）
RF インターフェアを防ぐために、フォトリレーを使用した PTT/FSK 端子です。

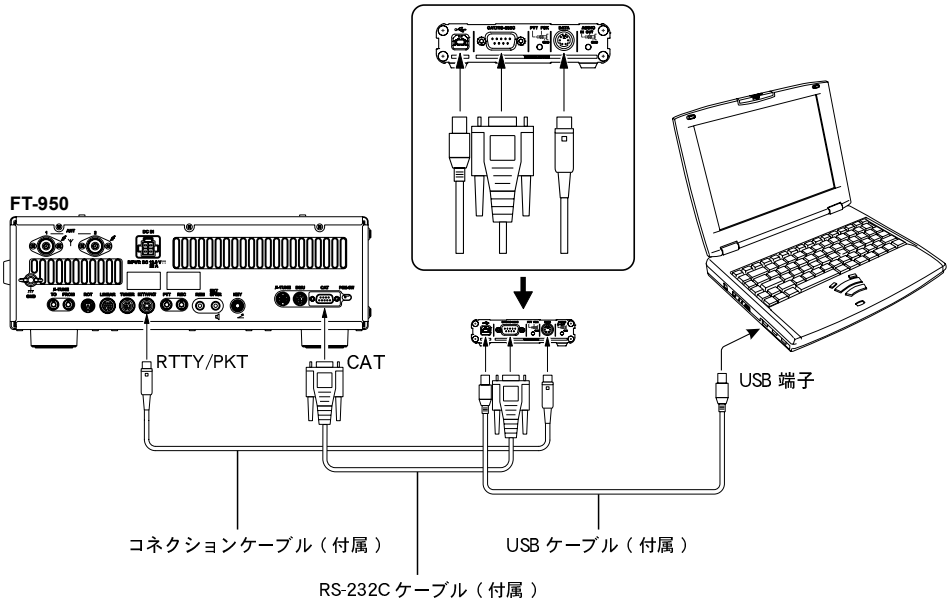
⑨ DATA ジャック
付属のコネクションケーブルを使用して、無線機の DATA 端子や PACKET 端子と接続します。

⑩ 3.5-mm ステレオジャック（AUDIO IN/OUT）
RF インターフェアを防ぐために、オーディオラインにトランスを使用し、GND アイソレーション可能な AUDIO IN/OUT 端子です。
なお、OUT 端子（送信オーディオ出力）は、SCU-17 内部のジャンパー設定を変更することにより、アッテネーターを動作させることができます（31 ページ参照）。

FTDX1200 との接続例

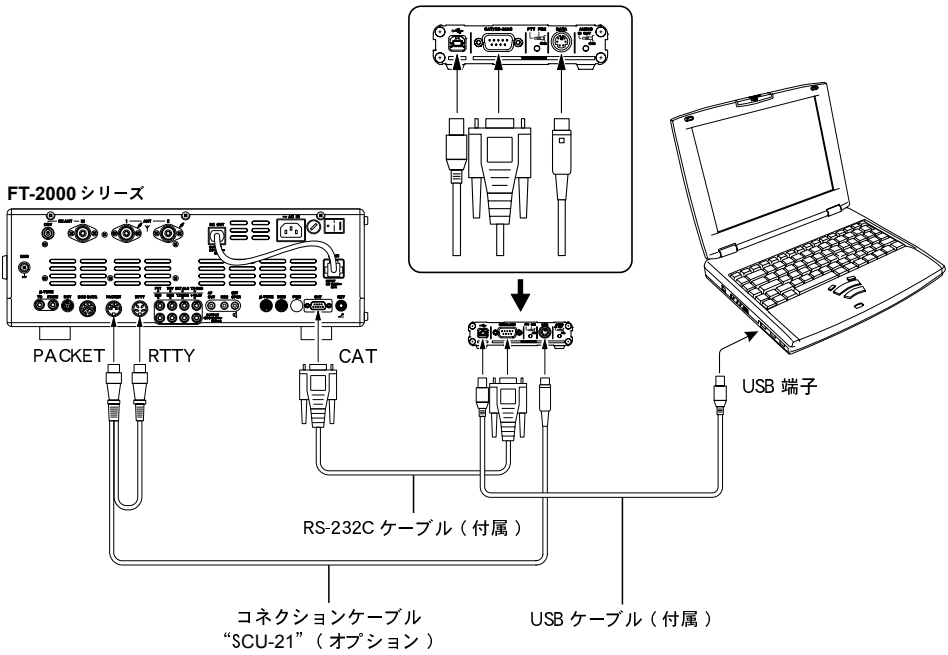


FT-950 との接続例

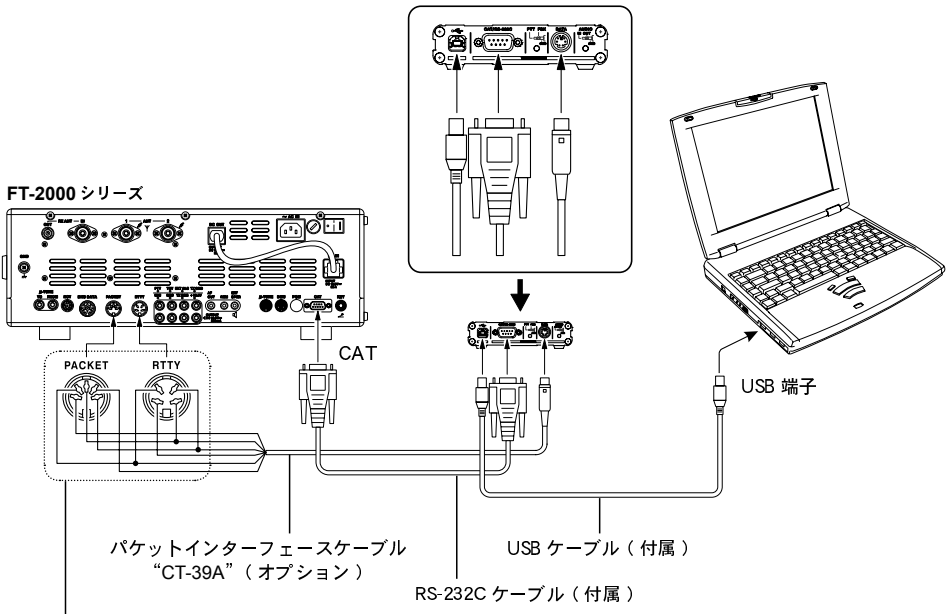


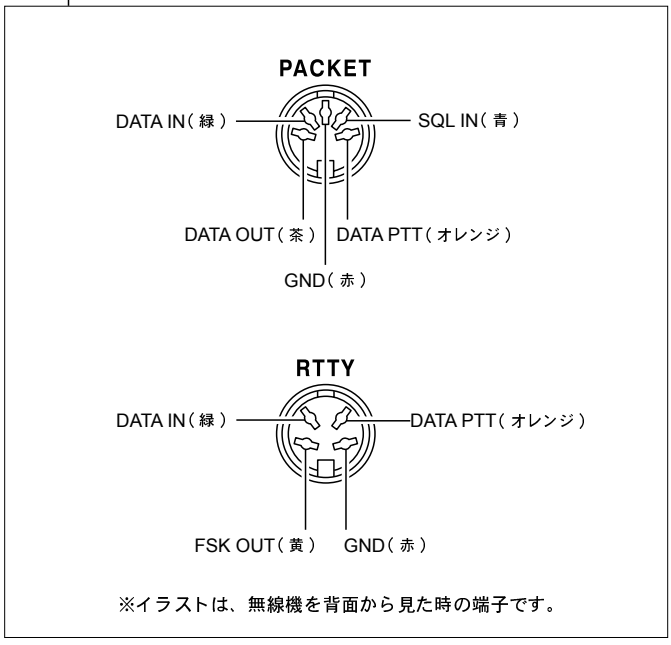
無線機との接続

FT-2000 シリーズとの接続例（オプションの SCU-21 を使用する場合）



FT-2000 シリーズとの接続例（オプションの CT-39A を使用する場合）

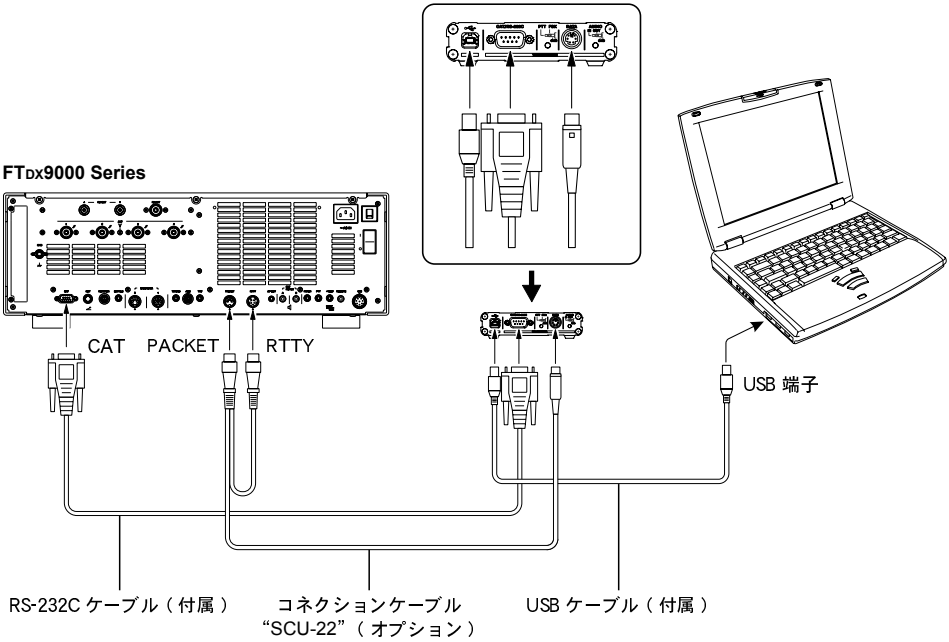




※イラストは、無線機を背面から見た時の端子です。

無線機との接続

FTDX9000 シリーズとの接続例（オプションの SCU-22 を使用する場合）



❒ RTTY で運用する場合

無線機の［RTTY］キーを押して運用モードを RTTY にします（FSK による RTTY 通信が可能です）。
ご使用のソフトウェアの PTT 制御を “RTS”、FSK 制御を “DTR” で行う設定にします。

❒ PSK で運用する場合

・PKT モードを使用する
無線機の［PKT］キーを押して運用モードを PKT にします。
ご使用のソフトウェアの PTT 制御を “RTS” で行う設定にします。

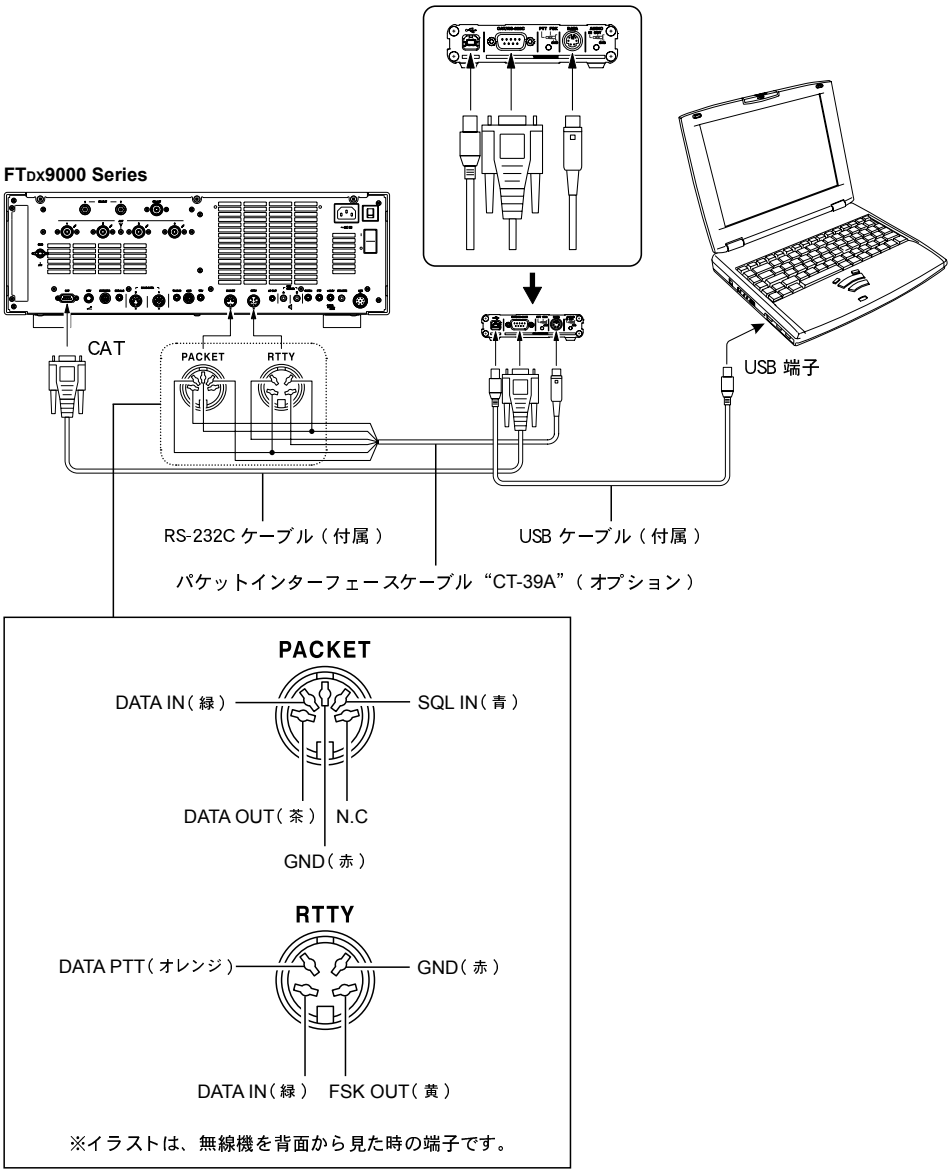
・SSB モードを使用する
ご使用のソフトウェアの PTT 制御を “DTR” で行う設定にします。

❒ SSTV で運用する場合

・PKT モードを使用する
無線機の［WIDTH］ツマミをまわして WIDTH を 2400Hz に広げます。
ご使用のソフトウェアの PTT 制御の設定を “RTS” にセットします。

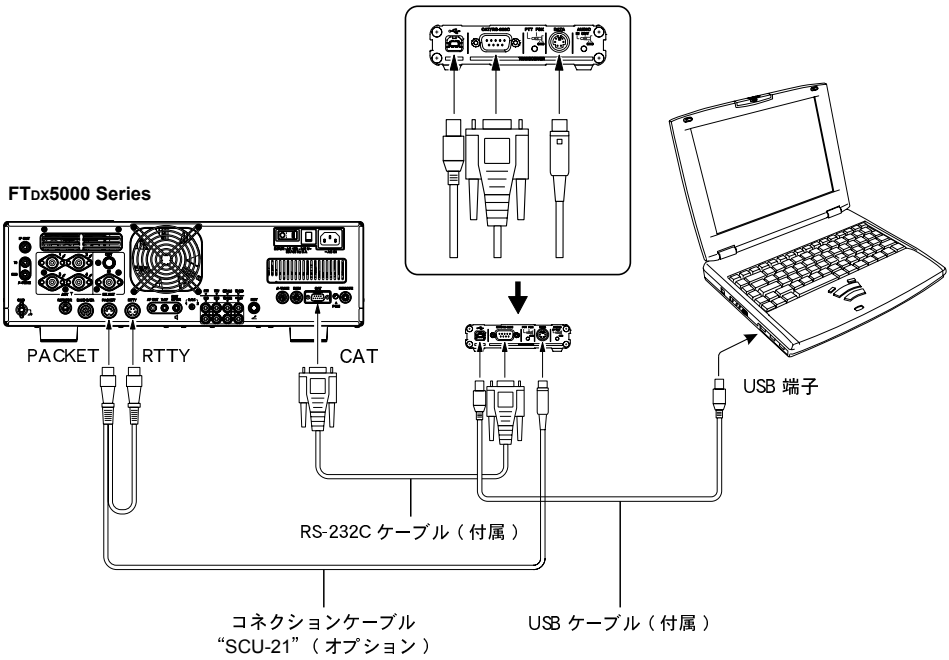
・SSB モードを使用する
ご使用のソフトウェアの PTT 制御の設定を “DTR” にセットします。

FTDX9000 シリーズとの接続例（オプションの CT-39A を使用する場合）

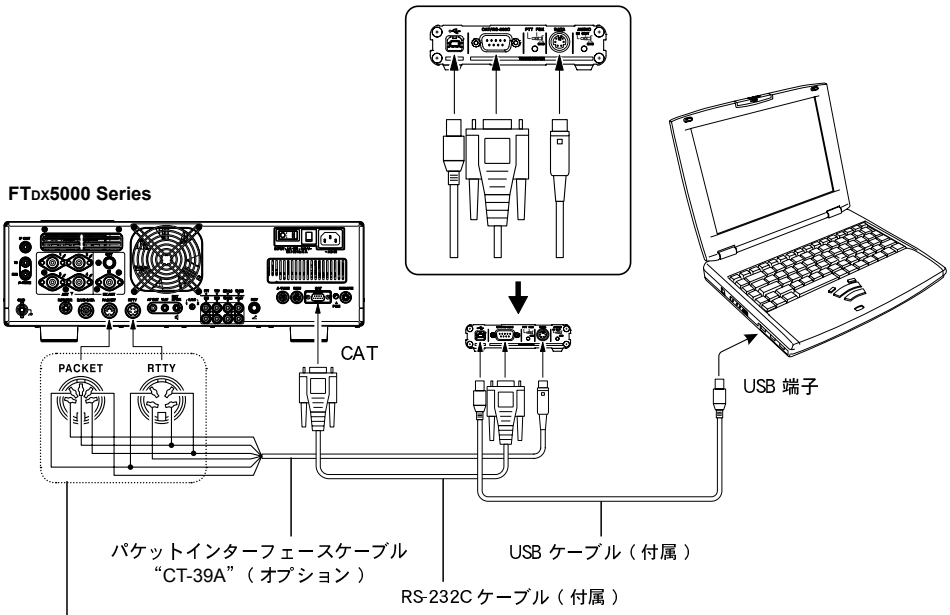


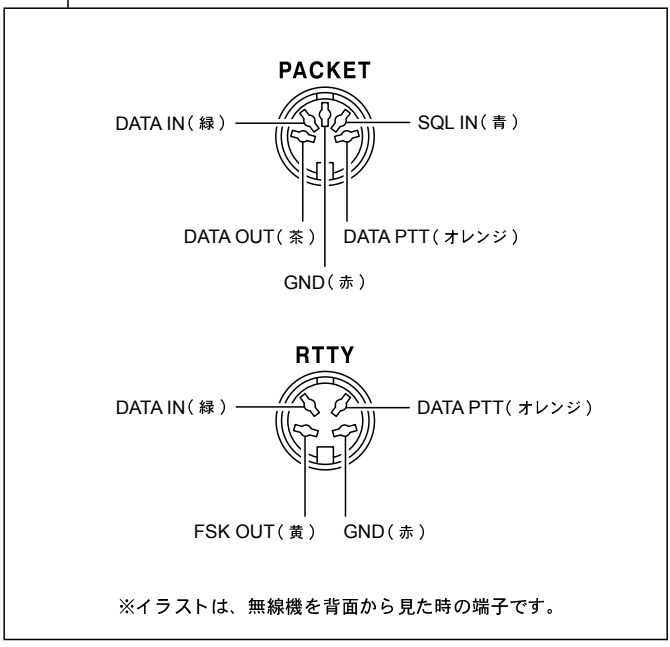
無線機との接続

FTDX5000 シリーズとの接続例（オプションの SCU-21 を使用する場合）



FTDX5000 シリーズとの接続例（オプションの CT-39A を使用する場合）

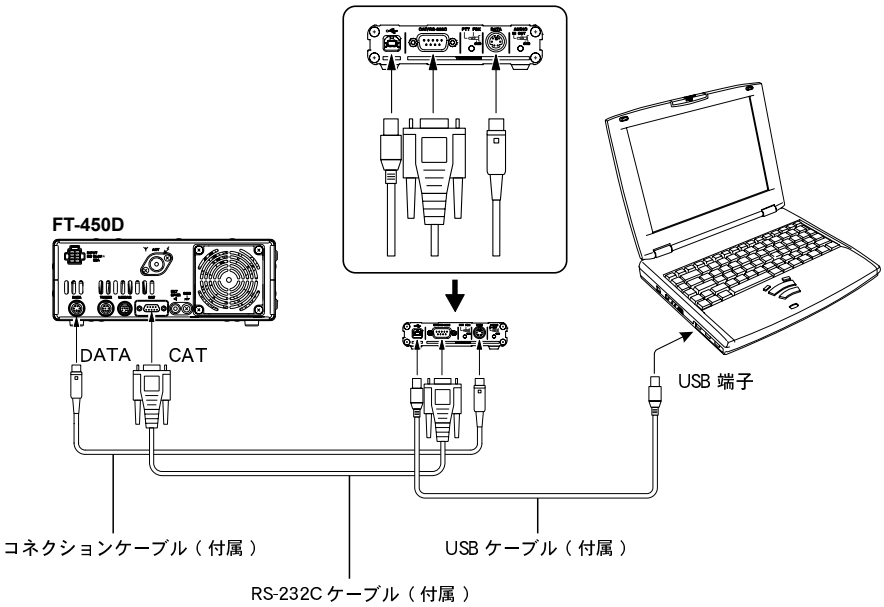




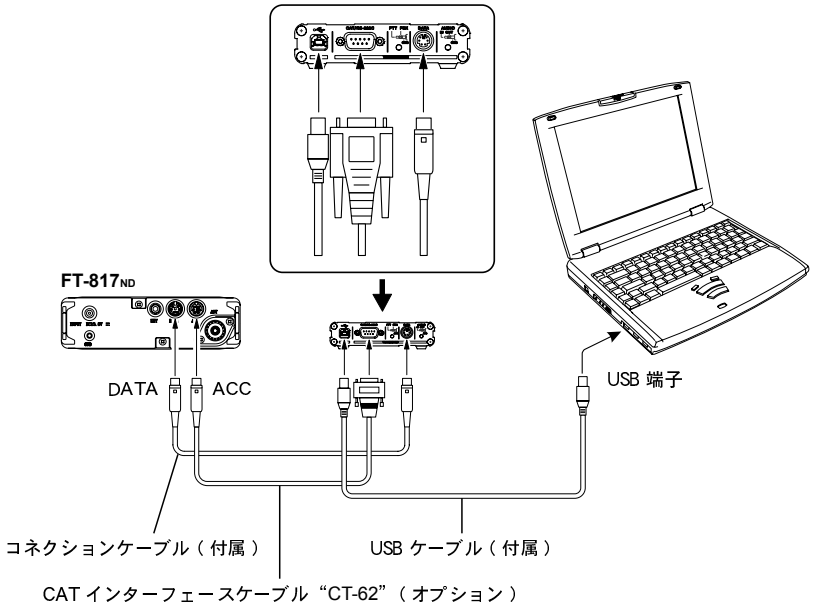
※イラストは、無線機を背面から見た時の端子です。

無線機との接続

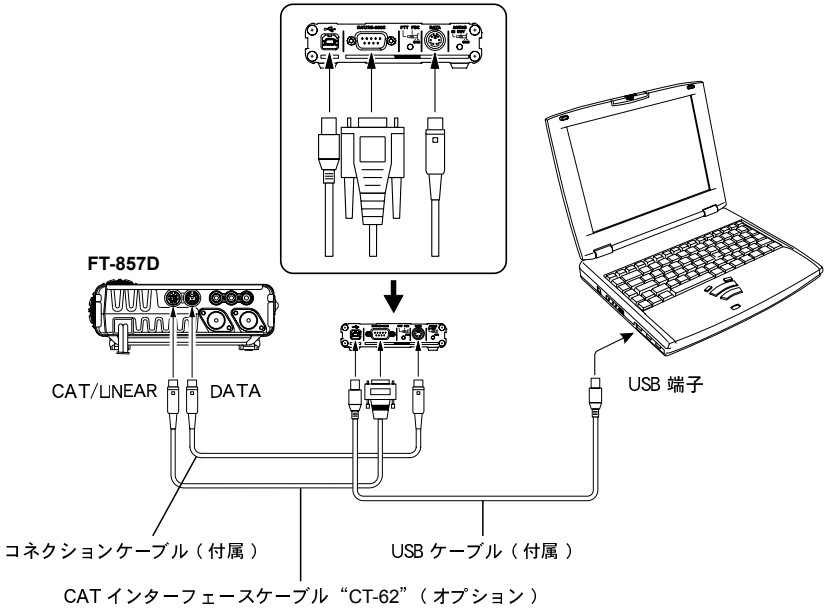
FT-450D との接続例



FT-817ND との接続例

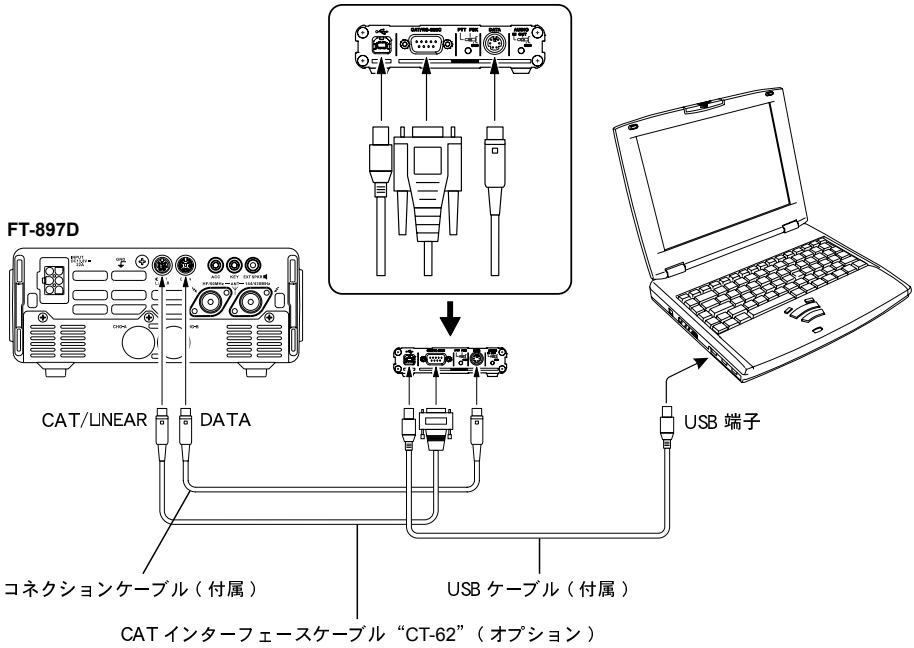


FT-857D との接続例



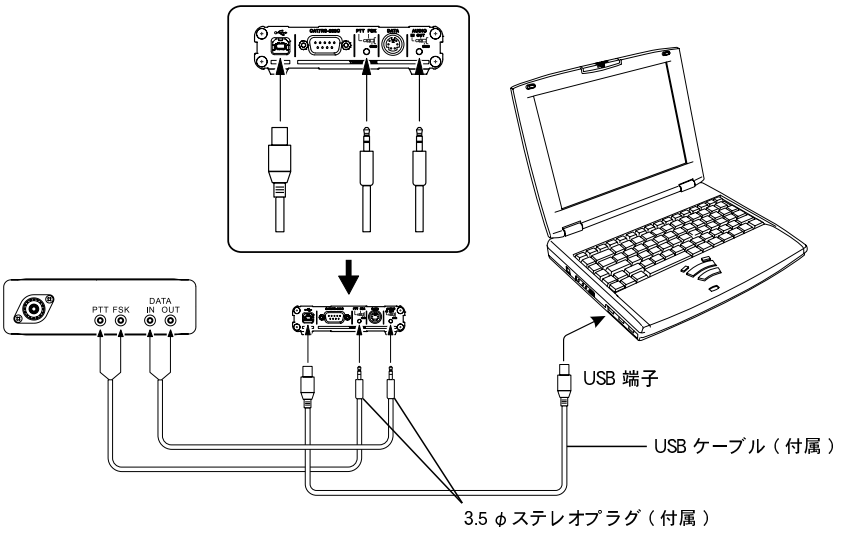
無線機との接続

FT-897D との接続例



その他の無線機との接続例

付属の 3.5 φ ステレオプラグを使用して、下図を参考に接続してください。



SCU-17 は、内部のジャンパー設定を変更することにより、AUDIO IN/OUT 端子の送信オーディオ出力側にアッテネーターを動作させることができます。
また、内部のスイッチを切り換えることにより、PTT/FSK の制御（PTT 制御：RTS、FSK 制御：DTR）を変更（PTT 制御：DTR、FSK 制御：RTS）することができます。

1．SCU-17 に接続されている全てのケーブル類を外します。
2．図 1 を参考に、4 本のネジを外して上ケースを外します。
　ケースが外れにくい場合は、下側のネジを緩めてください。
3．図 2 を参考に、ジャンパー（J1006）の設定または、スイッチ（S1001）の切り換えを行います。
4．上記 2 で外したネジ 4 本で、上ケースを取り付けます。
5．上記 1 で外したケーブル類を接続します。

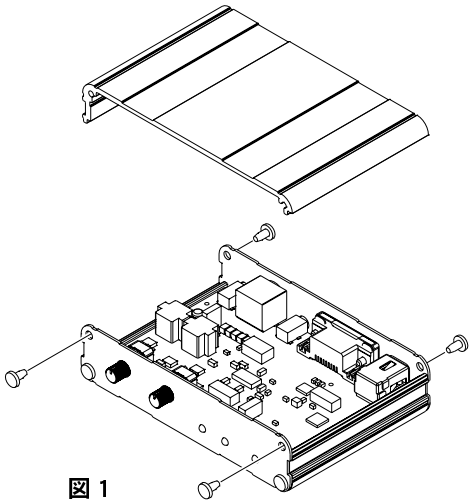


図 1

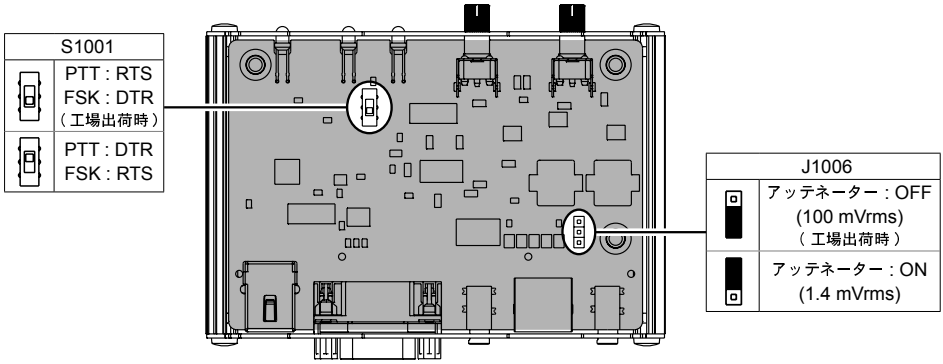


図 2

定格

電源電圧： DC 5.0V ± 5%、（ マイナス接地 ）
消費電流： 約 130mA
入出力レベル： DATA ジャック
PTT 出力端子：最大 +25V, 50mA（ オープンコレクタ制御 ）
FSK 出力端子：最大 +25V, 50mA（ オープンコレクタ制御 ）
DATA-IN：100mVrms @ 10k Ω
DATA-OUT：100mVrms @600 Ω
FSK/PTT ジャック
PTT 出力端子：最大 +30V, 250mA（ オープンドレイン制御 ）
FSK 出力端子：最大 +30V, 250mA（ オープンドレイン制御 ）
AUDIO ジャック
DATA-IN 端子：100mVrms @600 Ω
DATA-OUT 端子：100mVrms @600 Ω
CAT/RS-232C ジャック
RS-232C レベル
USB ジャック
USB 1.1 または USB 2.0（ バスパワー電源供給 ）
寸法： 111（ 幅 ）x 25.4（ 高さ ）x 74（ 奥行き ）mm
重量： 約 230 g

本製品または他の当社製品についてのお問い合わせは、お買い上げいただきました販売店または、当社カスタマーサポートにお願いいたします。

八重洲無線株式会社　カスタマーサポート

電話番号　0120-456-220
受付時間　平日 9：00 ～ 12：00、13：00 ～ 18：00

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Virtual COM Port Driver Installation Manual

Installing the virtual COM port driver software on a computer makes possible CAT communication via a USB cable to the SCU-17 or an compatible transceivers. This will allow computer control of TX (PTT, KEY, FSK), and the audio In/Out interface (except the FT-891). The COM port is also used for updating the transceiver firmware.

The SCU-17 or an compatible transceiver have two virtual COM ports, which can be used for CAT communication and TX control operations.

Please read this entire manual carefully. If you agree to the content of this manual, you may download and install the virtual COM port driver.

Do not connect the SCU-17 or transceiver to the computer via the USB cable until the virtual COM port driver installation process has been completed. Connecting the SCU-17 or transceiver to the computer via the USB cable before the driver installation has been completed may result in the wrong driver being installed, preventing proper operation.

Operating Environment

Supported Operating Systems

- Microsoft® Windows® 11
- Microsoft® Windows® 10
- Microsoft® Windows® 8.1

Port

USB port (USB1.1/USB2.0)

Cable

Use a commercially available A-B USB cable

Virtual COM Port Driver

- Microsoft® Windows® 11
- Microsoft® Windows® 10
  Compatible driver: **CP210x Universal Windows Driver**
- Microsoft® Windows® 8.1*
  Compatible driver: **CP210x Windows Drivers**

  *The previous version of the virtual COM port driver "**CP210x Windows Drivers**" (v6.7.6) for Windows 8.1 can be downloaded from the "DOWNLOADS" tab of the Silicon Labs, Inc. website (http://www.silabs.com/products/mcu/pages/usbtouartbridgevcpdrivers.aspx). (As of May 2022)

This driver installation program is provided by Silicon Labs, Inc.
The latest virtual COM port driver can be downloaded from the "DOWNLOADS" tab of the Silicon Labs, Inc. website (http://www.silabs.com/products/mcu/pages/usbtouartbridgevcpdrivers.aspx). (As of May 2022)

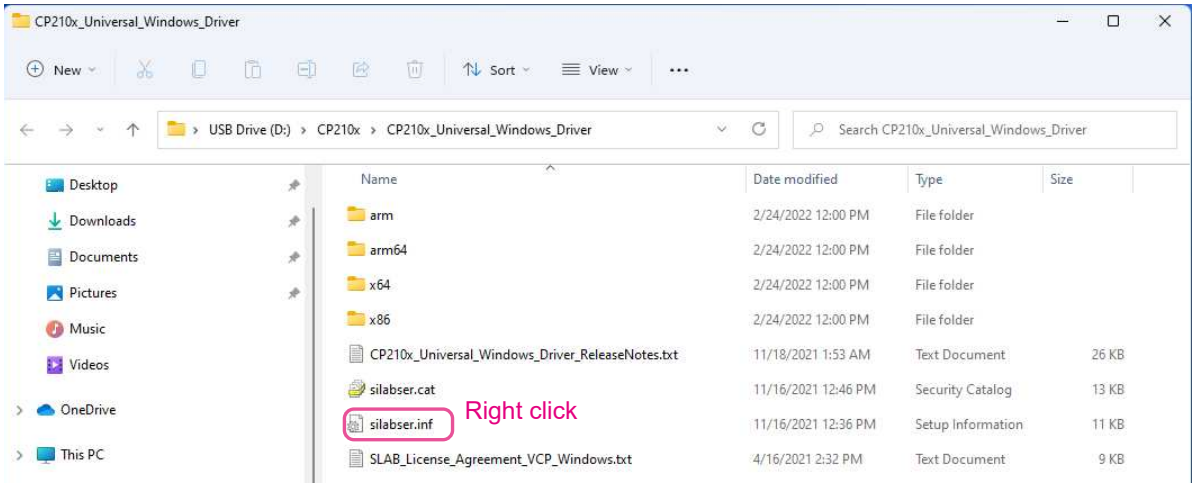
Installing the Virtual COM Port Driver

The installation procedure differs depending on the version of Windows:

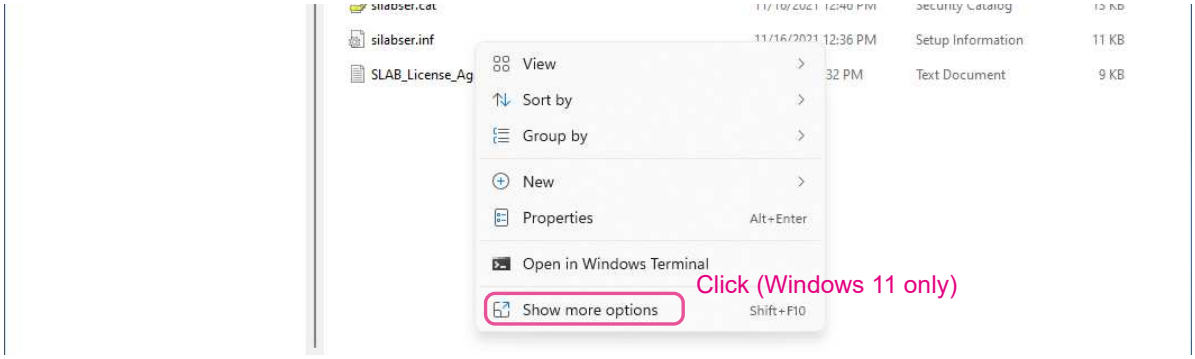
- **Microsoft® Windows® 11 or Microsoft® Windows® 10**
  "For Windows 11 or Windows 10" (see page 2)
- **Microsoft® Windows® 8.1**
  "For Windows 8.1" (see page 3)

For Windows 11 or Windows 10

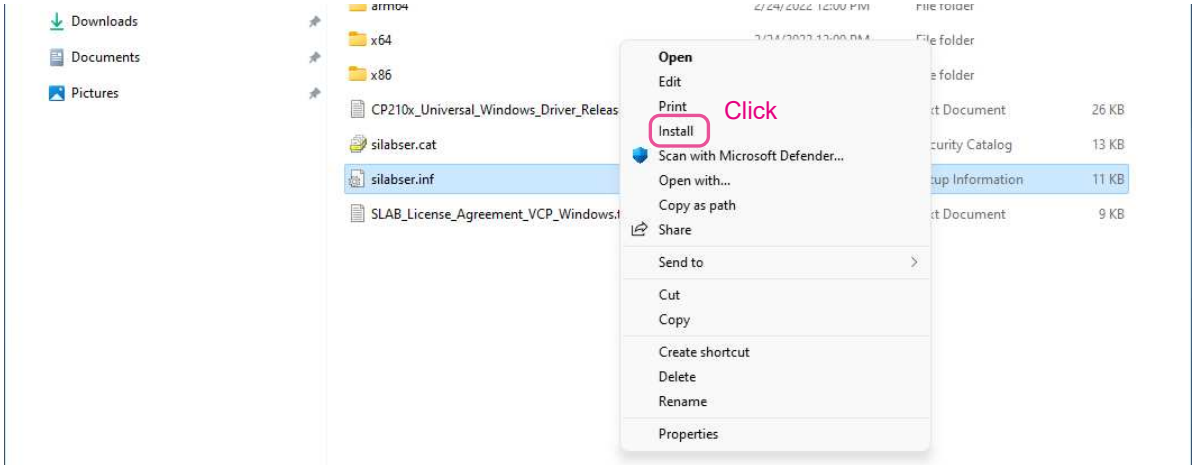
1. Unzip the downloaded (CP210x_Universal_Windows_Driver.zip) file.
2. Right-click the “**silabser.inf**” file in the folder.



3. Click “**Show more options**”.
   For Windows 10, proceed to step 4.



4. Click “**Install**”.



5. This completes the driver installation process.

For Windows 8.1

When you unzip the "**CP210x Windows Drivers.zip**" file, "**CP210xVCPInstaller_x64.exe**" and "**CP210xVCPInstaller_x86.exe**" will be generated. Choose the appropriate file depending on the OS version of your computer as follows:

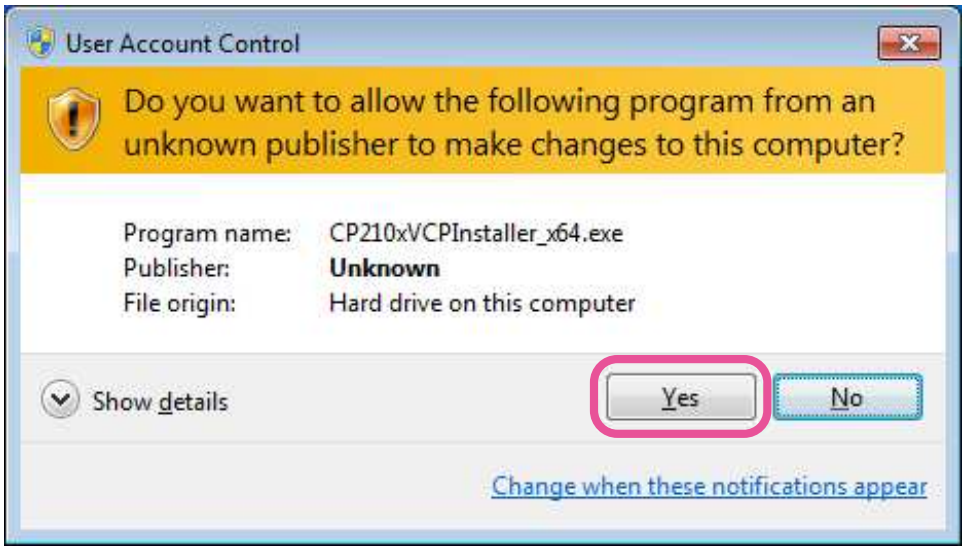
・OS for 64 bit version : "CP210xVCPInstaller_x64.exe"

・OS for 32 bit version : "CP210xVCPInstaller_x86.exe"

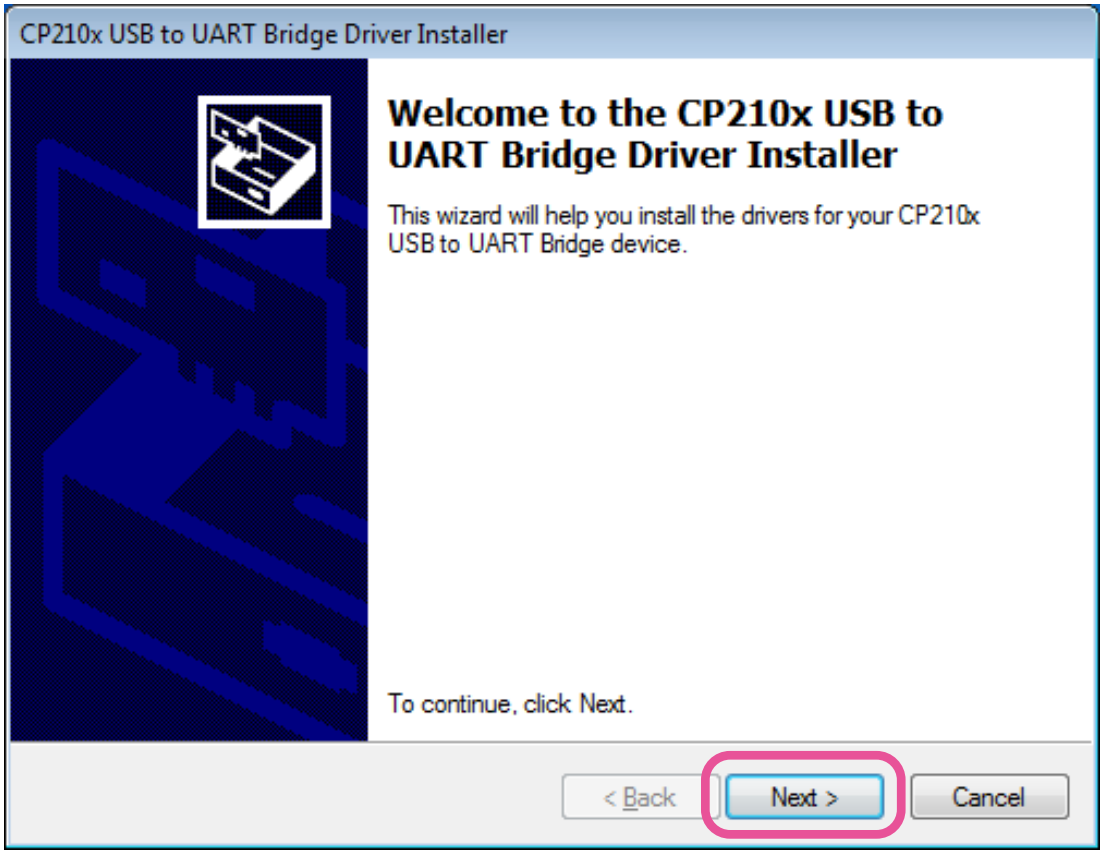
1. Unzip the downloaded (CP210x_VCP_Windows.zip) file.
2. Double-click "**CP210xVCPInstaller_x64.exe**"*

   The following window will appear.

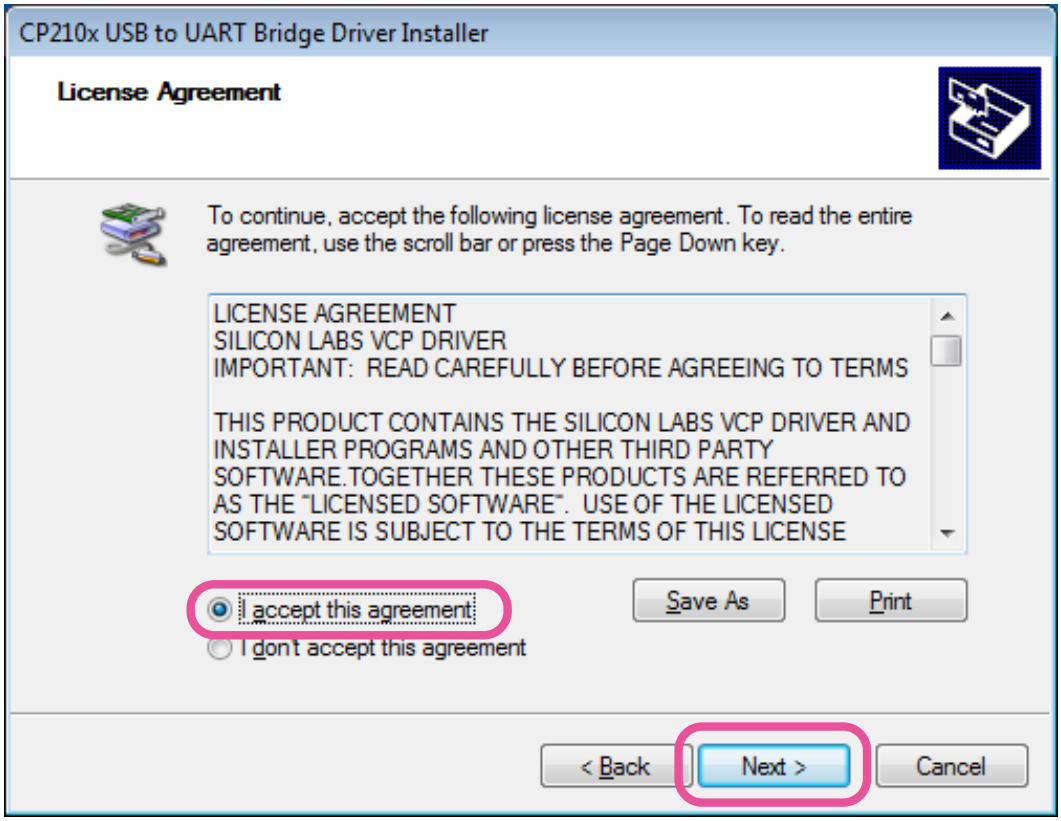
   * If the OS version of your computer is 32 bit version, you must choose "**CP210xVCPInstaller_x86.exe**".
3. Click the "**Yes**" button.



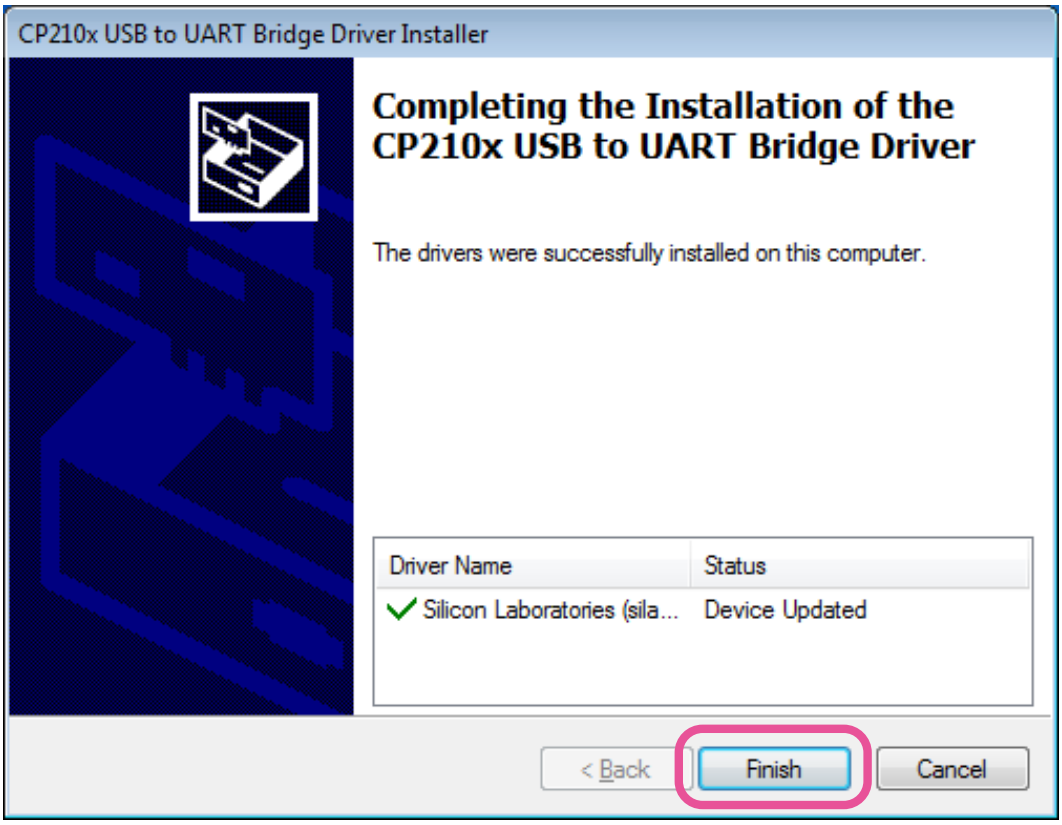
4. The following window will be displayed. Click the "**Next >**" button.



5. The “License Agreement” window will be displayed. Please read the License Agreement, and, if you agree to the terms therein, click the check box next to “I accept this agreement”, and click the “**Next >**” button.



6. The “Completing the Installation of the CP210x USB to UART Bridge Driver” window will be displayed. Click the “**Finish**” button.



7. This completes the driver installation process.

• Connecting the SCU-17 or Transceiver and the Computer

・Connect the computer and the SCU-17

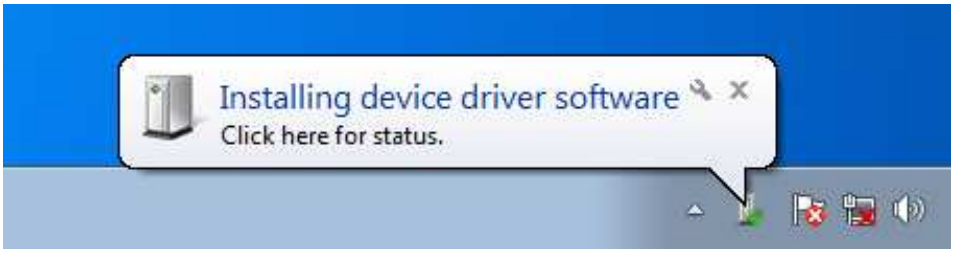
Connect the computer and the SCU-17 via USB cable.

A message such as the one below will be displayed, and the computer will recognize the new hardware and automatically begin device driver installation.

・Connect the computer and the transceiver

Connect the computer and the transceiver via USB cable, and then turn the transceiver on.

A message such as the one below will be displayed, and the computer will recognize the new hardware and automatically begin device driver installation.



When “Your devices are ready to use” appears, installation has been completed.

A reboot confirmation window may be displayed on some computers. If this window appears, follow the on-screen instructions and reboot the computer.

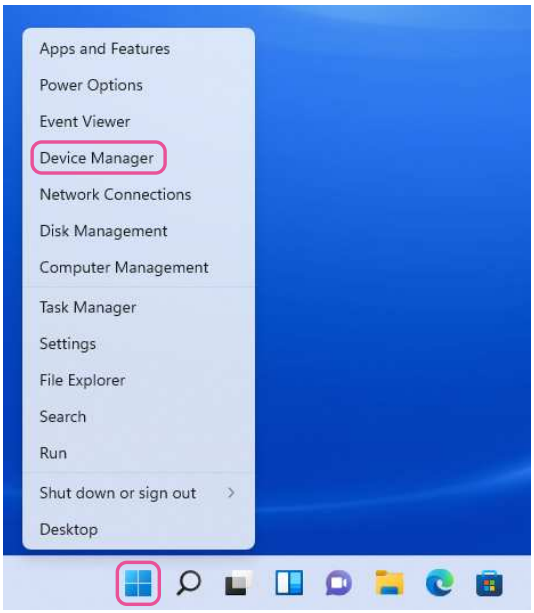
Once the computer has been rebooted, the virtual COM driver and USB audio driver will be installed.

(The standard Windows® USB audio driver will be automatically installed, so you do not need to specify which driver to use.)

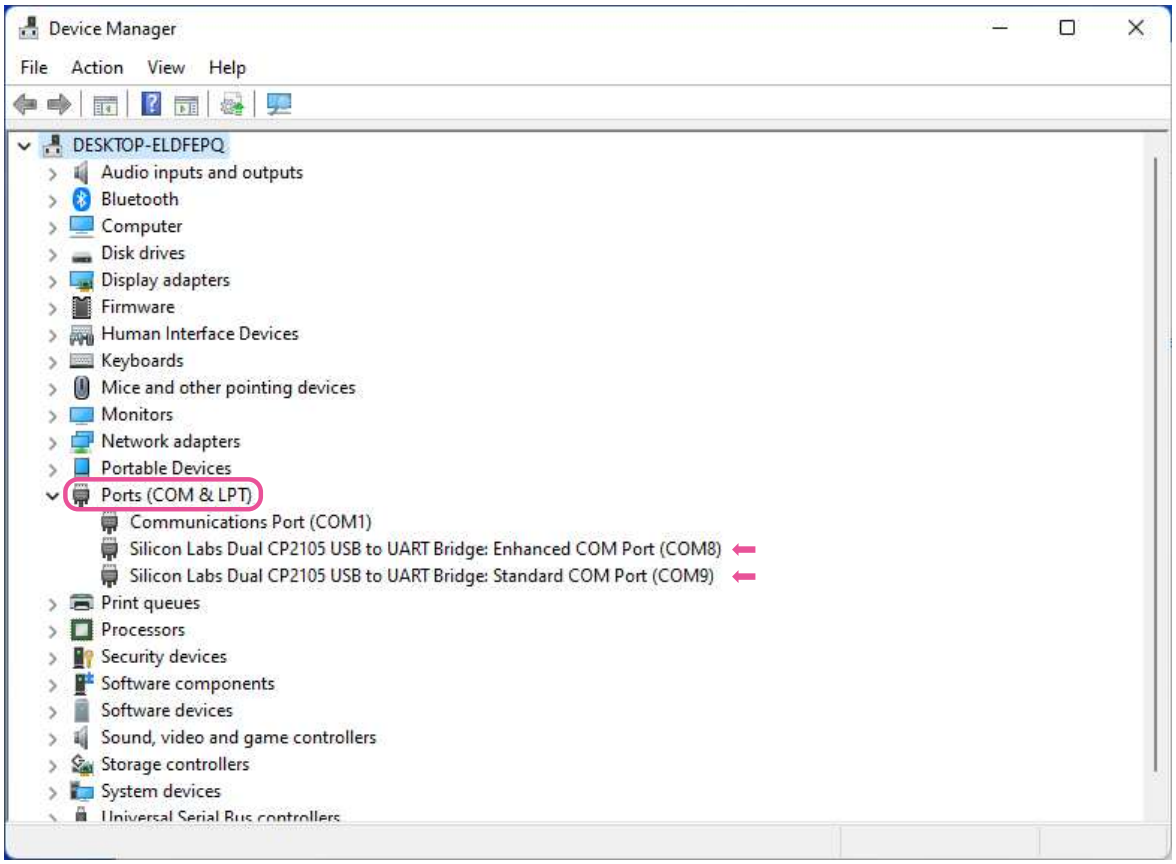
How to Confirm the Installation, and the COM Port Number

With the SCU-17 or transceiver and computer connected, confirm whether the virtual COM driver has been installed successfully.
The example below is for Windows® 11.

1. Connect the PC to the transceiver or the SCU-17 with a USB cable,then turn the transceiver **ON**.
2. Right-click the Windows **Start button**, then click "**Device Manager**".
   The Device Manager screen opens.



2. On the Device Manager screen, double-click "Port (COM & LPT)".
   「Silicon Labs Dual CP210x USB to UART Bridge : Enhanced COM Port (COM**)」
   「Silicon Labs Dual CP210x USB to UART Bridge : Standard COM Port (COM**)」
   The number in the "(COM**)" portion may vary from computer to computer.



The SCU-17 or an compatible transceiver contain two virtual COM ports, an **Enhanced COM Port** and a **Standard COM Port**. These ports offer the following functions:

- **Enhanced COM Port:** **AT Communications (Frequency and Communication Mode Settings) and firmware updating**
- **Standard COM Port:** **TX Controls (PTT control, CW Keying, Digital Mode Operation)**

The above window shows that COM8 can be used for CAT communications and firmware updating, and COM9 can be used for TX control (PTT control, CW Keying, Digital Mode Operation).

When performing software port configuration, select the COM port numbers that were confirmed using the procedure above.

- If a "!" or "X" is displayed for the port on the Device Manager, uninstall and reinstall the virtual COM driver.
- If an SCU-17 or transceiver with a different serial number is connected and turned ON, different COM port numbers will be assigned to it, making it possible to perform individual COM port configurations for separate transceivers.
- When using the USB cable for TX control, the transceiver may switch to the transmit mode when the computer is started.
- Always close the application on the computer before disconnecting the USB cable.

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