

## Notice of specification changes

IC-7610/IC-7610M Version 1.40

Due to the specification change, the functions of this product have been changed as shown below.

### Addition DPD features

Added DPD (digital predistortion) function. You can reduce distortion of radio waves transmitted by this product (operation mode: SSB/SSB-DATA/AM/ AM-DATA). Additionally, when used as an exciter for IC-PW2 (our linear amplifier), the distortion generated by the RF power amplifier is also reduced.

### How to use the DPD function

There are two ways to use the DPD function. When connecting IC-PW2, which is used only with this product, DPD is performed with linear amplifier OFF (through state)

This also applies when using features.

This product is used as an exciter for IC-PW2. When IC-PW2 is connected, it is used with the linear amplifier ON.

### To use the DPD function, DPD adjustment

for each operational band is required for each usage mode. By adjusting the ALC circuit reference voltage and gain in the FPGA,

Rapid fluctuations in the gain of the ALC circuit located after the FPGA are suppressed to a minimum, allowing for optimal distortion correction.

\*Re-adjustment is not necessary, but the adjustment may be deviated due to changes in characteristics over time. We recommend periodic readjustment. Also, if you replace IC-PW2, you will need to perform the DPD interlock adjustment again.

### Before adjusting the DPD of this product.

Connect a dummy load (pseudo load: 50Ω) to the antenna connector of this product. \* DPD adjustment may not be possible when SWR is 1.5 or higher.

there is.

- Turn off the built-in tuner of this product.
- If IC-PW2 is connected, remove it.

### To connect this product to IC-PW2 and perform DPD interlock adjustment

After completing the DPD adjustment of this product in advance, (ALC adjusted). \*If the ALC of IC-PW2 and the

DPD of this product are not adjusted, the DPD

Interlocking adjustment is not

possible. Connect a dummy load with sufficient input power capacity to the antenna connector of IC-PW2.

\*When the SWR of this product and IC-PW2 is 1.5 or higher,

DPD adjustment may not be possible.

- For DPD interlock adjustment and during use, connect IC-PW2 with a coaxial cable for DPD feedback (OPC-2501, sold separately). \*For details, please refer to the IC-PW2

instruction manual.

### About the DPD adjustment screen

The "DPD Adjustment" screen is displayed in set mode.

**MENU** SET > DPD Adjustment



### IC-7610 individual adjustment

When adjusting the DPD of this product, the selection of the DPD adjustment band and the individual adjustment status of each band are displayed.

### IC-PW2 interlocking adjustment (200V)

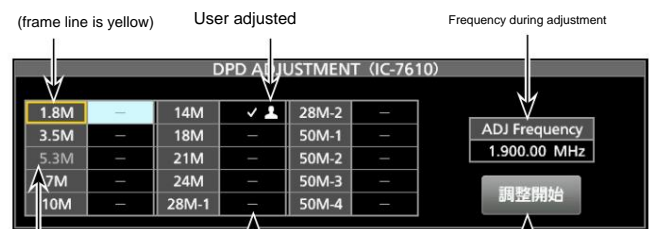
The selection of the band for DPD interlock adjustment with IC-PW2 (at AC200V) and the interlock adjustment status of each band (at 1kW/500W) are displayed. \*Adjustment will start at the maximum output power selected by IC-PW2. \*If IC-PW2 is not connected, the status at the time of interlock adjustment will be displayed. \*Before performing DPD interlock adjustment, IC-7610 individual adjustment is required.

### IC-PW2 interlocking adjustment (100V)

The selection of the band for DPD interlock adjustment with IC-PW2 (at AC100V) and the interlock adjustment status of each band (at 500W) are displayed. \*If IC-PW2 is not connected, the status at the time of interlock adjustment will be displayed. \*Before performing DPD interlock adjustment, IC-7610 individual adjustment is required.

### [Display example] IC-7610 single unit

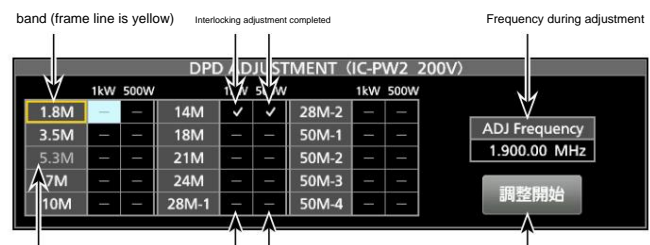
#### adjustment target band



Band outside the operating range Not adjusted [Adjustment start/cancel] key

### [Display example] IC-PW2 interlocking adjustment

#### (200V) adjustment target band



Band outside the operating range Not adjusted [Adjustment start/cancel] key

**Additio** DPD features

Individual adjustment of DPD function

Adjust the DPD of the band operated by the DPD function.

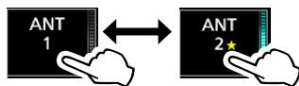
1. Display the "DPD Adjustment" screen.
2. Touch "IC-7610 individual adjustment".
  - The dialog "Do you want to move to the adjustment screen?" will be displayed.
3. Touch [Yes].
  - The "DPD ADJUSTMENT (IC-7610)" screen will be displayed.
4. Touch [y]/[y] to select the band for DPD adjustment. (Example: When selecting 14M)



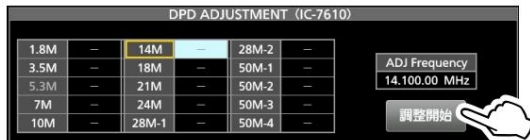
• The frequency at the time of DPD adjustment is displayed, and the appropriate operation mode is switched internally.

\* When adjusting the DPD, changing the frequency or switching the antenna connector will not affect the adjustment value. For frequency changes, see "About the frequency range of the DPD adjustment band" (P.4).

5. If the antenna connector connecting the dummy load is  
If it differs from the name memory, switch.



6. Touch [Start Adjustment].



•"Adjustment will start." will be displayed.

7. Touch [OK].

\*Automatically enters transmission state (maximum 30 seconds) at maximum output. \* If the transmission power is low, the message "Transmit at 100% RF POWER. Are you sure?" will be displayed, so touch [Yes].

• While sending, the [Start Adjustment] key switches to [Cancel]. Masu.

•"Adjustment completed." will be displayed, and the band for which the adjustment has to [check mark] [person icon] been completed will

8. If you want to use the DPD function even in unadjusted bands, follow steps 4 to Repeat step 7 to make adjustments.

DPD interlock adjustment

After completing the individual adjustment of the IC-7610 using the steps on the left, perform the DPD interlock adjustment with the IC-PW2 using the steps below.

1. When connecting IC-PW2 with AC200V, switch IC-PW2 to the maximum output power (1kW/500W) for DPD adjustment. \*Please adjust the DPD according to the output power used. (Example: At 1kW)
2. Display the "DPD adjustment" screen of this product.
3. Touch "IC-PW2 interlock adjustment (200V)".

•The dialog "Do you want to move to the adjustment screen?" will be displayed. \*When connecting IC-PW2 with AC100V, "IC-PW2 interlock adjustment (100V)" Touch. 4. Touch

[Yes].

- The "DPD ADJUSTMENT (IC-PW2 200V)" screen will be displayed. (Example: When using "IC-PW2 interlocking adjustment (200V)")
5. Touch [y]/[y] to select the band for DPD interlocking adjustment. (Example: When selecting 14M, 1kW)



• The frequency at the time of DPD interlock adjustment is displayed, and the appropriate operation mode is set.

Switched internally. \* Make

sure the selected band and frequency are synchronized with IC-PW2. \*During DPD interlock adjustment, frequency change and antenna connector switching It does not affect the adjustment value.

6. Switch to the antenna connector of this product connected to the RF input connector on the (transmission) display side of IC-PW2.



7. Switch the antenna connector of IC-PW2 to the antenna connector to which the dummy load is connected.

8. Touch [Start Adjustment].



•"The output power will be 1kW. Are you sure?" will be displayed. It will

9. Touch [Yes].

•"Adjustment will start." will be displayed.

- 10.Touch [OK]. • The exciter automatically enters the transmitting state, and the [Start Adjustment] key is pressed. will change to [Cancel].

•"Adjustment completed." will be displayed and the output voltage for which adjustment has been completed will be displayed.

is displayed on [check mark] [person icon] rce band. 11. If

- you want to use the DPD function even in unadjusted bands, follow steps 4 to Repeat step 9 to make adjustments.

## Additional DPD features

### Delete DPD adjustment value

DPD adjustment values can be deleted from the screen during adjustment.

\*The erasing range differs depending on the screen, and even when IC-PW2 is not connected.

Adjustment values during DPD interlock adjustment can be deleted.

### IC-7610 individual adjustment and DPD interlocking adjustment (100V/200V) adjustment

To clear all values at once

On the "DPD ADJUSTMENT (IC-7610)" screen, operate each menu key below.



[Operation of each menu key]

Key	action
↑, ↓ Band selection (valid when operating the [CLR] key)	
CLR	IC-7610 individual adjustment registered in the selected band Delete the adjustment values of DPD interlock adjustment (100V/200V) all at once.
CLR ALL	All adjustment values (1kW/500W: for all bands) of IC-7610 individual adjustment and DPD interlock adjustment (100V/200V) are deleted all at once.

### To delete only the adjustment value of DPD interlock adjustment

(200V) On the "DPD ADJUSTMENT (IC-PW2 200V)" screen, operate each menu key below.



[Operation of each menu key]

Key	action
↑, ↓ Band selection (valid when operating the [CLR] key)	
CLR	Delete only the adjustment value (1kW/500W) of DPD interlock adjustment (200V) registered in the selected band
CLR ALL (bands)	DPD interlock adjustment (200V) adjustment value (1kW/500W: all bands)

### To delete only the adjustment value of DPD interlock adjustment

(100V) On the "DPD ADJUSTMENT (IC-PW2 100V)" screen, operate each menu key below.



[Operation of each menu key]

Key	action
↑, ↓ Band selection (valid when operating the [CLR] key)	
CLR	Delete only the adjustment value (500W) of DPD interlock adjustment (100V) registered in the selected band
CLR ALL	Delete all adjustment values (500W: all bands) of DPD interlock adjustment (100V)

### DPD function switching

MODE SSB/SSB-DATA/AM/AM-DATA After adjusting the DPD function, you can switch the DPD function.

- Press **MENU**.
- Touch [DPD].

\*Even when IC-PW2 is connected, switching can be done simply by operating this product. \*It will be OFF (fixed) for bands without DPD adjustment and when FM/FM-DATA/CW/RTTY/PSK is selected. \* Even if the band is DPD adjusted, the operating frequency is the DPD adjusted frequency.

If the number is outside the range, it will be OFF (fixed).

\* While using the DPD function, feedback correction is performed while monitoring the transmit signal level of this product, so please adjust it to a level that does not cause the fluctuation of the ALC meter of this product to exceed the ALC zone.

When the ALC zone is exceeded, an abnormality in the correction value is detected and correction is stopped.



### Saving and loading DPD adjustment values

DPD adjustment values can be saved to an SD card or USB memory along with other setting data. When loading setup data, you can select the DPD adjustment value on the "Load Options" screen.



**Additional** DPD features

About the frequency selection range of DPD adjustment band

The table below shows the frequency range of each band that can be selected when adjusting DPD. If you wish to change the frequency during adjustment, select it within the transmission frequency range listed in the product's ratings. \* Even if you change the band edge on the "User Band Edge" screen of this product, it will not affect the frequency selection range.

adjustment band	Frequency selection range
1.8M	0.030.000 ÷ 1.999.999
3.5M	2.000.000 ÷ 3.999.999
7M	5.800.000 ÷ 7.999.999
10M	8.000.000 ÷ 11.999.999
14M	12.000.000 ÷ 14.999.999
18M	15.000.000 ÷ 18.999.999
21M	19.000.000 ÷ 21.999.999
24M	22.000.000 ÷ 24.999.999
28M-1	25.000.000 ÷ 28.999.999
28M-2	29.000.000 ÷ 29.999.999
50M-1	30.000.000 ÷ 50.999.999
50M-2	51.000.000 ÷ 52.000.000
50M-3	52.000.001 ÷ 52.999.999
50M-4	53.000.000 ÷ 60.000.000

**Additional** setting items

The following items have been added to the set mode function settings. ÷

IC-PW2 dual connection mode



IC-PW2 dual connection mode (Initial setting: OFF)

This is a setting to link the operating band and frequency when one product is connected to the RF input connectors (INPUT 1 and INPUT 2) of IC-PW2 and operated. ÷ OFF: Not interlocked (IC-PW2 is not connected) ÷ ON: Interlocked \*If IC-PW2 is not connected, be sure to use it with "OFF". When set to "ON", operations such as antenna switching of this product are restricted as it is linked with IC-PW2.

**Forced** tune operation in conjunction with IC-PW2

At the same time as the IC-PW2 forced tuning operation, this product automatically enters the transmitting state, and you can start the IC-PW2 forced tuning. \*Meters can be switched during forced tuning. \* If you briefly press **TUNER** on this product, the cooperative forced tune will be interrupted and the TUNER lamp will switch from flashing (red) to off.

**Additional** transmit interlock control

When two of our exciters that support transmission interlock control (this product) are connected to the IC-PW2, it prevents the two exciters from entering a simultaneous transmission state during SO2R operation. \* If the INPUT lamp of IC-PW2 is off or a TX Inhibit control command is set for this product connected to the RF input connector that is lit in green, "INH" will be displayed. When you perform a transmission operation, "Transmission inhibited" is displayed and the transmission is stopped.

It will not be.

Sending prohibited Display when sending operation is performed



**Additional** CI-V commands (supplementary instructions)

CI-V commands have been added due to specification changes. \*Items marked with "\*" can be read/written.

Command	sub data	16* 66	action
		00/01	TX Inhibit setting ÷ 00=OFF ÷ 01=ON
	67	00/01	DPD function setting * 00=OFF, 01=ON
1A* 05 0310	00/01		IC-PW2 dual connection mode setting * 00=OFF, 01=ON

## Notice of specification changes

IC-7610/IC-7610M Version 1.30

Due to the specification change, the functions of this product have been changed as shown below.

### Scroll mode for scope functions

Scroll mode has been added to the scope function. Temporarily fixes the frequency span (display range) and displays the signal within the span. When the received

frequency moves off the screen, the upper and lower limit frequencies of the frequency span (display range) scroll to switch the displayed frequency range.

Scroll mode is SCROLL-C to display from center mode.

There is a SCROLL-F that displays from FIX mode. \*When operating the scope function [SPAN] or [EDGE].

The setting value is now displayed approximately 1 second larger.

1. Display the "SPECTRUM SCOPE" screen.

**MENU** → **SCOPE**

2. Touch [CENT/FIX] for a long time (about 1 second) to switch to scroll mode.

Switch to display. (Example: MAIN band) \* To operate with a mouse, move the mouse pointer to the mode (CENTER, FIX) Press and hold the left button to switch to scroll mode display.

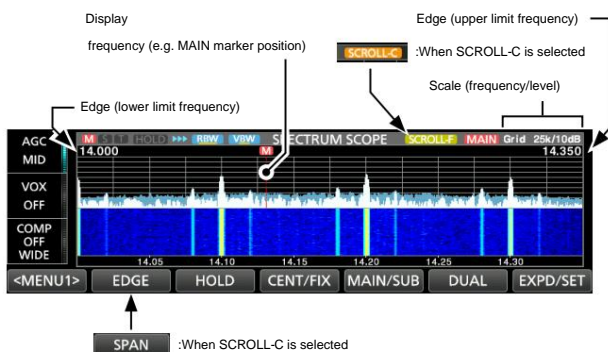
Center mode → Scroll mode When switching from center mode, SCROLL-C will be displayed. \* You can operate [SPAN] in the same way as in center mode.

FIX mode → Scroll mode When switching from FIX mode, SCROLL-F will be displayed. \*You can operate [EDGE] in the same way as in FIX mode.

3. Touch [CENT/FIX] briefly to return to the previous mode.

vinegar. \*The frequency span set in scroll mode will be displayed as is. \* If you return to FIX mode after switching the edge in SCROLL-F display, the edge that was set in SCROLL-F display will remain the same.

Also, if the current frequency is outside the scope display range, "yy" (low frequency) or "yy" (high) will be displayed on the left and right sides of the top of the screen.



### Changing item names in scope settings

The setting item name on the "Scope Settings" screen has been changed from "Marker Position (FIX Mode)" to "Marker Position (FIX Mode/Scroll Mode)." \* Marker position can

now be set even in scroll mode.

I did.

### Added FIX edge (No.4) for scope settings

There used to be up to 3 sets of FIX edges for each band on the "Scope Settings" screen, but now there are 4 sets with the addition of No. 4.

(CI-V command: 27 1E has also been changed: see page 4)

### Memorize scope reference level for each band

The reference level adjusted on the "SPECTRUM SCOPE" screen can now be memorized for each band.

### Addition of operation to cancel scope screen

While the scope screen is displayed, **you can now** cancel the scope screen by pressing M.SCOPE for a long time (approximately 1 second).

**Tone setting when receiving changed data mode**

When receiving in data mode, the receive tone control in set mode now always operates with the default setting.

**MENU** → SET > Tone Control/Transmission Bandwidth > Reception

Reception HPF/LPF (Initial setting: -----)  
 Reception sound quality (Initial setting: 0) (Initial setting: 0)  
 (bass) Reception sound quality (treble)

**change set mode**

The following items have been changed in the set mode function settings.

Reference frequency adjustment

The reference frequency adjustment setting value has been changed to be displayed to the first decimal place.

**MENU** → SET > Function settings > Reference frequency adjustment

Reference frequency adjustment

Adjust the reference frequency. Setting range: 0.0% to 100.0%

**Change CI-V command (supplementary instructions)**

CI-V commands have been added/changed due to specification changes. \*Items marked with "\*" can be read/written.

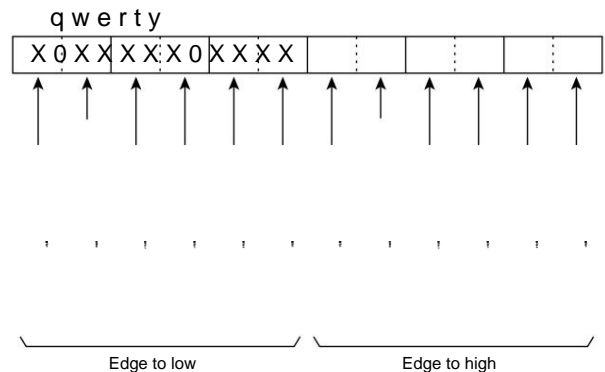
Command sub data		action
1A* 05 0169 00/01	Scope settings - Marker position (FIX mode/scroll mode) settings * 00=Filter center 01=Carrier point 0298 See the figure below	Scope settings - FIX edge - No.4: Setting of 0.03 – 1.60
0299	See the figure below	Scope settings - FIX edge - No.4: Setting of 1.60 – 2.00
0300	Scope settings as shown below	Scope settings - FIX edge - No.4: 2.00 – 6.00 settings
0301	Scope settings as shown below	Scope settings - FIX edge - No.4: 6.00 – 8.00 settings
0302	Scope settings as shown below	Scope settings - FIX Edge - No. 4: Settings of 8.00 – 11.00 0303
	Scope settings as shown below	Scope settings - FIX Edge - No. 4: Settings of 11.00 – 15.00 0304
	Scope settings as shown below	Scope settings - FIX Edge - No. 4: 15.00 – Settings of 20.00 0305
	Scope settings as shown below	Scope settings - FIX Edge - No. 4: Settings of 20.00 – 22.00 0306
	Scope settings as shown below	Scope settings - FIX Edge - No. 4: Settings of 22.00 – 26.00 0307
	Scope settings as shown below	Scope settings - FIX Edge - No. 4: Settings of 26.00 – 30.00 0308
	See the figure below	Scope settings - FIX edge - No. 4: Settings of 30.00 – 45.00
0309	See the figure below	Scope settings - FIX edge - No. 1: 45.00 - 60.00 settings See page 3 Spectrum scope output waveform data * Spectrum scope operation settings (command: 27 10) and spectrum scope waveform data output settings (Command: 27 11) Transferred when is ON.
27* 00		See P.4 Spectrum scope mode settings See P.4
14		Spectrum scope SPAN settings *In center mode, SCROLL-C mode
15		See P.4 Scope settings - FIX edge settings * In FIX (fixed) mode, SCROLL-F mode 00/01
16		Marker position settings * FIX (fixed) mode, scroll (SCROLL-C, SCROLL-F) mode *00=filter center, 01=Career points
20		

**Add/change command format**

Scope setting - FIX edge frequency setting Command:

1A 05 0182 to 0217

1A 05 0298 0309



Change CI-V command (supplementary instructions)

ÿAdd/change command format

Spectrum scope output waveform data

Command: 27 00

Outputs the spectrum scope waveform data from the radio.



1 MAIN/SUB data: 00=MAIN, 01=SUB 2 Division number (NOW): 01 to 15 3 Division number (MAX): 01=LAN, 15=USB ÿ When outputting from the [USB 1] port, the data Divide into 15 parts and output. ÿ When outputting from the [LAN] port, the data is output all at once.

It will be.

\*The division number (NOW) refers to the number of divisions. The division number (MAX) refers to the total number of divisions.

Example) When sending the 5th division out of 15 divisions, the division number (NOW) will be 5 and the division number

(MAX) will be 15. ÿ When outputting from the [USB 1] port, the waveform data (u) will not be added to the data with the first division number (NOW). The second and subsequent data include MAIN/SUB data (q), division number (NOW) (w), division number (MAX) (e), and waveform data (u).

4 Display mode: 00=CENTER mode,

01=FIX mode, 02=Scroll

(SCROLL-C) mode, 03=Scroll (SCROLL-F)

mode

5 Waveform

information Waveform information varies

depending on the display

mode. ÿFor center mode:

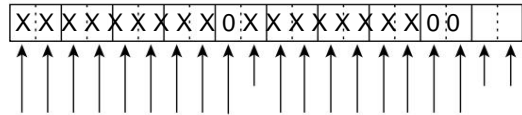
Center frequency + span \*Operating

frequency data (page 12 of supplementary manual) \* Spectrum

scope SPAN setting (for center mode, scroll (SCROLL-C) mode) (2~ on the next

ÿ For FIX (fixed) mode, scroll (SCROLL-C, SCROLL-F) mode: Lower

limit frequency + upper limit frequency



Band edge frequency (lower limit) Band edge frequency

(upper limit) \*In scroll (SCROLL-C, SCROLL-F) mode, if

the lower limit frequency is a negative value, the 1 GHz digit becomes "F".

6 Out of Range: 00 = in range, 01 = out of range

\*In the case of Out of Range, there is no waveform, so the waveform data (7) is I can't ride it.

7 Waveform data: 0 to 200 = data range, 689 = data

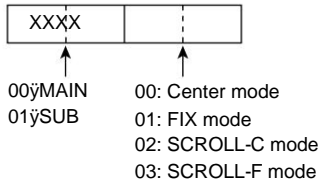
length

Change CI-V command (supplementary instructions)

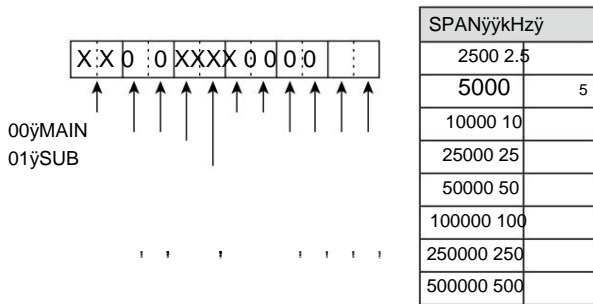
Add/change command format

Spectrum scope mode setting

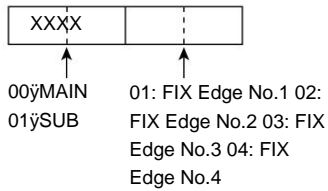
Command: 27 14



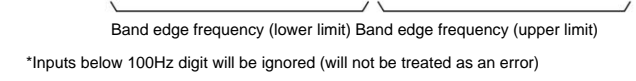
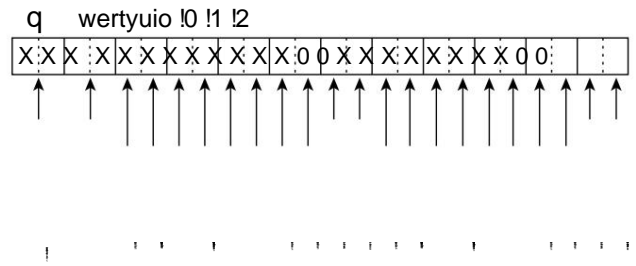
Spectrum scope SPAN setting (center mode, scroll (SCROLL-C) mode) Command: 27 15 qwerty



Scope settings - FIX edge settings  
(When in FIX (fixed) mode, scroll (SCROLL-F) mode) Command: 27 16



Setting the FIX edge frequency of the spectrum scope Command: 27 1E



1ANT classification (frequency range)

Data	ANT classification (frequency range) (MHz)
01	0.00~1.60
02	1.60~2.00
03	2.00~6.00
04	6.00~8.00
05	8.00~11.00
06	11.00~15.00
07	15.00~20.00
08	20.00~22.00
09	22.00~26.00
10	26.00~30.00
11	30.00~45.00
12	45.00~60.00

2 Edge number: 01=1, 02=2, 03=3, 04=4



## Notice of specification changes

IC-7610/IC-7610M Version 1.10

Due to the specification change, the functions of this product have been changed as shown below.

By using the update file (Version 1.10), this product will be updated with the following contents. For information on how to update the firmware and check the firmware version, be sure to read the instruction manual "Chapter 16 Firmware Upgrade" in advance.

Important! Before updating the firmware, back up the memory channel contents, filter setting information, etc. to an SD card or USB memory. Upgrading the firmware initializes (resets) the transceiver and erases all registered information.

### Default setting value of changed digital IF filter

The initial setting of passband width (SSB-DATA mode: FIL1 to FIL3) has been changed.

Operation mode	initial setting	Setting range (step width)
SSB-DATA	FIL1 $\dot{\sim}$ 3.0kHz $\dot{\sim}$	50Hz $\dot{\sim}$ 500Hz $\dot{\sim}$ 50Hz/ 600Hz $\dot{\sim}$ 3.6kHz $\dot{\sim}$ 100Hz $\dot{\sim}$
	FIL2 $\dot{\sim}$ 1.2kHz $\dot{\sim}$	
	FIL3 $\dot{\sim}$ 500Hz $\dot{\sim}$	

\*For operating instructions, please refer to "Digital IF filter passage bandwidth selection (P.4-5)" in the instruction manual.

### Setting items on the change "Set" screen

The "Tone Control" item on the "Set" screen has been changed to the "Tone Control/Transmission Bandwidth" item.



\* Regarding the abbreviations of operations described in the instruction manual,

MENU  $\dot{\sim}$  SET > Tone Control/Transmission Bandwidth

Please read it as follows.

### Added SSB-DATA mode transmit bandwidth settings

MENU  $\dot{\sim}$  SET > Tone Control/Transmission Bandwidth > Transmission > SSB-D

Added transmit bandwidth settings for SSB-DATA mode.

Transmission bandwidth (Initial setting: 300 – 2700)

Set the low and high range of the transmission bandwidth.  $\dot{\sim}$  Options:

Low range 100, 200, 300, 500 (Hz) High range 2500, 2700, 2800, 2900 (Hz)

### Added "input prohibition time when connected to USB" setting

MENU  $\dot{\sim}$  SET > External terminal > USB SEND/keying

A setting for "input prohibition time when connected to USB" has been added to the "USB SEND/Keying" item on the "External terminal" screen in set mode.

Input prohibition time when connected via USB (Initial setting: ON)

This setting prevents unintentional transmission of SEND signals and keying signals in the following situations.  $\dot{\sim}$ When you connect your computer and this product using a USB cable.  $\dot{\sim}$ When you start up your computer or connect or disconnect other USB-connected devices to your computer while your computer and this product are connected using a USB cable.

$\dot{\sim}$ When communication is established with the USB virtual COM port of this product  $\dot{\sim}$  OFF: Immediately after connection, SEND signals and keying signals are not sent.

$\dot{\sim}$  ON: Disables the sending operation of the SEND signal and keying signal for a few seconds after connection to prevent unintended sending. After updating, make sure that unintended transmissions do not occur.

**Add** "Settings Save Version" settings

**MENU** → SET > SD card

**MENU** → SET > USB memory

A "Save settings version" item has been added to the "SD card" screen or "USB memory" screen in set mode.

Settings save version (Initial setting: current version)

Set the format of the settings file saved to the SD card or USB memory. \*The number

in parentheses means the firmware version. • Current version:  
Update the configuration data to the current firmware version.

• Old version

(x.xx~x.xx): Firmware

version format in parentheses

Save with

**Note:**

• If settings are saved in the old version format, settings added with the new firmware version will not be saved. • Setting data saved in the current version format is Unable to read with software version IC-7610.

**Change** CI-V command (supplementary instructions)

For the following commands that have been added, please see the supplementary instructions posted on the

Icom homepage. •29: Specifying MAIN band and SUB band

•1A 05 0296: Setting SSB-D TBW (transmission bandwidth)

•1A 05 0297: Setting input prohibition time when connected

to USB •1A 0A: Reading OVF Indicator