ICOM IC-7100 Timing Adjustments
for use with a Linear Amplifier

> **WARNING:** **DO NOT 'ASSUME' YOUR 7100 WILL WORK SEAMLESSLY WITH EVERY LINEAR AMPLIFIER.**
>
> - Some older linear amplifiers use high voltage (i.e., 120 v.) for keying their T/R relay. **These amps will damage the 7100 the first time you key them.**
> - Some modern amps have relays the exceed the E/I ratings of the 7100 keying circuit. **See bottom of p. 1-16 in the standard user manual.**
> - In most cases you **must** make at least one timing adjustment to the transceiver; often it is two adjustments*****. Otherwise, you will burn the relay contacts in the amplifier's T/R relay.
> - Failure to make the proper timing adjustments to the 7100 USUALLY results in **Hot Switching** and possibly damage to the amplifier and/or transceiver.

Timing Adjustments:

*TX DELAY defines the time that the 7100 will wait after the first dit (or dah) begins, before transmitting RF. The wait is necessary to allow time for the amp's slow T/R relay to switch. If you don't set this properly, you will have **hot switching**.

You won't notice any negative affect of **hot switching** for at least a year, but eventually the amp's relay will begin to stick. You notice this when you cease transmitting and find that the receiver fails to receive anything, or if anything, then much weaker than it should be. **This is due to burnt relay contacts in the amplifier.**

The constant arcing of the relay over a longer period of time causes a build-up of black crud (carbon?) on the relay contacts, which creates a high resistance between the contacts. Worse yet, it may even cause the relay contacts to pit.

*[CW] Semi BK-In Delay adjusts the length of time that the amp's relay remains in the TX position, before releasing and returning to RX. When contesting at higher speeds, say 30 wpm and higher, I set this relatively short (perhaps ¼ second) so that I don't miss the first part of the QSO partner's response. In daily use (normal QSO's), I set it to about one second to reduce relay chatter. This makes it less hectic and I maintain my sanity.

Unless your amplifier supports Full-QSK, you must adjust Semi BK-In Delay.

> ***CAUTION: AMERITRON** claims their Amp's use a very fast T/R relay that switches in just 15 milliseconds. **NONESENSE!** These relays have an average switching time of about 20 ms and in some cases (worst case) need 22 ms to switch and settle. Thus a TX-Delay of 25 ms is required.
>
> **15 ms** is the 'raw spec' of the relay, measured when switched just one time. It does not include settling time (1 to 2 ms), nor the delay caused by the reverse-biased diode (1 to 2 ms). In addition, when the relay is trying to follow CW keying, it is even slower!

Adjusting TX-Delay:

The setting of TX Delay depends on the type of T/R relay(s) used in the external device and their switching speeds.

Please check the requirements of your amplifier before adjusting TX Delay.

In general:

1. **Default: 0 mS** when **no "switched" external devices** are used in the transmission line between the radio and the antenna. (Examples: Linear Amplifier, Pre-Selector, separate RX antenna, etc.)
2. For Linear Amplifiers using **PIN-DIODE** switching: use 5 mS
3. For Liner Amplifiers using **Vacuum Relays**: use 10 mS
4. For Linear Amplifiers using **fast non-Vacuum Relays**: use 15 mS
5. For Linear Amplifiers using **Open-Frame Relays**: use 25 mS
6. When **unknown: use 25 mS**

| TX Delay		
HF	**OFF**, 10ms, 15ms, 20ms, 25ms or 30ms	Sets the transmission's timing of the IC-7100 to prevent any external equipment that is connected from damage by the transmitted RF.
50M	**OFF**, 10ms, 15ms, 20ms, 25ms or 30ms	See HF above.
70M*	**OFF**, 10ms, 15ms, 20ms, 25ms or 30ms	See HF above.
144M	**OFF**, 10ms, 15ms, 20ms, 25ms or 30ms	See HF above.
430M	**OFF**, 10ms, 15ms, 20ms, 25ms or 30ms	See HF above.
* 70 MHz band transmission is available, depending on the transceiver version.		

(Page 17-5, Full Manual)

Note: if no external devices are used, leave TX Delay **OFF**.

HANG-DELAY ADJUSTMENT

Break-in function

(Mode: CW)
The Break-in function is used in the CW mode to automatically toggle the transceiver between transmit and receive when keying. The IC-7100 is capable of Full Break-in or Semi Break-in.
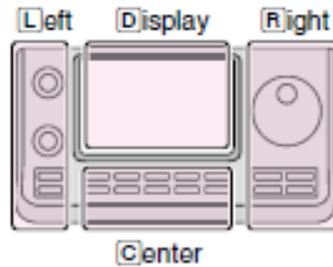
Left   Display   Right

The L, R, C or D in the instructions indicate the part of the controller.
L: Left side
R: Right side
C: Center bottom
D: Display (Touch screen)

Center

◇ Semi Break-in operation
During Semi Break-in operation, the transceiver immediately transmits when you key down, then returns to receive after a preset delay time has passed after you stop keying.

① Select the desired frequency band. (p. 3-6)
② On the Mode selection screen, select the CW or CW-R mode. (p. 3-17)
③ Push [MENU](C) one or more times to select the "M-3" screen (M-3 menu).
④ Touch [BK-IN](D) one or more times to turn ON the Semi Break-in function.
 • "BKIN" appears.
⑤ When the "M-3" screen (M-3 menu) is selected, touch [BK-IN](D) for 1 second to display the "BK-IN" screen.
⑥ Rotate the Dial to select the desired option.
 • If desired, touch [DEF](D) for 1 second to reset to the default setting.
⑦ Push [MENU](C) to exit the "BK-IN" screen.

Touch [BK-IN]

Semi Break-in icon

Touch [BK-IN] for 1 second
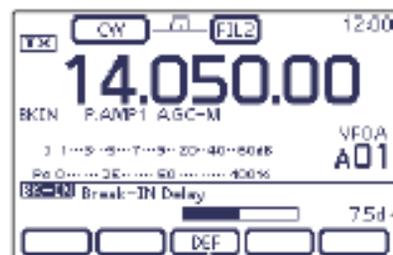
Touch for 1 second to reset to default

Shows break-in delay time

(Page 6-3, Full Manual)

3

## ◇ Full Break-in operation

During Full Break-in operation, the transceiver transmits when you key down, then immediately returns to receive when you release.

①On the Mode selection screen, select the CW or CW-R mode. (p. 3-17)
②Push [MENU](C) one or more times to select the "M-3" screen (M-3 menu).
③Touch [BK-IN](D) one or more times to turn ON the Full Break-in function.
 • "F-BKIN" appears.

Touch [BK-IN]

Full Break-in icon

The L, R, C or D in the instructions indicate the part of the controller.
L: Left side
R: Right side
C: Center bottom
D: Display (Touch screen)

Left   Display   Right
Center
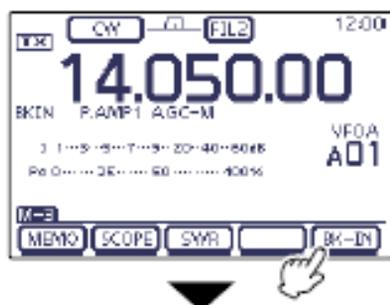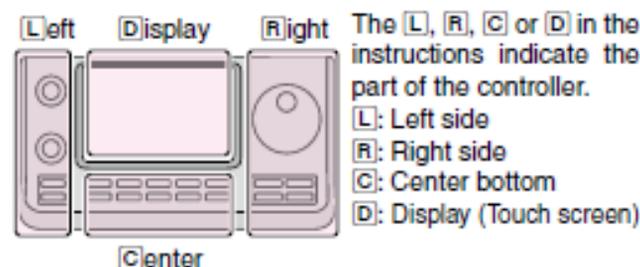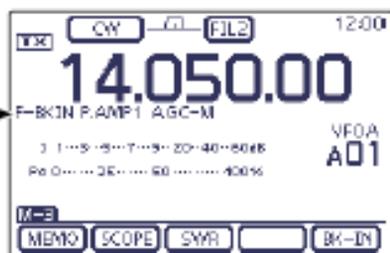
When using a paddle:

Adjust the keying speed while operating a paddle.

①Push [SPEED/PITCH](C) to open the Key speed/CW pitch adjustment window.
②Rotate [M-CH]◉(L) to adjust the Key speed.
 • The adjustable key speed is between 6 and 48 wpm (words per minute).
③Push [MENU](C) to close the window.

[M-CH]

[SPEED/PITCH]

KEY SPEED/CW PITCH
KEY SPEED: ▇▇▇▇   20 WPM
CW PITCH: ▇▇▇▇   600 Hz

(Page 6-4, Full Manual)

4