Introduction

The MFJ-441 *SlimLine*™ Econo Keyer with Memory is a microprocessor controlled keyer that provides iambic key operation and dot-and-dash memory to make sending perfect code easier. It has tunable code speed, code weight, and sidetone frequency; it supports both direct and grid-block keying outputs. You also get to choose between Iambic Type "A" and Type "B" keying. It even has a volatile memory to record and play a message of your choice.

Control Functions

1. The **Power** button turns the unit ON and OFF. The power is ON when the button is locked in the "in" position and OFF in the "out" position.

2. The **Semi-Auto/Auto** allows semi-automatic "bug" and manual operations. The keyer generates dots automatically when a squeeze or single lever key is used. Dashes are manually made. The keyer is completely manual when a straight key is used. Semi-Auto is active when the switch is locked in the "in" position and Auto is active in the "out" position.

3. The **Message** button lets you record and play a message from the volatile memory. It is a momentary push-buttom that is time sensitive.

4. The **Speed** control varies code speed from 2 to 65 WPM. Turn the control clockwise to increase speed and counter-clockwise to decrease speed.

5. The **Volume** control adjusts the sidetone level of the internal speaker. Turn the control clockwise to increase the volume and counter-clockwise to decrease the volume.

6. The **Weight** control varies the code weight. This control is located internally. When looking at the unit's front panel, it is accessible through the small hole on the left side, closest to the rear and may be adjusted by inserting a small, flat-headed screwdriver. The standard dot-dash-space ratio is 1:3:1 (trimpot at mid-range). This control is turned clockwise to increase dot and dash lengths and counter-clockwise to decrease dot and dash lengths. With the standard timing defined as 100% weight, the code weight varies in the range of approximately 10% to 190%.

7. The **Tone** control sets the desired sidetone pitch from approximately 200 to 1000 Hz. This control is also located internally. When looking at the unit's front panel, it is accessible through the small hole on the left side, closest to

the front and may be adjusted by inserting a small, flat-headed screwdriver. This control is turned clockwise to raise the pitch and counter-clockwise to lower the pitch.

8. The **Direct/Grid-Block Output** keying circuit allows keying of grid-block and solid state transmitters. The MFJ-441 can only key one type of transmitter at a time. This is an internal jumper selected option. The unit is factory set to direct keying. To change to grid-block keying the power must be off, then remove the cover by removing the two screws (one on each side) that secure it. Locate JMP1 and JMP2. JMP2 is directly behind the RCA jack. JMP1 is approximately ½" below and slightly to the left of JMP2. Set ***both*** jumpers (JMP1 & JMP2) to the "G" position. To key a solid state transmitter, set both jumpers to the "D" position.

   Note: *Power must be off when changing the jumper settings.*

9. The **Iambic Type A/B** mode is set inside the unit. The unit is factory set for Type "A" Iambic. If you prefer Type "B" Iambic, remove the cover by removing the two screws (one on each side) that secure it. Locate the through-hole resistor next to U1. The resistor is 1.5kΩ mounted vertically. Remove or cut the long lead of the through-hole resistor for Type "B" Iambic. If you choose not to completely remove the resistor, make sure the cut leads do not and will not short something out. Re-solder the resistor lead, if cut, for Type "A" Iambic or, if removed, add a 500Ω to 1.5kΩ resistor from U1 pin 9 to ground.

   When a squeeze is released during an element (dot or dash), type "B" adds the opposite element. Type "A" just finishes the element in progress and does *not* produce a following alternate element. For example, in Type "A" Iambic, a squeeze release during the "dah" in the letter A will produce "dit dah" (A). In Type "B" Iambic, a squeeze release during the "dah" in the letter A will produce "dit dah dit" (R).

INSTALLATION

1. A 9-volt battery (not included) may be installed. Remove the cover by removing the two screws (one on each side) that secure it.. A battery clip and a holder, located on the right side of the enclosure, are provided for installing a 9-volt battery.

2. A 12 Vdc power supply may also be used to power the MFJ-441. A 2.1mm coaxial plug with a positive center and a negative sleeve should be used to

power this unit. The MFJ-1312B, an optional 12 Vac adapter, is available from MFJ Enterprises, Inc. The battery is automatically disconnected when external power is used.

3. A squeeze or single lever key can be used. Squeeze key allows Iambic operation. A 1/4-inch stereo phono plug and a two-conductor shielded cable should be used. If separate shielded cables are used, the two shields should be tied together and connected to ground . The dot wire should next be connected to the tip of the plug and the dash wire to the ring. The MFJ-441 becomes a manual keyer when a straight key is used. The unit will safely key your transmitter and eliminate the shock hazard of high voltage being present on the straight key.

   Note: *To use a straight key, first switch the keyer to the **Semi-Auto** mode (button in). Again a 1/4-inch stereo phono plug should be used because a mono plug will not work on a straight key in **Semi-Auto** mode. Connect one wire to the ring of the plug and another wire to ground. The tip of the plug should not used.*

4. Output keying circuit allows keying of grid-block and solid state transmitters. Remember this is internally jumper selected (refer to page 2). The keying output connection is made with a RCA phono plug.

   Note: *Consult the transmitter's instruction manual to determine which output to use. When in doubt, try both jumper positions. The transmitter will key continuously when the jumpers are connected to the wrong positions.*

KEYER OPERATION

1. A 9-volt battery or an optional ac adapter may be used to supply power to the keyer.

2. The key paddle should be connected to the **Key** jack on the rear panel of the unit. A dual paddle squeeze key or a single lever key can be used.

3. Next, the keyer should be turned on with the **Power** switch.

4. The **Semi-Auto** switch should be in the "out" position for automatic operation.
4. The user should now start sending with the paddle and adjust volume, tone, weight, and speed to his or her preference.

5. The dot and dash memories make sending easier. The memories allow the user to key a dot before the completion of a dash and vice versa. This feature can be checked by setting the keyer to the lowest speed and tapping first the dash lever and then the dot lever before the completion of the dash. The keyer will provide both the dash and the dot. The dash memory can be checked in a similar manner. The dot insertion feature allows the user to insert a dot by tapping the dot lever while holding the dash lever in. The dash insertion feature allows the user to insert a dash while holding the dot lever in. The Iambic operation feature allows sending of alternate dots and dashes when using squeeze key and with both paddles squeezed. The first paddle contacted will determine whether a dot or dash occurs first.

6. The user may select either **Iambic A** or **B** according to his or her preference.

Message Memory

The **Message** button is used to record and play your message. To record the message, press and hold the **Message** button until the keyer plays "GO" (—• ––) in Morse code and the LED flashes. You may now key in the message of your choice. As you pause after every word, the keyer will play a "W" (•—) over the sidetone speaker to show that it is inserting a word break (uses one unit of memory). If you make a mistake entering a word, you can back up over it by pressing and releasing the **Message** button. The keyer will erase the last word, then play the word before it (if any) to let you know where you stopped. At the end of your message, press and hold the **Message** button until the keyer sends an end of message character "+" (•–•–•) and the LED stops flashing. If you try to save more characters than you have memory, the keyer will automatically end your message and send you an end of message character. To play the message, momentarily press the **Message** button. On-going message can be stopped by tapping the paddle. The speed, weight, and tone *cannot* be changed during message sending or message recording. Also, the output keying circuit is disabled during recording.

The memory is set up for *only one* message and it is volatile; that is, when power is removed the message is erased. There are 37 units of volatile memory, which can record up to 37 characters (nine elements maximum per character--an element is a dot or a dash). Only the rarely used 7-, 8-, and 9-element characters require two units of memory. The slash or fraction bar "/" must be recorded as "//" requiring two units of memory. When there are five or less units of memory remaining, the LED will flash faster to let you know the memory is running low.

Note: *A straight key cannot be used to record the message.*

Technical Assistance

If you have any problem with this unit first check the appropriate section of this manual. If the manual does not reference your problem or your problem is not solved by reading the manual you may call *MFJ Technical Service* at **601-323-0549** or the *MFJ Factory* at **601-323-5869**. You will be best helped if you have your unit, manual and all information on your station handy so you can answer any questions the technicians may ask.

You can also send questions by mail to MFJ Enterprises, Inc., 300 Industrial Park Road, Starkville, MS 39759; by Facsimile to 601-323-6551; or by email to mfj@mfjenterprises.com. Send a complete description of your problem, an explanation of exactly how you are using your unit, and a complete description of your station.

Schematic

Notes

Morse Code Character Set[1]

A	•–	I	••	S	•••
B	–•••	J	•–––	T	–
C	–•–•	K	–•–	U	••–
D	–••	L	•–••	V	•••–
E	•	M	––	W	•––
F	••–•	N	–•	X	–••–
G	––•	O	–––	Y	–•––
H	••••	P	•––•	Z	––••
		Q	––•–		
		R	•–•		

1	•———–	4	••••–	8	———••
2	••——–	5	•••••	9	————•
3	•••—–	6	–••••	0	————–
		7	––•••		

Period	[.]	•–•–•–	$\overline{\text{AAA}}$	Quotation Mark	["]	•–••–•	$\overline{\text{AF}}$
Comma	[,]	––••––	$\overline{\text{MIM}}$	Hyphen or Dash	[-]	–••••–	$\overline{\text{DU}}$
Question Mark	[?]	••––••	$\overline{\text{IMI}}$	Underline	[_]	••––•–	$\overline{\text{IQ}}$
Fraction Bar	[/]	–••–•	$\overline{\text{DN}}$	Dollar Sign	[$]	•••–••–	$\overline{\text{SX}}$
End of Message	[+]	•–•–•	$\overline{\text{AR}}$	Left Parenthesis	[(]	–•––•	$\overline{\text{KN}}$
End of Work		•••–•–	$\overline{\text{SK}}$	Right Parenthesis	[)]	–•––•–	$\overline{\text{KK}}$
Double Dash,				Wait		•–•••	$\overline{\text{AS}}$
Pause or Break	[=]	–•••–	$\overline{\text{BT}}$	Understood		•••–•	$\overline{\text{SN}}$
Semicolon	[;]	–•–•–•	$\overline{\text{KR}}$	Starting Signal		–•–•–	$\overline{\text{KA}}$
Colon	[:]	–––•••	$\overline{\text{OS}}$	Error		••••••••	$\overline{\text{HH}}$
Apostrophe	[']	•————•	$\overline{\text{WG}}$	Paragraph	[¶]	•–•–••	$\overline{\text{AL}}$

Note:

1. FCC testing requirement consists the 26 letters, the 10 numerals, the period, the comma, the question mark, $\overline{\text{AR}}$, $\overline{\text{SK}}$, $\overline{\text{BT}}$ and fraction bar [$\overline{\text{DN}}$].

Signals Used In Other Radio Services

Interrogatory	••–•–	$\overline{\text{INT}}$
Emergency silence	••••–––	$\overline{\text{HM}}$
Executive follows	••–••	$\overline{\text{IX}}$
Break-in Signal	—————	$\overline{\text{TTTTT}}$
Emergency signal	•••———•••	$\overline{\text{SOS}}$
Relay of distress	–••–••–••	$\overline{\text{DDD}}$