

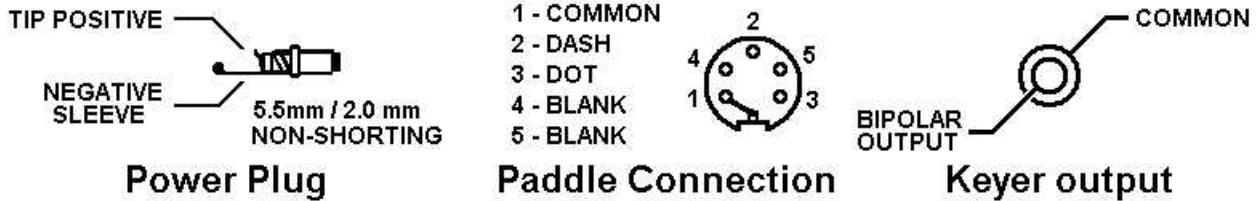


Instruction Manual
AEA MORSE
MEMORY KEYER
MODEL CK-1

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CK-1 WIRING INSTRUCTIONS



KEYING TRANSISTORIZED TRANSCEIVERS

Some transistorized transceivers such as the ICOM 701 and the Ten-Tec line require a slight modification of the AEA keyer. With this modification a reed relay is not required for proper keying.

If the CK-1 does not key your transceiver, check your transceivers key input polarity with respect to chassis ground. If positive, modify the unit as follows:

- Remove the keyer from case and locate the diode closest to the speaker (D4).
- Solder a jumper across this diode.
- Reassemble the keyer

IMPORTANT!

If the keyer is to be used with a transceiver or transmitter with negative keying polarity, such as a vacuum tube transmitter with grid blocked keying, it is necessary to remove this jumper.

OPERATION

I. General

The AEA keyer Model CK-1 has been designed for the serious CW operator. It features a versatile memory load and edit capability, automatic serial number, rapid CW speed changes and full weighting control.

II. Keyer

- Speed Change and Set.** Two methods of CW speed control are available, variable and pre-set.

Preset Speed

Two presentable speeds may be stored and quickly recalled. To store speed "A", press [*][*][8][N][N], when N N is the two digit speed in WPM desired. Similarly, for storing speed "B", press [*][*][9][N][N].

The keyer will be set to the last speed entered.

When the keyer is turned on, speeds "A" and "B" are initialized to 20 and 30 WPM respectively. To recall speed "A", press [*][8] and to recall speed "B", press [*][9].

Example: To store 5 and 15 WPM in speeds "A" and "B":

Press [*][*][8][0][5],
[*][*][9][1][5].

Now, to change from 15 WPM to 5 WPM, press [*][8]. To change back to 15, press [*][9].

Variable Speed Adjustment

A "variable" speed setting is also available. To increase speed, press [*][6] and hold the 6 until the desired speed is reached. The keyer will send alternating dots and dash during the change. To reduce speed, press [*][7] and hold the 7.

2. **Sidetone Change.** The sidetone is set to 500 Hz when the keyer is turned on. To increase the pitch press [*][1] and hold the 1 key until the desired tone is reached. The tone may be lowered by pressing [*] twice and holding the 1, i.e. [*][*][1].

The pitch of the tone when the "1" key is released will be the pitch of the CW sidetone. The pitch of the keypad feedback tone will be lower.

3. **Automatic or semi-automatic (bug) operation.** When the keyer is turned on, it is set for automatic, iambic operation. The keyer may be operated in the semi-automatic mode by pressing [*][*][6]. The keyer will now behave as a "bug". To return to full automatic operation, press [*][*][7].
4. **Dot-Space, Dash-Space Ratios (Weighting).** "Perfect" Morse code is formed with the length of a dot equal to the intra character space length (a dot-space ratio of 1.0) and the length equal to three space times (a dash-space ratio of 3.0).

The dot-space ratio is adjustable from 0.5 to 1.5 and is set to 1.0 on turn-on. To change the dot-space ratio, press [*][2] and enter the dot ratio using the pound key [#] as a decimal.

Example: To enter a dot-space ratio of 0.7 press [*][2][0][#][7] or [*][2][#][7].
To enter a dot-space ratio of 1.3 press [*][2][1][#][3].

If the dot-space ratio entered exceeds 1.5 or is less than 0.5, the ratio will be set to 1.0.

The dash-space ratio is set to 3.0 on turn-on and is adjustable from 2.0 to 4.0. To change the dash ratio, enter [*][*][2] and the new dash ratio.

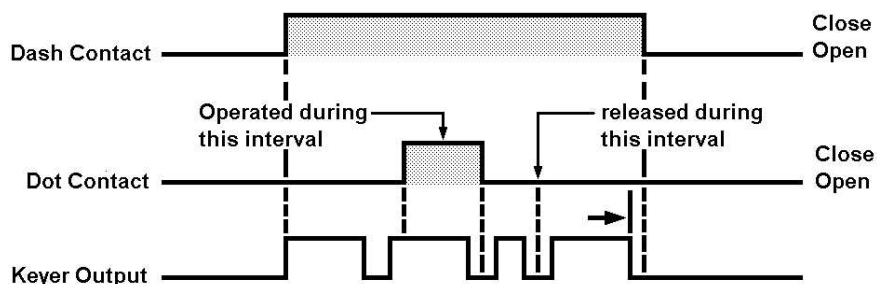
Example: A dash-space ratio of 3.7 is desired; press [*][*][2][3][#][7].

If the dash-space ratio entered exceeds 4.0 or is less than 2.0, the ratio will be set to 3.0.

The code speed is automatically adjusted for other than "perfect" dot and dash, ratios and is based on the word "PARIS" (See Appendix A).

When a new dot-space or dash-space ratio is entered, the code speed will revert to the last speed entered via **8 or **9. If no speed has been entered after turn-on, the keyer will revert to 15 WPM after a dot or dash ratio change. This will have the large effect if the variable speed change feature has been used before changing the ratio.

5. **Dot and Dash Memories.** The selectable Dot and Dash Memories are enabled on turn-on. The Dot Memory allows insertion of a dot during a string of dashes. For example, the letter "Q" could be sent as follows:



The Dash Memory operates in the same fashion, allowing the insertion of a dash in a string of dots.

To disable the Dot Memory, press [*][3].
To enable the Dot Memory, press [*][*][3].
To disable the Dash Memory, press [*][4].
To enable the Dash Memory, press [*][*][4].

Full iambic operation is available with the dot and dash memories enabled or disabled. This feature is useful for generating characters with alternating dots and dashes like the period and the letter "C". To utilize this feature, hold both the dot and the dash paddles.

6. **Transmitter Tuning.** To allow transmitter tuning, the keyer output transistors will be operated upon pressing [*][*][5]. **The '5' key must be released before the keypad tone is completed.** Tuning will be terminated by pressing **any** pad button or touching the dot or dash key paddle.

The tune feature only operates in the keyer-memory send mode.

7. **Mistakes.** Incomplete, undesired entries may be terminated by pressing [#]. Unacceptable entries will be ignored. For example, if a speed change were entered [*][*][8][2][*], the result will be no speed change.

III. Memory Operations

1. **Memory Locations.** The AEA CK-1 has ten separate, variable length memory locations. The total memory length is about 500 characters (the actual length is dependent on the length of the characters, the length and number of pauses, etc.), which may be divided into the ten locations in any fashion. Each memory location length is automatically adjusted during message loading.
2. **Memory Message Load.** Two methods of memory loading are available, Real Time loading and Automatic character and word space loading. In both modes memory loading does not begin until the first character is started. This prevents the undesirable pause at the beginning of the message playback. Messages may also be loaded in semi-automatic (bug) mode.

Real Time Memory Loading. To select Real Time loading, set the mode switch to Memory Load (toward the connector panel) and press [*][9]. Select the message location desired, 0 through 9, and press the location digit. Memory loading will begin with the first character and all pauses in sending will be loaded as sent (pauses use memory space). When message loading is complete, press [#] to terminate the message load.

Automatic Memory Loading. The keyer is set to automatic memory load on turn-on. If real-time load has been selected, automatic memory load may be re-selected by pressing [*][*][9] when the mode switch is in the memory load position.

In automatic message loading, a pause in sending longer than two space lengths records a character space (three intra character spaces). If the pause is longer than five space length, a word space is recorded (seven intra character spaces), loading then stops until the next character is started.

To record a message, set the mode switch to LOAD, press the message location digit, key in the message and terminate the message with the pound sign key [#].

Example: To store a message in memory location 5, set the mode switch to LOAD and press [5]. Now enter the message with the key. IMPORTANT: After the message is entered press [#] to signal the end of the message.

3. **Memory Erase.** Power is supplied to the memory from the 12 V source. Operation of the off-switch erases the entire memory, however the unit is designed to be left on continuously. To erase one of the memory locations, switch to Memory Load (toward the connector panel), press the location number and then [#]. The entire message in that location will be erased.

Example: Erase messages 3 and 7, set mode to Memory Load, press [3][#][7][#] or [7][#]3[#].

4. **Memory Retention.** When 12 V power is first applied the memory will contain random characters. These random characters should be erased (see previous section) before high speed loading is attempted.
5. **Maximum Loading Speed.** Loading speeds up to 99 WPM are permissible if memory locations higher than the location being located are empty or contain short messages. If, for example, memory location 5 contains about 300 characters and high speed message loading is attempted in locations 0 through 4 a pause between every two dots and/or dashes will occur. To prevent this either reduce loading speed, erase the long message or load the new message into a higher memory location.
6. **Serial Number Load and Set.** An automatically incremented serial number may be inserted anywhere in any of the ten messages. It may also be inserted as many times as desired within a message. The serial number is incremented just as the message is completed.

To insert the automatic serial number during the loading of a message press [*][0]. Insertion of a serial number in real time memory load will halt the real time loading of the pause. The next keyed character will restart pause loading.

When the power switch is turned on, the serial number is set to 01.

If the serial number has incremented, it may be reset to 01 **in the memory load mode** by pressing [*][*][0].

The serial number may be changed to any number between 01 and 9999 in the keyer memory send mode by pressing [*][*][0][N][N][N][N][#] where N N N N is the one to four digit serial number desired.

Example: A starting serial number of 971 is desired. Press [*][*][0][9][7][1][#]. The next serial number sent will be 971.

7. **Extra Word or Character Spaces.** In the automatic memory load mode, one word space is loaded after keying is halted. If desired, additional word (7 space length) or character (3 space length) may entered. Each time [*][*][8] is pressed, an additional word space will be loaded and each time [*][8] is pressed an additional character space will be loaded.

Insertion of a word or character space in real time memory loading will stop the real time load of a pause, the next keyed character will restart pause loading.

8. **Memory Full Warning.** When the memory is completely full, the CW sidetone pitch will decrease. At this point, load is automatically terminated. If further loading is desired, it will be necessary to erase one of the other messages.
9. **Semi-Auto (bug) Memory Loading.** Messages may be entered in the semi-automatic mode. During memory send, the messages will be sent with the selected dot and dash ratio and the keyer will revert to automatic operation.

If the paddle has contact bounce, it will be necessary to connect a 1 μ F cap across the dah contacts to prevent loading of extra dashes in semi-automatic mode.

IV. Memory Send Operation

1. **Sending a Message.** To start any of the ten messages, switch to Keyer-Memory Send (away from the connector panel) and press the digit of the desired message location. The message will start when the key pad button is released.

Example: To start message 6, press and release [6].

2. **Interrupting and Restarting a Message.** A message being sent from memory may be interrupted by pressing the pound sign key [#] or by tapping either of the keyer paddles. The Memory keyer then enters normal operation and a hand keyed message may be sent.

The interrupted message may either be restarted at the beginning by pressing the digit of the message, or resumed from the point of interruption by pressing [*][5]. If the message has completed, pressing [*][5] will start the next message, except for message 9.

3. **Serial Numbers in Memory Send.** The serial number will automatically incremented when a message containing a serial number is completed. If the message is interrupted, the serial number will not be incremented.

A new starting serial number may be loaded, in memory send mode by pressing [*][*][0][N][N][N][N], where N N N N is the new, one to four digit, serial number.

The previous serial number may be repeated by pressing, in memory send mode, [*][0] before starting the message. Each operation of [*][0] will reduce the serial number by one.

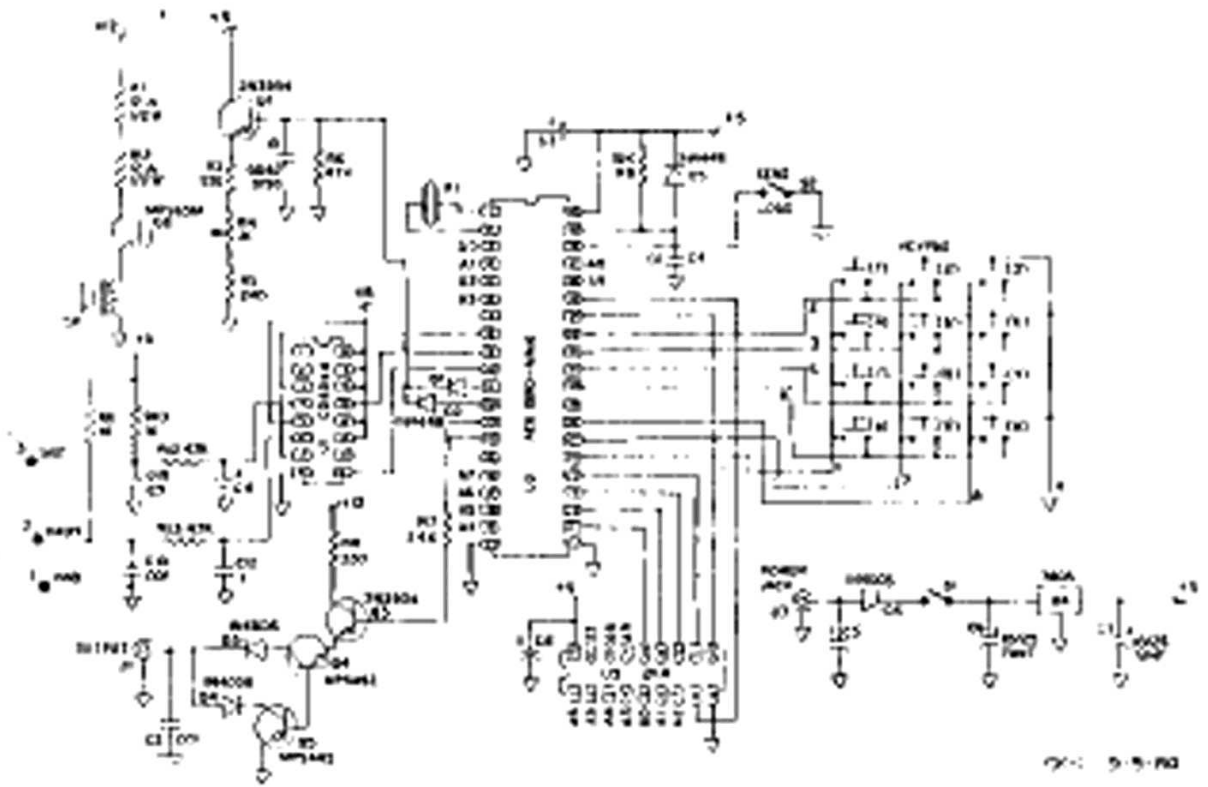
V. Editing Messages in Memory

1. **Edit Capabilities.** Messages in memory may have additions placed anywhere in the message and deletions from any point in the message to the end of the message.
2. **Insertion.** To insert additional text in an existing message, play the message in memory send mode and halt the message at the desired point with either paddle or the pound [#] key. Switch to memory load, press [*][5] and key the desired addition. Switch back to memory send **without** pressing [#].

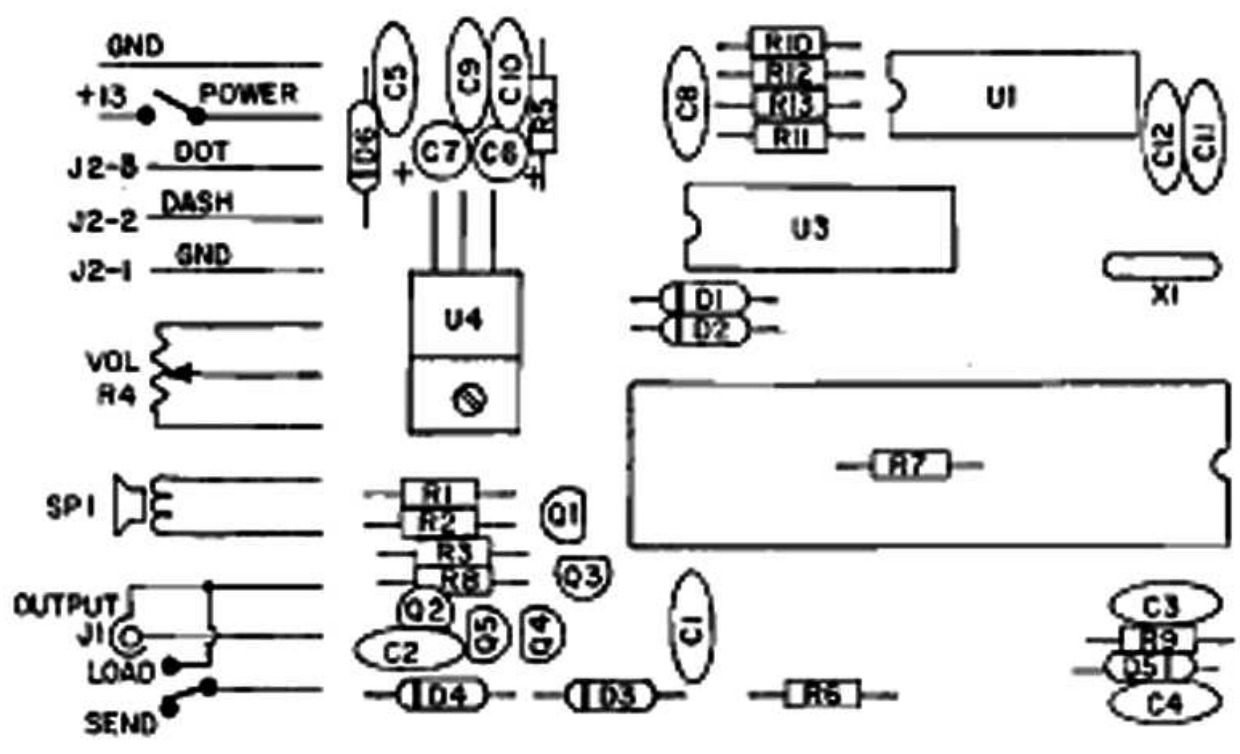
If the insertion is at the very beginning of a message, switch to memory load, press the digit of the message location and key in the desired addition, then switch back to memory send **without** pressing [#].

3. **Deletion.** During message loading, operation of the pound [#] key signals the end of message and erase the previous message from that point to the end of that message location. This may be used for partial message deletion as well as complete message erasure.

For a partial deletion, in memory send mode, play the message to desired point and halt it with either paddle or pound [#] key. Switch to memory load, and press [*][5]. At this point additional message text may be entered if desired. Press the pound [#] key. The message will be terminated at this point and the remaining text of the message will be deleted.



SCHEMATIC



PARTS PICTORIAL

CK-1 PARTS LIST

C1	0 μ 0047	50 V disc cer
C2, 9, 10	0 μ 001	500 V disc cer
C3, 5, 8, 11, 12	0 μ 1	50 V disc cer
C4	0 μ 01	50 V disc cer
C6, 7	10 μ or 6 μ 8	25 V dipped tantalum
D1, 2, 5	1N4448 or 1N4148	
D3, 4	1N4006	
D6	1N4003	
Q1, 3	2N3904	
Q2	MPS6561	
Q4	MPSA92	
Q5	MPSA42	
R1, 2	12 Ω	1/2 W, 5 %, Carbon Comp
R3, 8	330 Ω	1/4 W, 5 %, Carbon Comp
R4	1 k Ω	pot w switch, audio taper
R5	240 Ω	1/4 W, 5 %, Carbon Comp
R6, 12, 13	47 k	1/4 W, 5 %, Carbon Comp
R7	2k4	1/4 W, 5 %, Carbon Comp
R9	10 k	1/4 W, 5 %, Carbon Comp
R10, 11	1 k	1/4 W, 5 %, Carbon Comp
U1	CD4044B or MC14044B	
U2	AEA 1980 MMK	
U3	2114	
U4	7805 Voltage Regulator	
X1	4.000 MHz Xtal	
S1	Part of R4	
S2	SPST Slide SW	

APPENDIX A

Common Character Set

A	•—	O	—	2	••—
B	—•••	P	•—••	3	••—
C	—••••	Q	—•••—	4	••••—
D	—••	R	•—•	5	•••••
E	•	S	•••	6	—••••
F	••••	T	—	7	—••••
G	—••	U	••—	8	—••••
H	••••	V	•••—	9	—•••••
I	••	W	•—•—	Period	•—••••
J	•—•••—	X	—•••—	Comma	—•••••
K	—••	Y	—••••—	Hyphen	—•••••
L	••••	Z	—•••	Fraction bar	—•••••
M	—•	0	—•••••—	Question mark	••—••••
N	—•	1	•—••••—	Double dash	—••••—

Less Common Characters

Colon	—•••••	Understood	•••••
Semicolon	—••••••	Wait \overline{AS}	•—•••
Parenthesis	—••••••	End of Work \overline{SK}	•••••—
Apostrophe	•—•••••	Break \overline{BK}	—•••••—
Exclamation point	—•••••—	End of Message \overline{AR}	•—••••
Quote	•—•••••		

Trainer Character Error

In the Less Common Character set, the "parenthesis" has been accidentally coded incorrectly. It will sent as —•••••— instead of •—•••••, which makes the difficult character set even more difficult!

CODE

The International Morse Code speed is defined by the word "PARIS". It has 10 dots, 4 dashes, 9 intracharacter spaces, 4 intercharacter spaces, and one word space for a total equivalent of 50 code elements (dot or space time). To adjust code speed for various dot-space and dash-space ratios, the number of code elements in the word "PARIS" is used as a reference so that with any allowable dot-space and dash-space ratios, the code speed is correct for the reference word "PARIS".

An old rule of thumb says that to calculate code speed in words per minute, divide the total number of characters sent in one minute, by five. That can be quite misleading!!! This method does not accurately take into account the variable length of individual characters.

Quite often, when the speed of the MM-1 is compared against tape recordings of certain speeds, the MM-1 appears to be sending too slowly, but many tapes on the market are actually sent faster than the labeled speed! Suffice it to say that it is the opinion of AEA that the MM-1 has the most accurate speed calibration of **any** keyer, trainer, or code tape on the market.

PROGRAMMING KEY MORSE MEMORY KEYER

B U T T O N	KEYER MEMORY/SEND		MEMORY LOAD			
	D I G I T	* **	D I G I T	* **		
1	Send Selected	Tone Up	Tone Down	Select Storage Location	Tone Up	Tone Down
2		Dot Ratio	Dash Ratio		Dot Ratio	Dash Ratio
3		Dot M. Off	Dot M. On		Dot M. Off	Dot M. On
4		Dash M. Off	Dash M. On		Dash M. Off	Dash M. On
5		Resume	Tune		Edit (Insert)	
6		Speed	Semi-Auto		Speed	Semi-Auto
7		Speed	Auto		Speed	Auto
8		A Speed	Set A		Char. Space	Word Space
9		B Speed	Set B		Real Time	Auto Load
0		S/N Repeat	S/N Set		S/N Load	S/N = 1
#	Halt		End Input			