Enhance the Performance of Your Accu-Memory

Updated information for a very popular keying device.

By James M. Garrett,* WB4VVF

If the sale of circuit boards is any indicator, the Accu-Keyer[1] with the Accu-Memory[2] may be the most popular keying device ever to be presented for home construction by the amateur. The circuit boards that have been sold number literally into the thousands, and there's no way of telling for sure how many additional builders have made their own boards or used other means of construction.

Shortly after writing the article, I realized that some people may have problems loading the memory because of the free-running clock in the automatic word-space interval. The problem will show up as shortened dashes when you are loading a message into the memory. Although the dashes are recorded properly in the memory, the short dash during the sending of code in the LOAD mode tends to disrupt one's sense of timing, causing him to make sending errors. I have devised a modification that totally eliminates this problem. It does not require any extra parts, if you are using the readout driver board, except for one capacitor.

Refer to pages 14 and 15 of *QST* for August, 1975, the memory diagram. Remove the two 1N4153 diodes shown above and below U4D. In the layout of the memory board on page 18, these are to the left and right of the 7402 IC. Remove the 1500-Ω resistor connected to pin 6 of U4D. This is located between U4 and U10. Change the capacitor

between pins 14 and 15 of U14B from a .001 μF to a 1 μF. If you use an electrolytic capacitor, connect the positive terminal to pin 15. Take one of the diodes removed, and connect the cathode (the bar end) to wire 3 and the anode to pin 13 of U14B. This diode may be soldered to the back of the memory board. Connect the cathode of the other diode to pin 4 of U14B and the anode to the base of Q1 in the keyer. You may have to cement this diode to one of the boards. Next, note that one of the sections of the 7402 on the driver board is not used. Connect it as shown in Fig. 1. You can splice into the wires indicated. If you are not using the driver board, you will have to add a 7402.

These changes completely eliminate any loading difficulty. In fact, you can load the memory while you are transmitting. Essentially, the modification causes the clock to resync each time the paddle is touched.
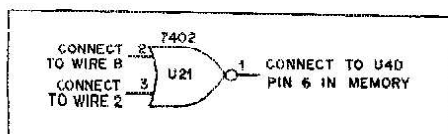
Feedback Information

Basically, the Accu-Memory article in August, 1975, *QST* is correct. The only corrections are that some interconnect numbers are not shown on the

Fig. 1 — Wiring of a previously unused IC section in the Accu-Memory to alleviate the "short dash" problem in the LOAD mode.

memory schematic diagram. They are important, however, because they show the wiring of the switches, as mentioned below. In addition, the 4-input NAND gate at the top of page 15 should be labeled U13B, and not U12B as shown.

With reference to Fig. 4 of the Accu-Memory article, label the wires going to the LOAD/SEND switch as follows. Trace back from the IC pin and label near the switch: Wire 6 — U3D, pin 1; wire 7 — U13B, pin 13; wire 8 — U13B, pin 12; wire 9 — U8A, pin 12; wire 10 — upper wiper; and wire 11 — U7, pin 2. In a like manner label near the reset switches as follows: Wire 14 — U6B, pin 4; wire 15 — U6D, pin 12; wire 16 — U6C, pin 9; wire 17 — U6A, pin 1; wire 18 — U3B, pin 11. Near the RUN switch: Wire 12 — U5A, pin 9; wire 13 — U4A, pin 10. Near the stop switch: Wire 19 — U7, pins 6 and 7.

Here are some supplemental notes regarding Table 1, page 13 of the Accu-Memory article. Wire 1 should be connected to the ungrounded end of R6 in the keyer. Wires 2 and 3 connect to where CR1 originally was in the keyer. CR1 must be removed. Wire 4 should be connected to U7B, *pin 6*. Let me also mention that the 5-volt pads on all boards are connected to the 5-volt supply. There are extra holes for 5 volts and ground on the memory board which may be used as tie points. The unlabeled triangle near the 5-volt pad on the readout board is the decimal point (connected to wire 13). The return lead from the speaker goes to ground. Q1 is the circle above U10 on the memory board. Its tab should be closest to the

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[1] This and all subsequent footnotes will appear on page 30.

pad having the wire jumper. Wire connections to the readout board are made from the foil side. The 21 wires connecting the readout and driver MSB, CSB, and LSB leads will connect in a straight line with no crossing if wired as shown in Fig. 3 of the article. If only the memory board is used without the readout board, omit the wiring to the driver board and connect wire 26 of the memory board to ground. The quadrant readout will now read 0-1-2-3.

It is important *not* to use 74S, 74I, or 74H series logic in the unit as this may cause improper operation. Be *sure*

to shield the unit. Some builders have reported loss of iambic operation. To prevent this, connect a .001-μF capacitor between pin 3 of U6A and ground, on the keyer board. Also add the 150-ohm resistor and .001-μF bypass capacitor at pin 1 of U3A as mentioned in the note of Feedback which appears on page 36 of *QST* for October, 1973. It is further advisable to change C1 in the keyer from a 2.2 to a 4.7-μF capacitor to slow the speed range down — unless you're one of those high-speed key merchants!

Some builders are receiving push-

button switches with the number turned sideways. The distributor wi correct this problem if the switches a returned. I've also been told that it possible to pry off the numbers withou damaging them, if a pen knife is use with care. Once removed, they may b reinstalled correctly.

Within three weeks of the appea ance of the article on the Accu-Memor in August, 1975, over 400 sets of circu boards were sold. And the orders cor tinue to show an interest in this instr ment. In case anyone asks you, cw is n dead!

The WA1JZC Accu-Stop

By Edward B. Kalin,* WA1JZC

If the feature Garrett describes above is not added, a simple modification to the WB4VVF Accu-Memory[2] will allow the keyer paddle to perform the same function as the STOP button. One of the four NOR gates that compose U21 (located on the driver circuit board) is unused in the original circuit. The modification involves the following: Connect a jumper wire between pin 2 of U21 and pin 1 of U3D on the memory board; connect a jumper wire between pin 3 of U21 and pin 8 of U6C on the original Accu-Keyer board; connect one lead of a .001-μF disk-ceramic capacitor to pin 1 of U21; and run a jumper from the other lead of the capacitor to U7, pin 6 on the memory board.

When the contents of a memory register are being read out, it is now necessary only to tap the keyer paddle either to the dot or dash side to interrupt the memory output. The output can be continued from the point at which it was interrupted by pushing the

RUN button, or alternatively, a different memory quadrant can be selected by pushing the appropriate RESET switch. Fig. 1 shows a diagram of the change.

Footnotes

[1] Garrett, "The WB4VVF Accu-Keyer," *QS* August, 1973.
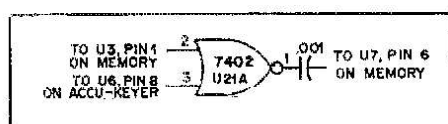[2] Garrett and Contini, "The Accu-Memory *QST*, August, 1975.

Fig. 1 — Wiring of U21 for the WA1JZC Accu-Stop. This section of U21 is unused in the original version of the Accu-Memory, but is employed for another purpose if the information above by Garrett is followed. If the builder wishes to incorporate both changes an additional 7402 IC may be added.

*410 Memorial Dr., Cambridge, MA 02139
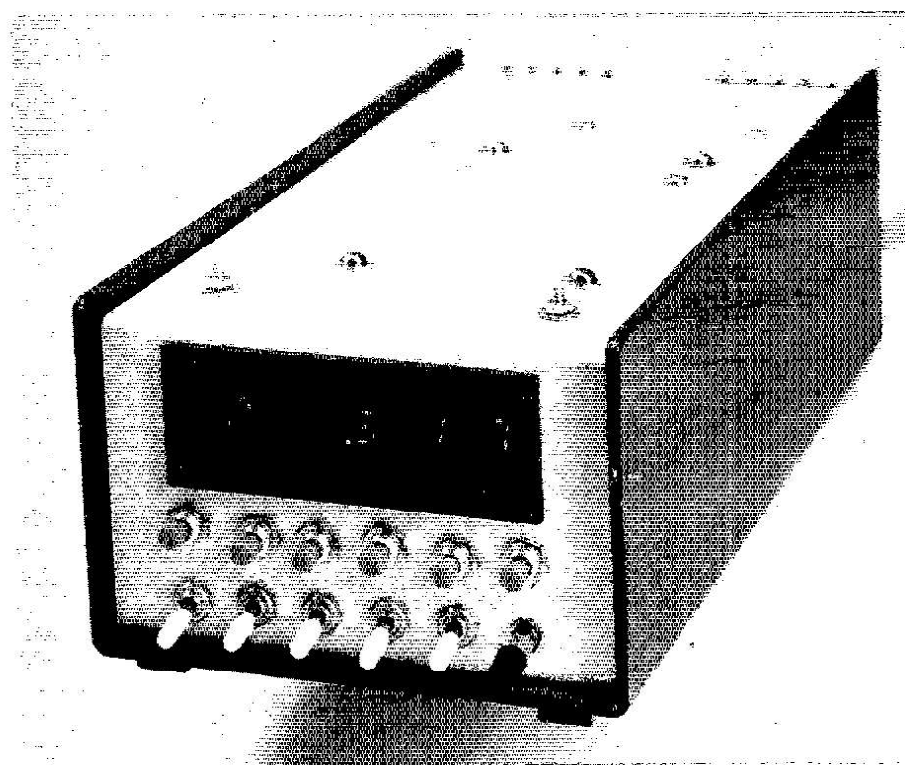
WA1JZC built his Accu-Memory and keyer inside a Bud RC-11100 cabinet measuring 3-1/4 : 5 X 10 inches. The six push-button switches are for the RUN, STOP and MEMORY QUAD-RANT SELECT functions. The toggle switches provide for loading the memories, for activating the automatic character-space feature, for transmitter tuning and for switching the readout devices off to lower power consumption. The speed control is located at the bottom right.