

Heathkit AJ-1510A LED Display Manual

The Heathkit AJ-1510 and AJ-1510A are one of the first synthesized FM Stereo tuners to be introduced in the 1970's. Today, these units are not only nostalgic tuners from the golden audiophile era, but they still have very respectable performance. The biggest problem in keeping these operational is display failure. These units were designed before the advent of LED displays and utilized a 7-segment filament type display in a glass tube. Over time, the fragile filaments will break causing a segment to no longer light. These displays are almost impossible to find. I have several of the AJ-1510 FM Tuners and to help keep them running, I have designed a replacement display using newer LED type displays. The modification consists of two boards that replace the existing driver board and displays.

Assembly of the AJ-1510 Display Board

() Solder the two LED displays onto the board making sure they are as close as possible to the PC board. (Note: Do not try to use sockets on these displays as there is not enough physical room for the displays and any type of socket when mounted in the AJ-1510 tuner) Each display has been 100% tested before being placed in the kit.

() Trim the leads from the LED displays as close to the PC board as possible.

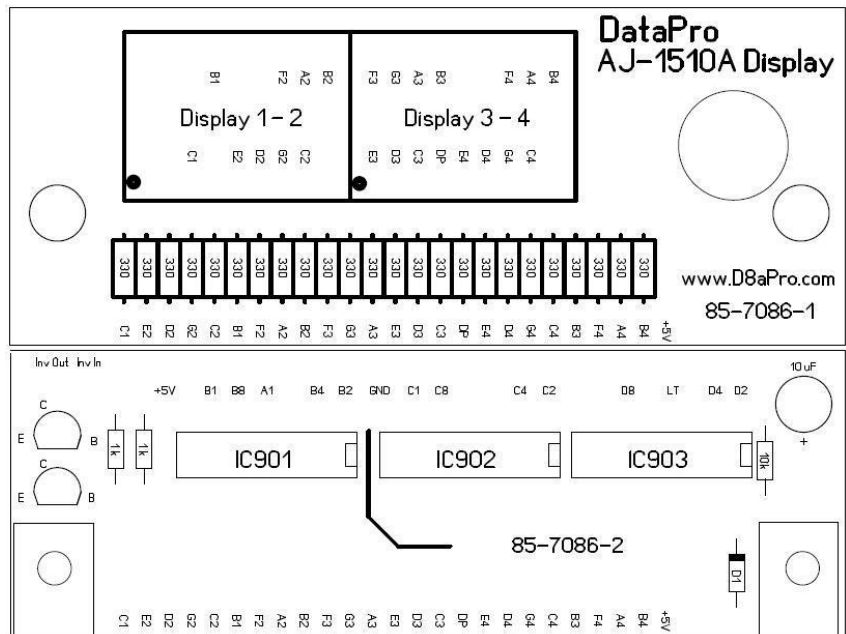
() Install each of the 330 Ohm (Org-Org-Brn) resistors on the display board. Solder each resistor only on the pads located near the LED displays (top section of the board). Do not solder the other leads just yet.

() Now cut off the excess lengths of leads on the pads that have already been soldered. Save at least one of these for use later.

() Now using a pair of 'needle-nose' pliers, straighten out the leads from each resistor making sure that they are perpendicular to the PC board and equally spaced. Now solder these leads being careful not to bend them. **DO NOT TRIM THESE LEADS**

() Now solder the saved resistor lead to the pad labeled '+5'. It should be aligned with the rest of the leads to make a row of pins that will mate with the driver board.

() Now TRIM ALL THE LEADS TO 0.500 INCHES in length. You are going to leave the 0.500 inch length of lead to plug into the mating 25 pin connector of the driver board.



- () Break the two PC board halves apart and set the display board aside to be used later
- () Now install the 25 edge connectors along the bottom of the driver board using the provided right-angle sockets. Each set of sockets should provide 25 connections in various configurations. They may be (8 + 9 + 8), (15 + 10) or even (10 + 10 + 5). Solder the connectors making sure they are as close as possible to the PC board.
- () Install two 1k (Brn-Blk-Red) resistors on the driver board
- () Install one 10k (Brn-Blk-Org) resistor on the driver board
- () Install the one 1N4148 Diode at location D1. Make sure that the band on the diode matches the band on the silkscreen outline.
- () Install a short jumper wire between location IC-901 and IC-902
- () Install three 16-pin sockets at locations IC-901, IC-902, and IC903. Make sure the end with the notch is toward the Pin 1 end of the silkscreen.
- () Install two MPSA20 transistors following the actual lead labels of the device (E B C). This device has been changed and will NOT match the outline of the silkscreen on the PC board.
- () Install one 10 uF Capacitor (make sure the orientation of the plus or minus lead matches the outline drawing
- () Install each of the 74LS47 IC's in each of the sockets on the driver board observing the orientation of Pin 1 on the board and socket.
- () Install a short jumper wire between the two holes marked 'D1' and 'Od'. The 'D1' connection is provided for a future modification of the AJ-1510 intended to be able to receive and display both Even and Odd frequencies on the FM band.

Set the AJ-1510 on a large flat surface where there is plenty of room to lay the front panel down in front of the tuner. Now remove the wood cover from the AJ-1510 FM tuner and set it aside until finished with the Display Modification. Remove the front panel bezel by removing the two screws on each side. You can then gently remove the front panel and lay it forward of the tuner. Be careful not to stress any of the existing wiring going between the front panel and the rest of the unit. There are two screws that hold the front plastic display panel to the aluminum sub-panel. Carefully remove these two screws and set them aside to be re-used when re-assembling the AJ-1510. The front Plastic panel can now be removed and cleaned with a gentle soap solution to remove any accumulated dirt or film on the plastic panel. Do not use any harsh chemicals as it may also remove the silk-screening from the front panel.

- () Remove the Lamp nearest the display board and move it back out of the way.
- () Remove the four display tubes from the display board and set these aside. They will no longer be needed.
- () Carefully remove the existing display board by removing the two #6 self-tapping sheet metal screws from the mounting brackets. These two screws will no longer be needed.

() Remove the two angle brackets from the existing display board and re-mount them on the new driver board using the same hardware and brackets. Make sure that the shorter side of the angle bracket is against the PC board.

() You should now be able to physically remove the old display board from the unit and lay it back out of the way. Do not remove any of the wires from the old display board just yet.

() You will need to carefully drill out the two holes in the front sub-panel where the two self-tapping screws were previously installed. This should be drilled out with a 5/32 drill. If you intend to re-install the old display board at some point, it will be necessary to use a 6-32 screw, lockwasher, and nut to re-install the original board. The self-tapping screws will no longer work once the holes have been drilled to a larger size.

In the next step, you will be installing the new boards into the AJ-1510. It will be easier if you make sure that the leads from the display board align and mate with the 25 pin sockets on the driver board. Try mating the display board to the driver board several times until you are sure that all of the leads are now straight and line up with the 25 pin sockets. You may find it easier to simply mate the two boards into the AJ-1510, then use smaller tools to install the hardware holding the boards to the sub-panel. Either way, ensure that there are 3 nylon washers between the display board and the sub-panel on each of the mounting screws. This is necessary to prevent the display board from shorting out against the aluminum sub-panel.

() Now begin to install the new display board using the provided hardware in the kit. You will use a 6-32 1/2" screw, through the display board, then 3 nylon washers on each screw. Then place the screw through the front sub-panel, the driver board brackets, and secure with a lockwasher and nut.

() During the above process, it will also be necessary to plug each of the leads from the front display panel into the corresponding socket of the driver board.

() Double check to ensure that there is adequate space between the display board and the aluminum sub-panel.

() Now you can begin to solder each wire from the old display board to the new display board. These wires should be in the same order as the original making it possible to move one wire at a time.

() Replace the Lamp that is used to back-light the 'FM' indicator. Make sure that the original light insulator is surrounding the bulb to keep stray light from entering the 7-segment display area. This should now protrude slightly through the new display board.

() Replace the front plastic front window to the sub-panel using the original hardware.

() Re-install the front panel to the main chassis using the original hardware

() Now you can test the display to ensure that all segments are now working

() Re-install the wood case using the original hardware