

Alter CPU PC Board

Four integrated circuits will be removed from the CPU PC board assembly. For those parts with a socket or socket pins, just use a small screw driver and alternately pry up on each end to work the part out of the socket. For those parts that are soldered onto the PC board, use a small diagonal pliers or toenail clippers to cut the leads off the integrated circuits as you will not be using them again. This is preferable to attempting to unsolder the parts as there is less chance of damaging the PC board. First clip the leads right next to the body of the IC, and after the IC is removed, you can trim the remaining leads closer to the PC board.

One location where you will remove an IC will be used again... the large CPU chip. If this is soldered, you will want to clip the leads next to the body, but not trim them close to the PC board. This makes them easier to remove one-at-a-time. If this is the case, a solder sucker is really called for. Even a cheap hand-type solder sucker is better than trying to get solder out of a through-hole using solder wick.

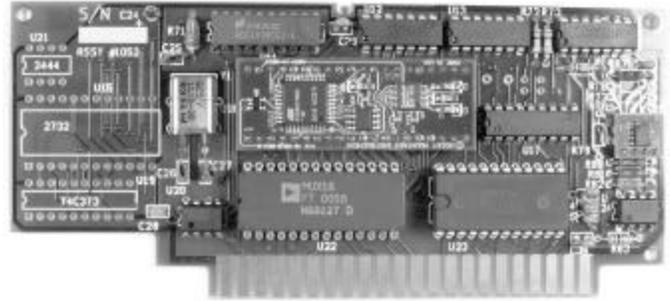
< One at a time, remove U15, U19 & U21. U15 should have a white label on the top. If not the part marking should read 2732. U19 should be marked 74C(or HC)373. U21 will be a small PC board assembly.

< Remove U16, being careful as this is where a new assembly will be used. ONLY IF the part is soldered to the PC board, clip the leads next to the body. Have a friend help by grabbing each cut-off lead and tugging as you heat the lead from the solder side of the PC board. Once all the leads have been removed, use a solder sucker to remove the excess solder remaining in the holes. ONLY IF THERE IS NO OTHER CHOICE in getting the solder out, use a .032 (1/32") drill in a HAND-CHUCK to remove the excess solder. Any larger drill or using power will probably drill out the connecting tube between the top and bottom of the PC board.

< ONLY IF the IC was soldered in, install and solder the supplied 40 pin socket, positioning the cut-out on the end rail of the socket (indicating front of IC) to match the cut-out on the designator on the PC board.

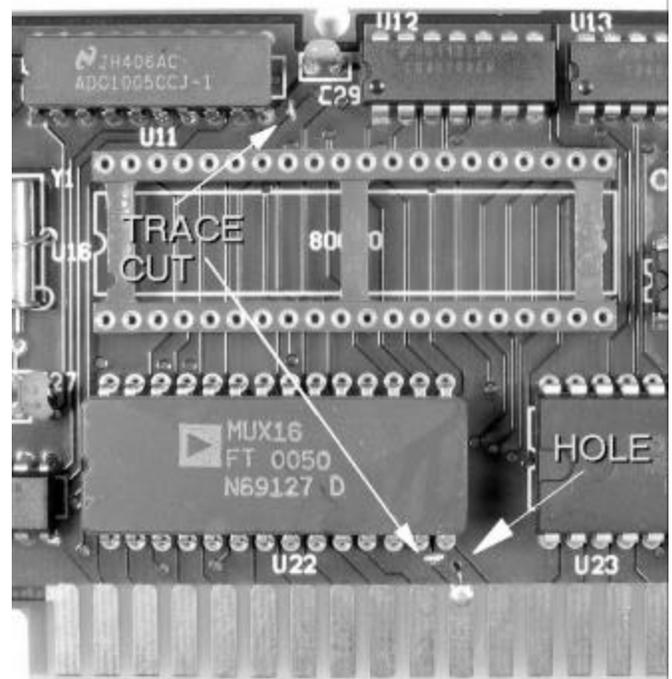
< If U16 was plugged into individual socket pins, make sure all the pins are aligned and the same height because the new CPU assembly's stiff pins will not allow misalignment. If any look off line or too high, use a straight dentist pick and solder iron to adjust the socket pins. You can also make a tool using a sewing needle stuck into a small dowel for a handle. Lightly stick the tool into each socket pin and touch the side of the pin with the tip of the solder iron so it heats up and also melts the solder holding it into the PC board. As the solder melts, you can apply a little downward pressure with the tool to make sure it goes all the way to the PC board, and also make sure that it is straight up and down. It helps to put a LITTLE bit of solder on the tip of the iron to help make heat contact with the socket pin. Be careful to not get too close to the top of the socket pin, or the solder will "jump" down into the hole and ruin the socket pin. Spare socket pins are in the kit if you goof.

< Locate and remove the crystal Y1 (refer to picture below). One end of the bare wire that is supporting the crystal needs to be heated and lifted from its hole. A helping friend is handy. Clip the two leads near the crystal body and then melt the solder while tugging on the leads. Refer back three steps for directions on removing the solder from the holes.



< Locate and install the crystal from the upgrade kit, marked 11.0592 or 11.05, in the same place and reinstall the hold down strap. Solder both leads and the hold down wire.

< Use the .032 drill (1/32"), preferably in a hand-chuck, and drill a hole through the PC board as shown in the picture below. Be exact in the placement of the hole. After just starting the hole, flip the board back and forth to make sure that no traces on the other side of the board will be damaged.

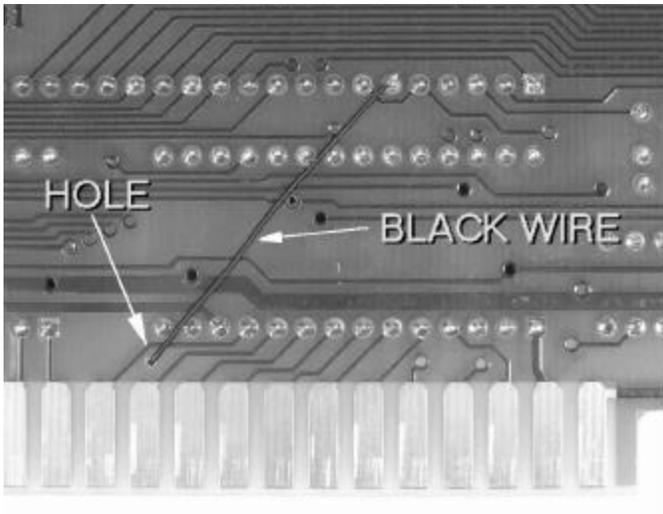


< Use a sharp tool like an Xacto knife or a box cutter to carefully remove a portion of the traces as shown above. A rotary tool will also work. Just be careful not to cut too deep or damage adjacent traces, but be sure that the traces on either side of the cut are no longer joined.

< Locate the black jumper wire from the upgrade kit. Cut the lead off one end of the wire so the bare lead is about 1/8" long. Bring this end up through the hole and bend the bare portion flat to the gold tab and solder as shown in the

picture above.

< Turn the PC board over and solder the other end of the black jumper as shown in the picture below. Trim the end.

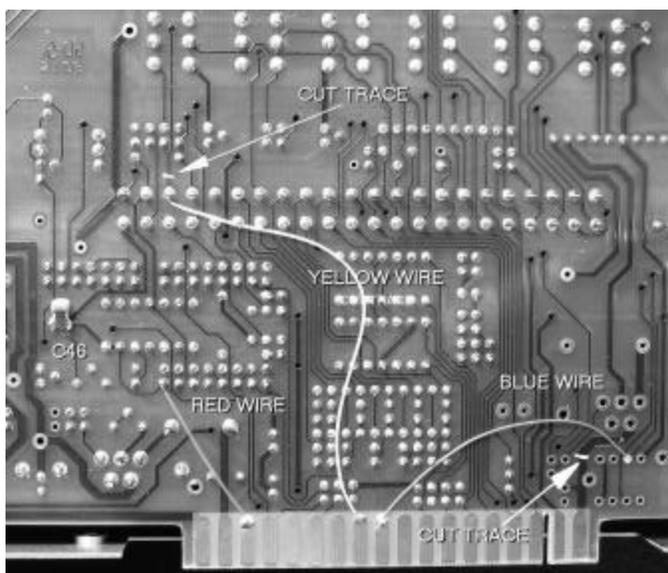


< Locate and install the new CPU assembly at position U16, oriented as shown in the first picture. Make sure all the leads on the assembly are starting into the socket pins before pressing the assembly down.

Alter Main PC Board

Two jumper wires will be added to the bottom of the main PC board and two traces will be cut. This will route the serial RS232 input and output to the rear connector of the FMONITOR.

< Use the photo below to locate where the two PC board traces will be cut. Cut the traces as before.



The red wire and the capacitor at C45 should already be installed. This jumper powers the manifold pressure sensor.

< Locate the yellow wire included in the upgrade kit and

cut some of the bare wire off on each end to leave about 1/16 inch of bare wire on each end. With a drop of solder on the tip of your iron, tack one end to the round end of the gold edge connector tab shown in the photo. Keep the dab of solder as far as possible away from the edge of the gold tab that plugs into the black connector in the mounting tray.

< Tack the other end of the yellow wire to the solder pad as shown.

< Locate the blue wire from the upgrade kit and trim back the bare wires as was done with the yellow wire. Tack one end of this wire to the gold edge connector pad as shown in the same manner as the yellow.

< Solder the other end of the blue wire as shown. This pad is one of the pads from the IC U8 that has been removed.

Reassemble Unit

< Plug the CPU PC board assembly into the socket on the main PC board and install the two screws at the top.

< Slide the long retaining screw, at an angle through the rear of the chassis, from inside to outside the chassis. Tilt the screw down into the slot at the top of the CPU PC board assembly and then slide the slotted end into the rear of the display assembly. The retaining clip should still be on the front of the screw. It will hit the back of the display assembly PC board.

< Install the rear retaining clip. Note that the clip has one side with sharp edges and one side with rounded edges. Install with the sharp edge toward the center of the long retaining screw.

< Install the top and bottom cover.

This completes the modifications to the unit itself.

Aircraft Changes

The only modification needed on your aircraft is the addition of wiring and connector to support the new RS232 serial port. The new serial input and output connections at the back of the FMONITOR are connected to a phone-jack connector that is installed in the instrument panel. This allows you to easily upgrade the unit's software using a PC or laptop by connecting the supplied serial port cable to that computer and uploading new software obtained via email or downloaded from the RMI website.

In addition, if the fuel-data (or fuel-air-data if a FENCODER is connected) serial information can be fed to a GPS or other system capable of receiving it, the serial port wiring will also need to connect to that equipment. See the new installation manual supplied with this upgrade for details on the RS232 adapter cable and the panel jack.

List of Upgrade Materials

- 1 14-0013 FMONITOR CPU PC board assembly
- 1 18-0110 1 x 3/32" Shrink Tubing
- 1 18-0014 1 x 5/16" Shrink/adhesive Tubing
- 2 26-0023 Retaining Ring (spares)
- 1 42-0007 40-pin IC Socket
- 3 42-0040 FMONITOR Crimp Terminals
- 2 42-0052 RS232 Male Pins
- 2 44-0011 Solder
- 2 44-0015 Twisted-pair Shielded Wire
- 1 44-0017 9-Pin RS232 Cable – Female x bare
- 1 44-0018 3.5mm RS232 Panel Jack
- 1 44-0019 2" Blue WW Wire
- 1 44-0020 3" Yellow WW Wire
- 1 44-0021 3.5mm RS232 Phone Plug
- 1 44-0025 1.25" Black WW Wire
- 1 54-0006 11.0592MHZ Crystal HC-49U Case
- 1 62-0005 FMONITOR Installation Manual
- 1 62-0011 FMONITOR Operations & Programming Man.