

Multus Proficio Enclosure Assembly Manual

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□ 1. Welcome

Please find below the instructions for assembling the Multus Proficio Enclosure.

Tools / Supplies

#3 Phillips Head Screw Driver

#2 Phillips Head Screw Driver

3/32 Drill bit and Drill (optional)

Adhesive tape (Scotch Brand Tape)

Do not use abrasives or strong chemicals to clean the case. Isopropal alcohol or mild soap and water is recommended.

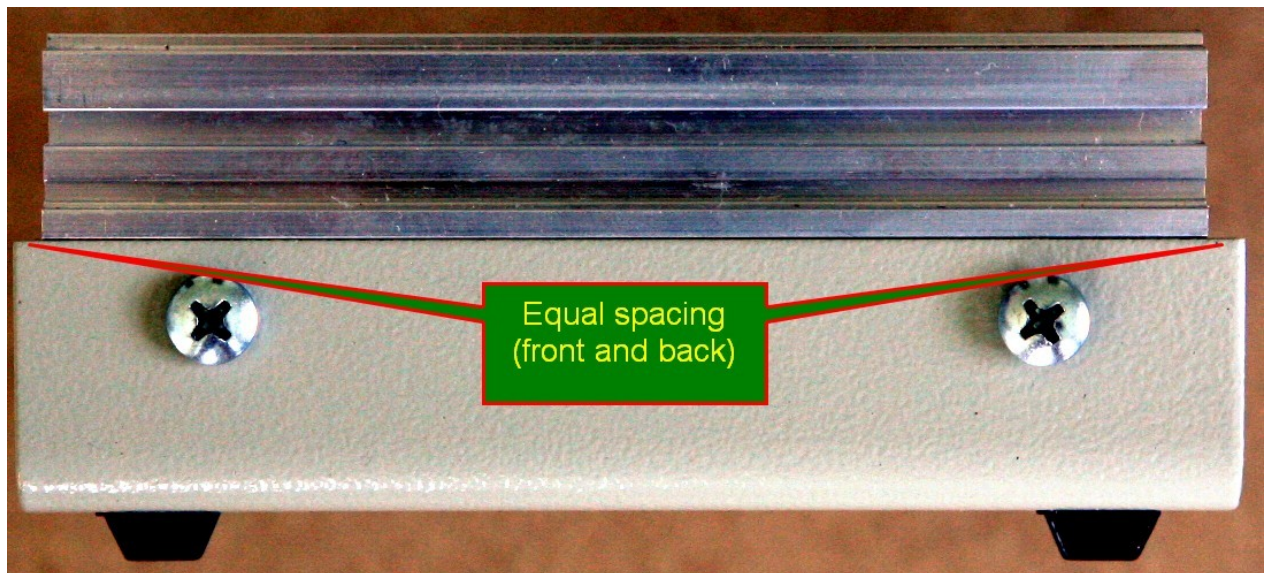
NOTE: For transceivers purchased after 06/05/2017 (PCB REV C) consult Appendix A before installing the fan. For transceivers with a Ver. 4.(x) mark, consult Appendix B before installing the fan.

All support for the Multus SDR Proficio Enclosure is located at: Multus SDR. Please join the group. Please refer to the ECN and Errata documents for the latest changes and updates at Multus SDR.

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□ 2. Preparation

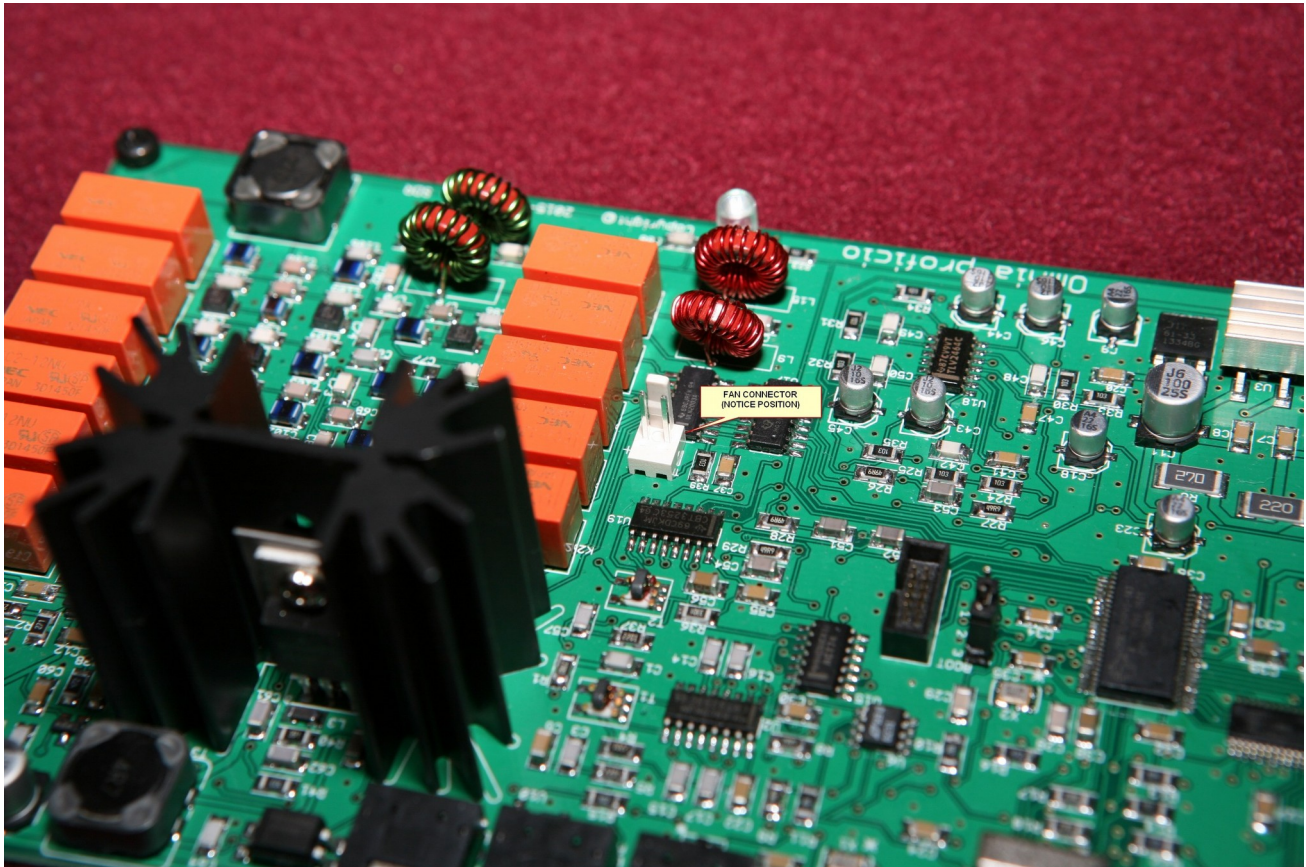
Assemble the enclosure following the instructions provided with the Hammond enclosure. Be certain to align the top and bottom covers of the enclosure properly with the side rails making sure the top and bottom are equally positioned from front to back. Do not attach the Hammond supplied front and back panels. The Multus supplied front and back panels will be attached in later steps of this manual.



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□ 3. Install PCB Fan Connector

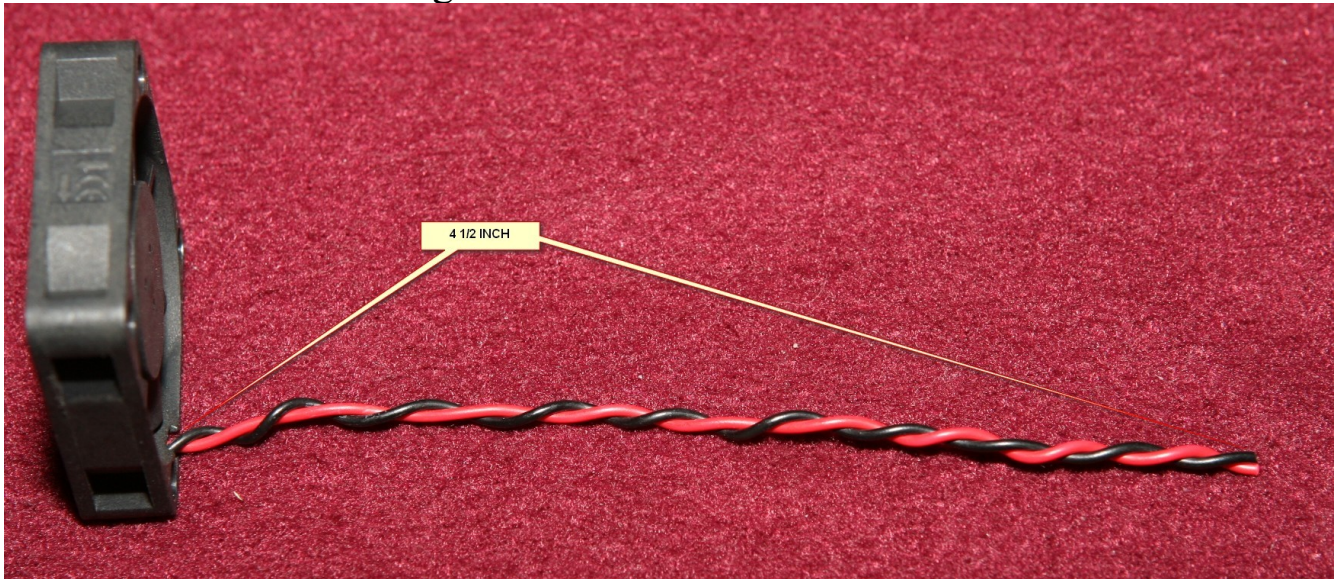
Install the PCB mounted fan connector. Take note of the positioning. The connector will only fit in one direction.



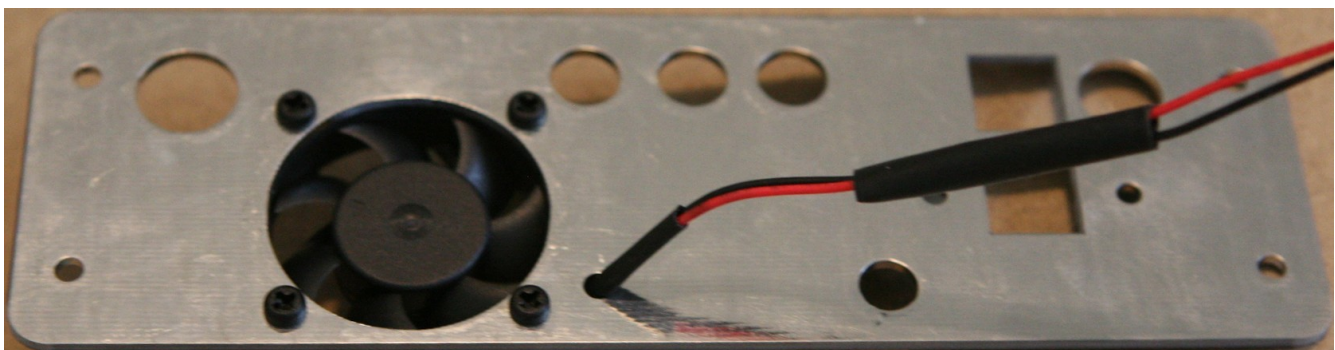
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□ 5. Prepare Fan Connection

1) Twist the fan wires together. Two or three twists per inch is sufficient. Cut the fan wires to a length of 4 1/2"



2) Slip a 1" (inch) piece of heat shrink over the fan wire. Slide the heat shrink up to and touching the fan. Heat the heat shrink until it is a tight fit over the fan wire. Mount the fan to the outside of the back plate with the fan name plate facing outward using 4 supplied bolts. Insert the mounting screws through the inside of the back panel, attach the fan and secure with nuts hand tight only. Now place a second section of heat shrink over the fan wires.



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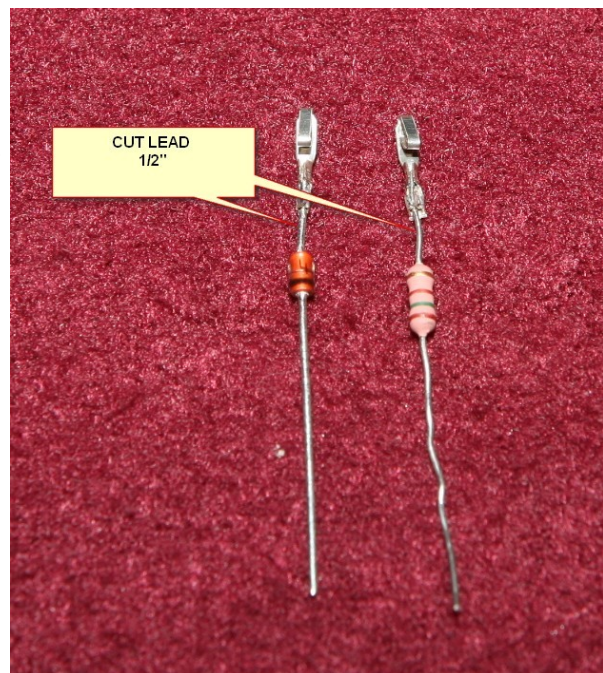
NOTE: For transceivers marked REV C please review Appendix A before installing the fan. For transceivers marked 4.(x) please review Appendix B before installing the fan.

3) Two options are available for attaching the cooling fan, approximately half speed and full speed. The half speed option reduces fan noise. The option chosen depends primarily on your most used type of operation and the length of time PTT is active. For long PTT (key down) type of operations such as RTTY, PSK, long CW sessions or long SSB voice (rag chewing) chose the full speed option. For operating modes such as WSJT-X half speed is appropriate. **Note:** The fan primarily is used not for cooling the PA heat sink but rather is used to remove heat from the enclosure and thereby keeping other components at a stable temperature. The Proficio is designed to operate without a fan.

To run the fan at full speed connect the fan wires to the push pins. Take note of the keyed side of the connector and insert the push pins into the connector.

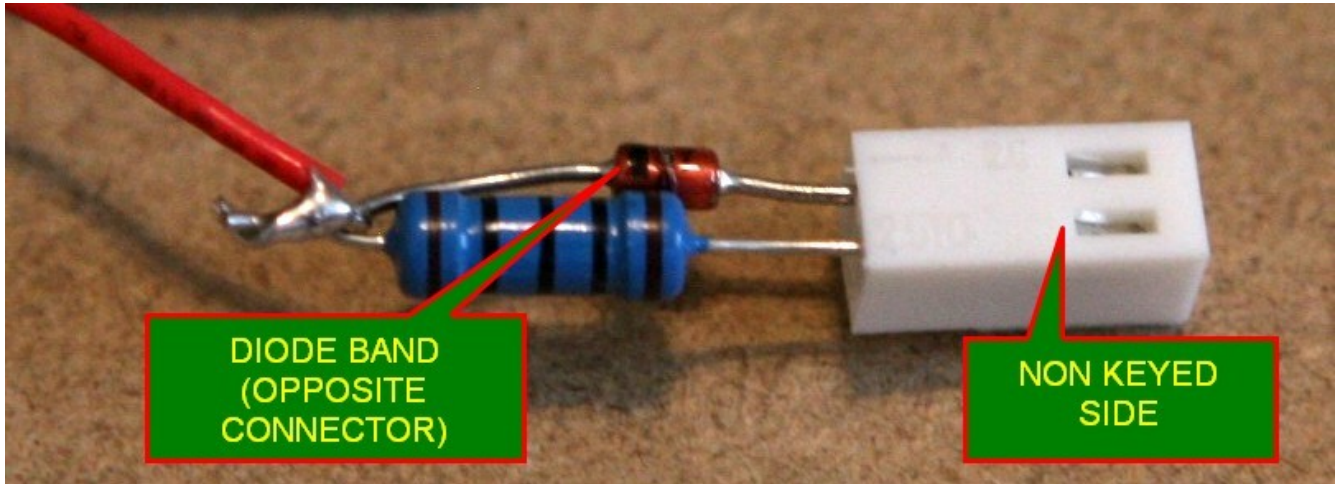
For half speed operating, the fan speed is controlled by a simple Zener diode regulator circuit. Perform the following steps to construct and install the fan connector.

Locate the Zener diode and the resistor. Cut one lead of the Zener diode to 1/2" that is OPPOSITE the BLACK BAND as seen in the photograph. Cut one end of the resistor to 1/2". Locate the two push pins and crimp them onto the 1/2" leads of the Zener diode and resistor.



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Insert the push pins into the connector body as shown in the photograph. Take note of the NON keyed side of the connector. Twist the ends of the resistor and zener diode together. Remove 1/2" from the red wire and solder to the junction of the resistor and zener diode.



Now attach the black wire to the connector side of the zener diode.



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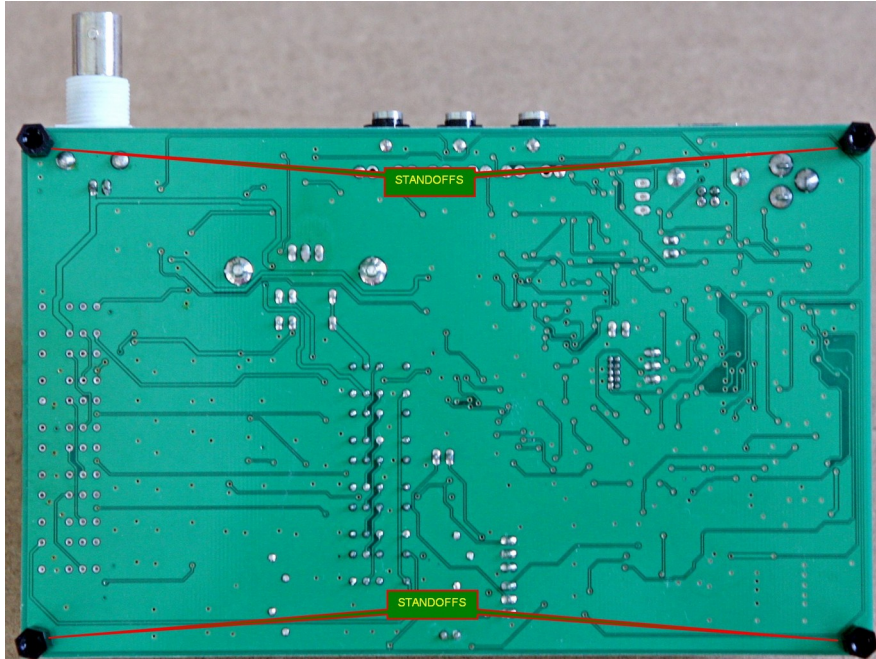
Slide the heat shrink over the resistor and zener diode and heat.



The fan connector is now complete.

□ 5. Install Standoffs

Install the M3 stand offs into the bottom of the Proficio PCB. NOTE: The standoffs will have a snug fit and some force will be required to insert the standoffs. Twist the standoff in a clockwise direction as the standoff is being inserted into the mounting hole.



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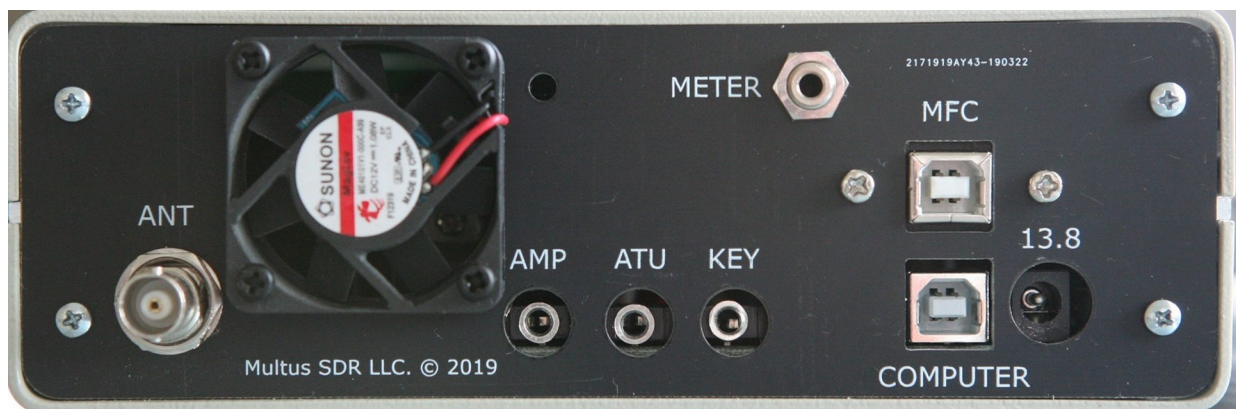
□ 6. Attach Rear Panel

Using the Hammond supplied sheet metal screws, attach the rear panel to the enclosure. Optionally enlarge the holes in the side rails with a 3/32" drill. This allows for easier installation of the screws.



□ 7. Attach Proficio

If the BNC washer and nut are on the BNC connector, remove them. Now slide the Proficio into the front of the enclosure until mates with the rear panel. Secure the Proficio to the rear panel with the BNC washer and nut.



NOTE: Shown with optional MFC installed.

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□ 8. Attach Fan Connector

Attach the fan connector to the connector on the Proficio PCB chosen for fan operation.

□ 9. Attach Front Panel

Before for attaching the front panel to the enclosure, apply adhesive tape to the rear of the panel over the mounting point holes for the length of the side rails. This will prevent marring the painted rear surface of the panel. Now position the panel into place and secure with the Hammond supplied screws. As in step xxx, optionally enlarge the holes with a 3/32” drill.



Your Multus Proficio Enclosure is now complete.

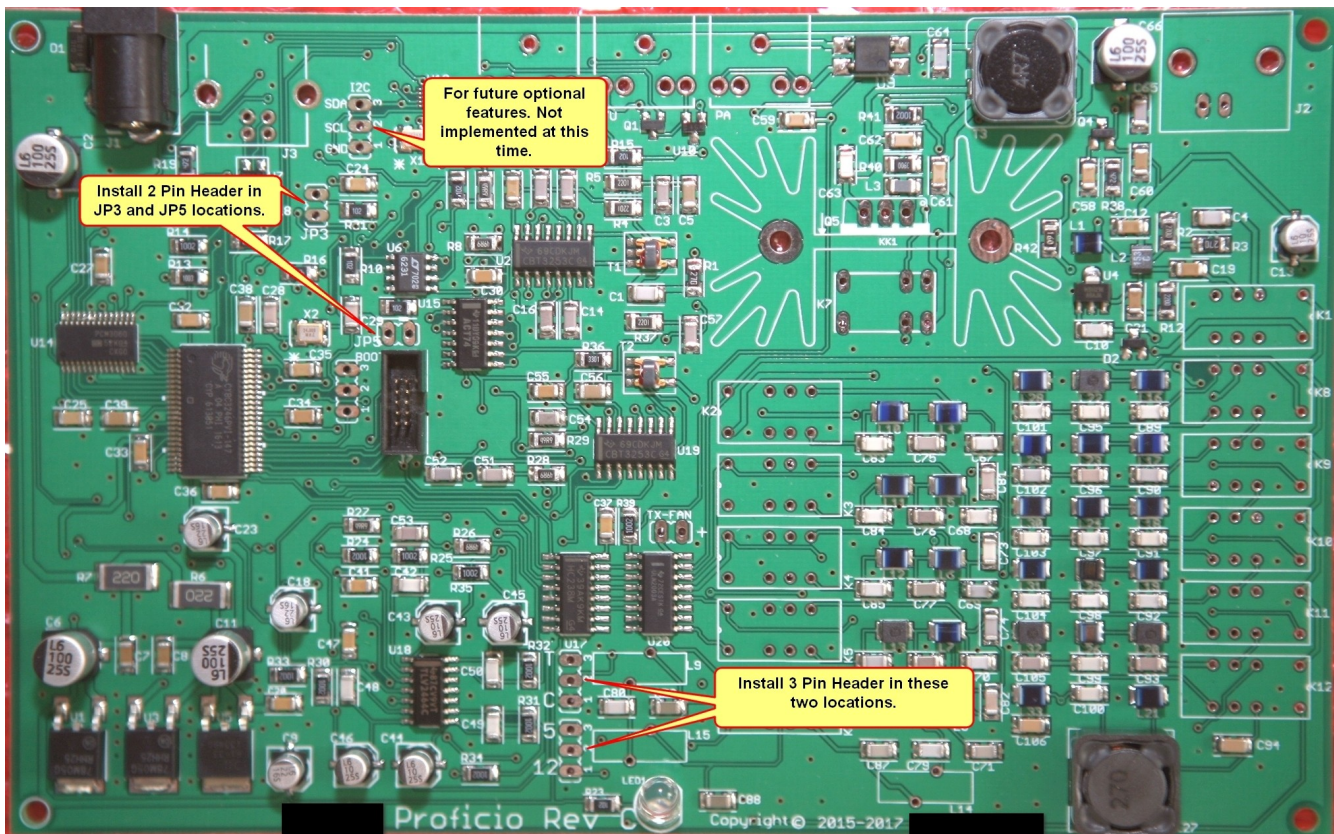
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□ Appendix A: REV C PCB Changes

Proficio transceivers purchased after 06/05/2017 now have a number of options for fan control.

1. The fan may be set to run constantly from the 5V rail.
2. The fan may be set to run constantly from the 12V rail.
3. The fan may be set to run only when the transceiver is in TX mode on the 12V rail.
4. A Zener voltage drop down circuit may be installed to provide 5V switched mode as in option #3 above.

Install a three (3) pin header in locations indicated in the photograph below.



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Fan Control Options

- 12V constant on. Place a jumper between the center pin and the pin marked “C”. Place a jumper between the center pin and the pin marked “12”.
- 5V constant on. Place a jumper between the center pin and the pin marked “C”. Place a jumper between the center pin and the pin marked “5”.
- 12V switched. Place a jumper between the center pin and the pin marked “T”. Place a jumper between the center pin and the pin marked “12”.
- For 5V switched operation a Zener voltage drop down circuit is required. This is provided if the Proficio Enclosure is purchased. Set the jumpers as in item #3 above and install the voltage drop down circuit as provided with enclosure instructions.

NOTE. There is no direct option for 5V switched. DO NOT PLACE A JUMPER ON “T” AND A JUMPER ON “5”. This will cause the PA section transceiver to be placed permanently in TX mode. Use option #4 as noted above.

NOTE: If a fan other than a fan supplied by Multus SDR is used, the fan must NOT consume more than 350ma or transceiver will be damaged.

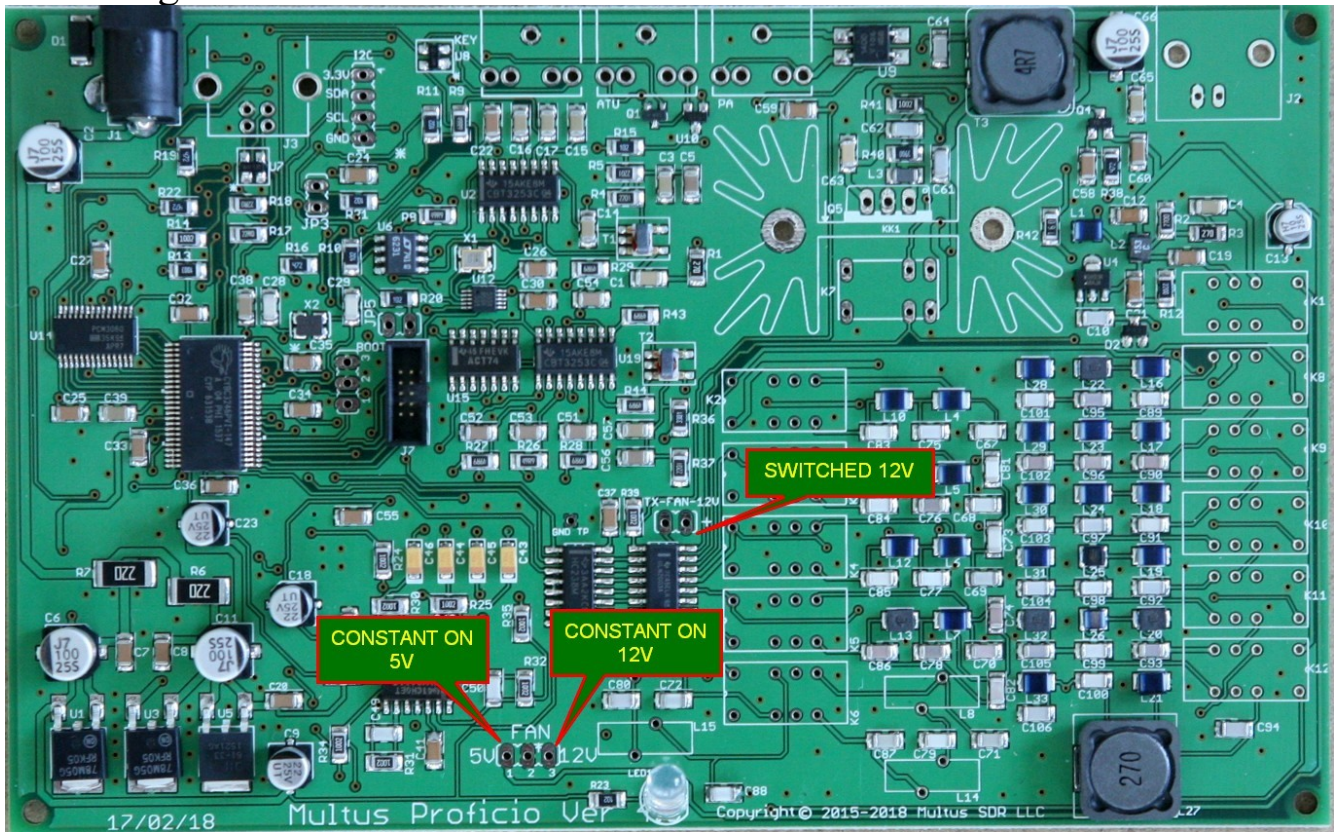
Fan Option:	Operating Mode:	Jumper placement on 3-pin header next to L9	Jumper placement on 3-pin header next to L15	Connection:
A	Always on, slow speed (5V)	Pins 1 & 2	Pins 2 & 3	Connect fan directly to TX-FAN header on the board <i>NOTE: The fan may not start and/or run properly with this configuration.</i>
B	Always on, high speed (12V)	Pins 1 & 2	Pins 1 & 2	Connect fan directly to TX-FAN header on the board
C	On when transmitting, low speed (5V)	Pins 2 & 3	Pins 1 & 2	Use zener diode & resistor as described in the enclosure assembly manual
D	On when transmitting, high speed (12V)	Pins 2 & 3	Pins 1 & 2	Connect fan directly to TX-FAN header on the board
	DO NOT USE	Pins 2 & 3	Pins 2 & 3	DO NOT USE

Table #1

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□ Appendix B: Proficio PCB Version 4.(x).

Proficio transceivers with a PCB marking of 4.(x) have a different cooling fan arrangement. Refer to the illustration below:



Three options are available for controlling the fan.

1) Switched 12V. This connection switches to ON when the transceiver is in TX mode and OFF when in RX mode. The speed of the fan may be further controlled by using the zener diode arrangement as previously described. The zener arrangement will provide for more quiet fan operation.



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2) Constant ON 5V or 12V. Attaching the fan to either of these connection points will provide a constant ON condition of either 5V or 12V. If the 5V position is selected do not use the zener diode arrangement for the fan will not run.