

PHASER → Digital Mode Transceiver

‘Rev C’ Retrofit Instructions

Upgrade your original ‘Rev B’ Phaser to the latest capabilities being shipped in Round 4

WHAT IS THE RETROFIT?

This is an upgrading of any existing Phaser kits from Rounds 1, 2 or 3, to the latest ‘Rev C’ pc board being used in Round 4 kits.

NEW CAPABILITIES WITH THE RETROFIT KIT

- **Tx indicator LED** -- Provides visual indication of when the Phaser is in Tx mode.
- **Improved transistor feeding the Vsw bus** – Transistor NTD2995 (a 12A-rated device) replaces existing Q7 to sustain higher-than-recommended RF power levels.
- **Higher Voltage Supply for Tx Audio Chain** – New 6V regulator replaces 5V regulator U7 to improve Tx audio signals (minimize distortion) at higher drive settings. *The logic ICs (U12, U5 and U6) are rated for a maximum 7V supply and are unaffected by this change.*
- **Additional heatsink** – This optionally provides additional thermal dissipation for the Q4 final transistor.

NOTE: Items 2 and 3 above are related to ‘Turning the Amp up to 11’ (i.e., attempting to overdrive the Tx audio input to the Tx chain which can lead to Q4 and Q7 failures.) While it is tempting, things do not improve when pushing the audio drive all the way up. Available output power is unaffected by these changes - the goal is improved reliability.

RETROFIT PARTS

Visit Digi-Key online (<https://www.digikey.com/>) to purchase the parts individually by entering the part number in search bar on that site. Price will be about \$2 with \$8 shipping.

QTY	Designator	Description	Digi-Key P/N	Unit Price
1	LED	LED GREEN DIFFUSED T-1 3/4 T/H	160-1130-ND	0.36
1	Resistor	RES 1K OHM 1/8W 5% CF AXIAL	CF18JT1K00CT-ND	0.1
1	6V Regulator	IC REG LINEAR 6V 100MA TO92-3	497-1010-ND	0.39
1	Heatsink	HEATSINK TO-263 12.70X26.20MM	A10760-ND	0.43
1	Q7	MOSFET P-CH 60V 12A IPAK	NTD2955-1GOS-ND	0.86

ADDING TX INDICATOR LED and RESISTOR

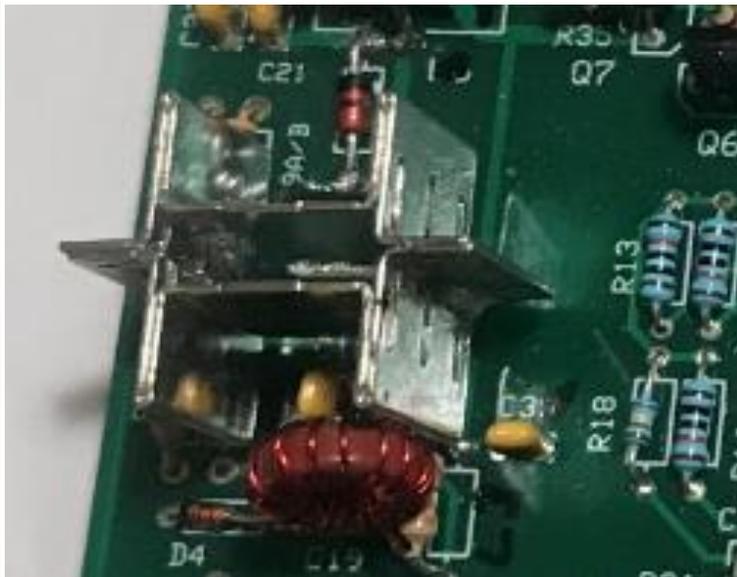
A simple addition to your Phaser can serve as a Tx mode indicator. Just place an LED and 1K resistor in series from the top of L3 (the 12V switched bus Vsw for the transmit strip) to a ground conveniently at the top of nearby R26. (The 'anode' or long lead of the LED should be soldered to the top of L3, and the other lead is soldered to the 1K resistor that is standing upright at the top of R26.) Now whenever your Phaser is commanded by WSJT-X to go into transmit, the LED will come on. You might consider adding the LED to a new hole in the front panel right next to the arrow in the Phaser logo and your Phaser will look STUNning!



ADDING AN EXTRA HEATSINK

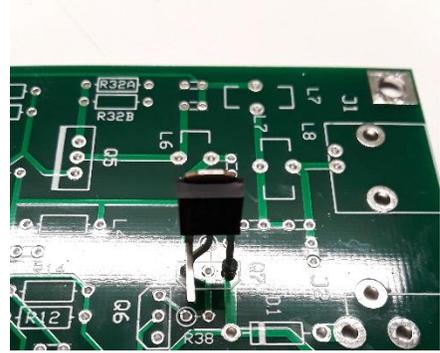
The heatsink on power transistor Q4 does indeed get warm, as it is supposed to. And sometimes with long duty-cycle digital modes it even gets too hot to the touch after a while, but this is still okay. We've measured the temperature of Q4 and its heatsink at 170-degF after a 10 minute tune cycle, which is still within the safety window for safe device operation.

If you are still worried about having such a hot heatsink, or if you often operate high duty-cycle 'conversational' modes such as JS8 and PSK31, then you might consider 'piggybacking' another heatsink on the existing one. If you get the heatsink we specify here, you can clamp it to the back of the existing one using a hemostat, for example, and use a high-wattage (hot!) soldering iron to solder the edges together.

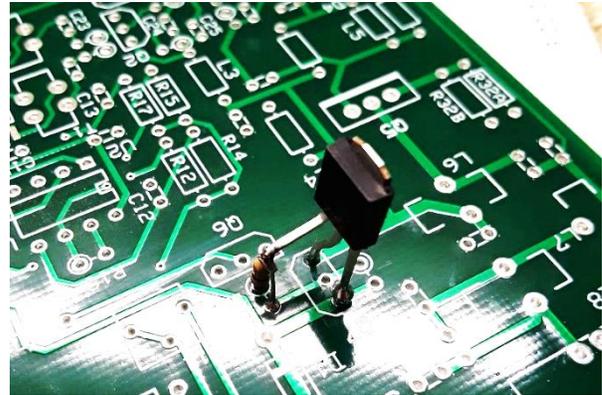


- 6) Solder the device to the two endmost Q7 pads on the printed circuit board as shown below.

Note: *this printed circuit board is a pre-production version- disregard layout differences.* –



- 7) Solder the remaining lead of the device to R36's wire loop as shown below. Trim excess lead length, if any, from this last connection. ***This completes the replacement of Q7.***



SUPPORT QUESTIONS:

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