Note 5:

KM3000 Yellow and Green time-out modification

Disclaimer

This modification is carried out at your own risk. The capacitor is very small and needs careful soldering to ensure the logic board and components are not damaged. It is recommended that you attempt this modification with care if you are not conversant with SMD soldering work.

Background

The KM3000 2M radios sold by TVRG were originally used in remote locations as data radios. A transmit timeout of approximately 2.5 minutes was safety feature to reduce the risk of the radio catching fire, should the transmitter remain on transmit, causing the radio to overheat.

The KM3000 timeout uses a 14-stage binary ripple counter which starts its count whenever the PTT line is operated.

Used now for voice the default setting may be considered to be too short, by some for amateur operation. The following modification will in the case of the "yellow board" radios extend the timeout to around 5 or 7 minutes depending on the value of capacitor chosen. The modification will remove the timeout altogether on the "green board" radios.

When modified care should be taken not to allow the radio to overheat when in use. It is recommended that consideration be given to reducing the output power from 15 watts to 10 watts or transmissions be kept relatively short to protect the radio.

The modification on either PCB is not difficult if carried out in a methodical way. The attached photographs show the process of removing the logic board, adding the capacitor and reassembly of the radio for the "yellow" PCB or cutting and bridging the tracks on the "green" PCB.

This modification can easily be completed in 30 minutes even if you are not familiar with these radios.

So, clean and clear your working area, prepare a container for the screws and small parts, turn on your soldering iron.

The components are going to look very small!

Tools required

Weller or Antex type temperature controlled soldering iron with 1mm tip max

22 SWG or thinner fluxed solder wire or SMD solder paste

SMT flux pen or SMD flux liquid

Magnifying lenses, strong glasses or bench microscope

Philips screwdriver, Small flat instrument screwdriver

Scalpel

Components required

Capacitor SMD 0603 Capacitor 16V “Yellow board”

100nF = 5 minutes

220nF = 7 minutes

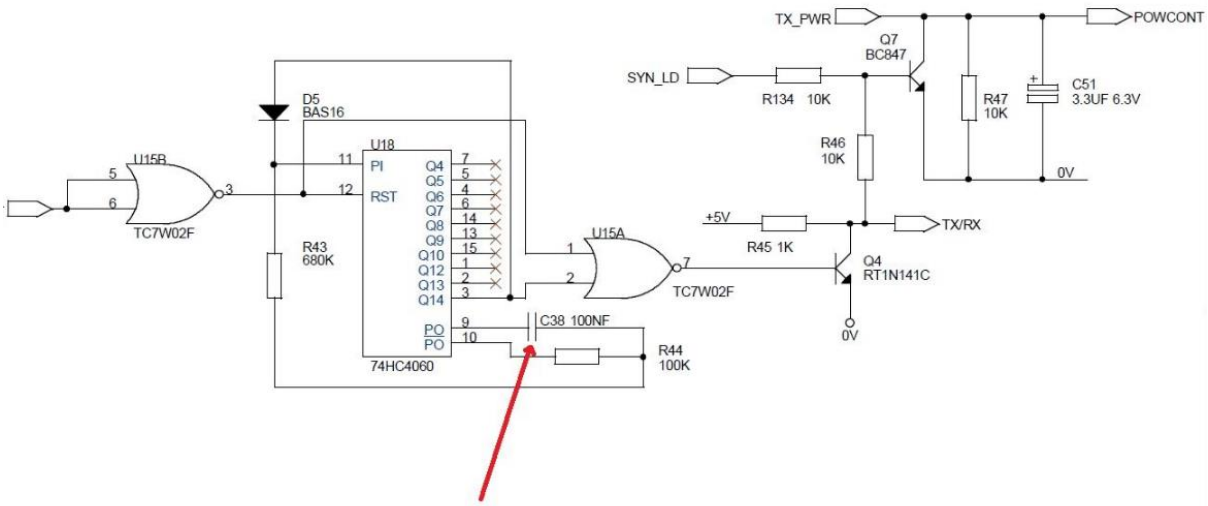
Heat sink compound

* No additional components required for the “green” PCB

Yellow PCB Radio follow the pictures to help you

1. Test KM3000 radio and check it is working correctly before starting.
2. Turn the radio over and remove the screw in the middle of the bottom cover near the front and loosen the rear screw.
3. Remove bottom cover.
4. Identify the 6 fixing screws holding the board down to the chassis.
5. Remove these screws including the black ground wire with the tag on it.
6. Remove the two copper earth clips
7. Remove the screw holding the LM7805 regulator to the chassis
8. Place all these parts in a storage tray to avoid loss of the screws.
9. Remove the two screws holding the RJ45 or MOLEX connector and unplug the connector from the board.
10. With connector removed gently ease the logic board upwards. Avoid bending the pins on the rear of board on the inter board connector.
11. Carefully ease the board out.
12. Remove the four connectors from the front of the board
13. Set the chassis aside for the time being.
14. Place the KMX logic board with the main EEPROM downwards on the bench
15. Identify capacitor C38 and resistor R44 these are the C/R timing circuit components. They are located near to the copper spring clip on the opposite side of the board to the main EEPROM.
16. C38 is brown with silver ends and is in the middle of two resistors R44 and R49
17. Prepare the additional capacitor, 100nF for a 5 minute timeout or 220nF for 8 minute timeout.
18. The capacitors are 0603 size and are very small; they come in a ribbon with a film covering.
19. Remove the covering and place the capacitor on the bench. The size of the capacitor can be seen relative to a 1cm grid square on the work bench.
20. With a flux pen add flux to C38.
21. Very quickly add a small amount of solder to one end of C38. Using tweezers place the additional capacitor on top of C38, align it and touch the tip of the soldering iron onto the tinned end of the capacitor. Once the capacitor is tacked in place carefully solder the other end. Return to the first end and solder this end again. Do not overheat the capacitor and work quickly otherwise it may come loose on the board. If it should come loose reposition it and solder it back in place.
22. Details of the component type and value are shown in the photograph. Capacitors can be easily purchased from many suppliers on the internet.
23. Locate the chassis and get ready to reassemble the radio.
24. Find the parts tray and check all the screws and copper earth clips are present

25. Add a small amount of fresh heatsink compound to the tab on the LM7805 regulator.
26. Replace the larger screw in the LM7805 regulator and tighten it down.
27. Carefully, replace the board into the chassis, making sure the inter board connector is properly seated. Replace the screw in the black earth wire tab and the 5 other fixing screws.
28. Replace the two screws holding the RJ45 or MOLEX connector and plug in the connector/s on the board.
29. Plug in the 4 front panel connectors on the board
30. Replace the bottom cover and screw the cover down with the central black screw.
31. Power up radio and check it is all working correctly.



KM3000 Ripple countdown PTT timer showing timing capacitor

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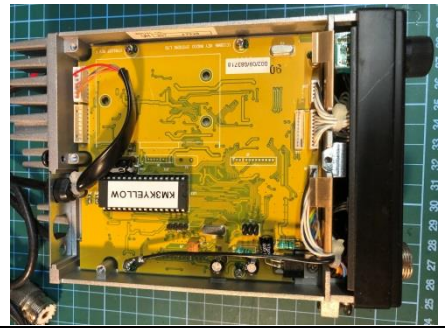

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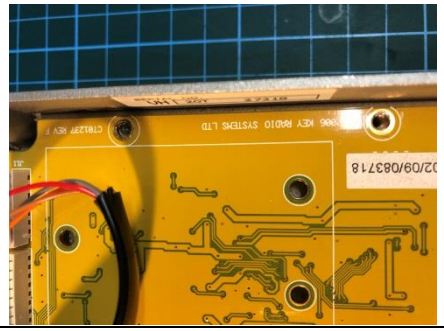

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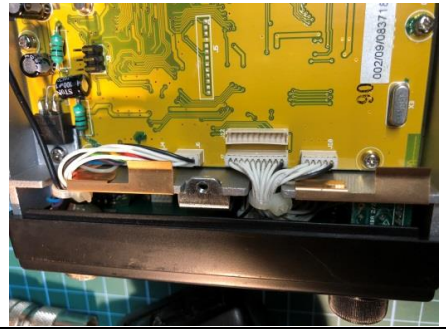

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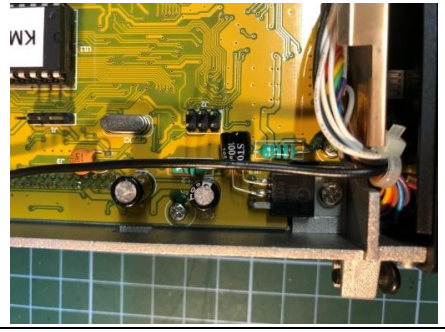

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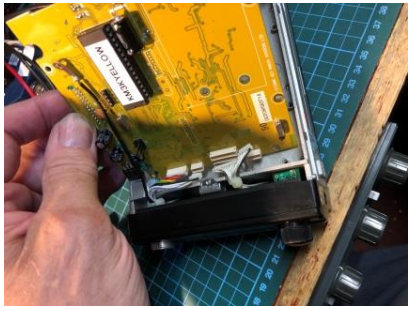

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			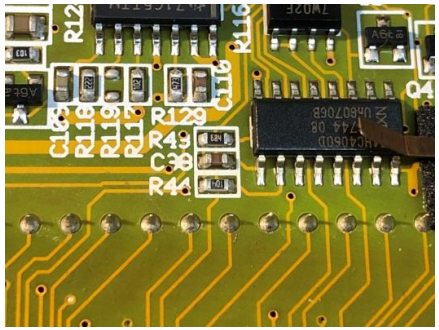

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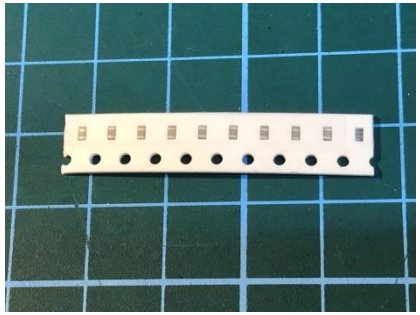	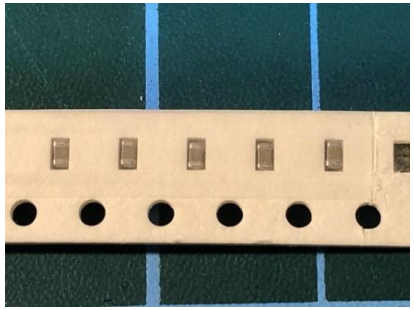	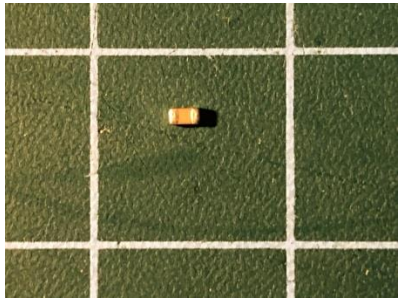	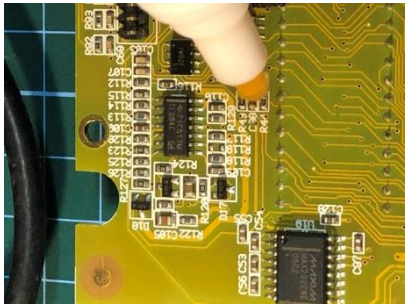
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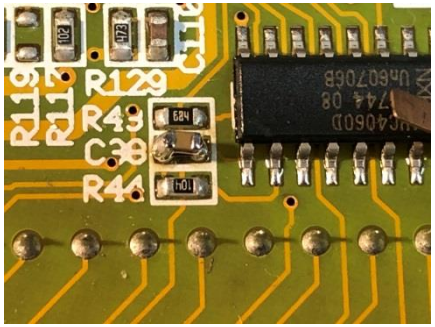
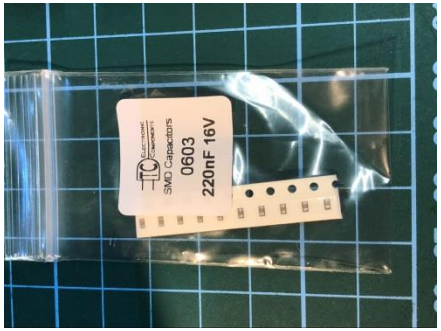
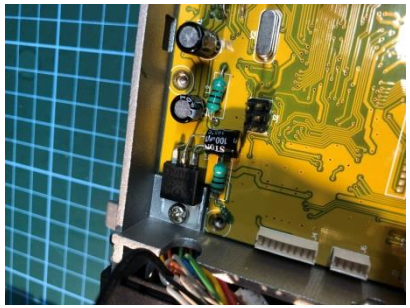
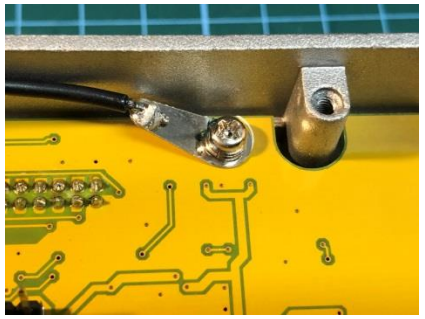
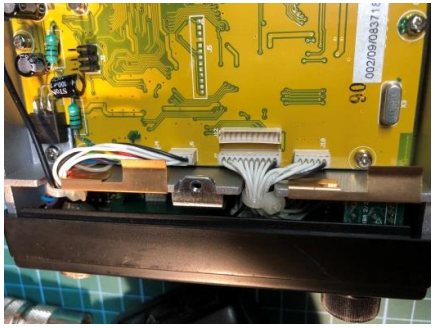
			

25 	26 	27 	28 
29 	30 	31 	Well Done!

Green PCB Radio follow the pictures to help you

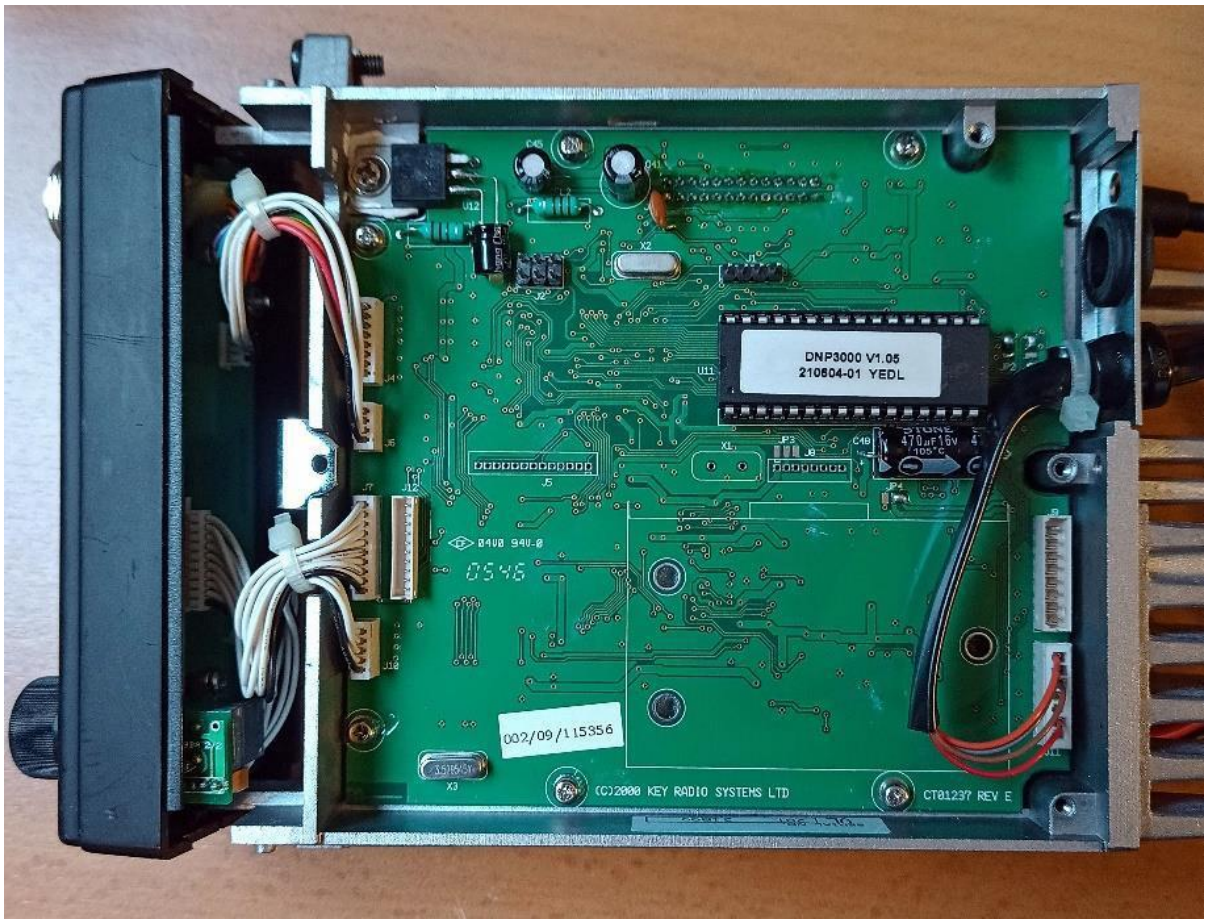


Figure 1 the logic board with the front panel released

1. Test KM3000 radio and check it is working correctly before starting.
2. Turn the radio over and remove the screw in the middle of the bottom cover near the front and loosen the rear screw.
3. Remove bottom cover.
4. Identify the 6 fixing screws holding the board down to the chassis.
5. Remove these screws including the black ground wire with the tag on it.
6. Remove the two copper earth clips
7. Remove the screw holding the LM7805 regulator to the chassis
8. Place all these parts in a storage tray to avoid loss of the screws.
9. Remove the two screws holding the RJ45 or MOLEX connector and unplug the connector from the board.
10. With connector removed gently ease the logic board upwards. Avoid bending the pins on the rear of board on the inter board connector.
11. Carefully ease the board out.
12. Remove the four connectors from the front of the board
13. Set the chassis aside for the time being.
14. Place the KMX logic board with the main EEPROM downwards on the bench

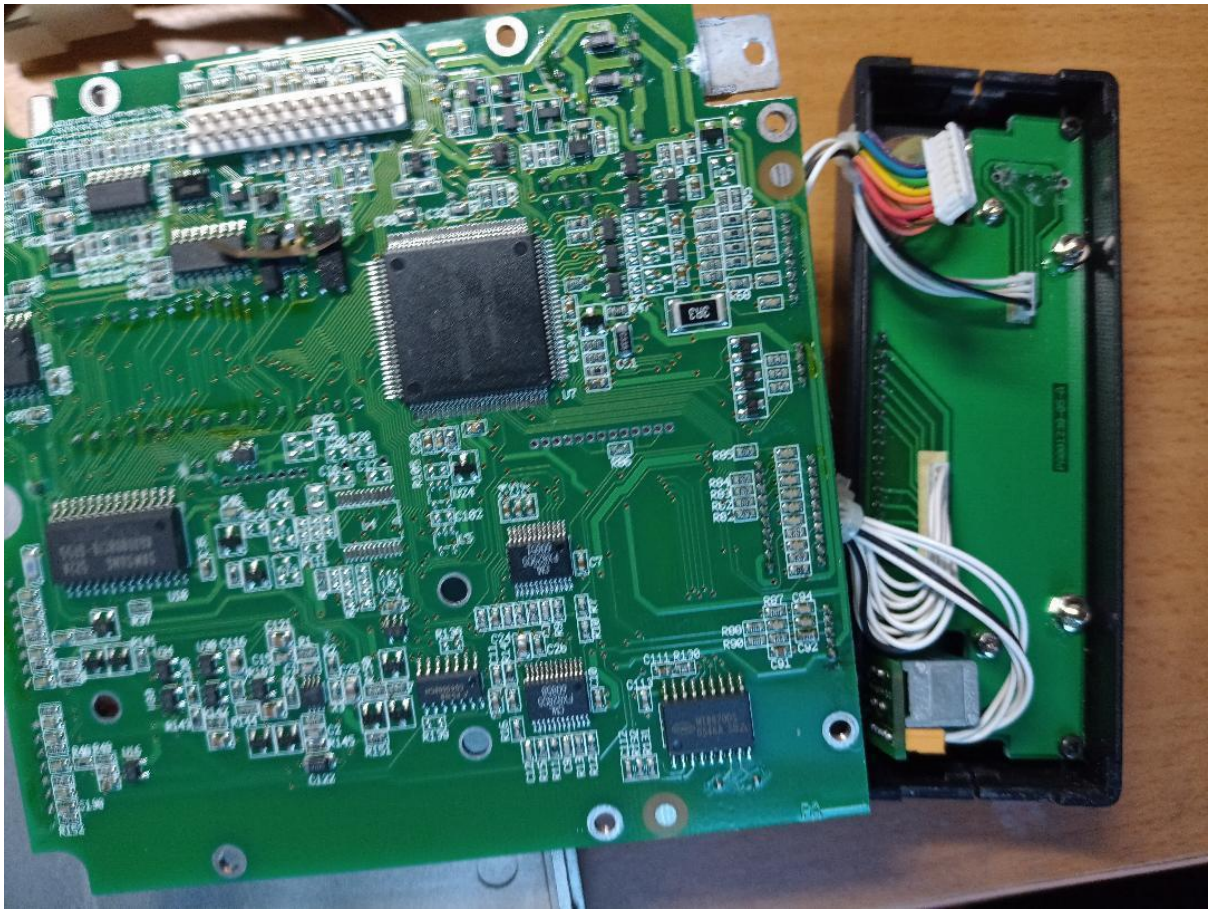


Figure 2 The Green logic board

15. Locate U15 and U18 (both are located close to the connector that joins the two main boards). The modification requires one track break and one link to be made (as shown in figure 4). The track break is between pin-3 of U18 and pin-2 of U15. The link is between pin-1 and pin-2 of U15. For reference the original circuit of the ripple countdown PTT timer is shown above as for the “yellow” board.

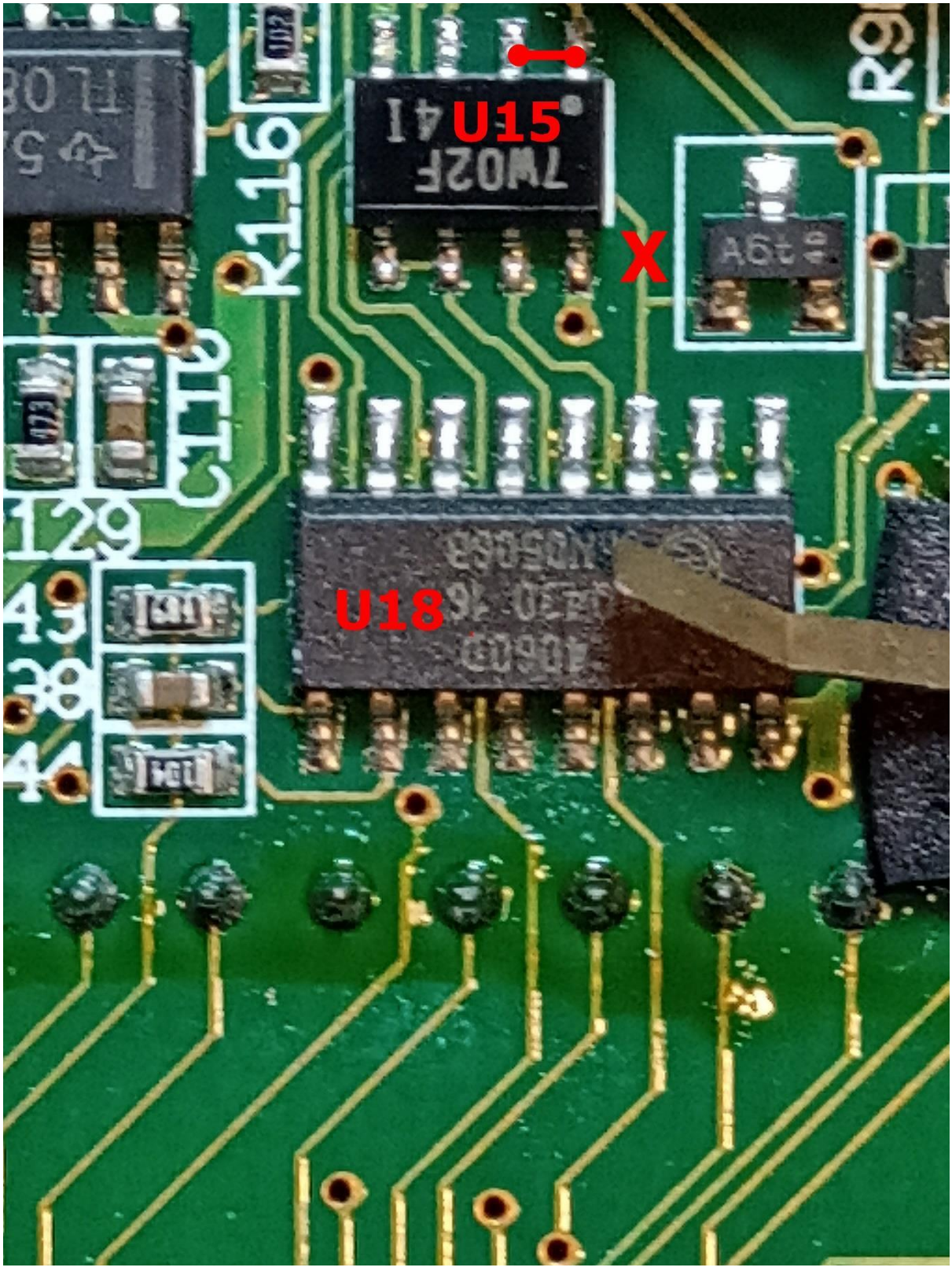


Figure 3 Modifications required to disable the PTT timer (X=track break)

16. The track can easily be broken using a scalpel (make sure you break it exactly as shown in figure 3). The link can be easily made using a small blob of solder. A good desk lamp and a magnifying glass could be useful here.
17. Locate the chassis and get ready to reassemble the radio.
18. Find the parts tray and check all the screws and copper earth clips are present
19. Add a small amount of fresh heatsink compound to the tab on the LM7805 regulator.

20. Replace the larger screw in the LM7805 regulator and tighten it down.
21. Carefully, replace the board into the chassis, making sure the inter board connector is properly seated. Replace the screw in the black earth wire tab and the 5 other fixing screws.
22. Replace the two screws holding the RJ45 or MOLEX connector and plug in the connector/s on the board.
23. Plug in the 4 front panel connectors on the board
24. Replace the bottom cover and screw the cover down with the central black screw.
25. Power up radio and check it is all working correctly.

Well done, make a coffee and have a good rag chew with your mates on your local 2M repeater.