

Modifications instructions for using Soarer TV in Australia, New Zealand, UK and Ireland

(cost down version without auxiliary audio/video inputs)

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Disclaimer

The installation of this kit is complex and carries a potential risk of damaging your car as well as the components comprising the kit. Unique Design Concepts does not assume any responsibility if the kit does not function as anticipated in your car. Prior to being advertised for selling, the kit was successfully implemented in TV tuners for Soarer models 1991 and 1995.

It is the responsibility of the person installing the kit to ensure that all the steps of the installation process are carried with utmost care and all necessary precautions are taken to ensure that the car, the TV tuner, the PAL-NTSC decoder and the kit components are not damaged during installation. Unique Design Concepts does not assume any responsibilities for damages to the TV tuner, decoder and kit caused as a result of improper installation. Unique Design Concepts does not assume any responsibilities and liabilities for damages and side effects to the car or personal injuries in the process of installing and using the TV conversion kit.

This document contains complete instruction on how to make the Soarer TV tuner working in Australia, NZ, UK and Ireland. Unique Design Concepts reserves the rights to change the kit and the instructions document at any time without prior notification. The document describing the installation instructions is prepared with every intent to be correct, but it is not guaranteed to be free of errors.

The quality of the TV reception could vary from perfect to poor or no picture at all depending on the strength and the quality of the TV signal. This is not a limitation of the conversion but a limitation of the tuner capabilities. A good rule of thumb is to compare the Soarer TV reception with a home TV set using indoor antenna. If the reception is good for the home TV, there is a good chance the Soarer TV reception would be good too, within close distance. Note that the indoor TV antenna will have a much better reception if it is on a higher altitude (higher floor of a building for example). Another important factor affecting the quality is the reception of the secondary (reflected) TV signals. The effect of these signals tends to change when moving objects (relative to the car) are present, which makes the TV picture unstable. The Soarer TV has a four-way diversity antenna, and tries to choose the strongest signal. Again in the case of moving objects, the switch between the antennas causes the picture to tremble. **The Soarer TV does NOT operate when the car moves and the kit does NOT change this.** The negative influences caused by the quality of the TV signal, affect the TV sound quality too. In general, the sound quality of the Soarer TV is worst than the sound quality of the Soarer FM radio receiver.

Sales inquiries and technical support

For sales inquiries and technical support please email to udc_au@hotmail.com

Getting started

Please read this document throughout before starting any work. Some parts of it will make more sense after reading the document for a second time.

Figure 1 shows the components comprising the kit.

- The parts circled in red are the four components for the sound conversion of the tuner. There are two ceramic filters and two surface mount capacitors that need to be replaced in the tuner.
- The part circled in blue are components used to perform the channel mapping from

the original Japanese to Australian/NZ/UK/Ireland frequencies. On the left is a double-sided tape used to stick the chip to the bottom PCB of the tuner as explained later. The six rainbow wires cable on the right are used to connect the chip to six points on the bottom PCB of the tuner again explained in more details later.

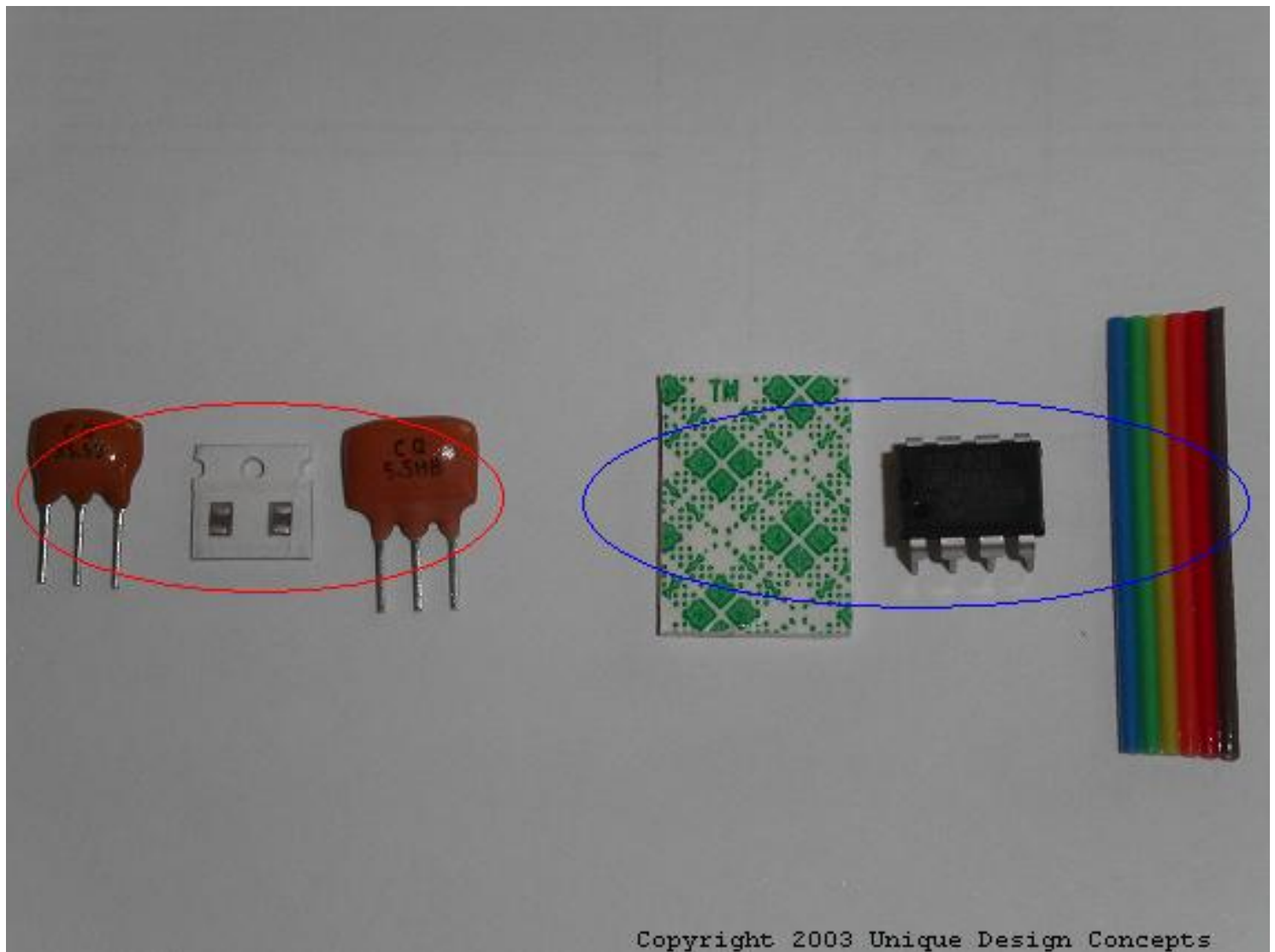


Figure 1

Dismounting the tuner

Lift out the back seat of the car as shown on Figure 2.



Figure 2

Undo the two buttons circled in red to release the carpet as shown on Figure 3.



Figure 3

Undo the six screws to remove the black bracket containing the TV tuner as shown on Figure 4.

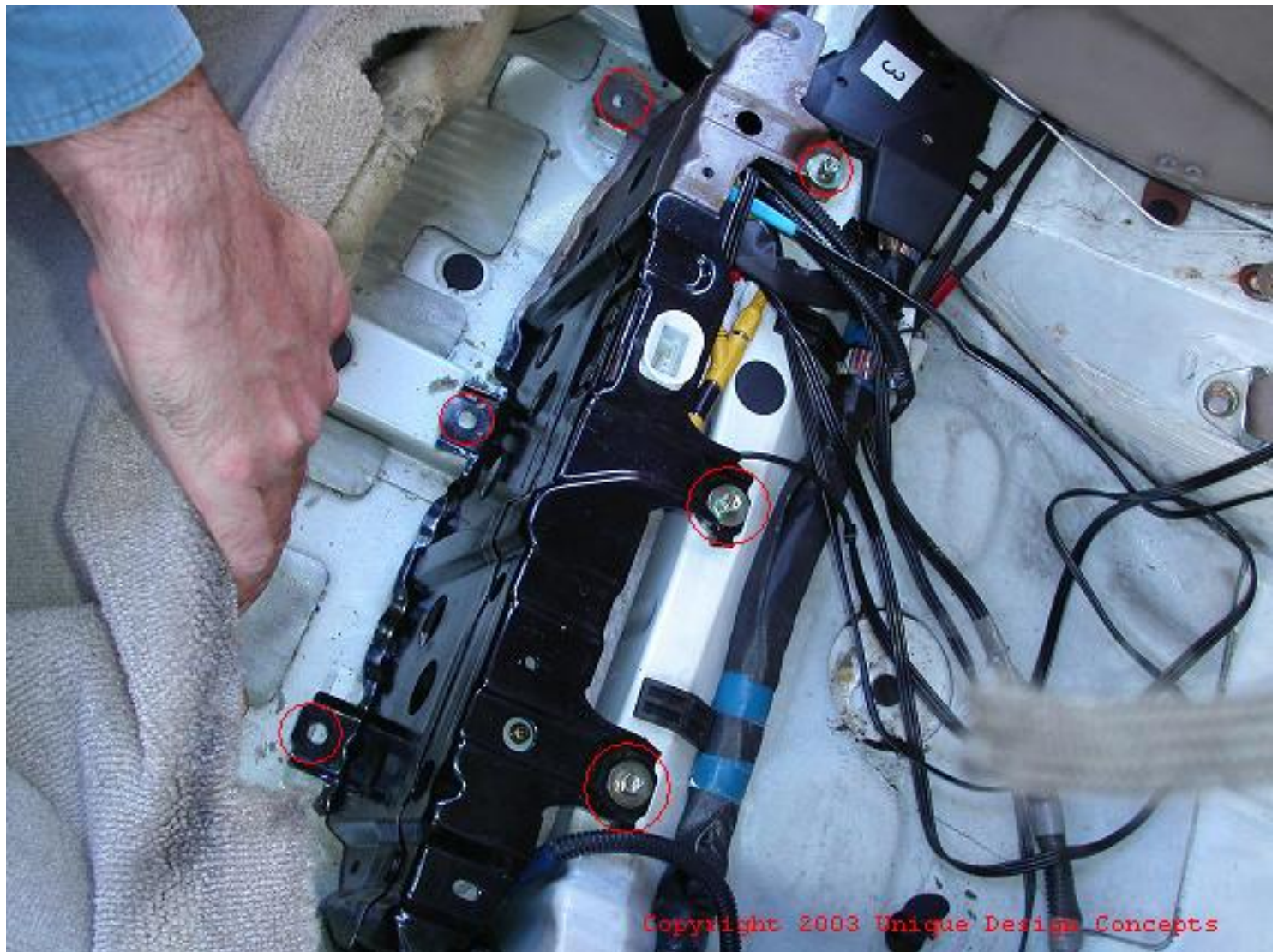


Figure 4

Disconnect the connectors (circled in yellow) and undo the three screws (circled in red) to detach the tuner from the panel as shown on Figure 5. The two video/audio cables going out of the tuner don't exist on this version of the kit. Please ignore them.

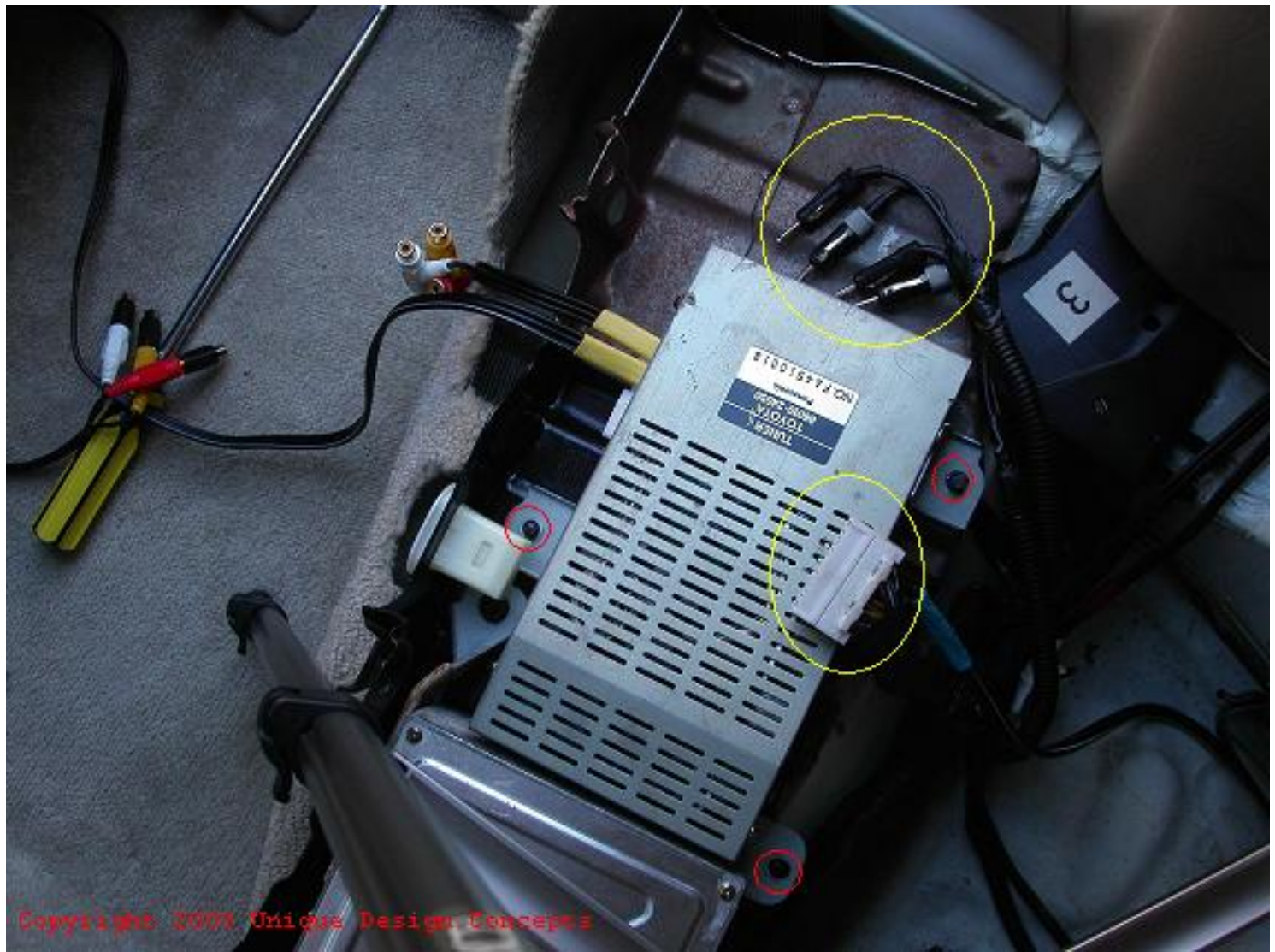


Figure 5

TV Sound modifications

Undo the eight screws holding the cover and the base of the tuner - Figure 6.



Figure 6

Undo the three screws holding the top PCB - Figure 7.

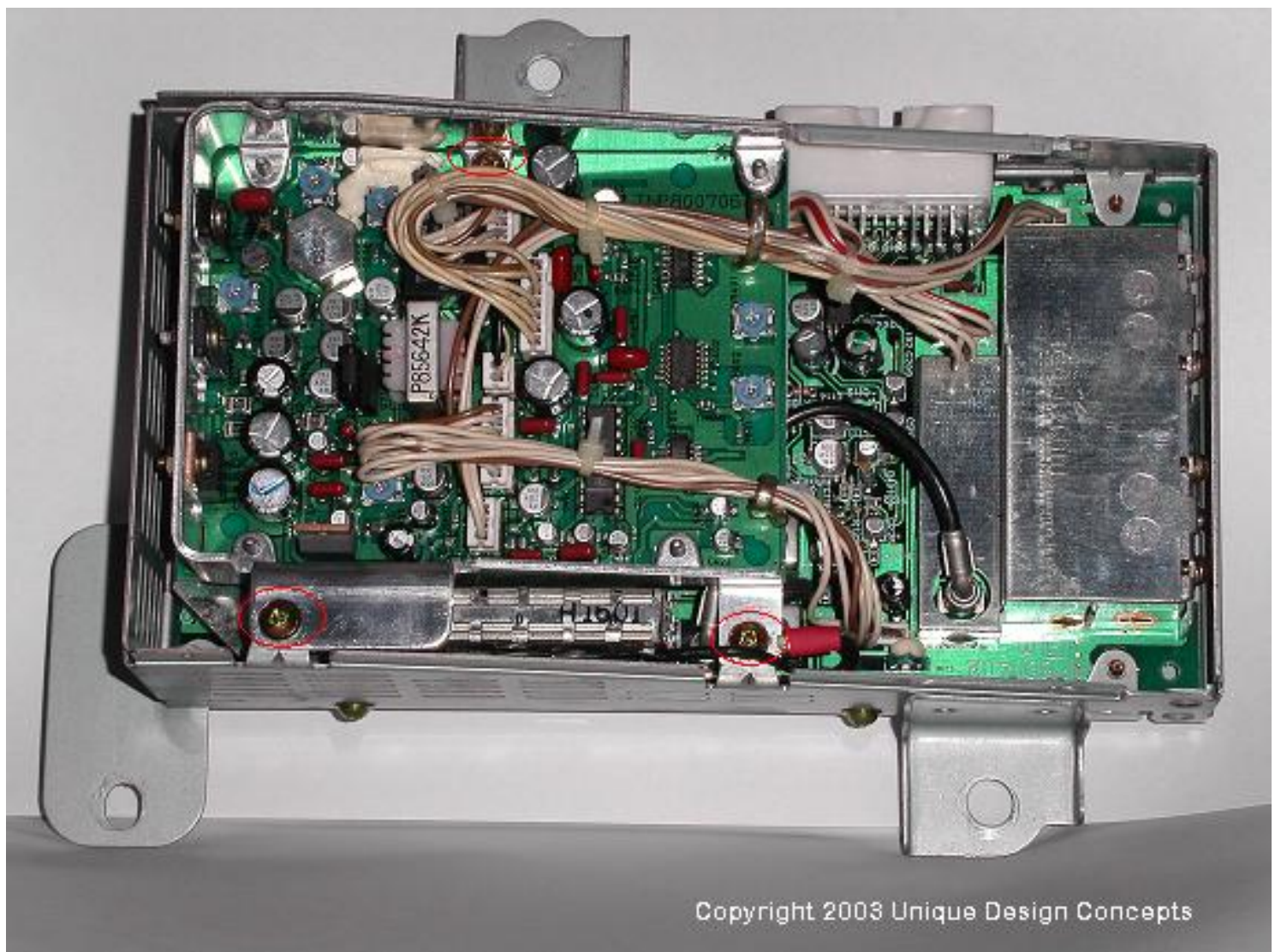


Figure 7

Unplug the five connectors from the top PCB. Figure 8 shows the tuner without the top PCB.

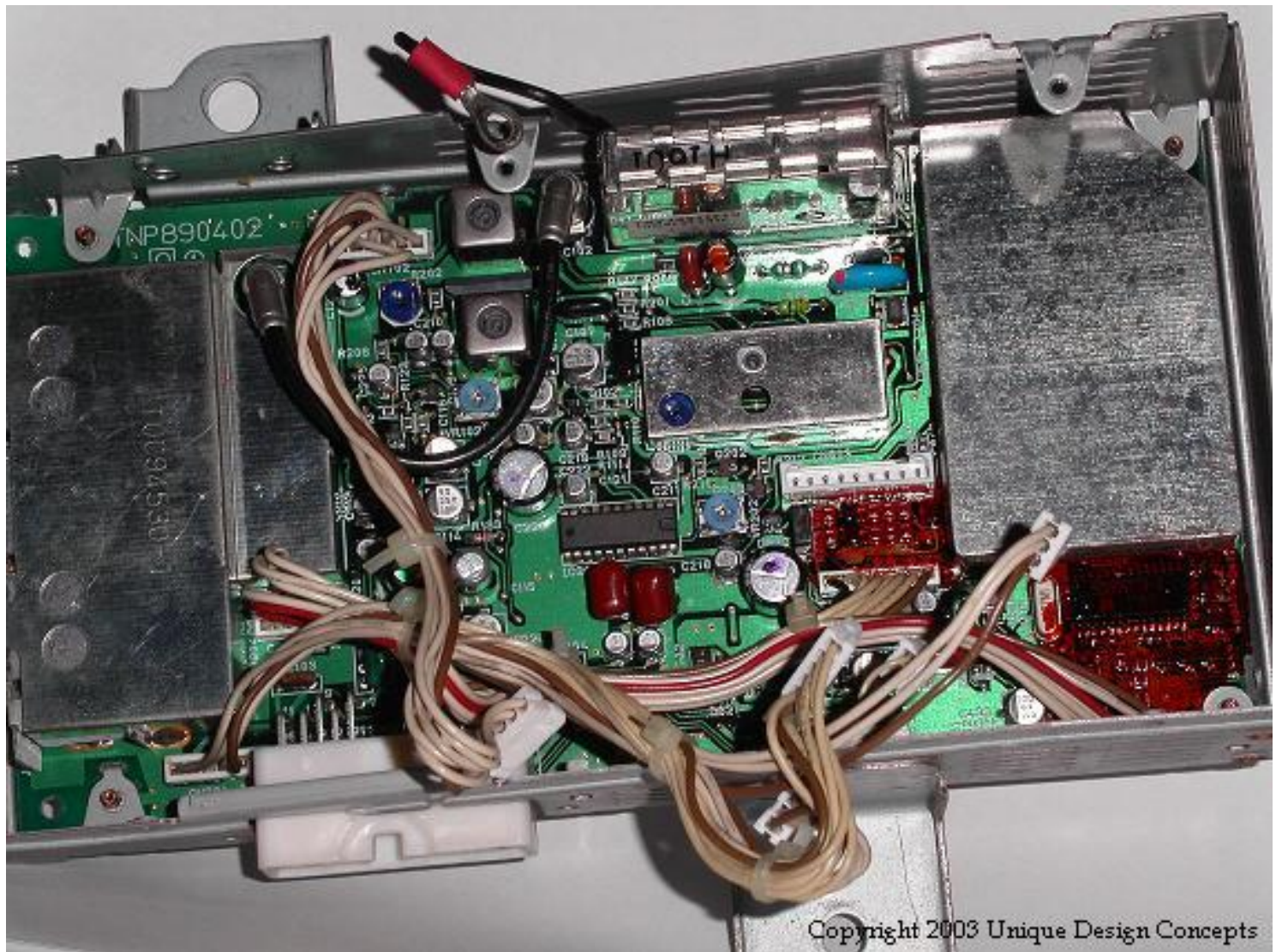


Figure 8

Undo the five screws from the bottom PCB - Figure 9

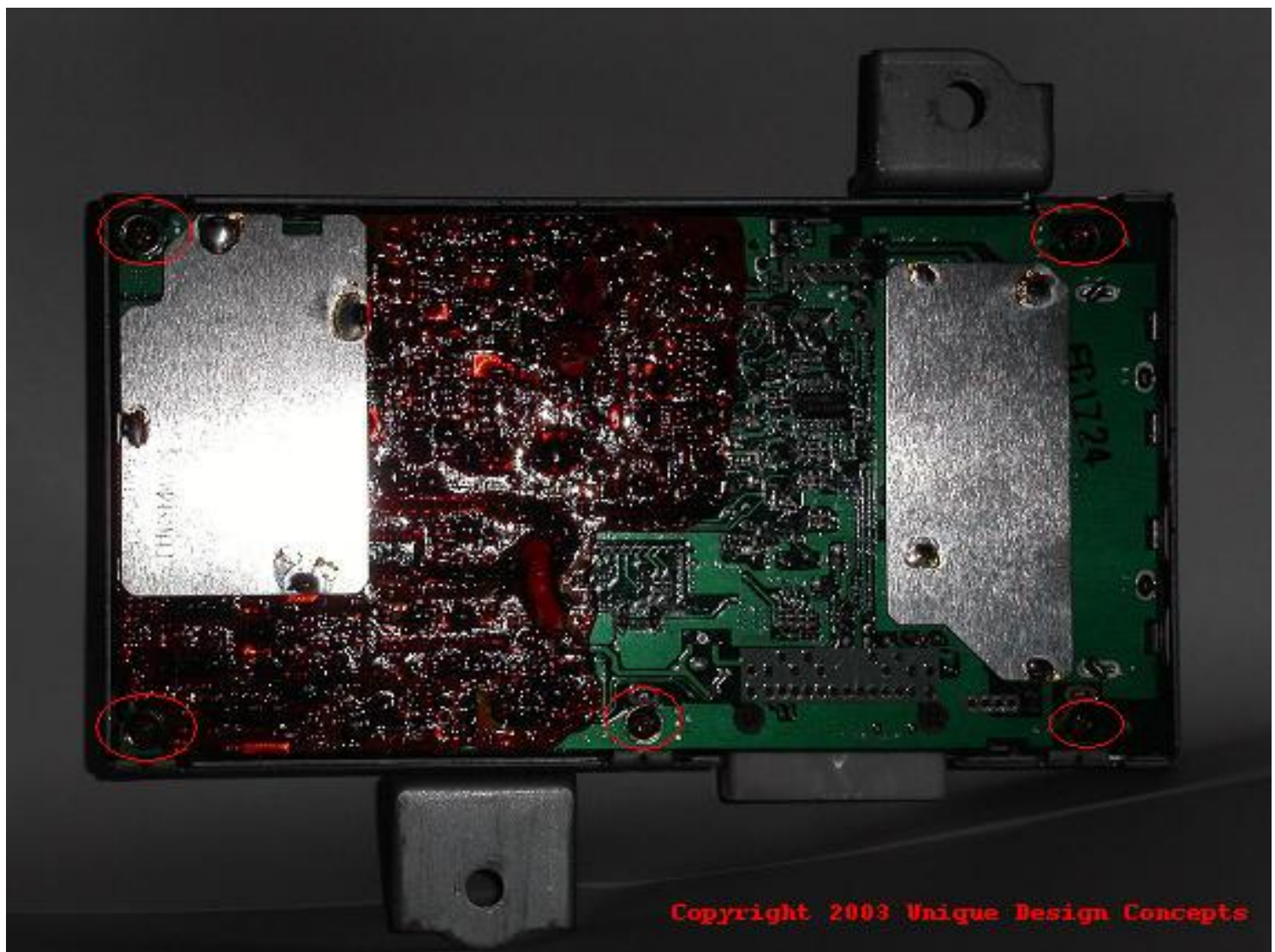


Figure 9

Dismount the two black ceramic filters from the bottom PCB - Figure 10.

Hint: braking the black ceramic filters between their legs with cutters would make it easier to de-solder from the PCB.

The labels “5.5MB” and “X5.58” are the part numbers of the replacement ceramic filters provided with the kit (for UK and Ireland substitute 5.5 with 6.0 in the labels). Solder the replacement filters in such a way that their markings (i.e. 5.5MB and X5.58) face the location of the labels as on Figure 10.

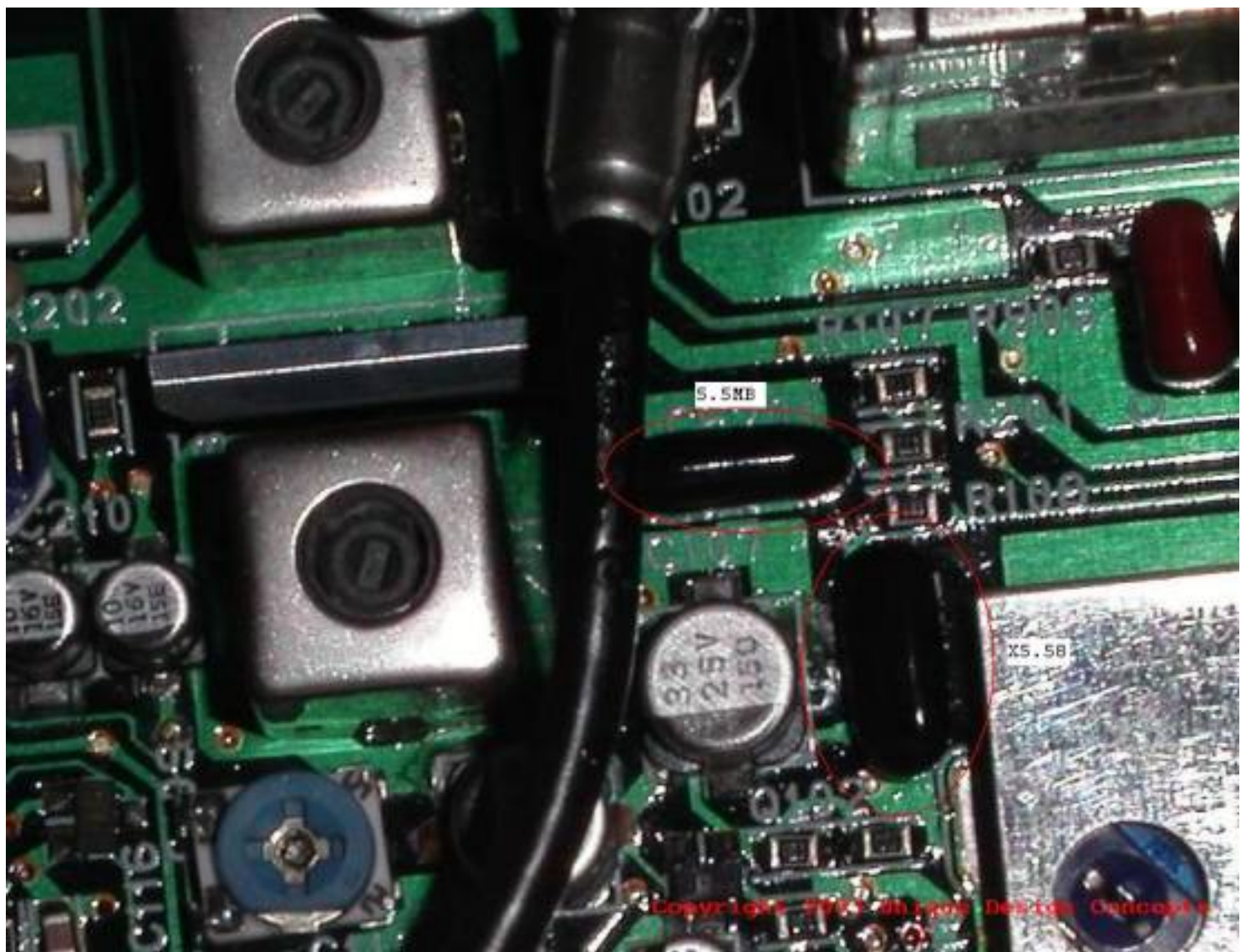


Figure 10

Replace the two surface mount capacitors (bottom PCB) shown on Figure 11 (closer view - Figure 12) with the ones provided with the kit.

Hint: using two soldering irons at the same time on both sides of a surface mount component would make it easier to de-solder it from the PCB.

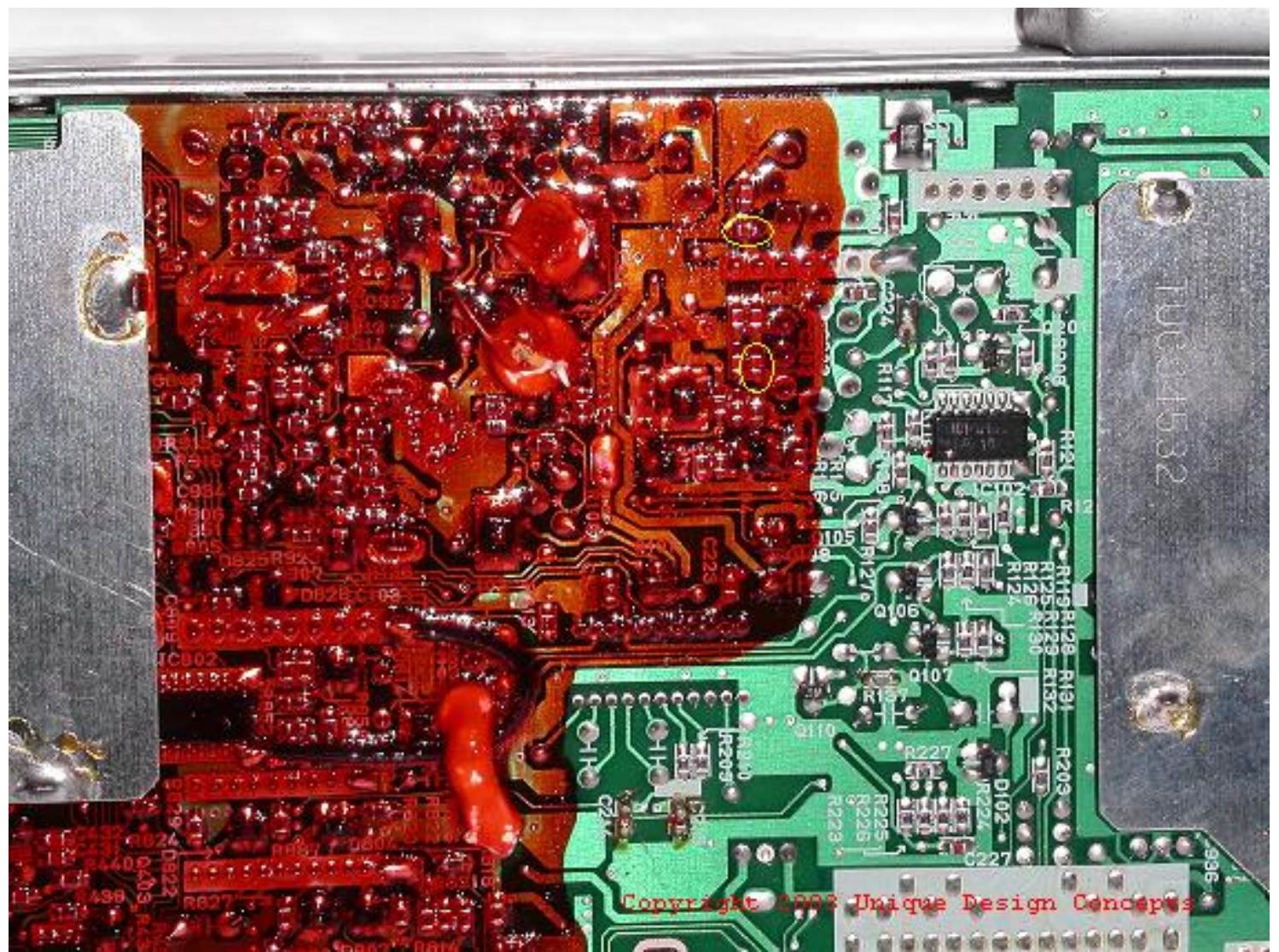


Figure 11

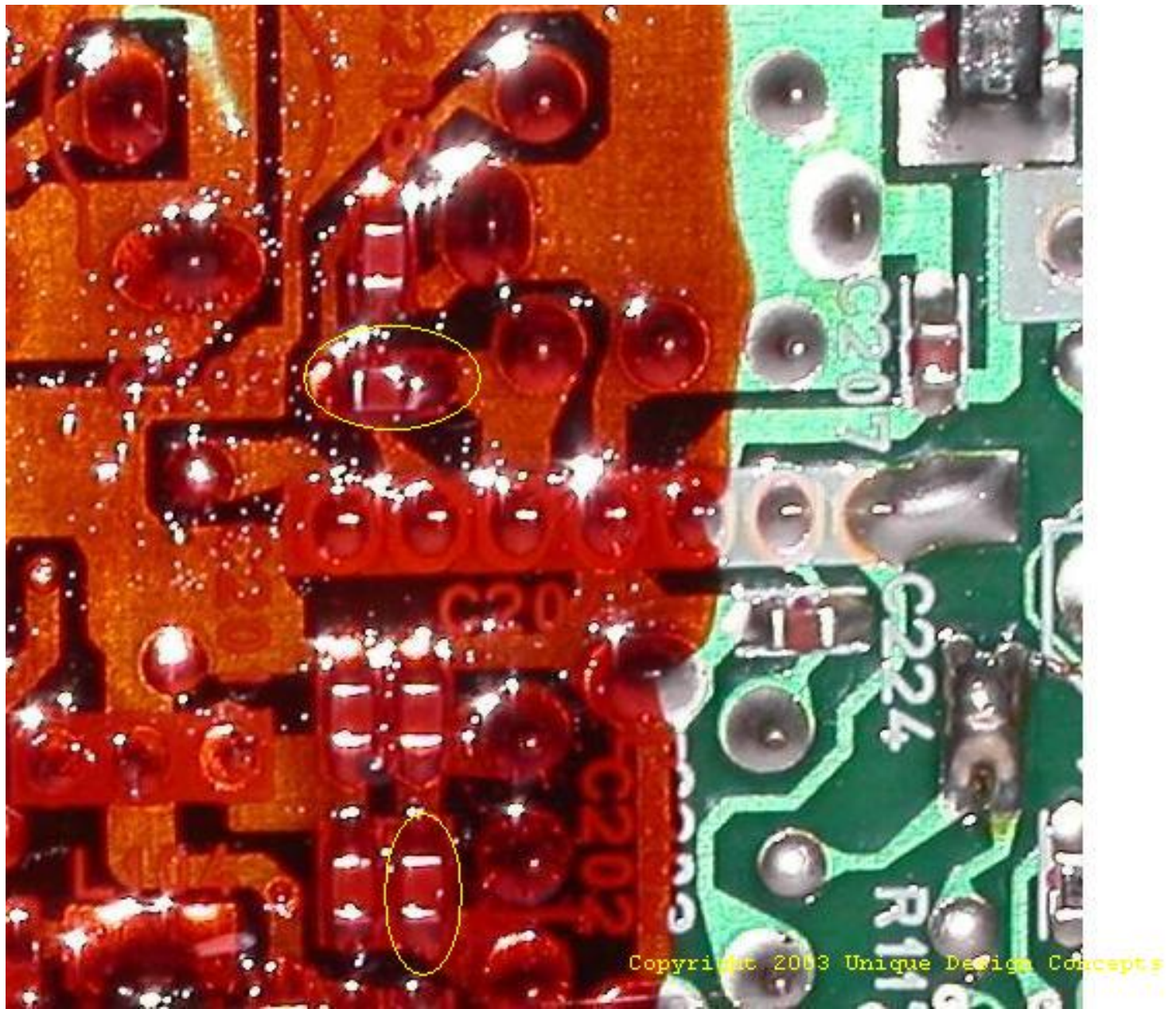


Figure 12

TV channel mapping modifications

Remove the metal shielding cover located on the top-left side of the bottom PCB shown on Figure 9. Figure 13 shows the four spots circled in blue which need to be de-soldered. Do it one at the time and lift the cover up with a screwdriver as shown on the picture.

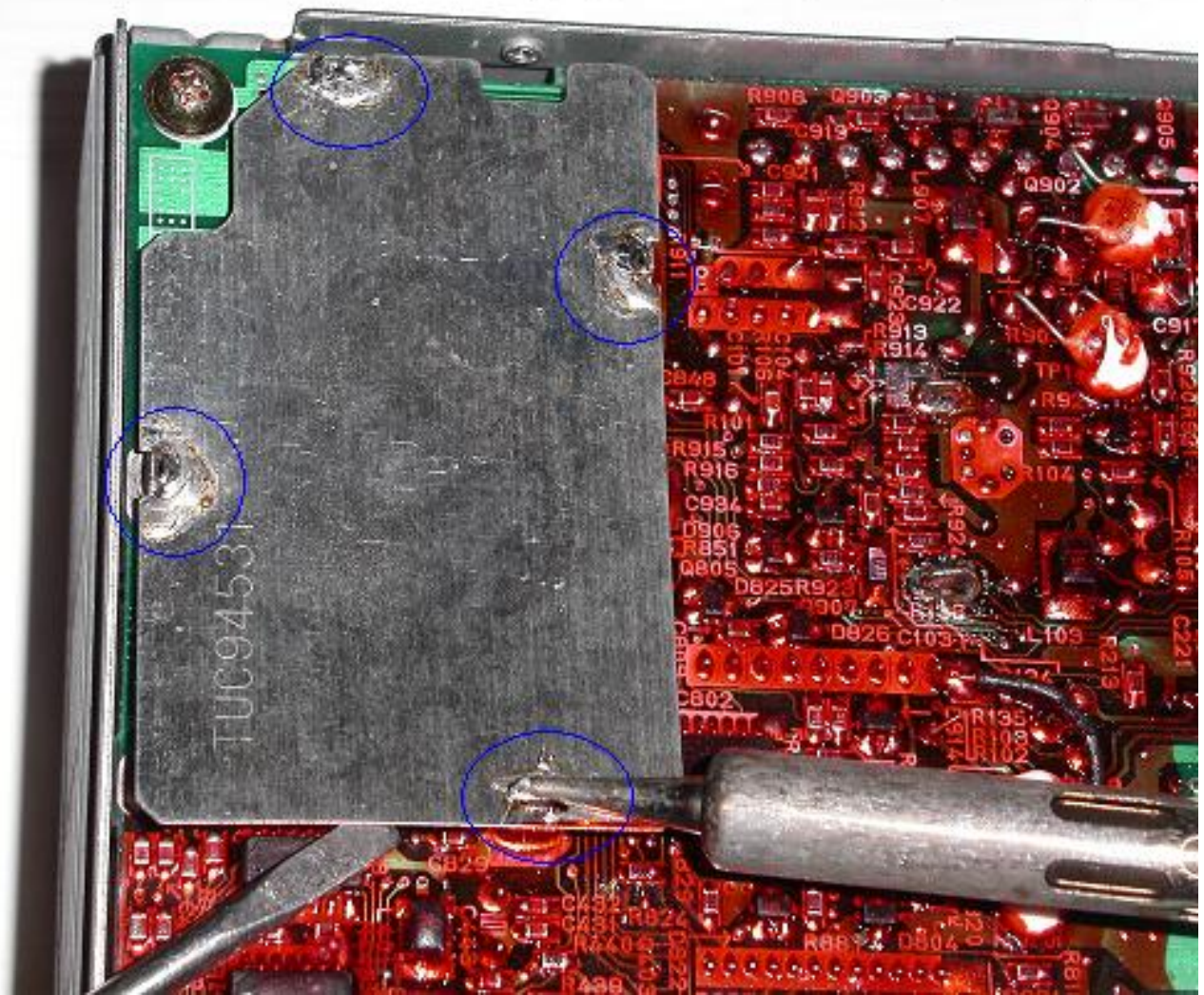


Figure 13

Figure 14 has a yellow circle around a surface mount resistor, which needs to be removed. The blue square shows an area on the PCB clear of components. The double-sided tape provided with the kit has to be stuck there.



Figure 14

Figure 15 shows the double-sided tape stuck to the board and the surface mount resistor dismounted.

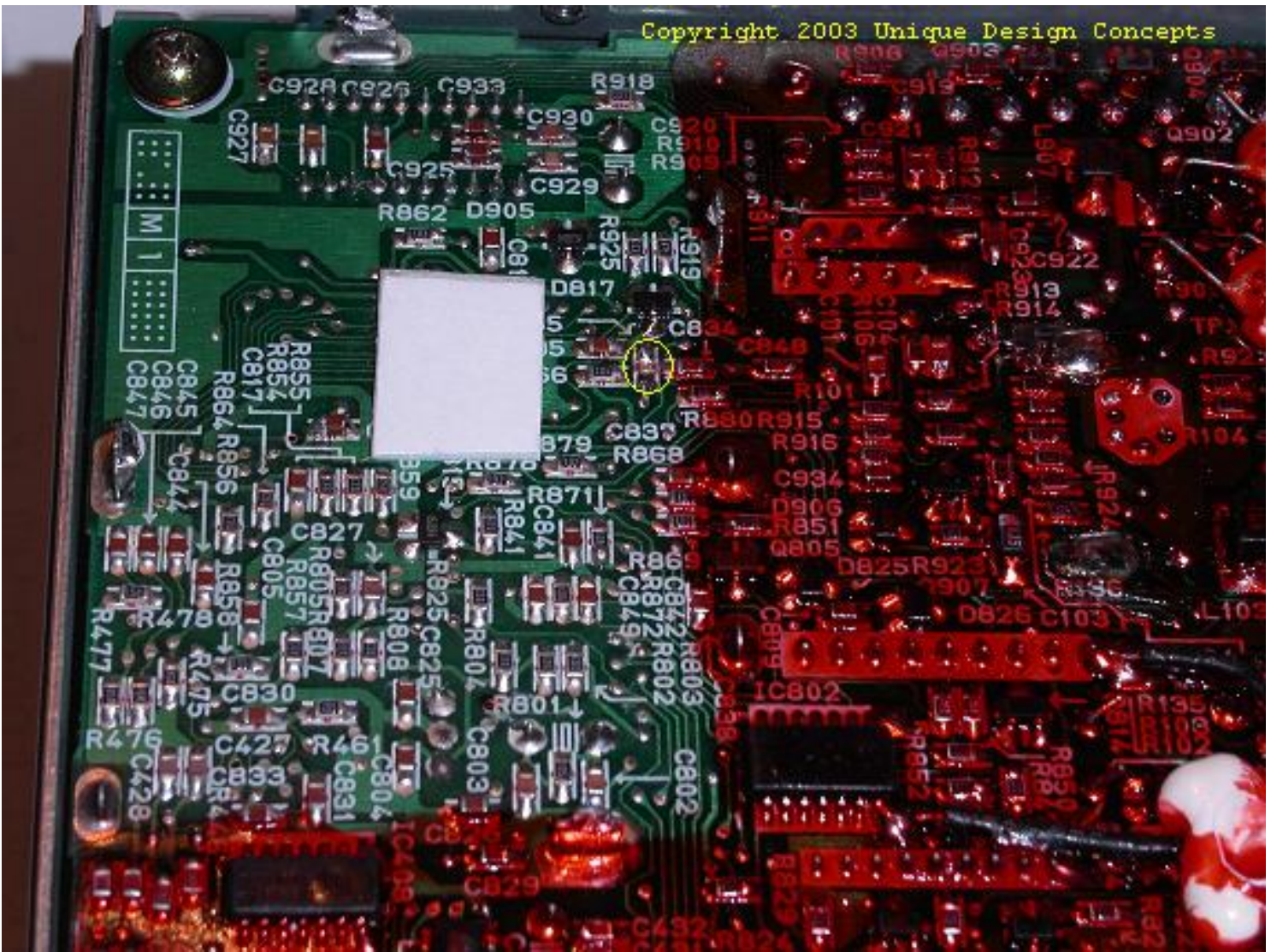


Figure 15

Figure 16 shows the chip connected via the rainbow wires provided with the kit. Note how the green wire connects two pins circled in purple and green of the chip together. This connection selects Australian channel mapping. For New Zealand channel mapping connect the purple pin with the red pin. For UK and Ireland channel mapping connect the purple pin with the brown pin.

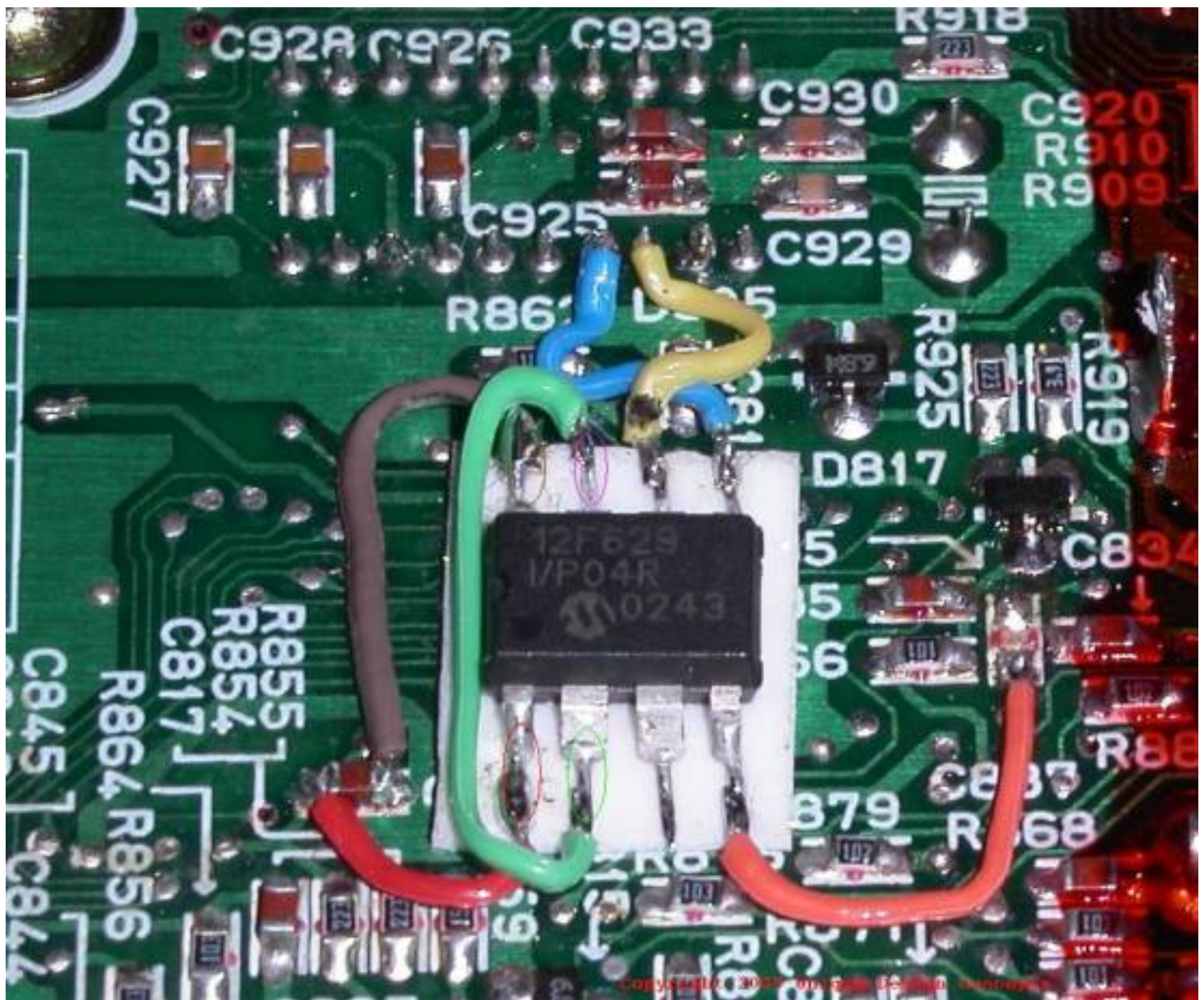


Figure 16

Tuning the sound

The next step is tuning of the TV sound. Assemble the tuner back but leave the top PCB hang on the connector cables as shown on Figure 17. Note that the two yellow cables visible on the picture are not part of this kit, just ignore them. Tune the tuner to a channel with a strong reception (see chapter “Tuning TV channels”). At this point a black & white picture with no vertical synchronisation and no sound will be received. Use a ceramic non-conductive screwdriver to rotate the top inductor slug as shown on Figure 17.

Hint: Ceramic non-conductive screwdriver could be purchased from Dick Smith Electronics – part number T5206.

Trim the inductor until maximum sound level is achieved. Be extremely gentle with the

slug because it brakes very easily and could irreversibly damage the inductor. Apply the same procedure to trim the bottom inductor on Figure 17 and try to achieve best signal to noise ratio.

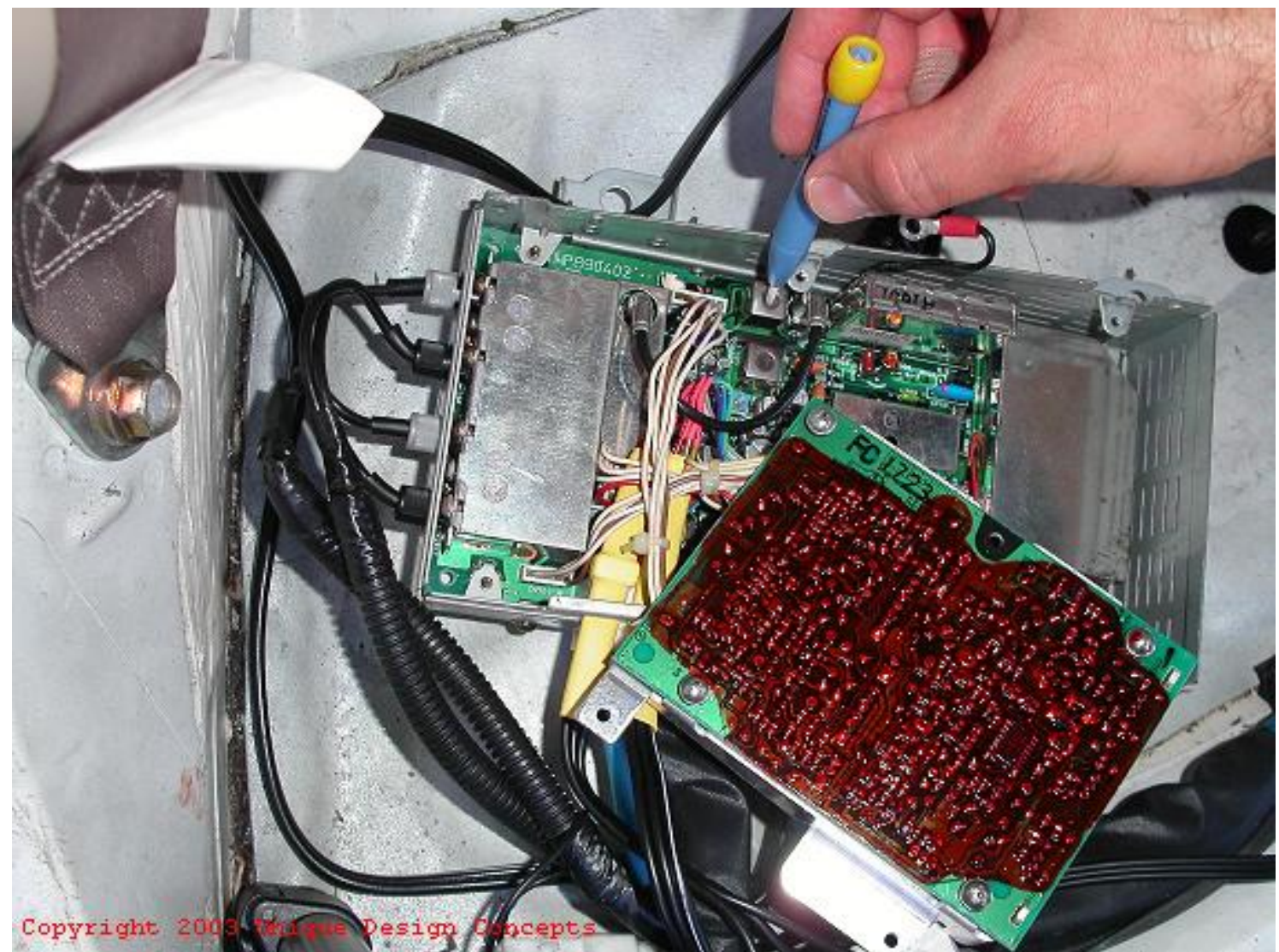


Figure 17

Last assemble the tuner back and install it in its place under the back car seat. Verify that the TV can receive black & white picture with no vertical synchronization. Check the TV sound works too.

Installing PAL to NTSC converter

The PAL->NTSC converter should be purchased separately from here:

http://www.converters.tv/products/converters/digital_video_system_converters/57.html

It is recommended to purchase the converter after the TV tuner conversion has been successfully implemented and tested.

The converter creates electro magnetic interference, which reduces the sensitivity of the

TV tuner. It has to be installed as far as possible from the TV antennas, which are imbedded in the car backside windows. A suitable space is available in the cavity on the left side of the EMV unit. The PAL->NTSC converter needs connections to 12V power supply, video input and video output signals. Three cables are required – one power and two video. The video cables have to be terminated at one end with RCA plugs. The cables should be around 80 centimeters long.

Hint: The video cable should be as thin and flexible as possible. One 1.5m video cable could be cut in two for this application.

The installation procedure is as follows:

Apply the car handbrake, select neutral gear (keep the red button pressed), and push down the brown plastic cover under the gear handle. Undo the two screws shown on Figure 18.



Figure 18

Remove the gear handle and the cup holder as shown on Figure 19.



Figure 19

Take out the black plastic cover as shown on Figure 20



Figure 20

Disconnect the three connectors shown on Figure 21.



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Figure 21

Undo the six screws shown on Figure 22.



Figure 22

Remove the brown plastic cover around the EMV screen as shown on Figure 23.



Figure 23

Disconnect the three connectors show on Figure 24.



Figure 24

Undo the six screws shown on Figure 25.



Figure 25

Take out the top row buttons from the EMV by undoing the screws shown on Figure 26 (this picture view is taken through the windscreen of the car).



Figure 26

Unplug the seven connectors from the EMV as shown on Figure 27. The seventh (blue in colour) connector is not visible on Figure 27. It is on the same level as the two white connectors behind the bunch of cables.



Figure 27

Here is another view that shows the seventh connector location - Figure 28.



Figure 28

Figure 29 shows the seven connectors after the EMV is removed. The one marked with red will be used to patch the video cables for the PAL->NTSC converter.



Figure 29

Figure 30 shows the two connectors that will be used to patch wires to the PAL->NTSC converter. The blue one is the car cigarette lighter connector. It will be used to power the PAL->NTSC converter. The white one provides the video signal from the TV tuner to the EMV. The video signal will be passed through the PAL->NTSC converter. As a result of that, the EMV will always get NTSC video signal required for normal operation.



Figure 30

Figure 31 shows the two video cables patched to the white connector. The common cable shields are soldered to pin 4 (brown/white) - this is the video ground. The blue video signal wire (pin 3) has been cut. The left side is soldered to the white video cable, which is going to the PAL->NTSC converter video input. The right side (connector side) of the blue wire is soldered to the yellow video cable, which is going to the PAL->NTSC converter video output.

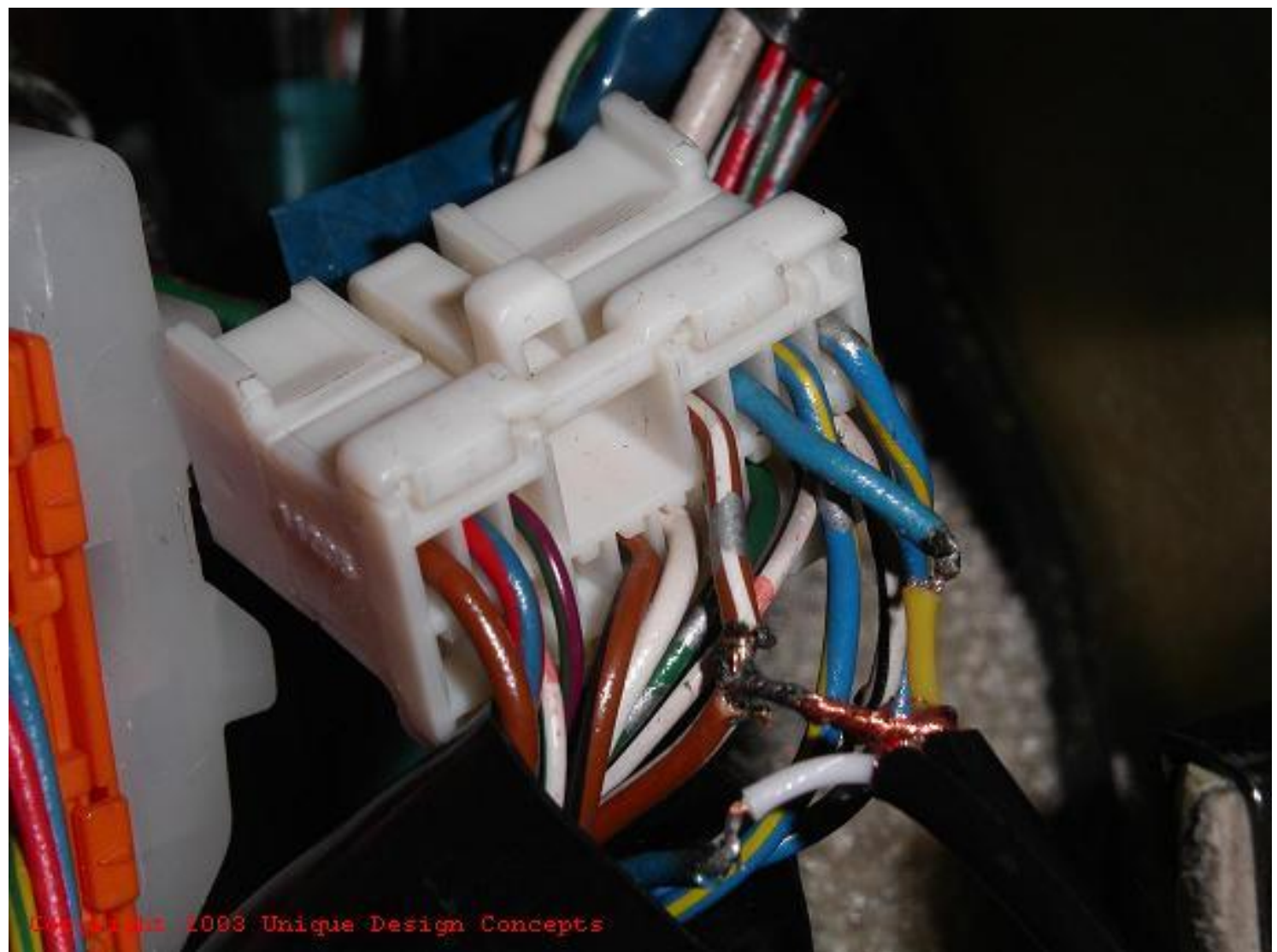


Figure 31

Figure 32 shows the patch wires providing power to the PAL->NTSC converter from the car cigarette lighter connector. The black/white connector wire is the ground, the blue/red one is +12V.

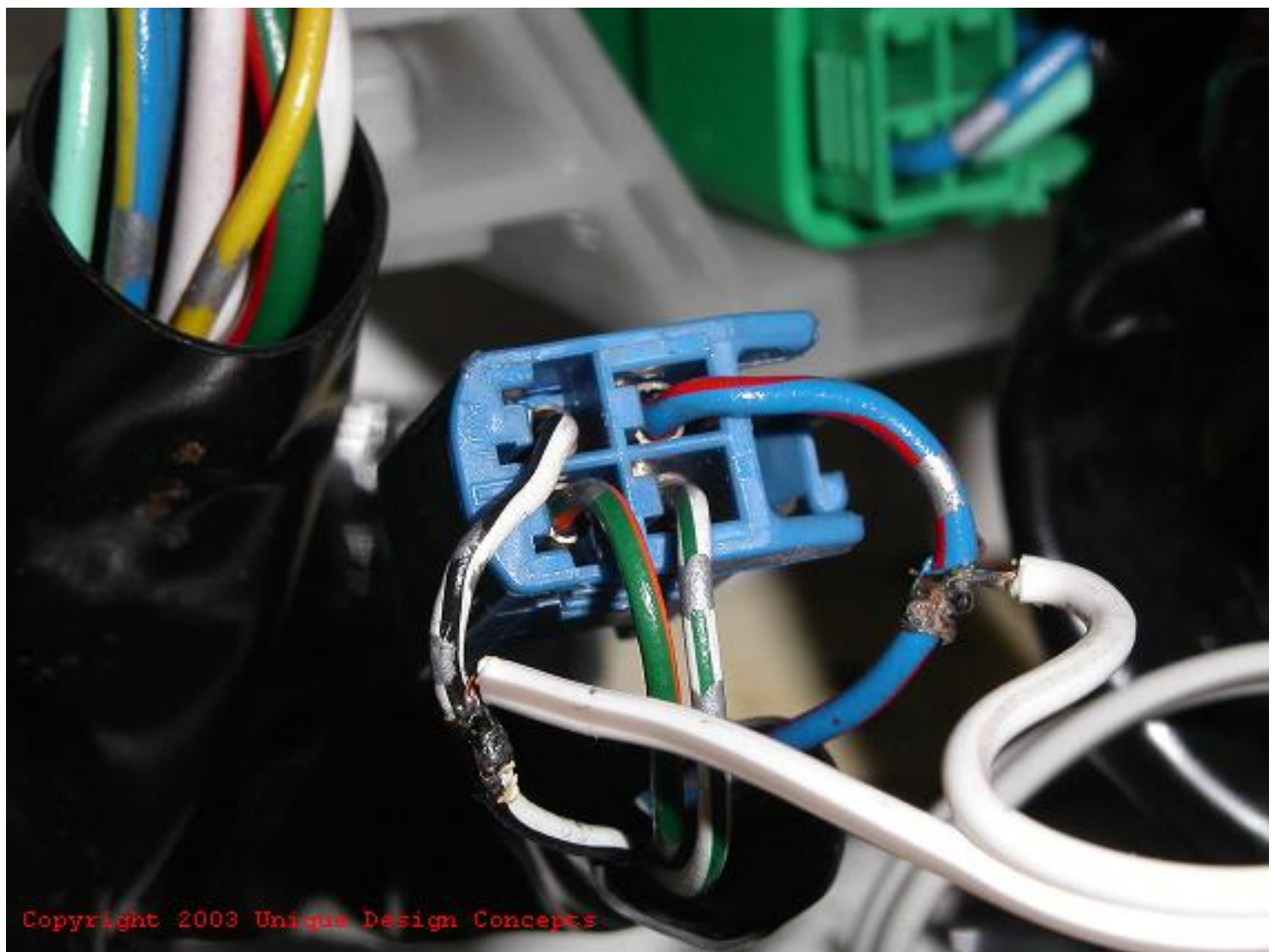


Figure 32

Figure 33 shows the power plug connection. The ground wire is marked with red at both ends.

Hint: The power plug could be purchased from Jaycar Electronics – part number PP0511.

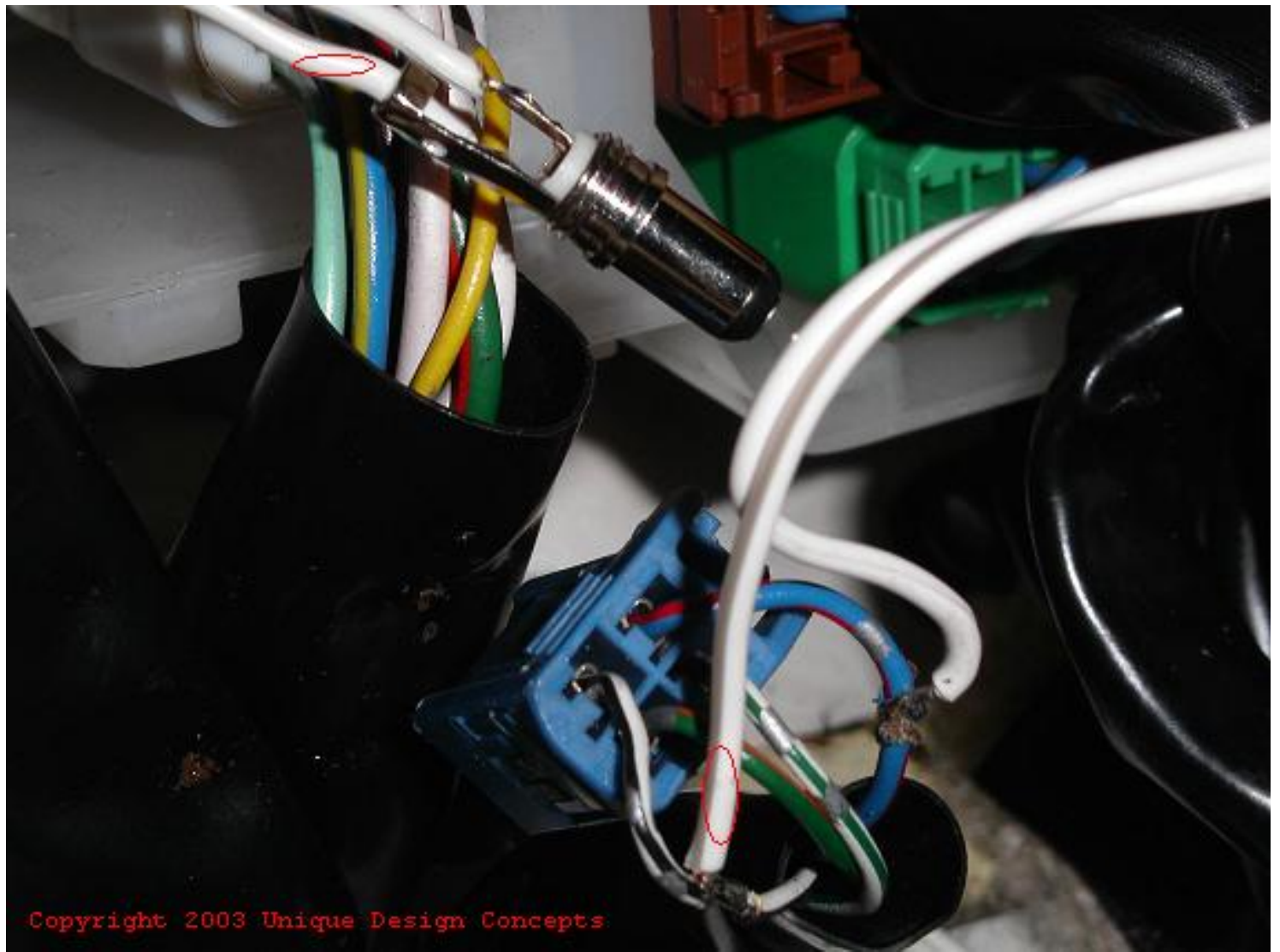


Figure 33

Figure 34 shows the final cable patch.



Figure 34

Next mount back the EMV unit and plug the cables to the PAL->NTSC converter as shown on Figure 35. The converter LED display is not required and has been unplugged. Move the gear to park position, switch the ignition on and tune to a TV channel. No sound should be heard because the volume control knob is not connected. The RCA plug marked with blue is the converter video input. The RCA plug marked with red is the converter video output. The two black switches should be set as on Figure 35.



Figure 35

The PAL-NTSC converter needs to be electrically isolated before it is plugged next to the EMV. Cut a rectangular polycarbonate sheet with size 20/22 centimetres. This is a non-flammable high temperature resistant material.

Hint: Polycarbonate sheet as the one shown on Figure 36 could be purchased from Bunnings.

Fold it over the longer (22 centimetres) side and insert the converter in. Stick it with adhesive tape in a few places to form an envelope (caution: care should be taken not to block the path for heat dissipation). The isolated converter is shown on Figure 36.



Figure 36

Insert the PAL-NTSC converter board as shown on Figure 37. Note the visible RCA plug is the converter video output.



Figure 37

Assemble back all the rest.

Tuning TV channels

Turn the ignition on, press the TV button circled in yellow then press the button circled in red as shown on Figure 38. The TV channel control screen is displayed.



Figure 38

Press TUNE/CH/TRACK button until the desired channel is displayed on the top of the screen (circled in yellow) as shown on Figure 39. Touch and hold one of the twelve blue squares until a long beep is heard. The square changes its colour to green and displays the ID number of the memorised channel. Apply the same procedure for the rest of the channels.



Figure 39

Figure 40 shows an example channel tuning. Channels 7, 9, 10, 28 and 31 are received in Melbourne and Geelong. Channels 30, 33, 36, 39 and 42 are received in Ballarat. Once the channels are memorised, touch the SKIP button and notice its colour changed to green as shown on Figure 40. After this selection the TUNE/CH/TRACK button will select only the memorised channels. The touch button on the left of SKIP will delete a selected (green) memorised channel. The touch button on the right of SKIP is used for auto tuning. This function will not work correctly on the modified tuner.



Figure 40

Figure 41 shows selection of a TV channel through TUNE/CH/TRACK button.



Figure 41

Figure 42 shows how to invoke the TV picture adjustment menu. The bars starting from the top control the contrast, colour saturation, colour hue and brightness.



Figure 42

The following table shows the tuner channel mappings for Australia, New Zealand, UK and Ireland.

<i>Tuner channel Number(Japan)</i>	<i>Australian channel mapping</i>	<i>New Zealand channel mapping</i>	<i>UK/Ireland channel mapping</i>
1	1*	1*	-
2	2*	2*	A(2)*
3	3*	3*	B(3)*
4	4	4	C(4)*
5	5	5	D(5)
6	6	6	E(6)
7	7	7	F(7)
8	8	8	G(8)
9	9	9	H(9)

10	10	10	I(10)
11	11	11	J(11)
12	12	-	-
13	63*	-	63*
14	64*	-	64*
15	65*	-	65*
16	66*	-	66*
17	67*	-	67*
18	68*	-	68*
19	-	-	-
20	-	-	-
21	69*	-	21
22	5A	-	22
23	0*	-	23
24	-	-	24
25	-	25	25
26	-	26	26
27	-	27	27
28	28	28	28
29	29	29	29
30	30	30	30
31	31	31	31
32	32	32	32
33	33	33	33
34	34	34	34
35	35	35	35
36	36	36	36
37	37	37	37
38	38	38	38
39	39	39	39
40	40	40	40
41	41	41	41
42	42	42	42
43	43	43	43
44	44	44	44
45	45	45	45

46	46	46	46
47	47	47	47
48	48	48	48
49	49	49	49
50	50	50	50
51	51	51	51
52	52	52	52
53	53	53	53
54	54	54	54
55	55	55	55
56	56	56	56
57	57	57	57
58	58	58	58
59	59	59*	59*
60	60	60*	60*
61	61	61*	61*
62	62	62*	62*

Table 1

* outside of the tuner frequency range – may not work.