

Rohde & Schwarz FSE Series LED Backlight kit

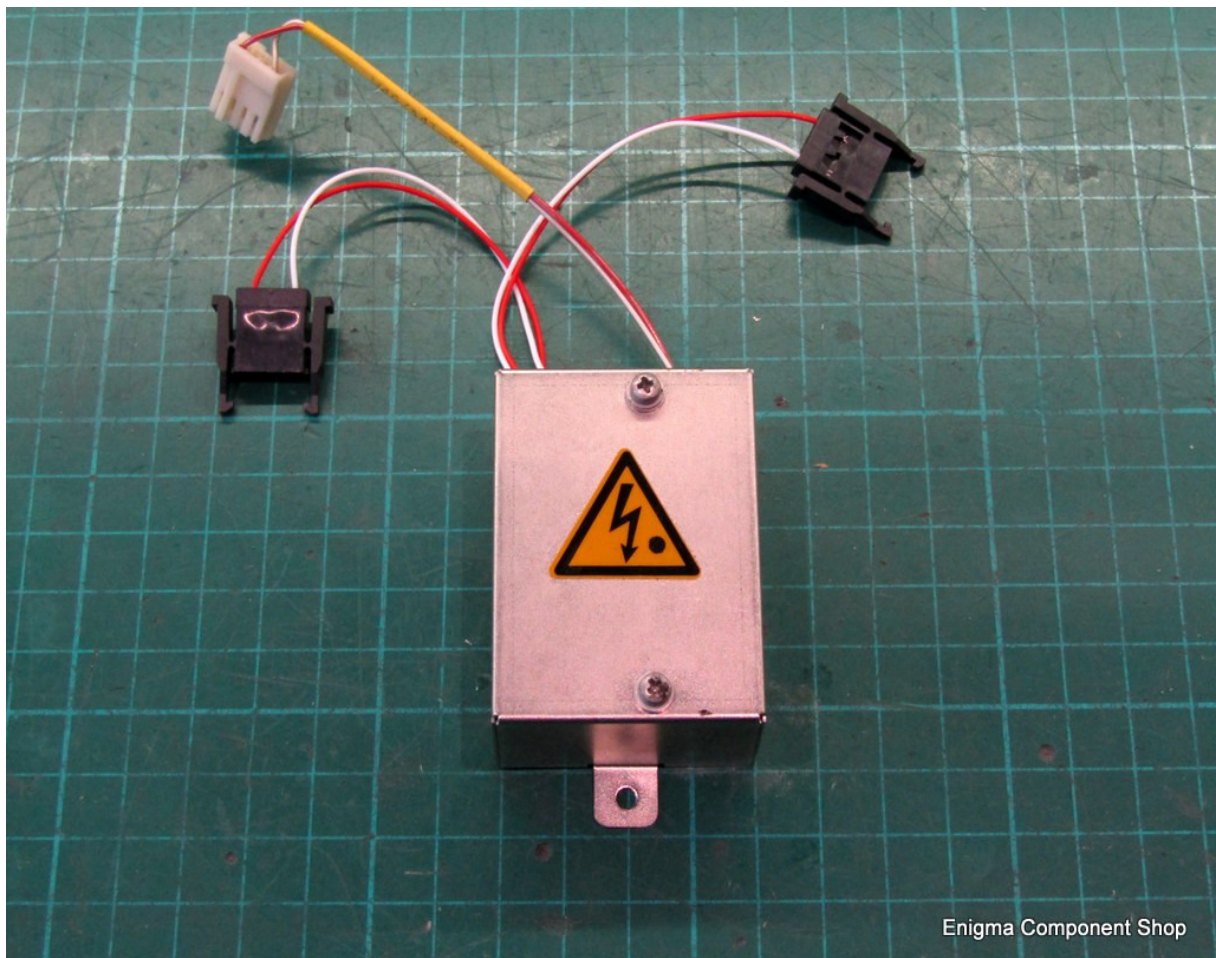
This upgrade kit is intended to replace the CCFL backlight with a modern LED alternative and is compatible with instruments fitted with the NEC **NL6448AC30-10** LCD display panel.

Some early “red face” FSE units have a Toshiba display with two backlight tubes, and this kit is not compatible with these early models.

All later “blue face” instruments should be compatible with this kit.

Before beginning installation of this kit it is recommended to check that the instrument has the later NEC display. You will need to remove the rear feet (bumpers) from the instrument, slide off the top cover, and look behind the front panel. If you see a separate backlight driver assembly as indicated in the picture below, installation of this kit should not be continued.

For information on removing the analyser top cover, follow steps 1 & 2 in the instructions that follow.



Old backlight converter – Not compatible with this kit.

Installation Instructions

Tools you will need:

- ✓ Small sidecutters
- ✓ Philips PH0 (small) screwdriver
- ✓ Philips PH1 (medium) screwdriver
- ✓ Philips PH2 (large) screwdriver
- ✓ Pozidrive PZ2 (large) screwdriver
- ✓ Small/ medium flat screwdriver
- ✓ Small long-nose pliers
- ✓ Soldering iron (optional)
- ✓ A large workbench or table
- ✓ Several small pots or bags to house various screws

STEP 1

Place the instrument on the bench with the rear of the unit facing you. Locate the four screw holes in the corners of the rear feet (bumpers). Using a PZ 2 Pozidrive screwdriver loosen the screws and pull the feet backwards to remove them. The screws are not designed to be removed from the feet and can be left inside.

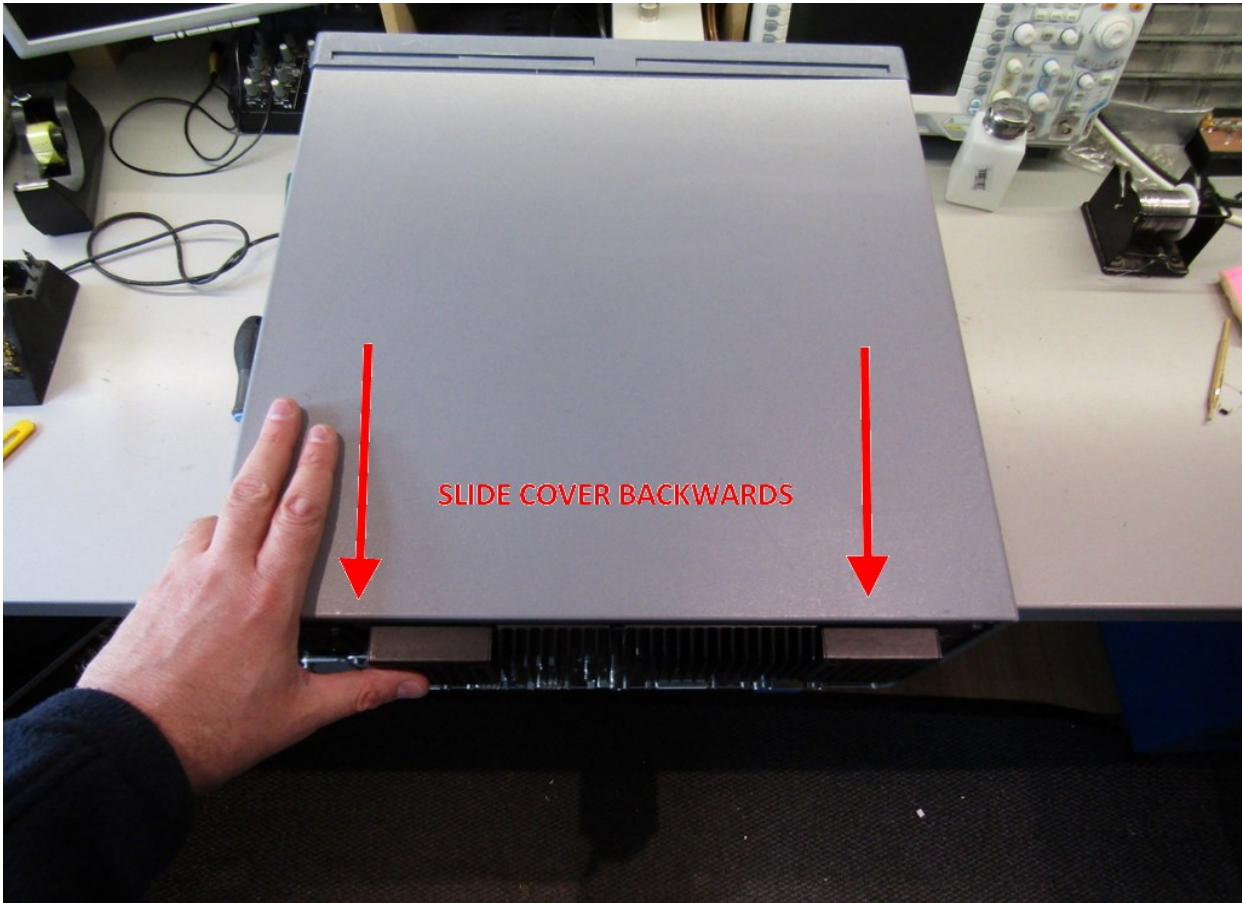




STEP 2

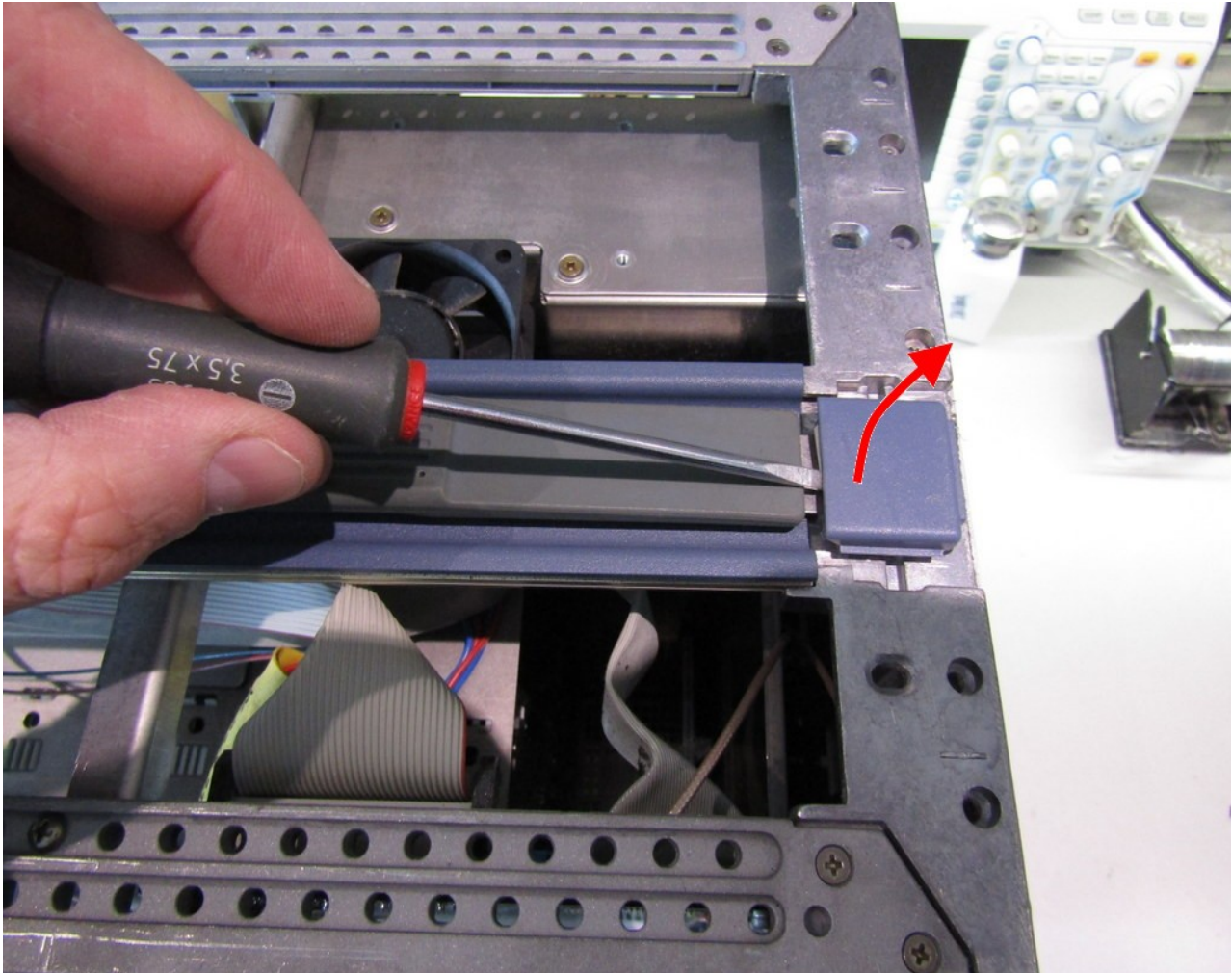
Grip the top cover of the analyser and slide it backwards to remove it. If the cover is stiff, a pair of small screwdrivers can be inserted in to the ventilation holes on the side of the instrument to improve the grip.

Turn the analyser over and repeat to remove the bottom cover.



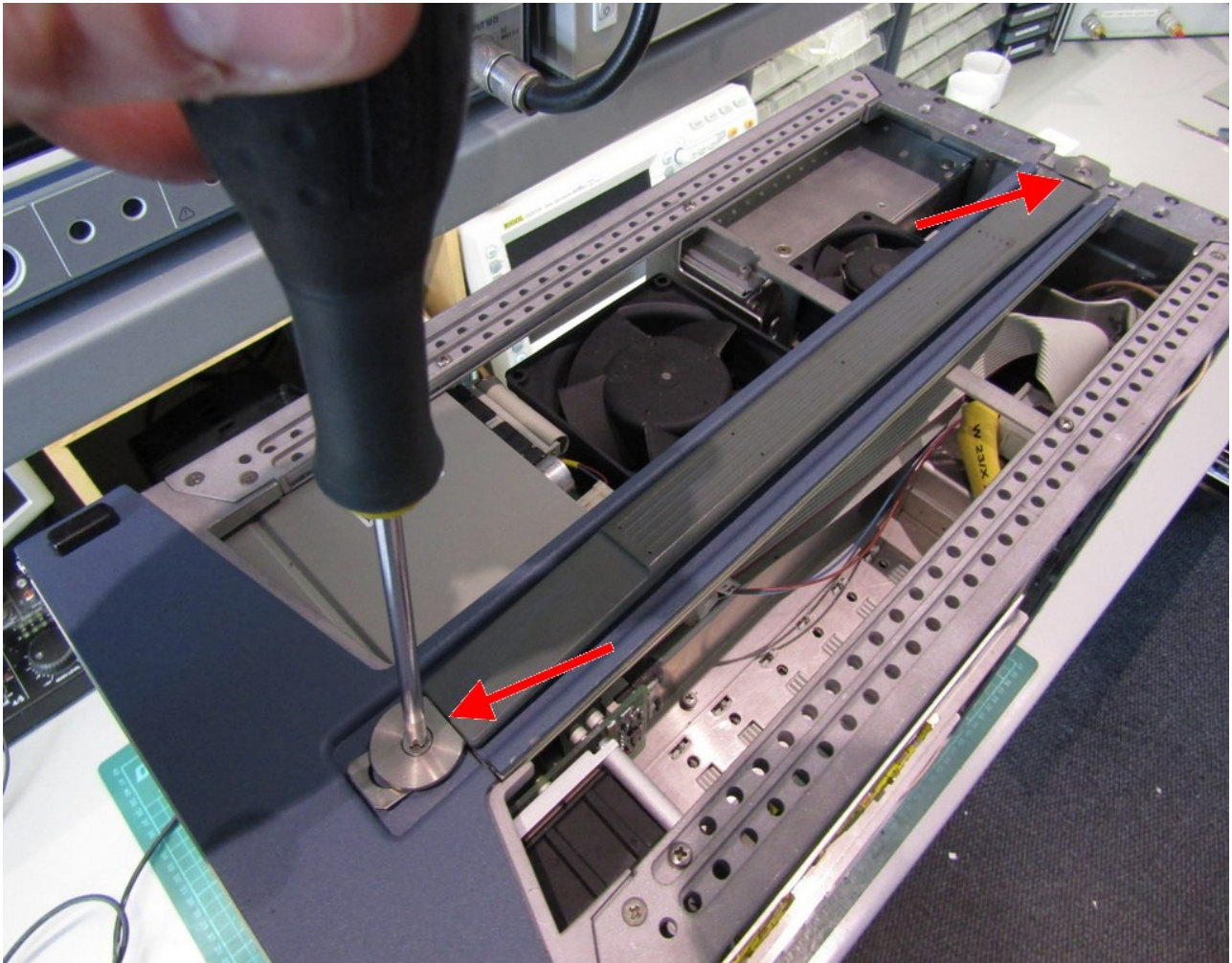
STEP 3

On each side of the unit there are small plastic covers concealing the carry handle screws. Using a small flat screwdriver gently prize these off as shown. There are four covers, two on each side of the instrument.



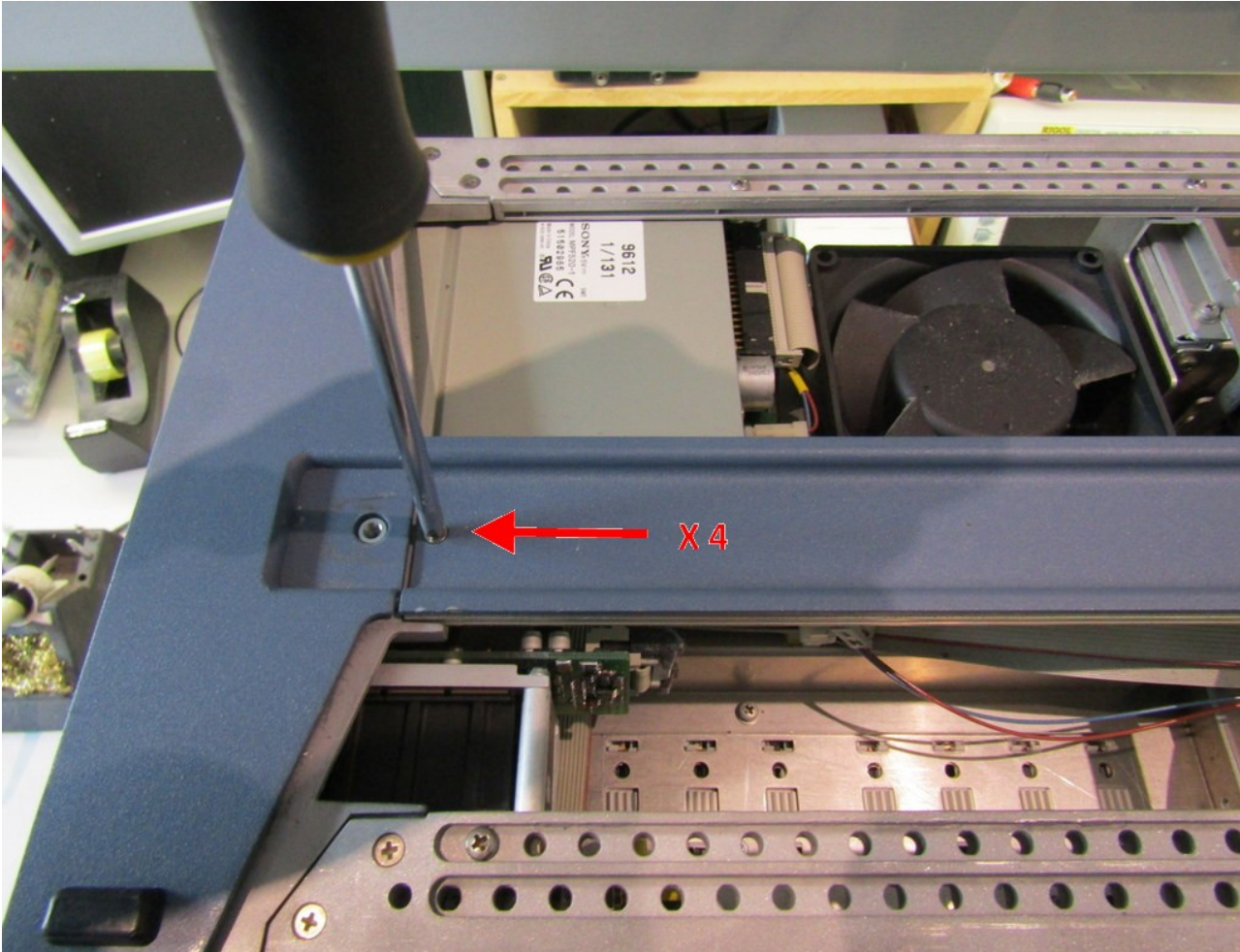
STEP 4

Using a PH 2 Philips screwdriver, remove the carry handle screws. There are four in total, two on each side of the instrument. Keep the screws and large washers with the handles and place them to the side. Note the orientation of the large washers which have a flat on one side, this faces inwards towards the rubber handle.



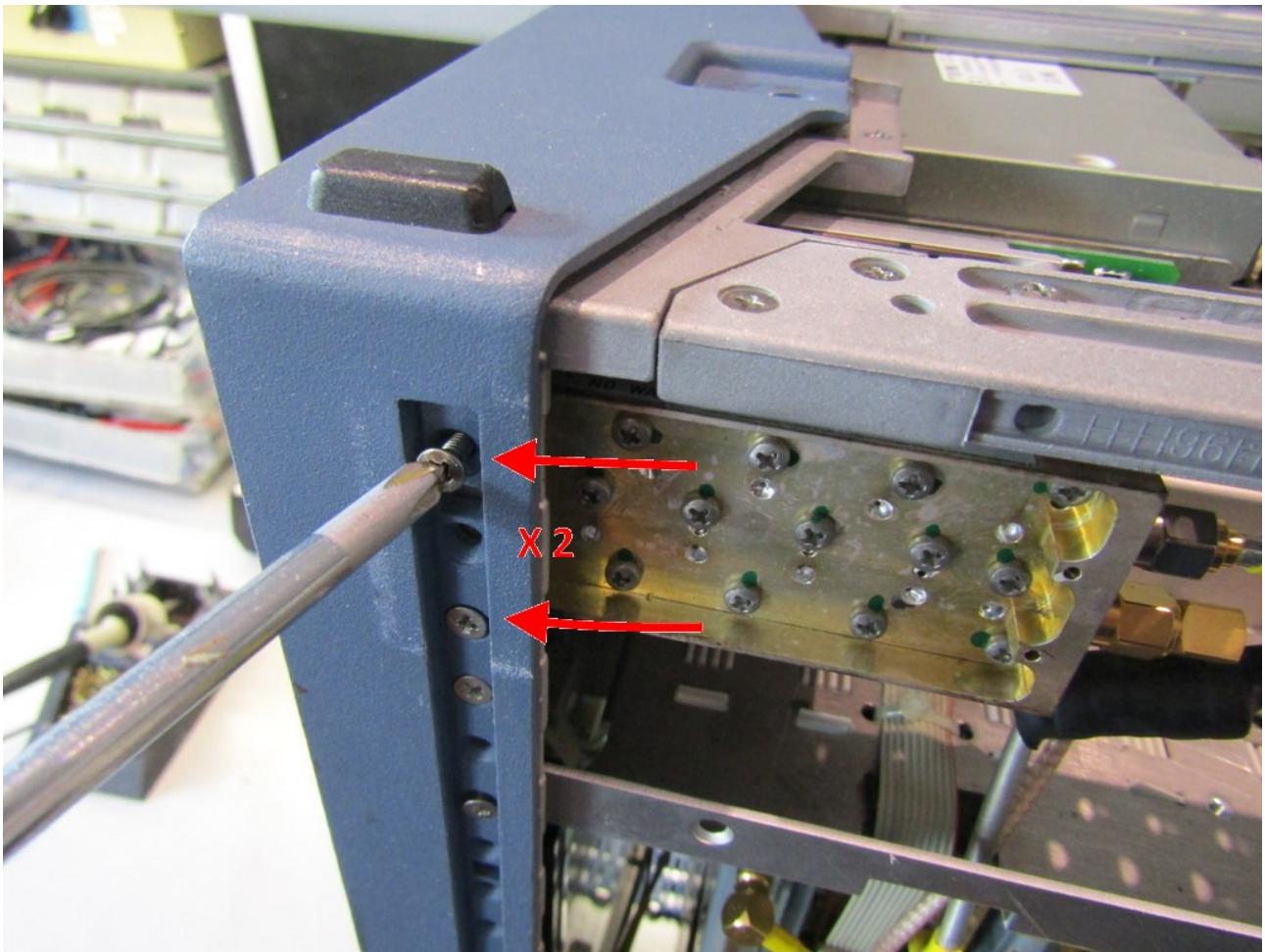
STEP 5

Using a PH 1 Philips screwdriver, locate the chassis side bars which were under the carry handles. Remove the four screws, two on each side of the instrument. Keep the screws with the side bars or place them in a bag named "Side bar screws".



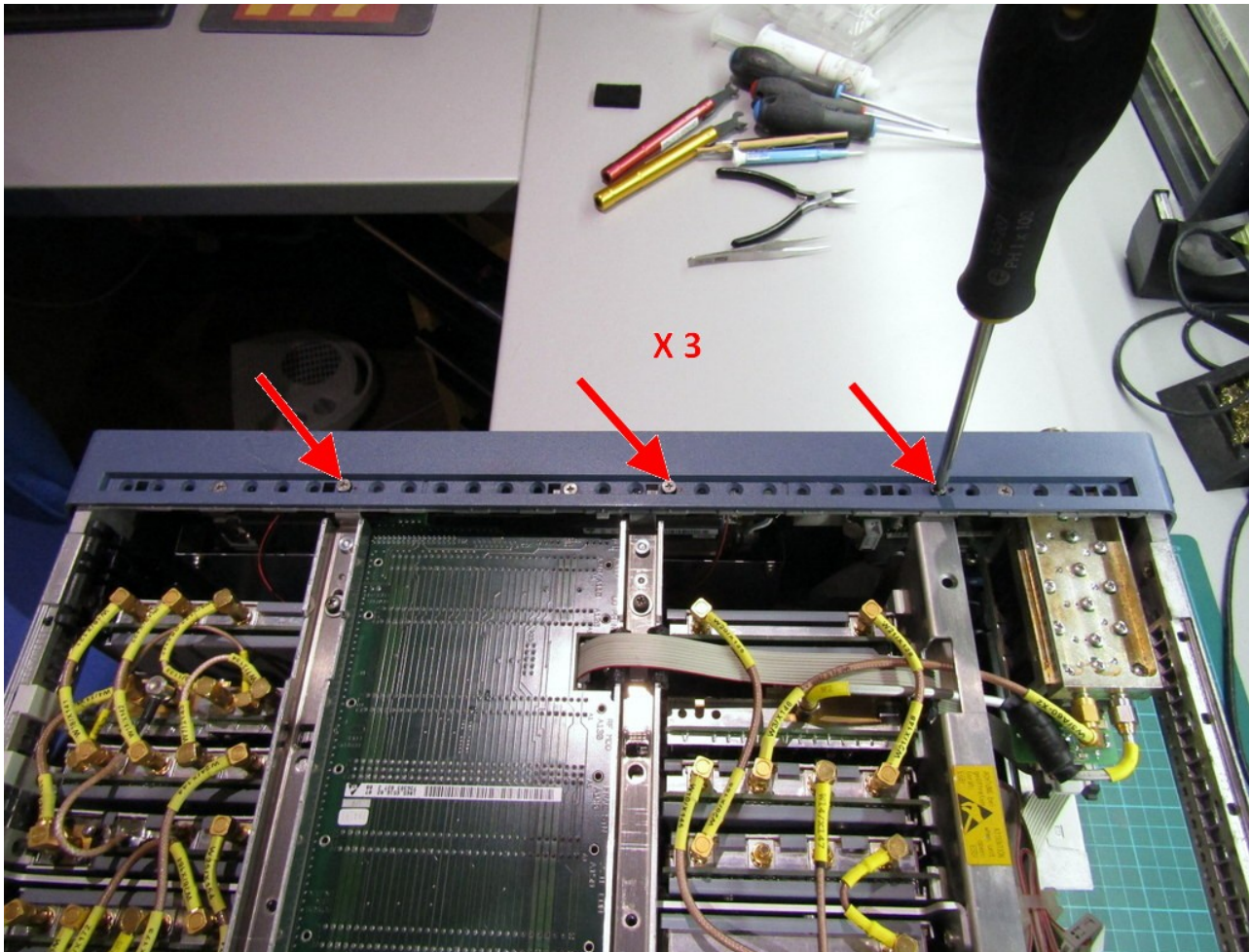
STEP 6

Locate the RF attenuator assembly which is directly behind the N-type RF input socket on the front of the analyser. Turn the analyser on its left side and remove the two screws using a PH 1 Philips screwdriver from the bottom of the attenuator as shown. Put the screws in a bag marked "Attenuator bottom".



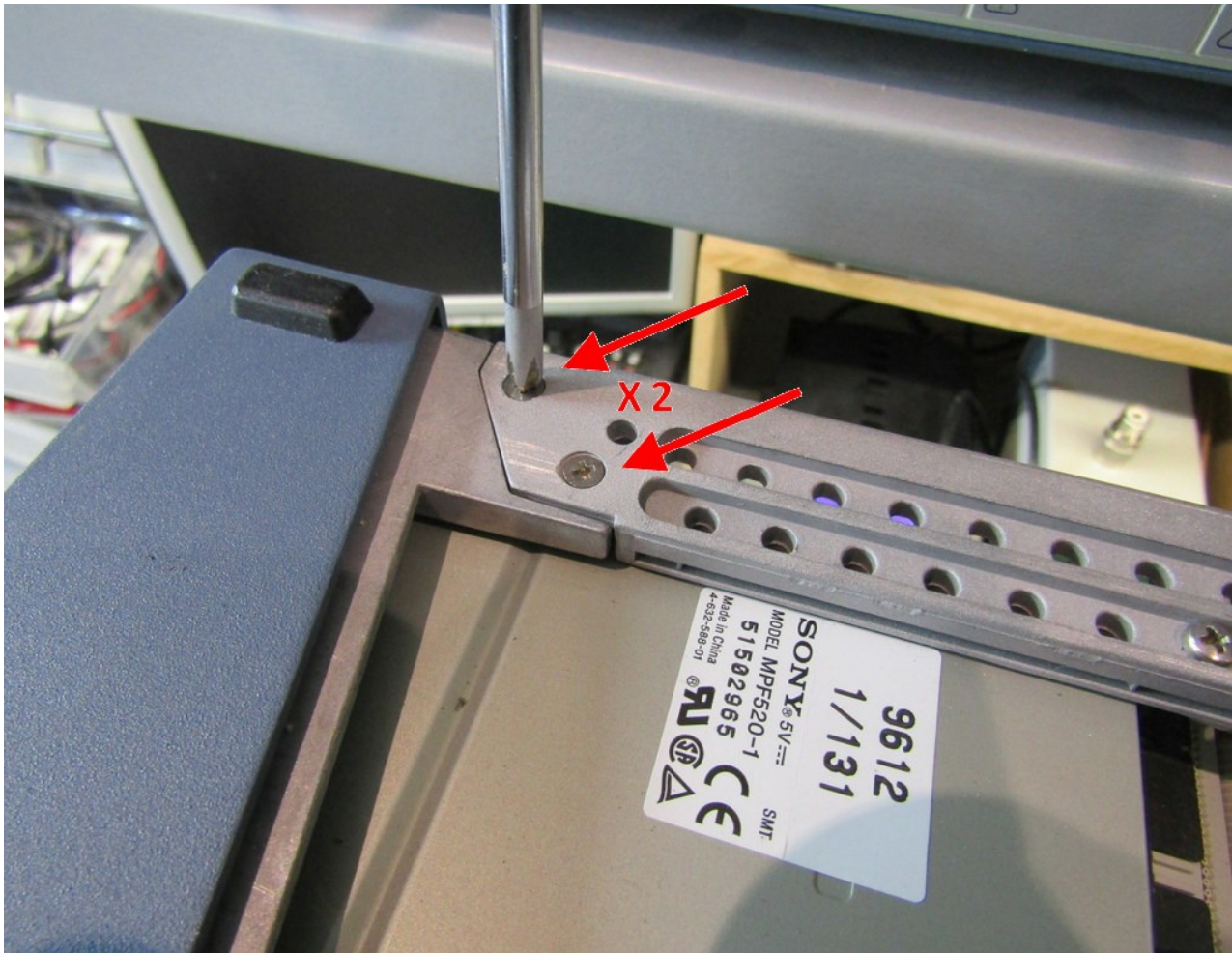
STEP 7

Turn the analyser upside-down and using a Philips PH 1 screwdriver remove the three screws from the underside of the front panel as shown. Put the screws in a bag marked "Front panel bottom".

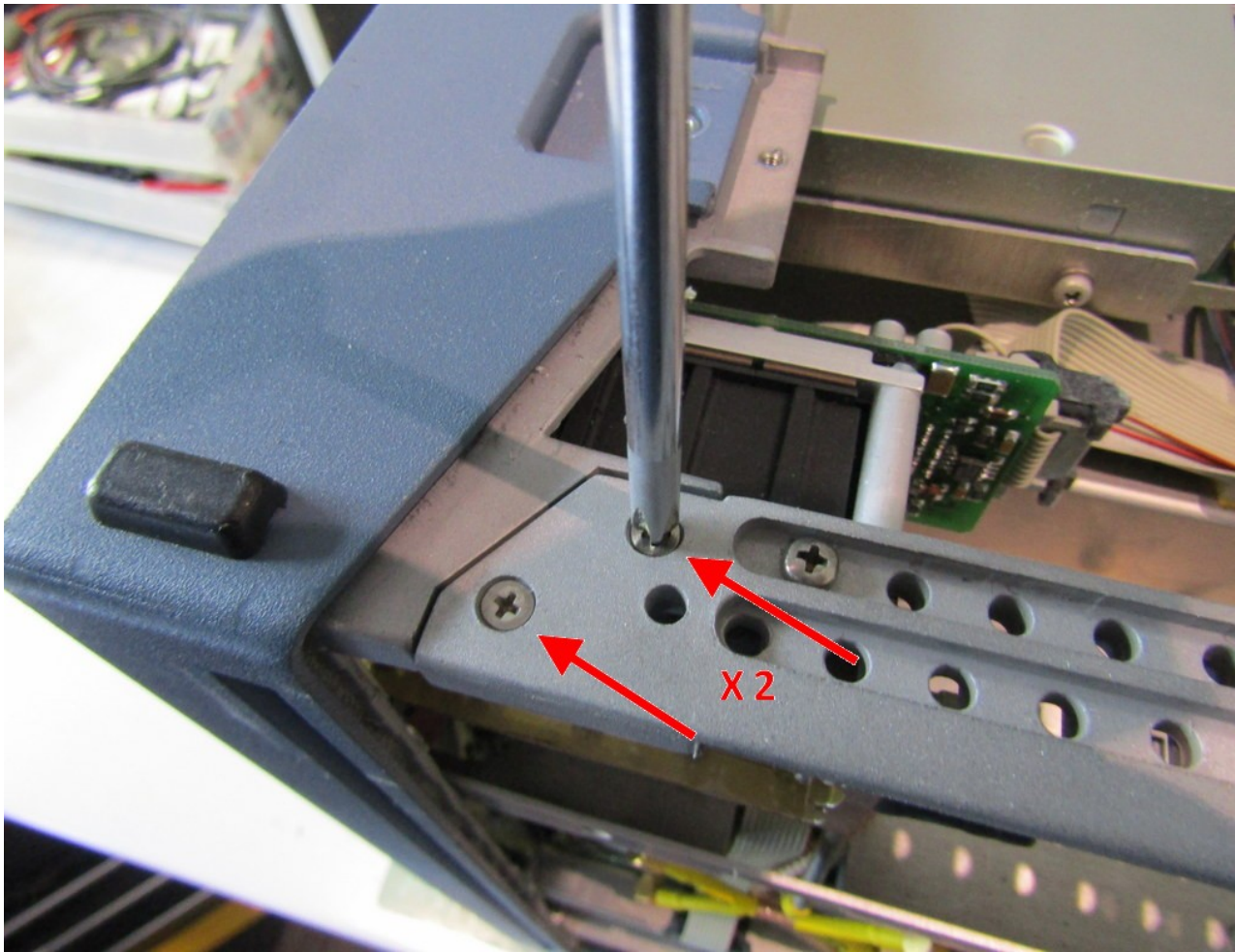


STEP 8

Turn the analyser on its left side and using a Philips PH 1 screwdriver remove the two screws holding the front panel to the chassis. Put the screws in a bag marked "Front panel chassis corners".

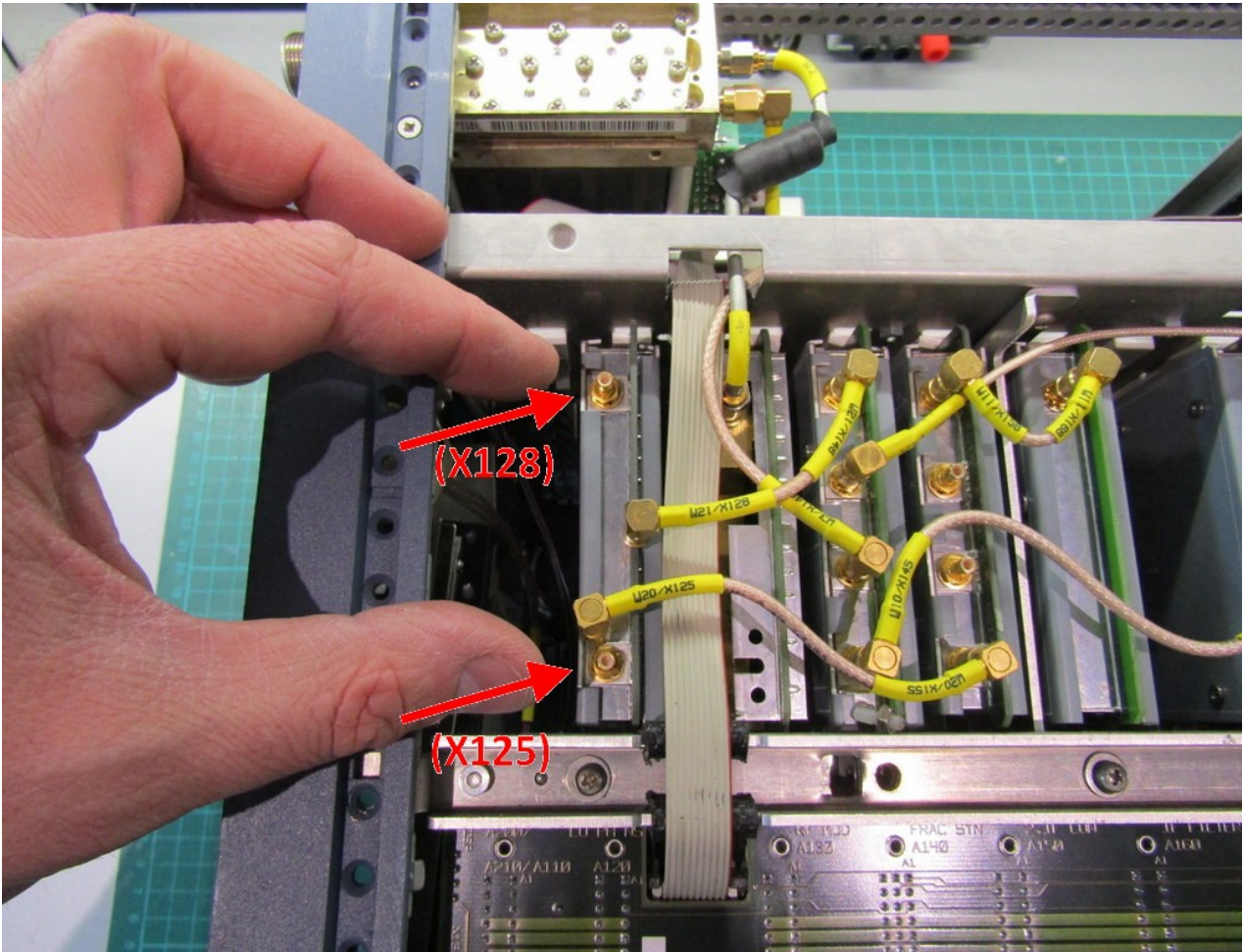


Repeat this process for the bottom of the chassis on the right-hand side. Put the screws in the same bag,

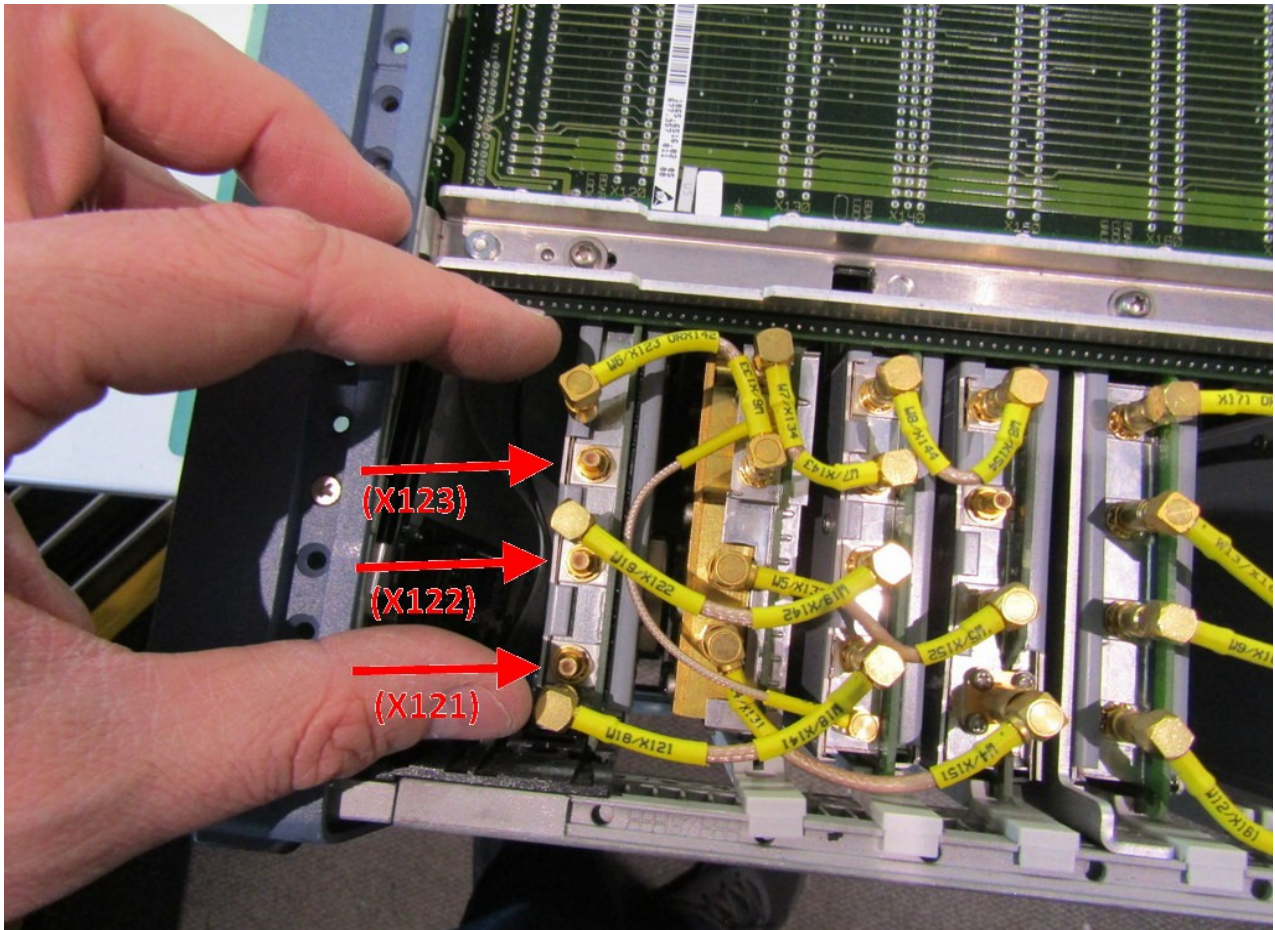


STEP 9

Turn the analyser upside-down again and locate the slide-out module (A120) nearest the front panel. Using your fingers, gently unplug the RF connectors marked X125 and X128 by pulling upwards (the slide-out RF module will be removed later, we're just taking off the cables).



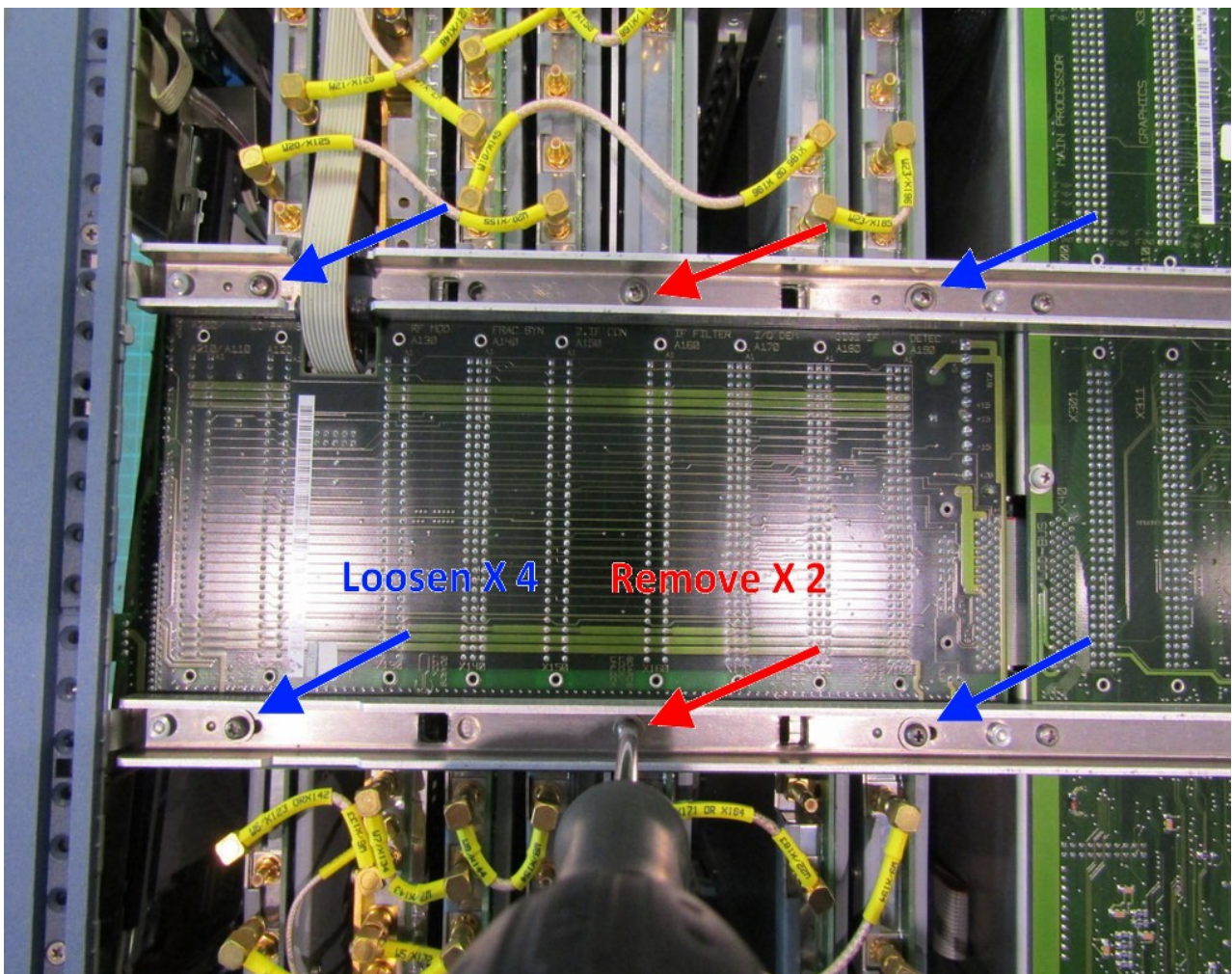
Repeat this process for the other three RF cables, marked X121, X122 and X123. There is no need to remove both ends of the cables, they just need to be unplugged from bottom of the A120 module.



STEP 10

All of the slide-out RF modules in the analyser are locked in place by two sliding bar assemblies. Using a PH 1 Philips screwdriver completely remove the two middle screws marked by the red arrows and place them in a bag marked “Locking bars”.

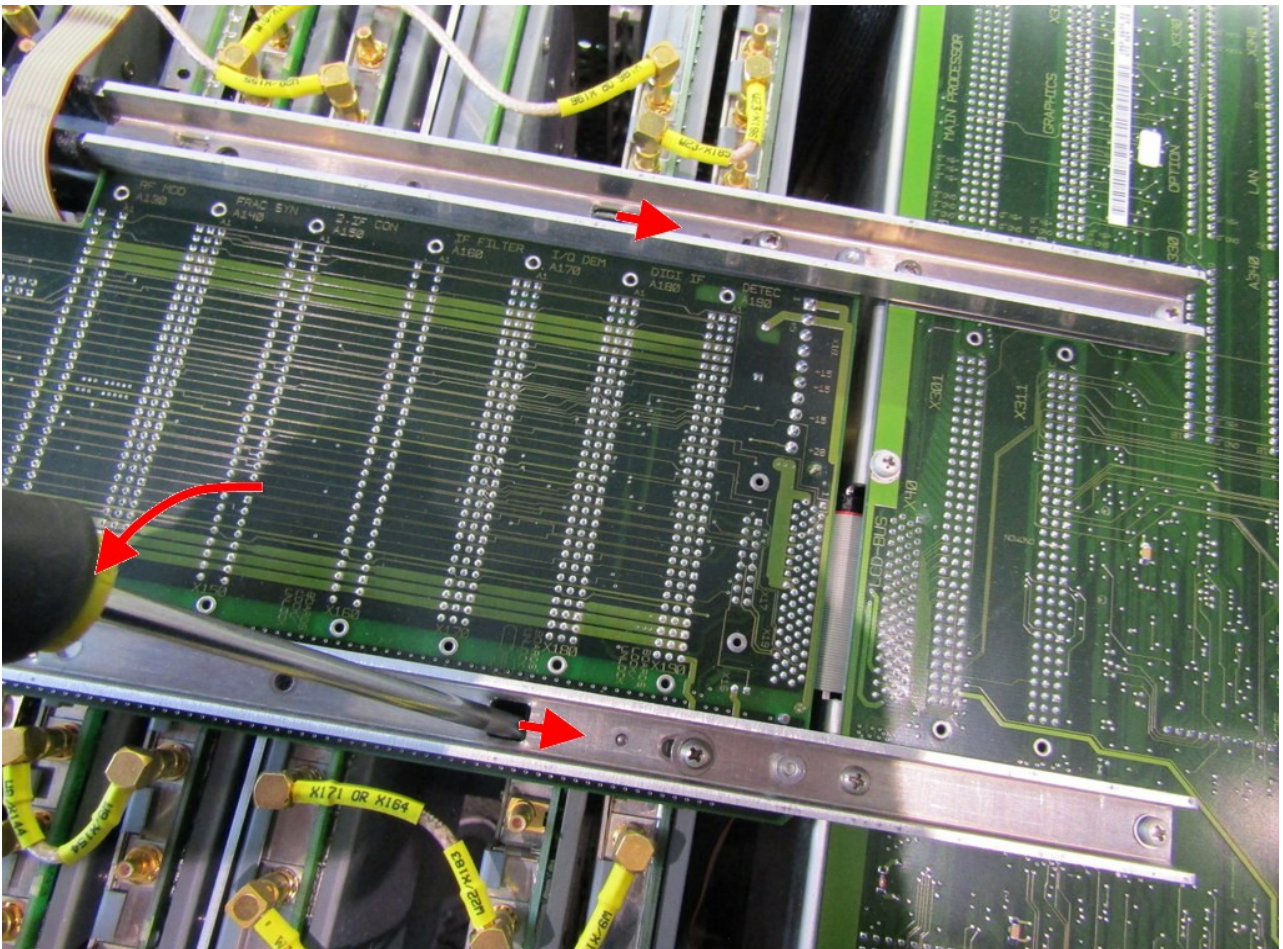
Using the same screwdriver, loosen the four remaining screws as shown by the blue arrows.



STEP 11

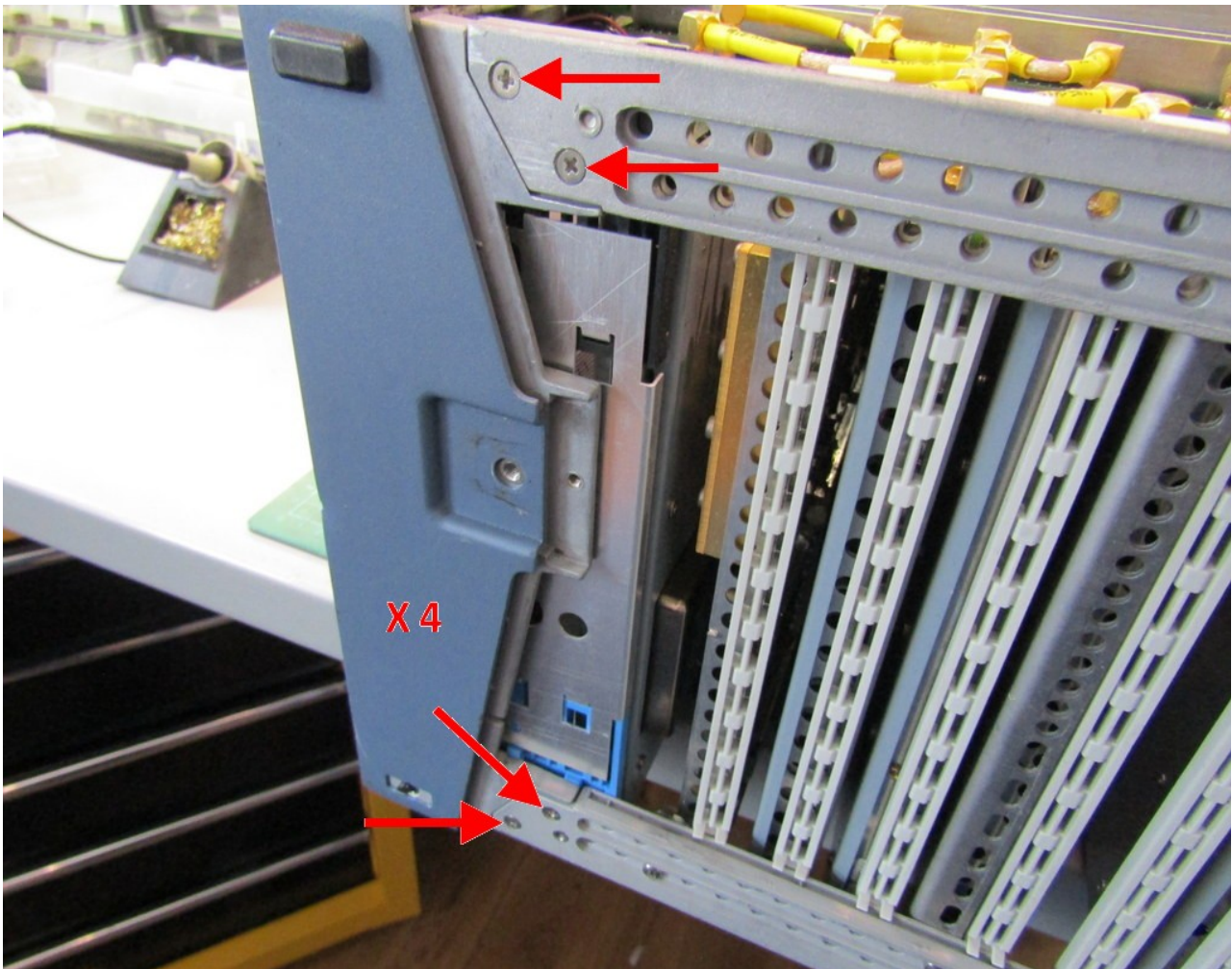
Locate the four square holes in the bars you've just removed screws from. Insert a screwdriver in to the holes nearest the rear of the unit and use it to slide the locking bar underneath in to the "Unlocked" position.

Note: When re-assembling the analyser, the locking bar is slid to the left (front) using the other square holes, nearest the front of the unit.



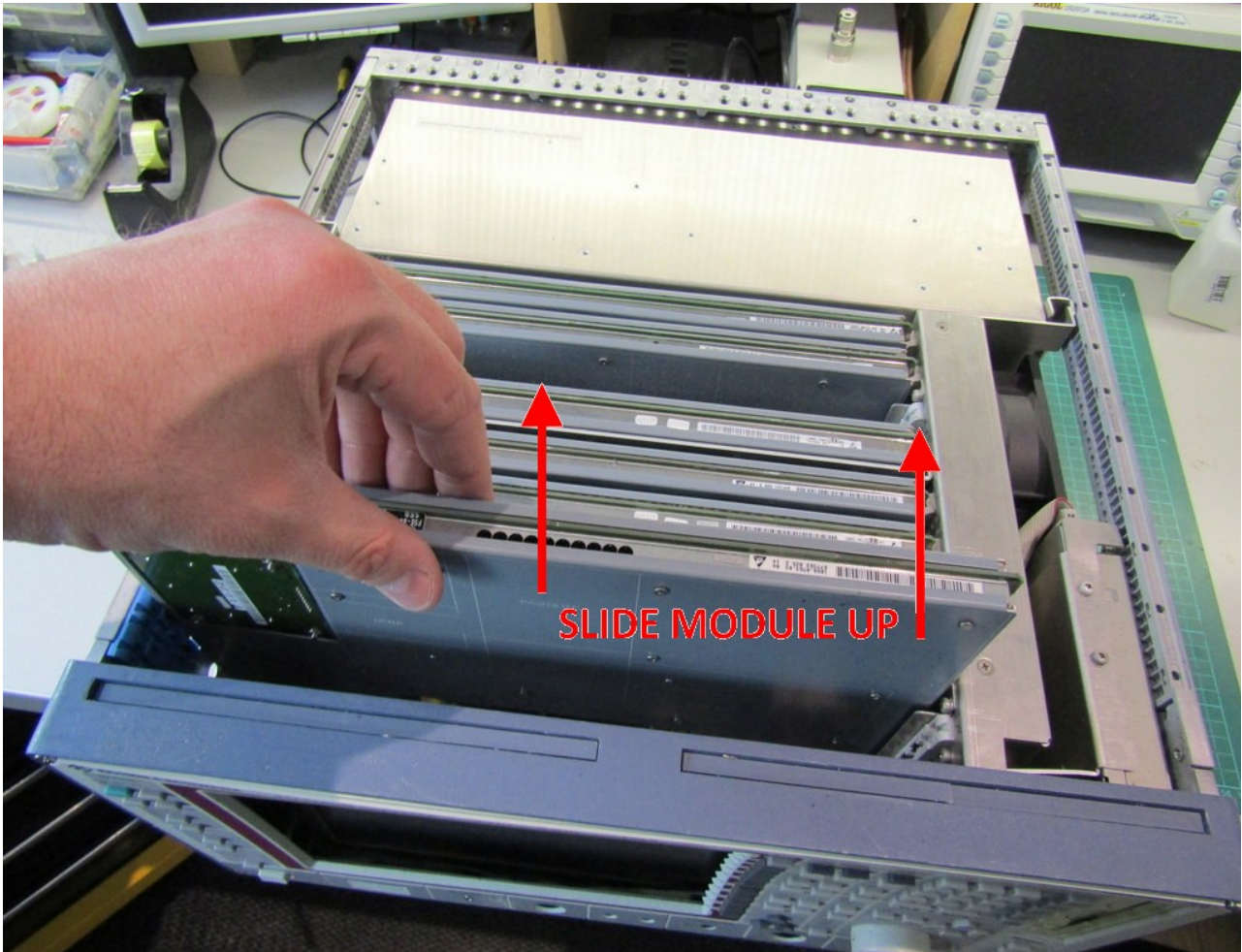
STEP 12

Using a PH 1 Philips screwdriver, remove the four remaining screws holding the front panel to the chassis. Put the screws in the bag you made earlier called “Front panel chassis corners”.



STEP 13

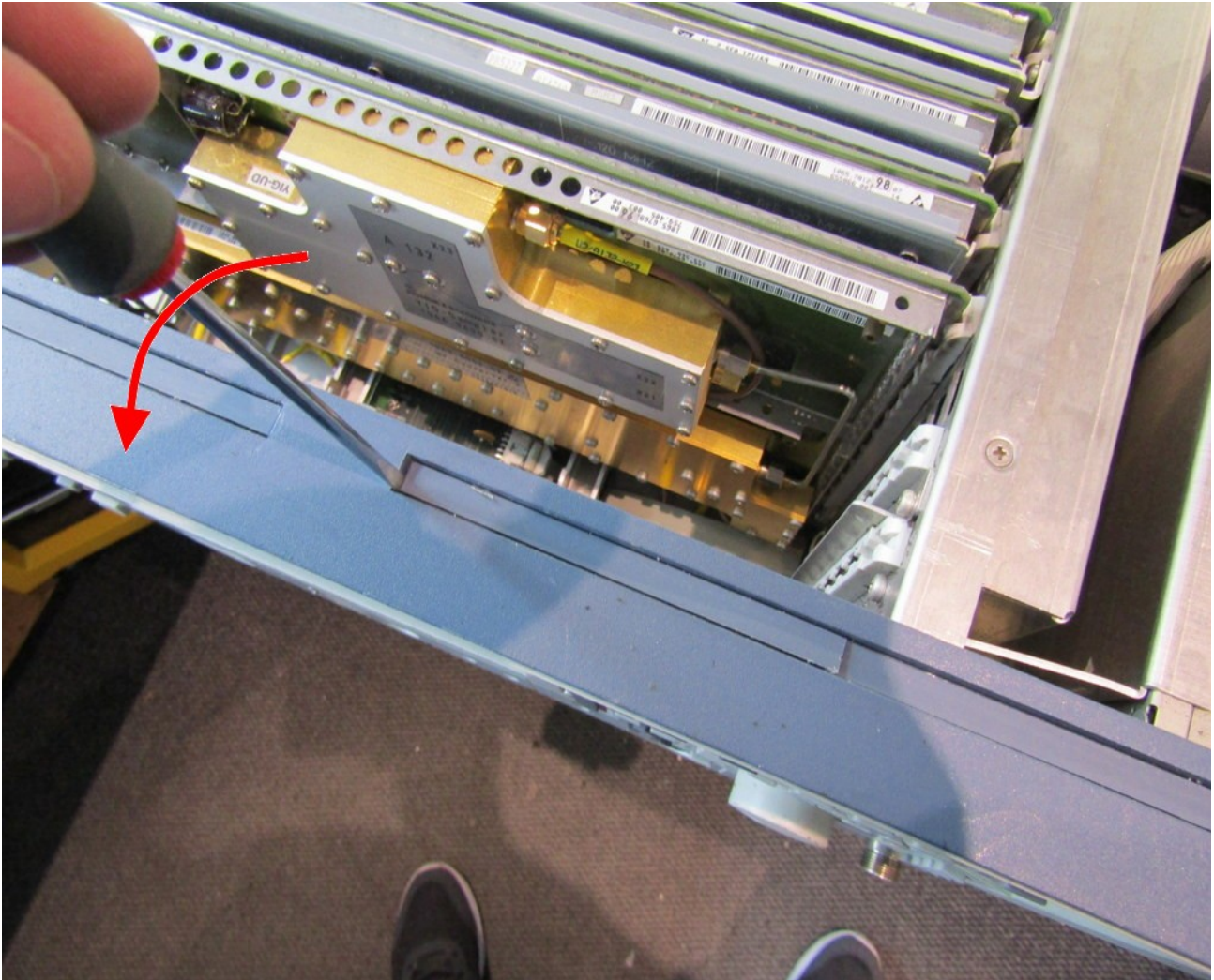
Turn the analyser right-way-up and using both hands grip the A120 module and slide it vertically upwards until its fully removed. Carefully put the module somewhere safe where it cannot be damaged by mechanical shock or dropped on the floor.



STEP 14

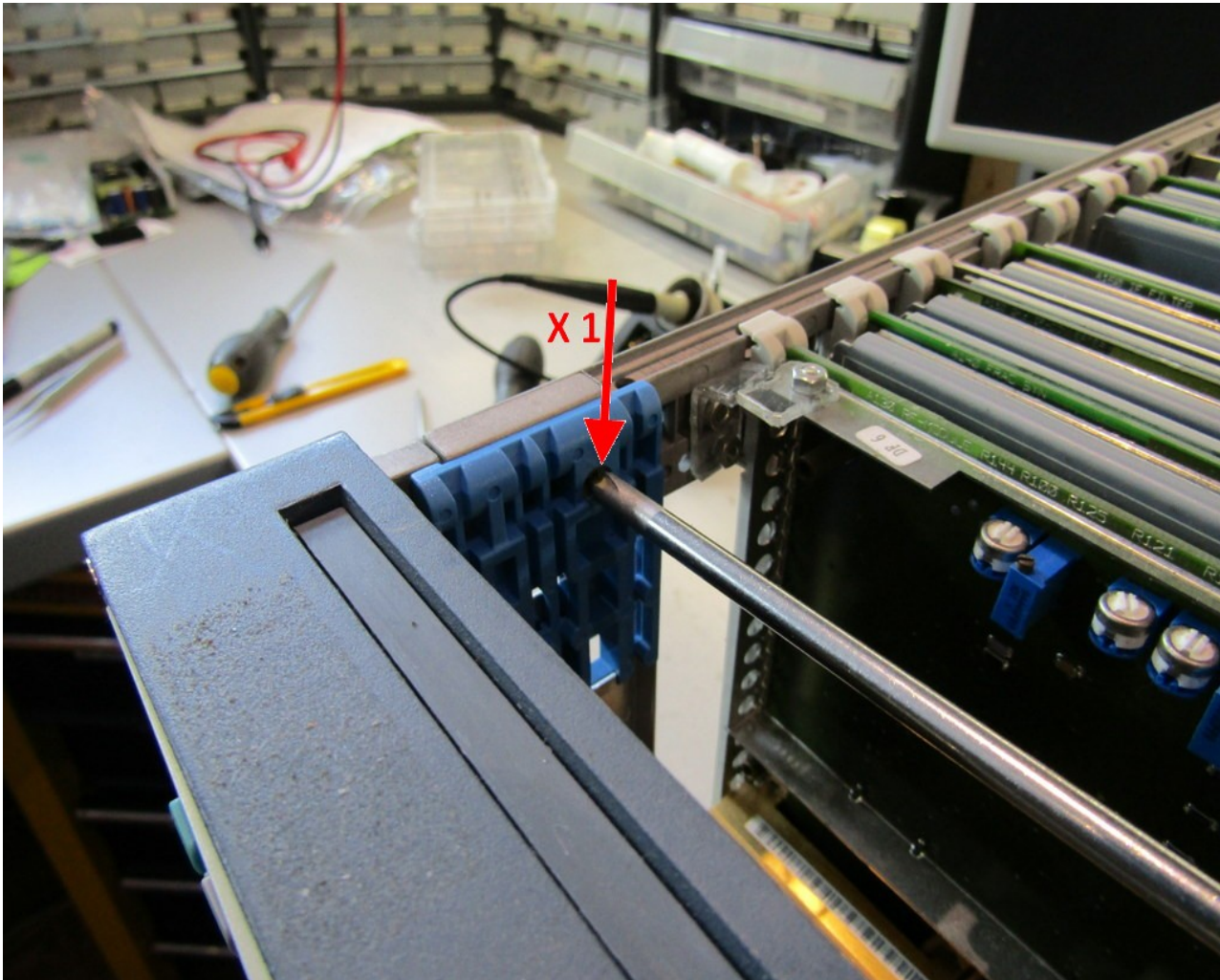
Locate a small plastic trim cover on the top of the analyser on the right-hand side. Using a small flat screwdriver gently prize this up at one end and remove it to reveal screws underneath. The trim is simply held in place using double-sided adhesive tape and plastic clips.

(The trim in the photo below is cracked in the middle, yours will be longer).

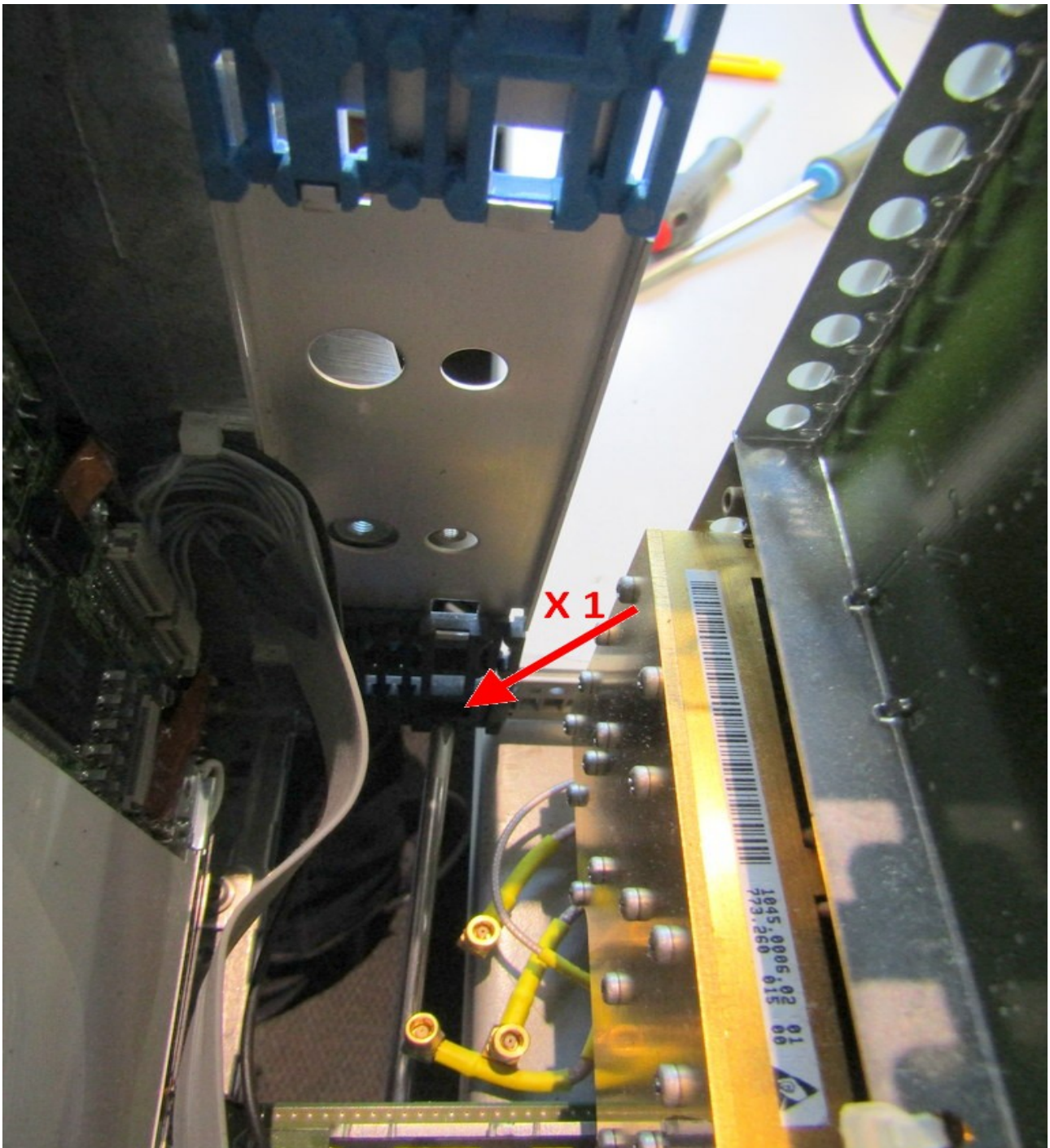


STEP 15

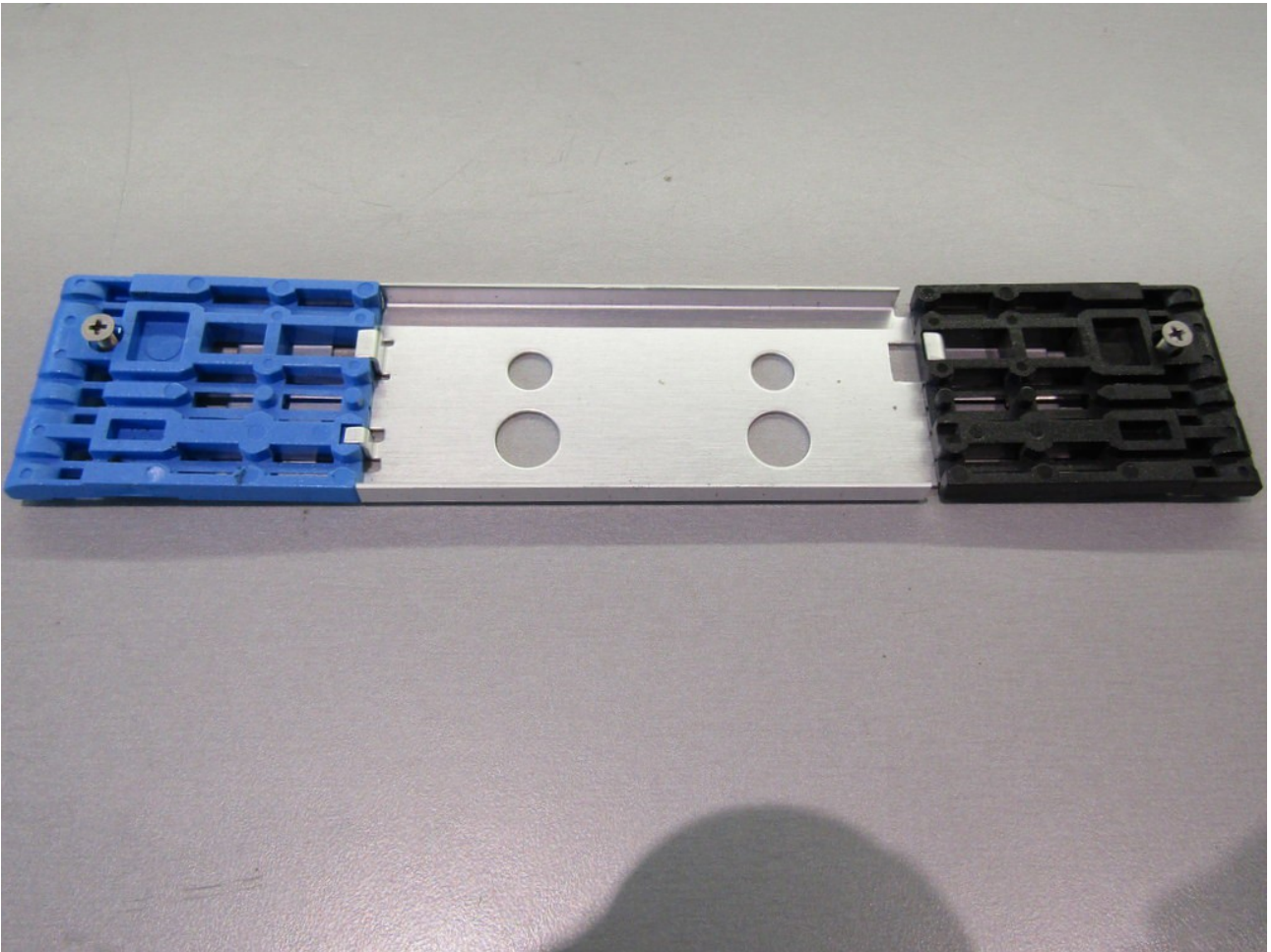
At the top of the analyser behind the front panel and to the left, find the blue plastic bracket which is used to secure the A120 RF module. Using a Philips PH 1 screwdriver remove the screw near the top.



Slide the analyser forwards on the workbench so that the front of the unit is overhanging and a screwdriver can get access to the bottom of the A120 bracket. Remove the bottom screw from the bracket which is black coloured plastic.



Carefully remove the A120 bracket from the analyser and place it somewhere safe on a table nearby. The screws can be left in the bracket or put in bag marked "A120 Bracket" for safe keeping.

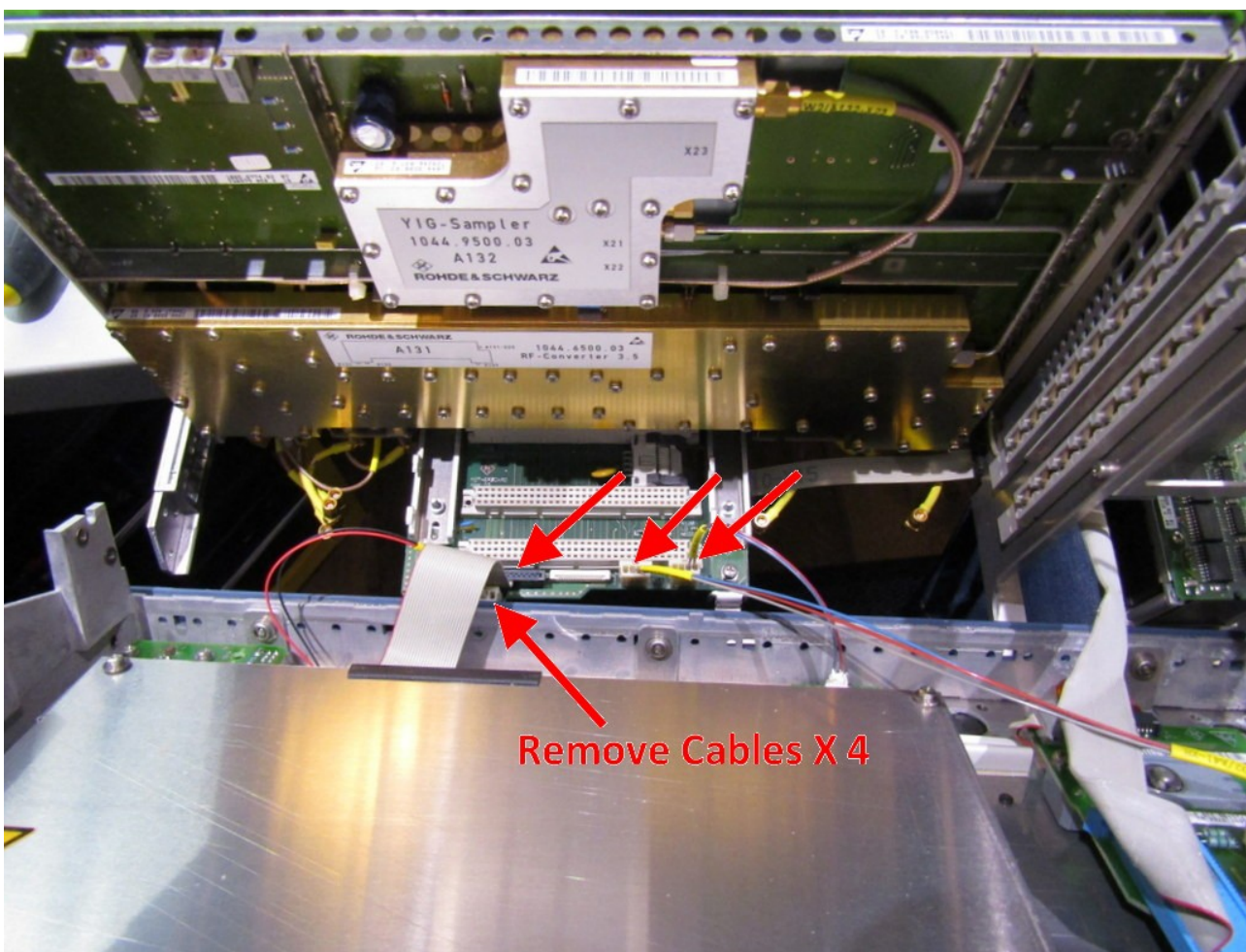


STEP 16

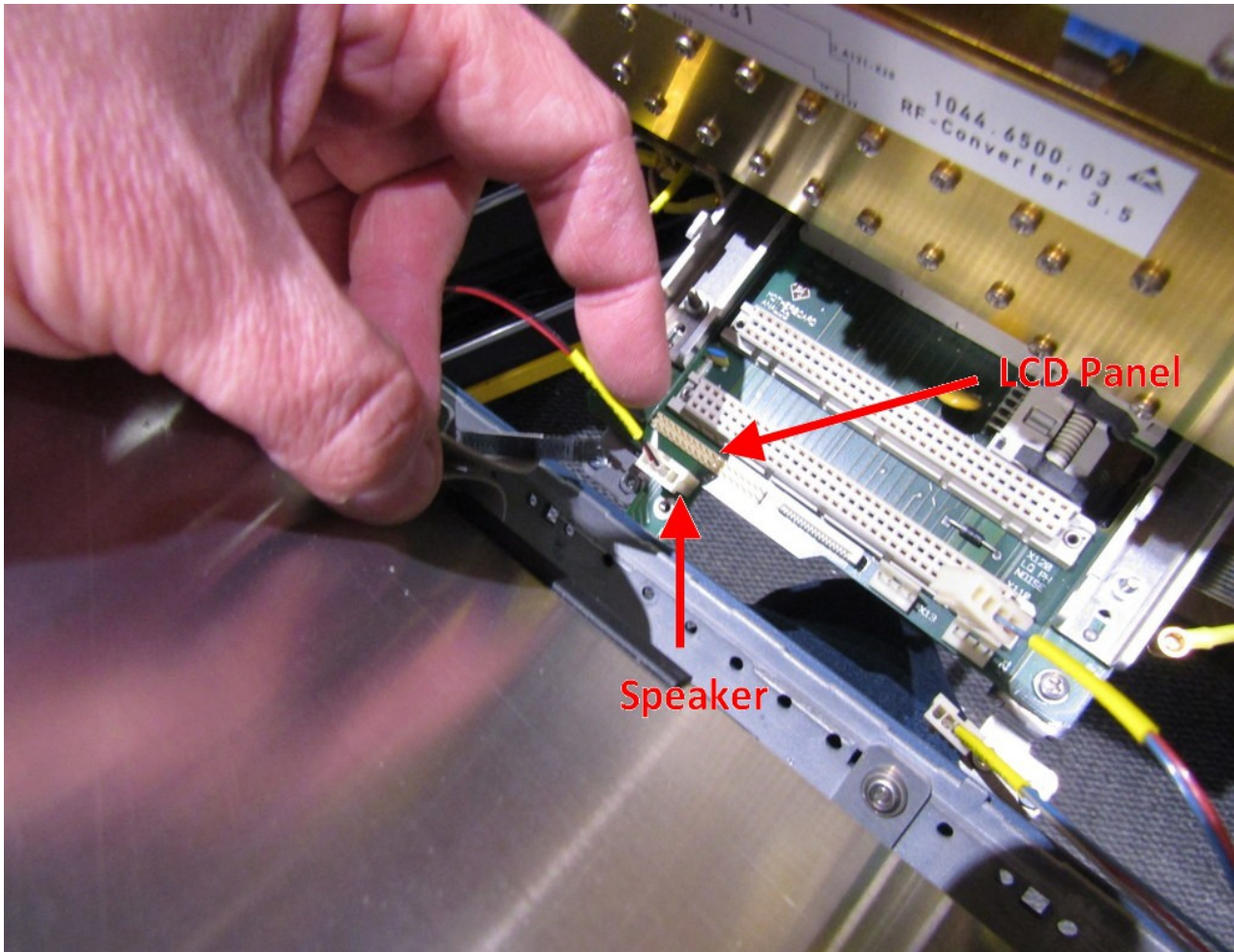
It's now time to remove the front panel of the instrument. Position the analyser so that the front panel is facing towards you, slightly overhanging the bench. Gently pull the front panel toward you with your hands at the left and right edges. The panel can be a little stiff and may need gently rocking left and right for it to come loose.

Once it comes free you will need to support the bottom edge and lean it back towards you to reveal the cables at the bottom which need disconnecting.

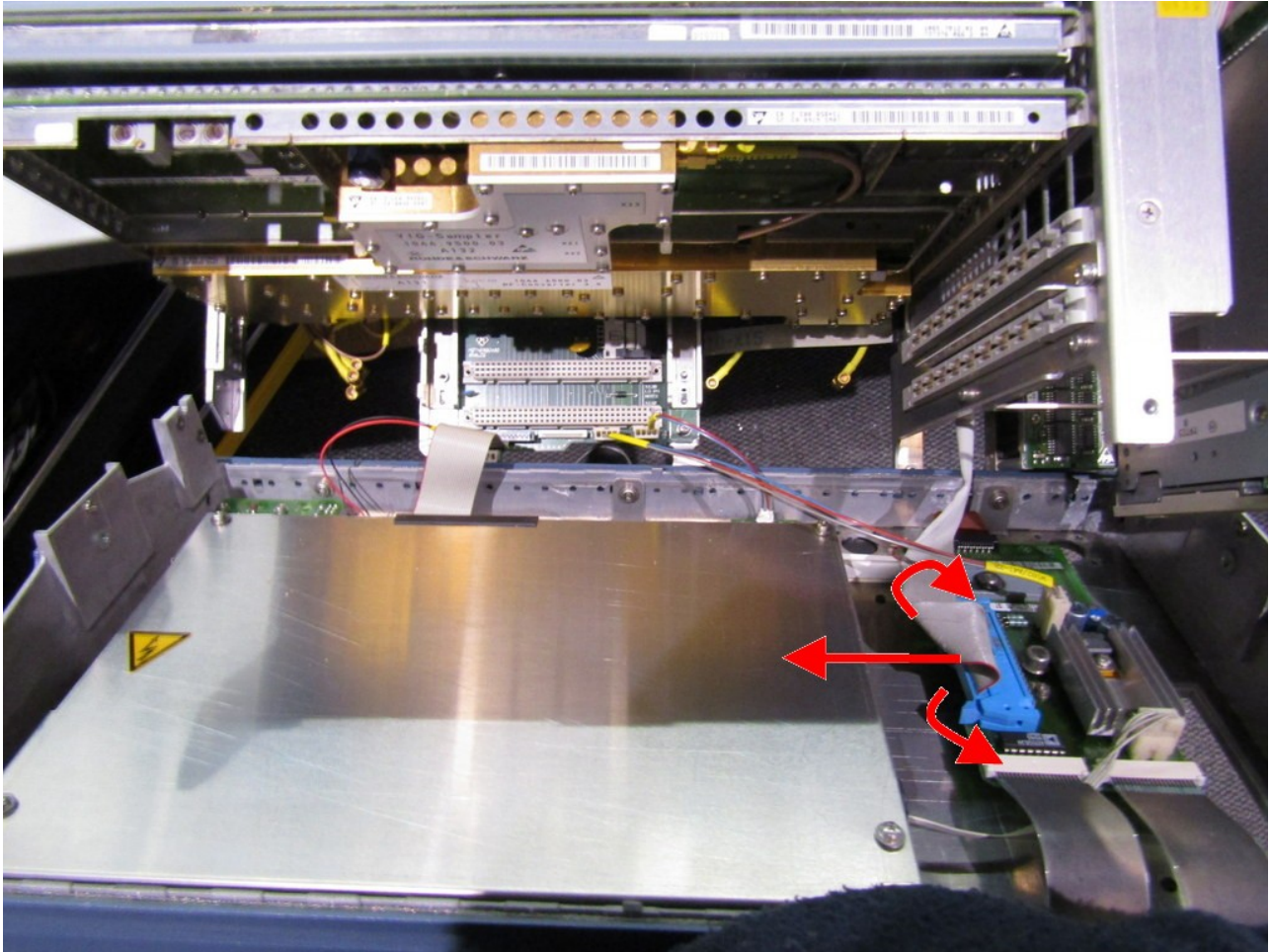
Remove four cables as shown in the photo by gently pulling upwards on the connectors with your fingers.



Note: The loudspeaker cable is hidden under the LCD ribbon cable (left), so the ribbon will need to be removed first. The LCD ribbon is push-fit and does not lock in place.

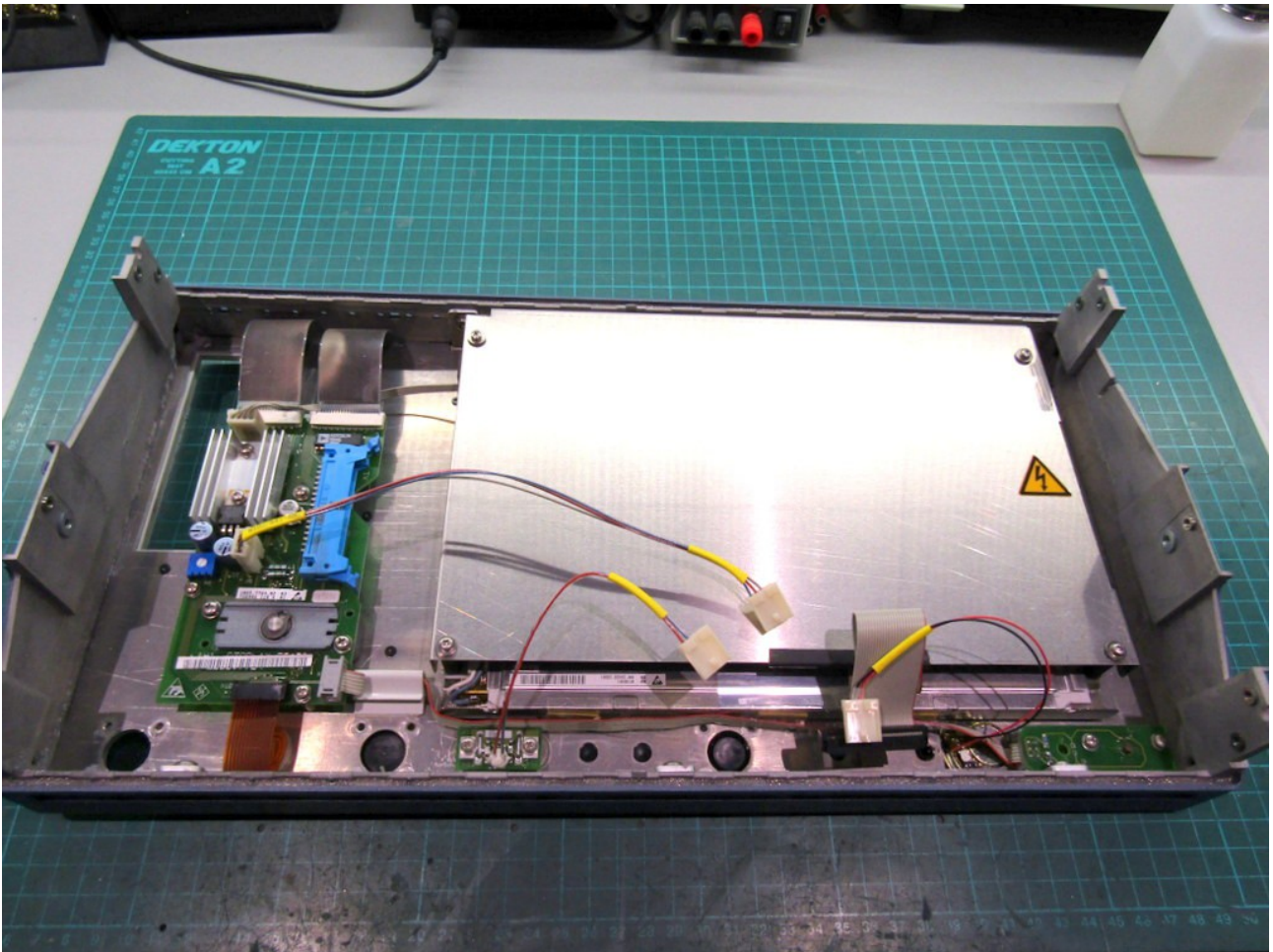


Remove the large ribbon cable from the rear of the front panel. There are locking tabs at each side which need to be pulled apart to allow the ribbon connector to come free. Once unlocked, pull the connector back.



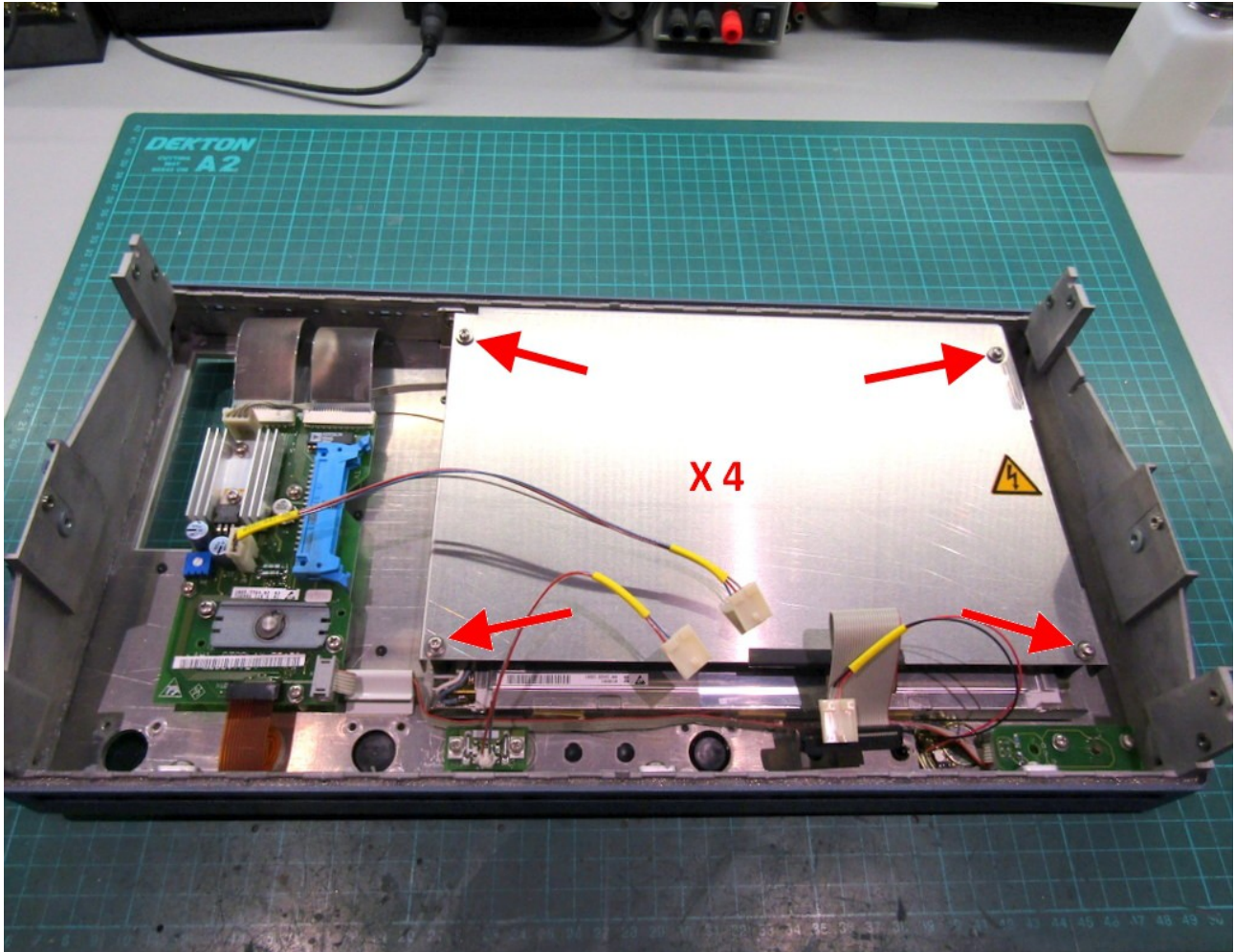
Once the complete front panel is correctly removed it will look like the photo below. Move the main part of the analyser somewhere safe. Do not rest the analyser on its back because the connectors may become damaged. Placing it on its side is fine.

Rest the front panel face-down on the bench.

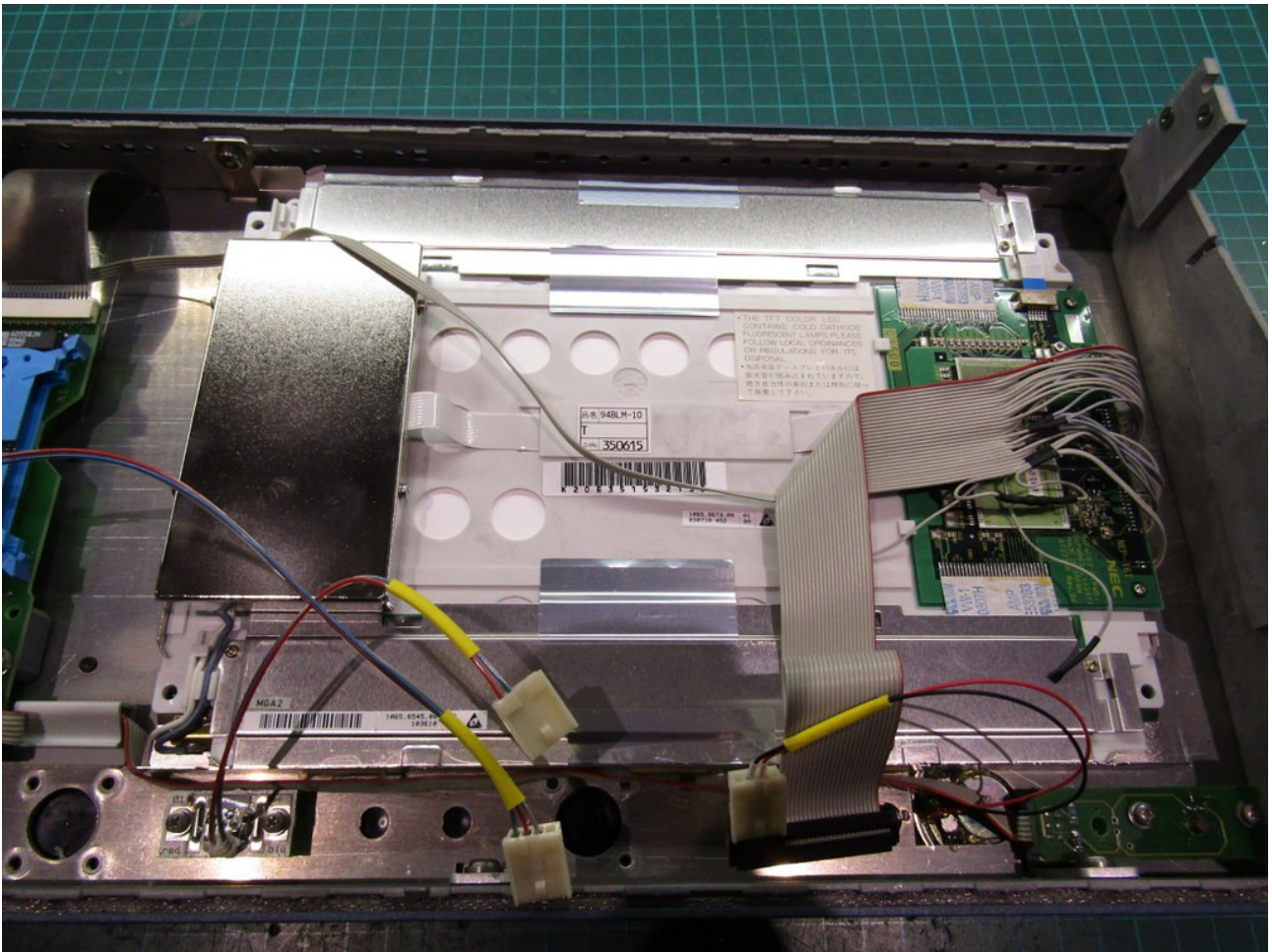


STEP 17

Using a PH 1 Philips screwdriver, remove the LCD cover screws as shown. The screws and plastic standoffs can be kept with the cover to one side.

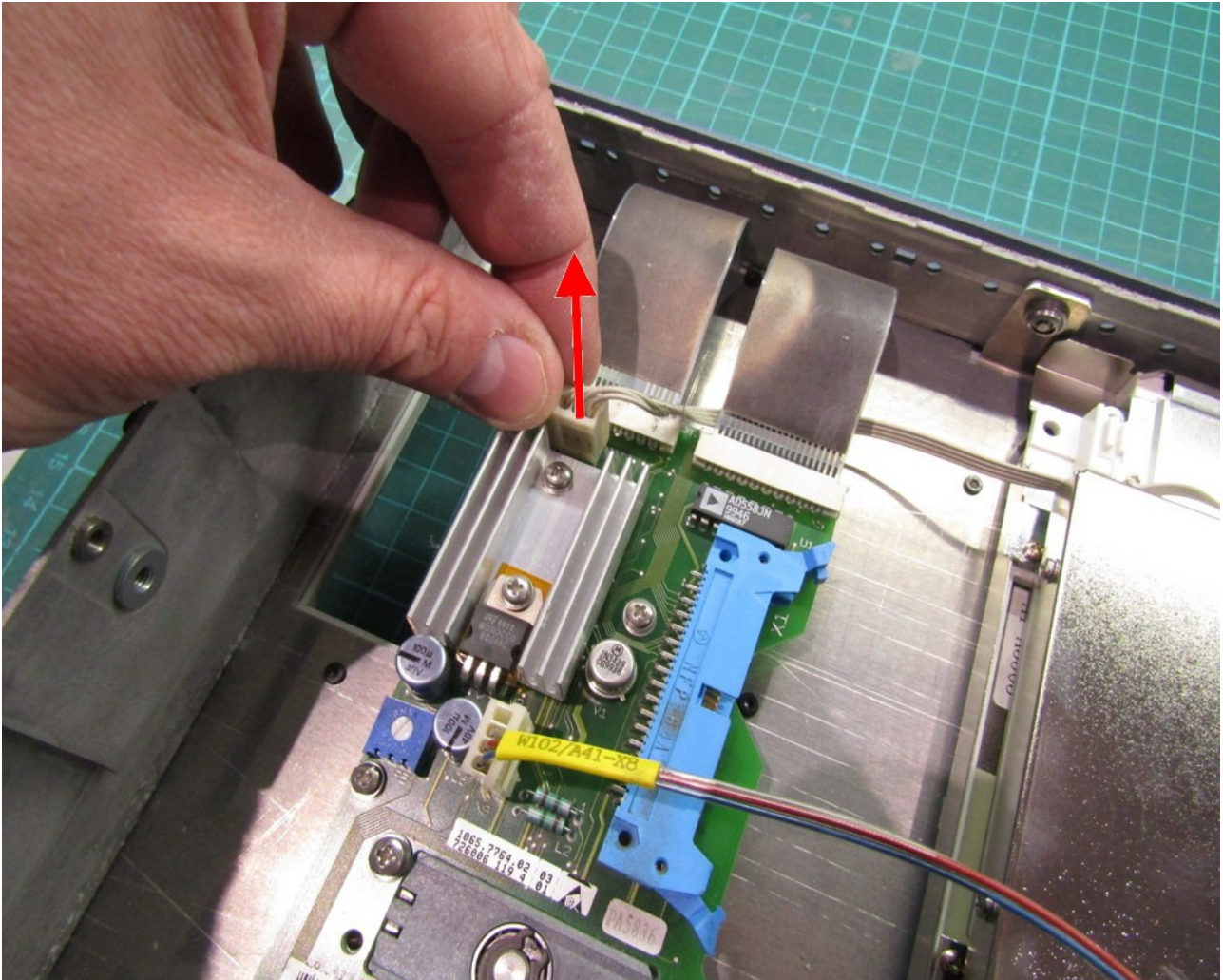


Once the LCD cover is removed it will look like this. The LCD panel is now loose and can be lifted away from the front panel if required.



STEP 18

Before removing the LCD panel, pull out the last connector using your fingers.

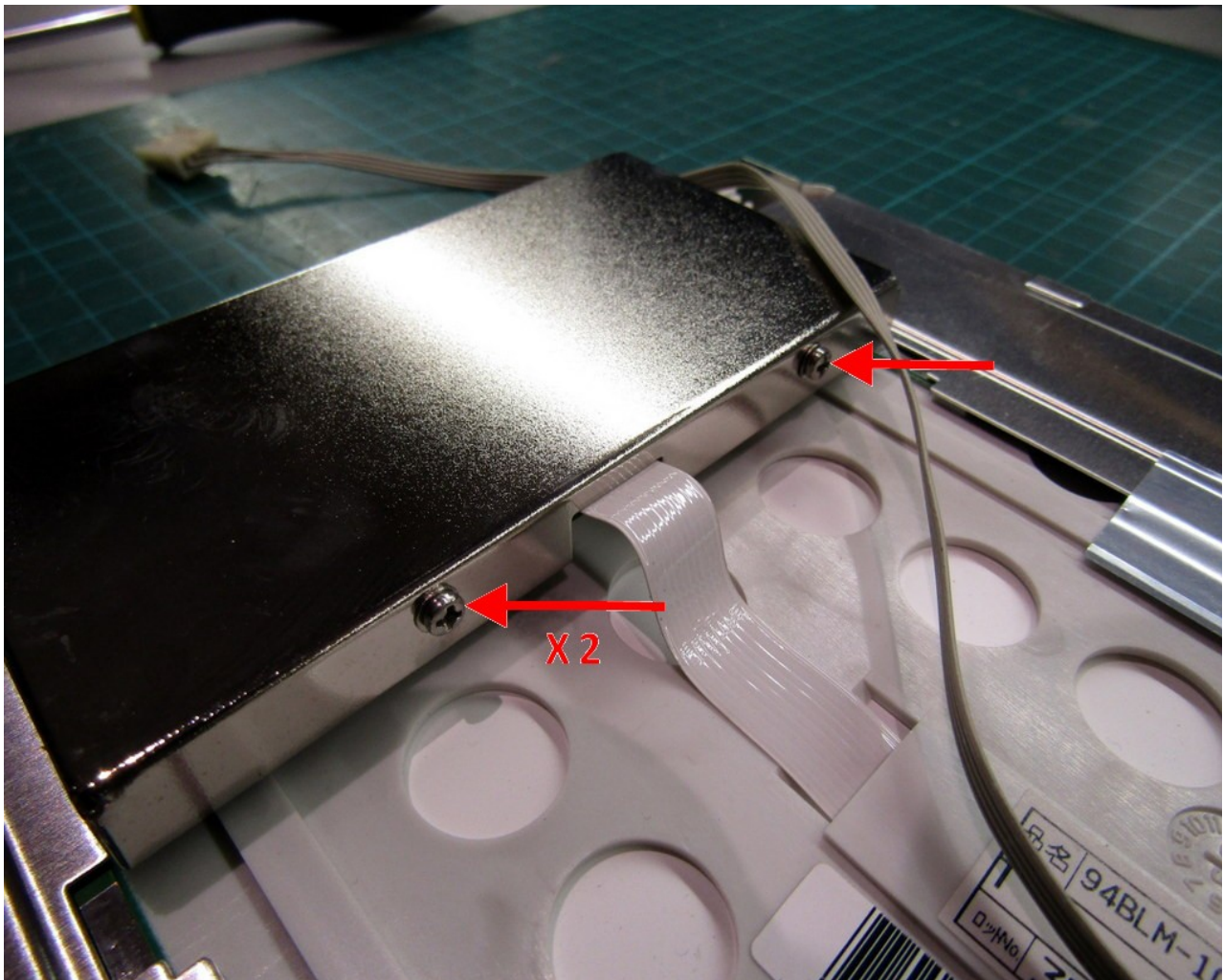


STEP 19

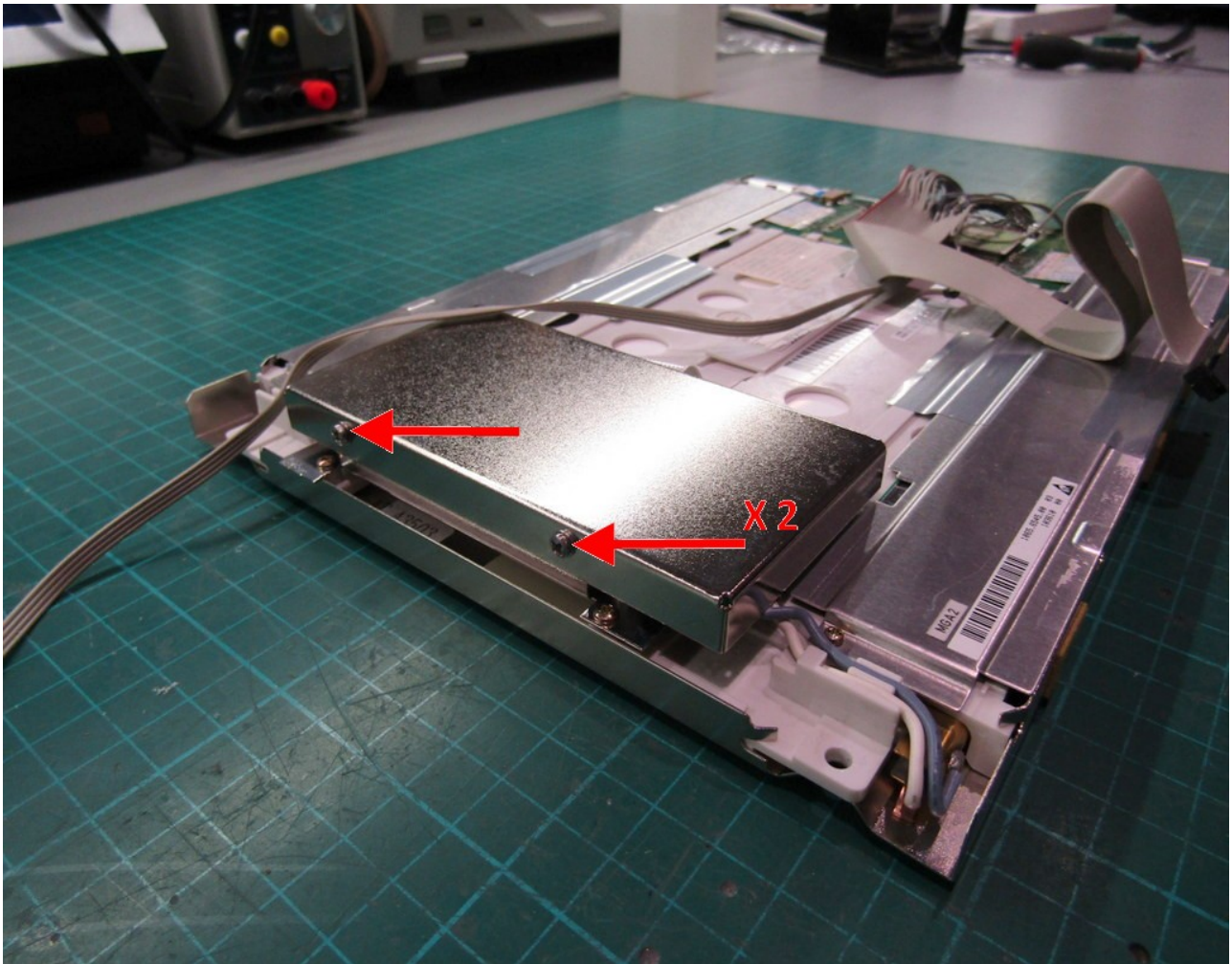
Lift the LCD panel out of the analyser front panel and place it face-down on the bench.

Note: To protect the LCD and front panel glass from dust ingress there is foam gasket tape installed on the front of the LCD panel around the edges. Sometimes this foam degrades and becomes very sticky. We have provided pre-cut black self adhesive foam strips inside the kit which may be fitted after the old foam is cleaned off using isopropyl alcohol or similar cleaning liquid to remove the old adhesive residue.

Using a PH 0 Philips screwdriver remove the two screws from the backlight converter can as shown below.

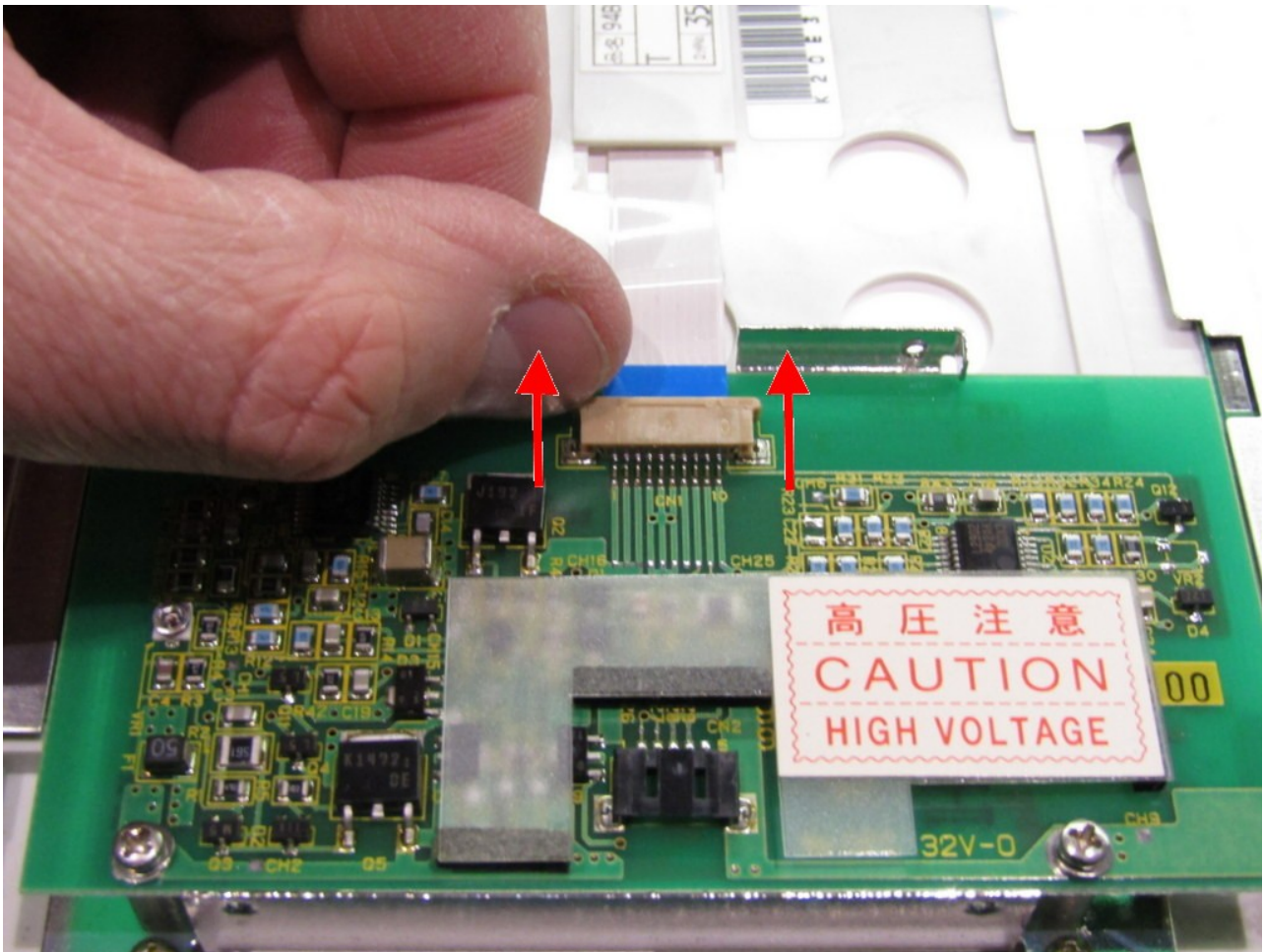


Remove the screws on the opposite side as well.



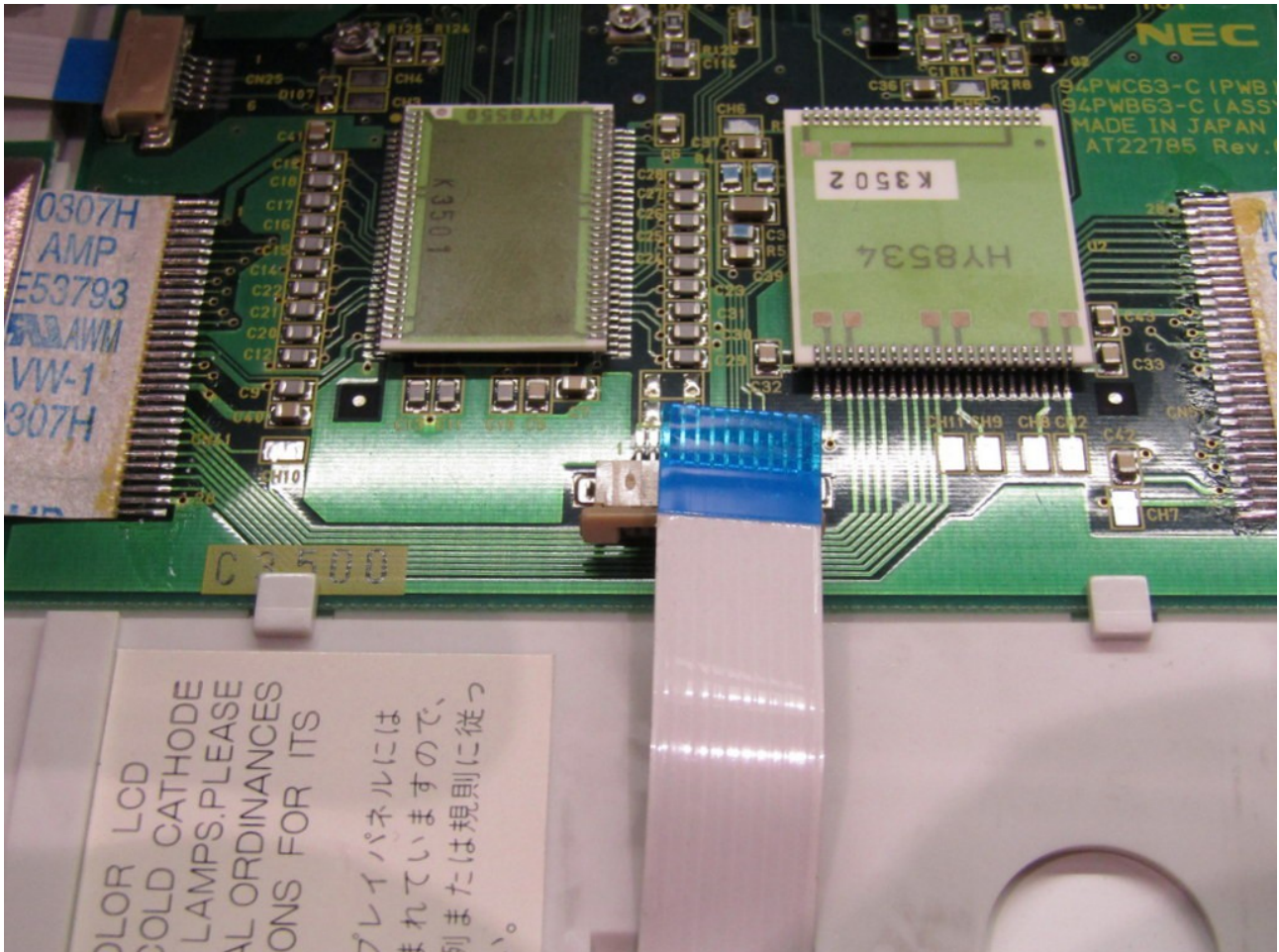
STEP 20

Locate the ribbon cable feeding the backlight converter board. There is a small locking bar holding the ribbon cable securely in place which needs to be loosened before the cable can be released. To unlock the cable, insert a fingernail into each corner of the brown housing and pull in the direction shown in the photo. Once the locking bar is a short way out (not fully removed, don't force it) the ribbon cable can simply be pulled out.



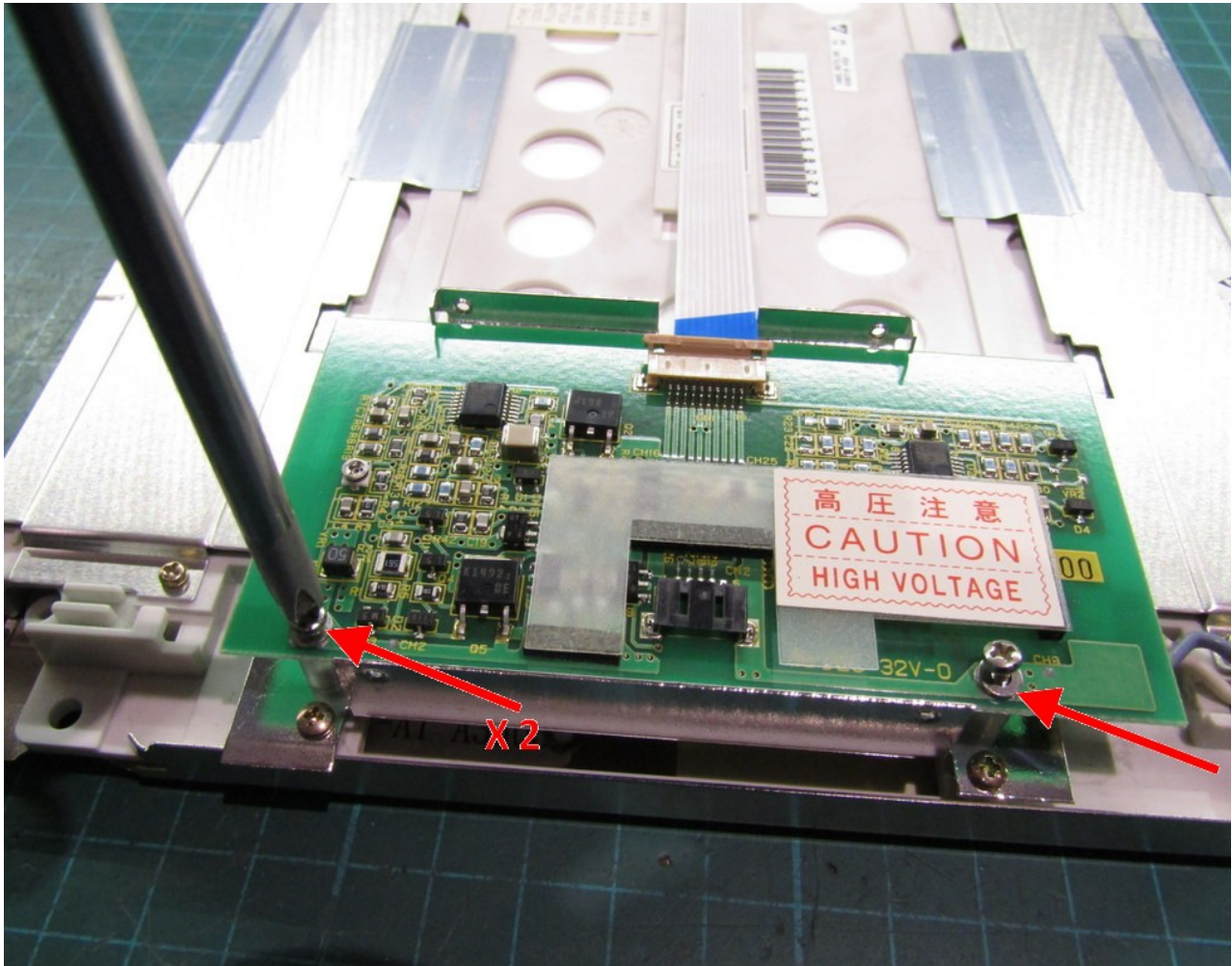
Repeat this process and remove the ribbon cable from the other end at the LCD driver board. The photo illustrates the ribbon cable removed and the locking bar in the open position, angled upwards slightly.

Once the ribbon cable is free at both ends slide it out from the white plastic channel and discard it.



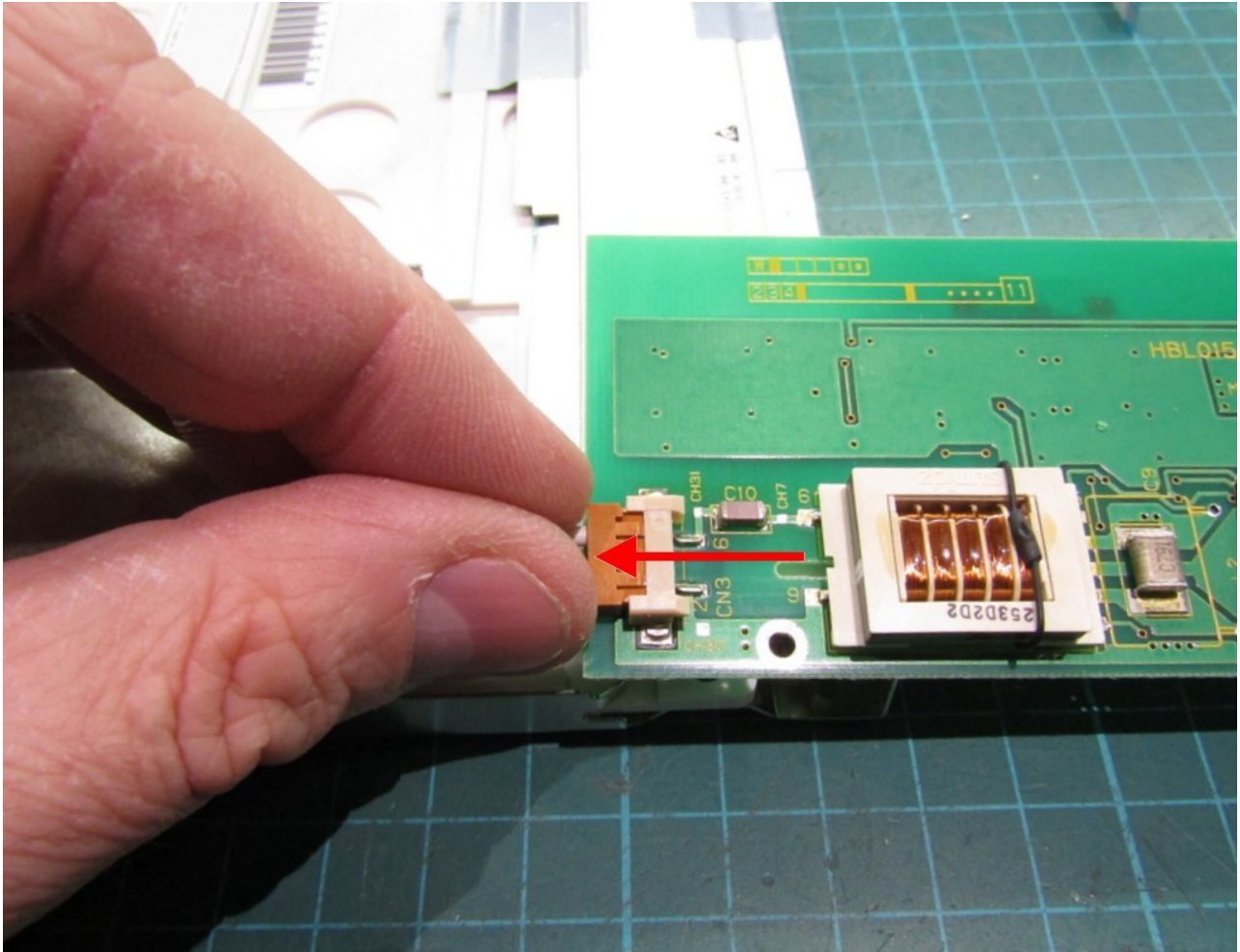
STEP 21

Using a PH 1 Philips screwdriver remove the two screws holding the backlight converter board in place.



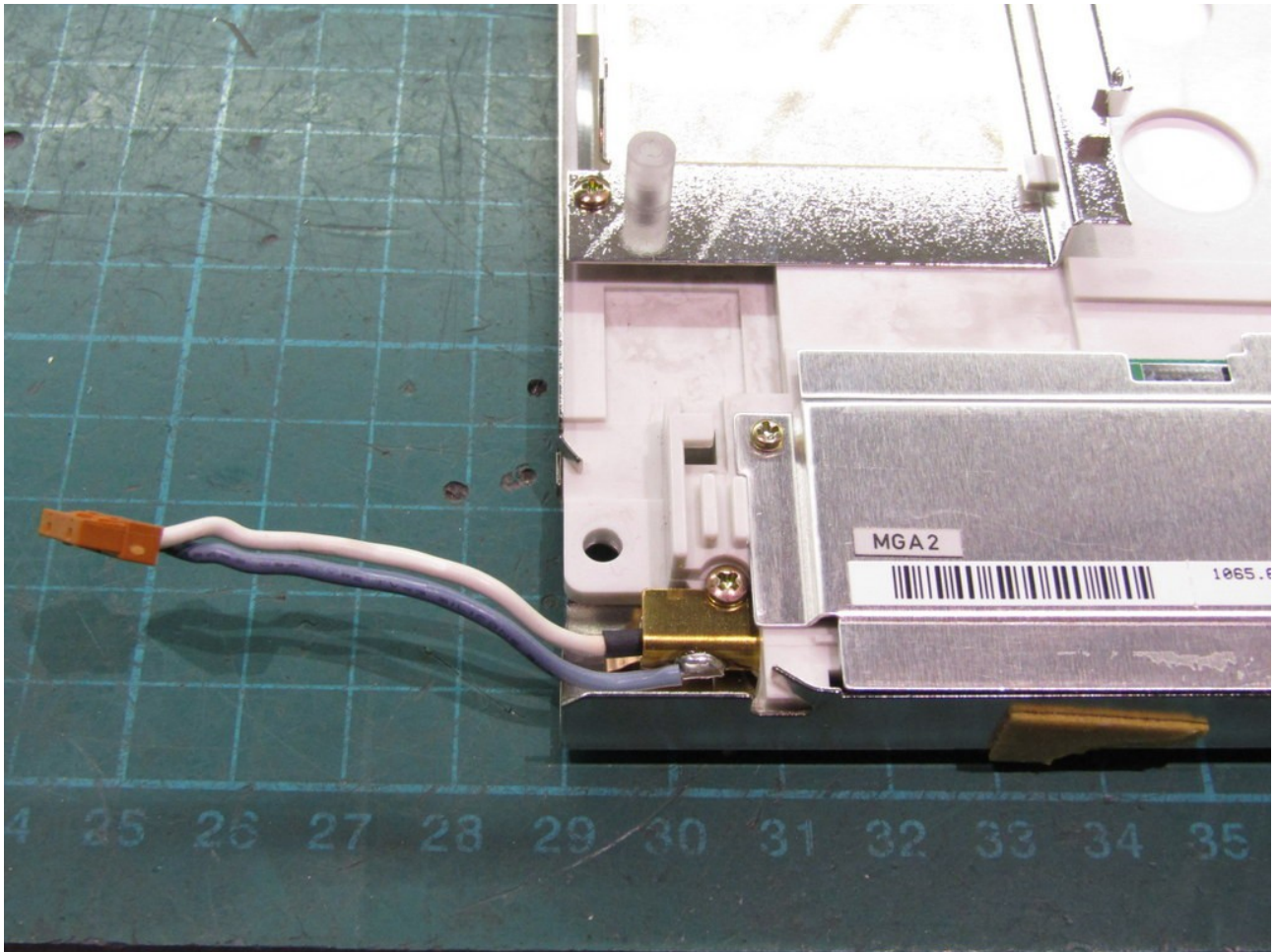
STEP 22

Turn the backlight converter board over and remove the output plug by pulling it out by hand.



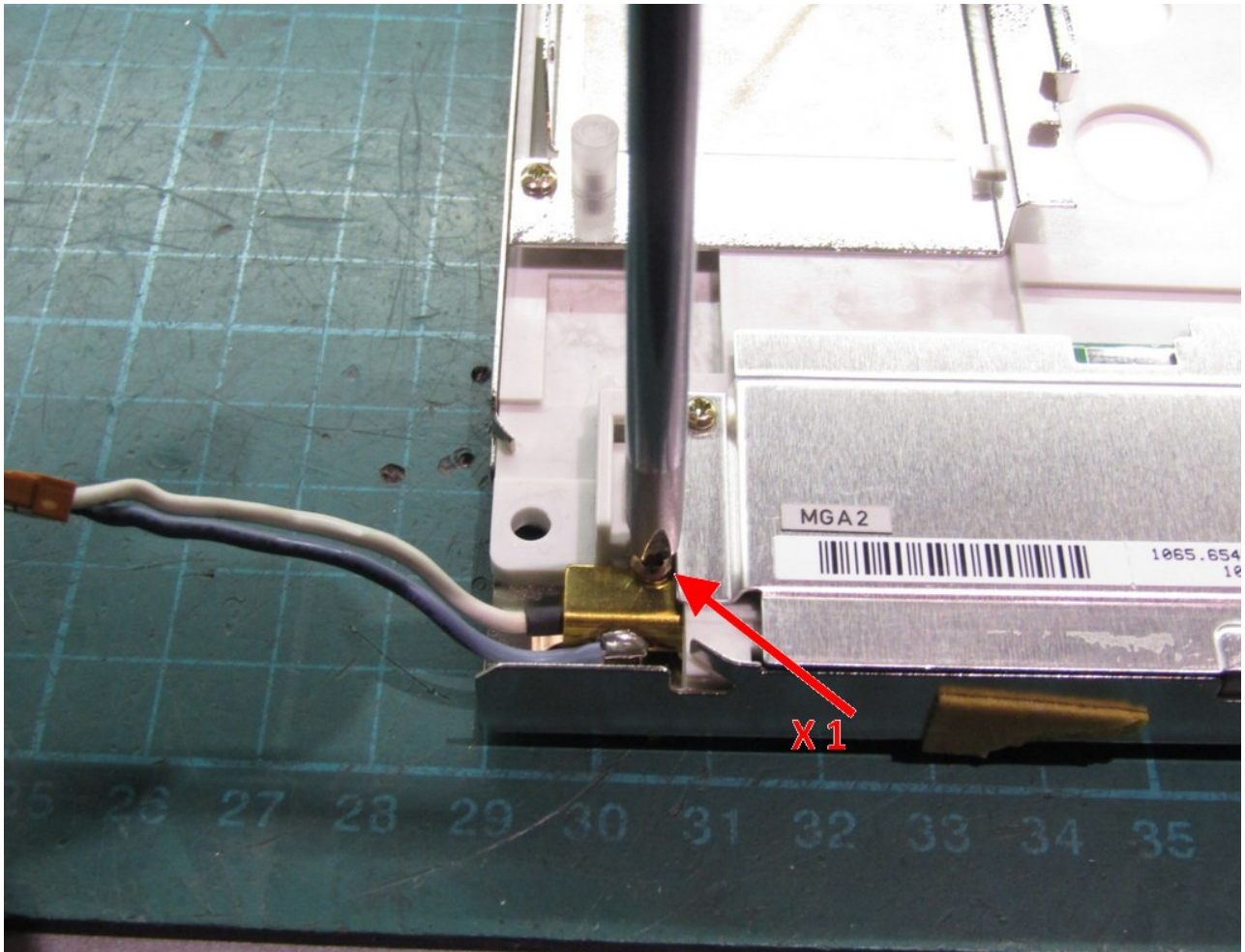
STEP 23

Discard the backlight converter board and locate the old CCFL backlight assembly. It is in a U-shaped brass housing inside the LCD panel.



STEP 24

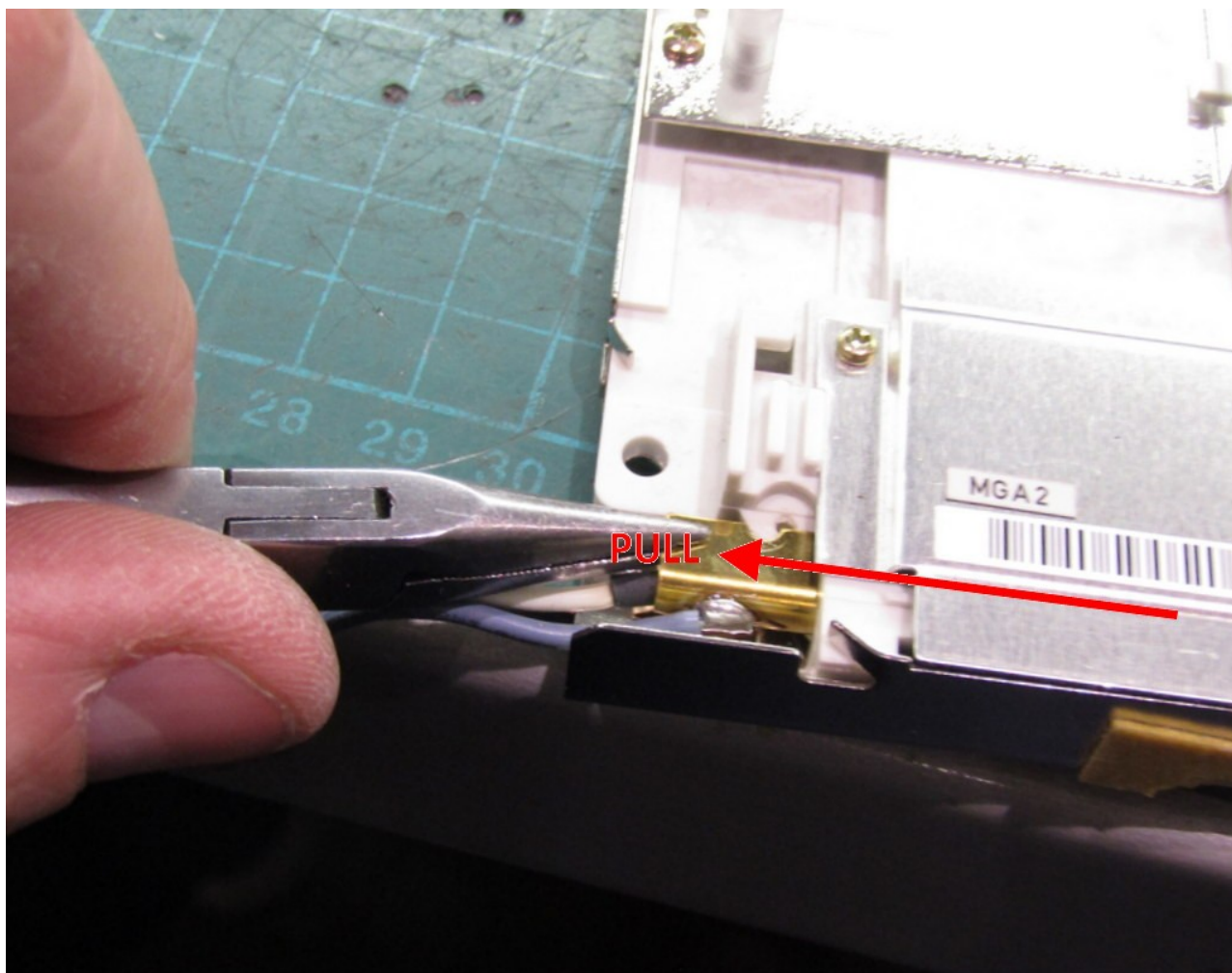
Using a PH 1 Philips screwdriver, remove the screw holding the backlight assembly in place.

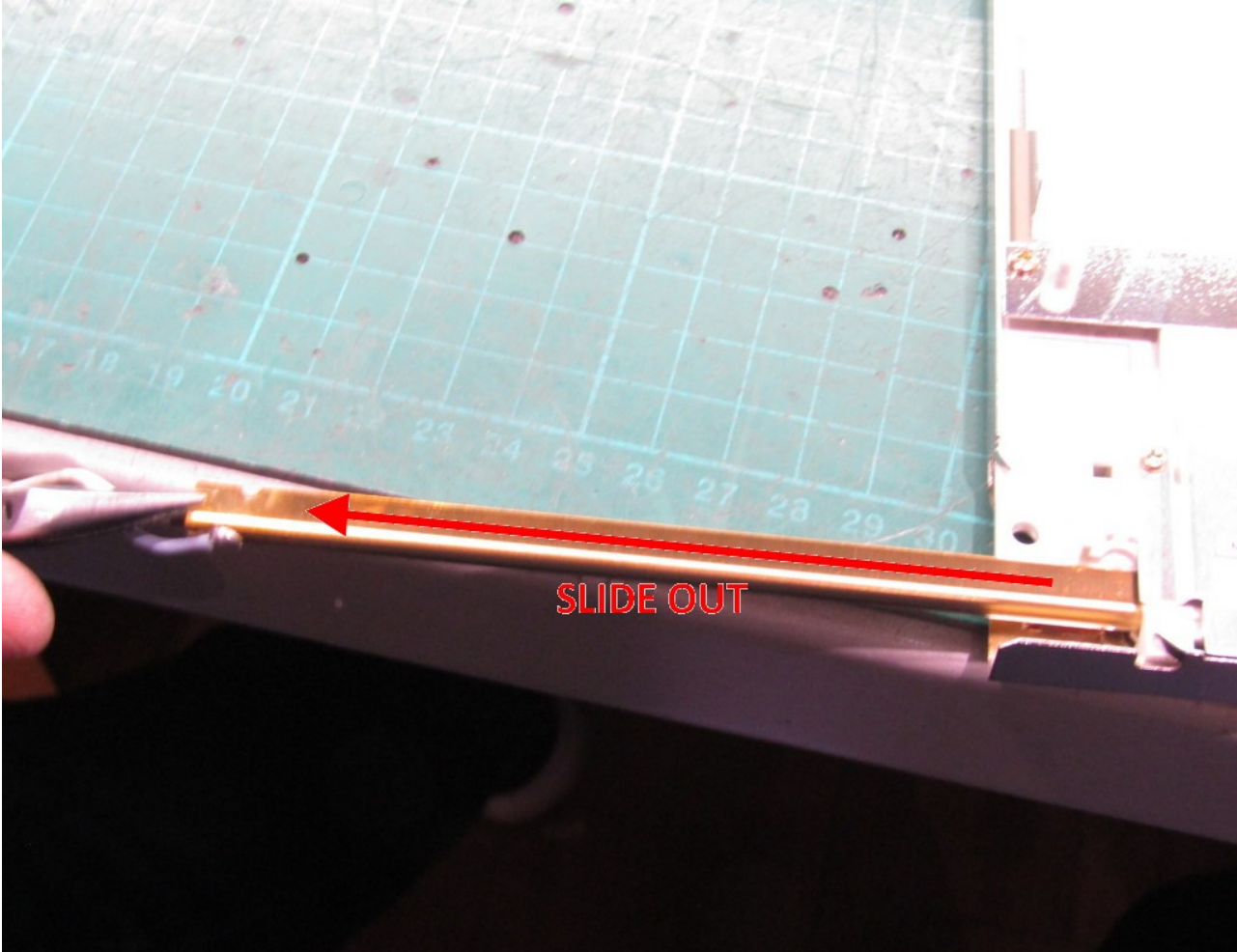


STEP 25

Using a pair of small long nose pliers grip the end of the backlight housing and slide it out of the LCD panel. This tube can be a little stiff when pulling out, if so pull it left and right a few times and it will eventually come free and slide out easily.

Be careful not to bend the brass tube as you slide it out.

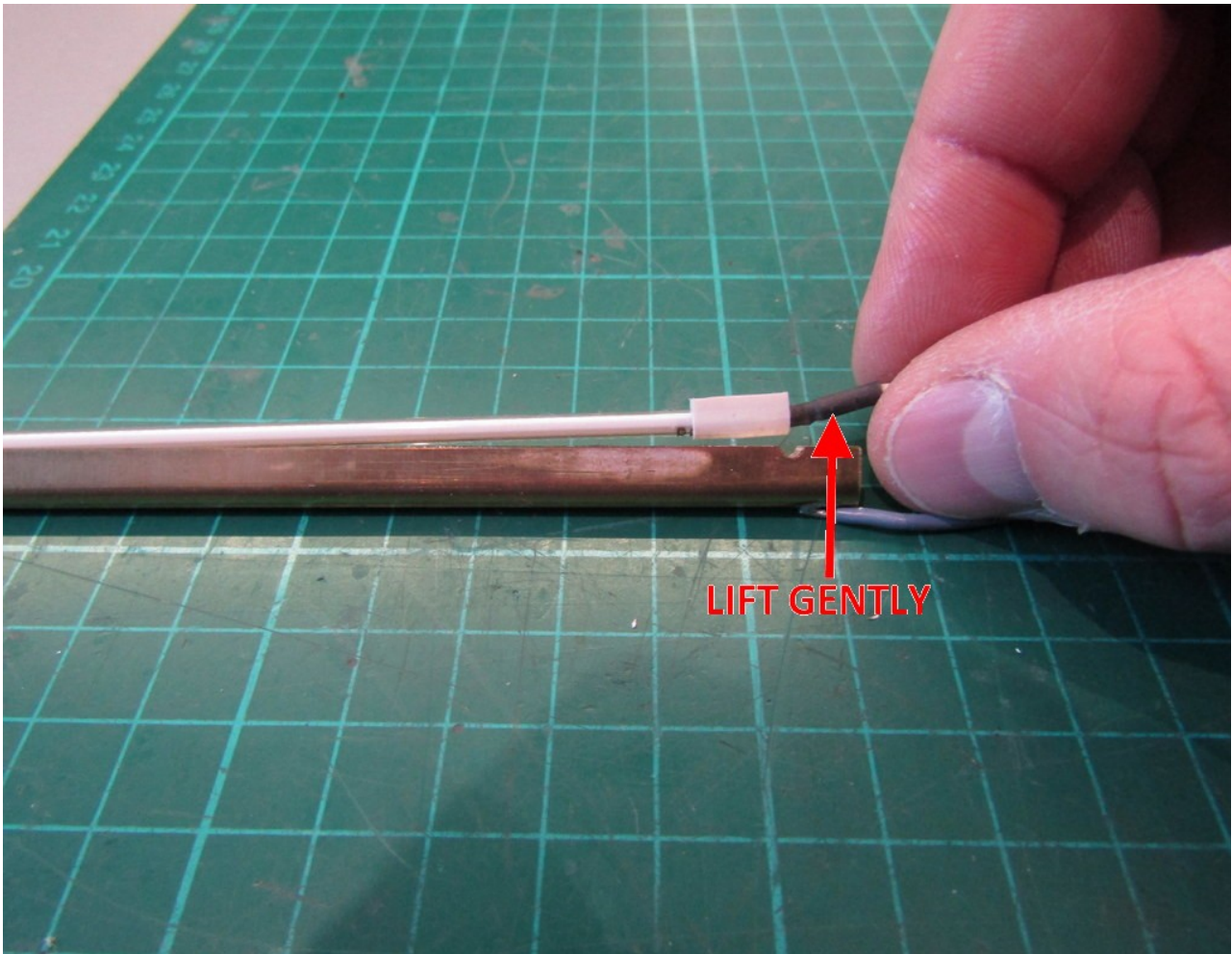




SLIDE OUT

STEP 26

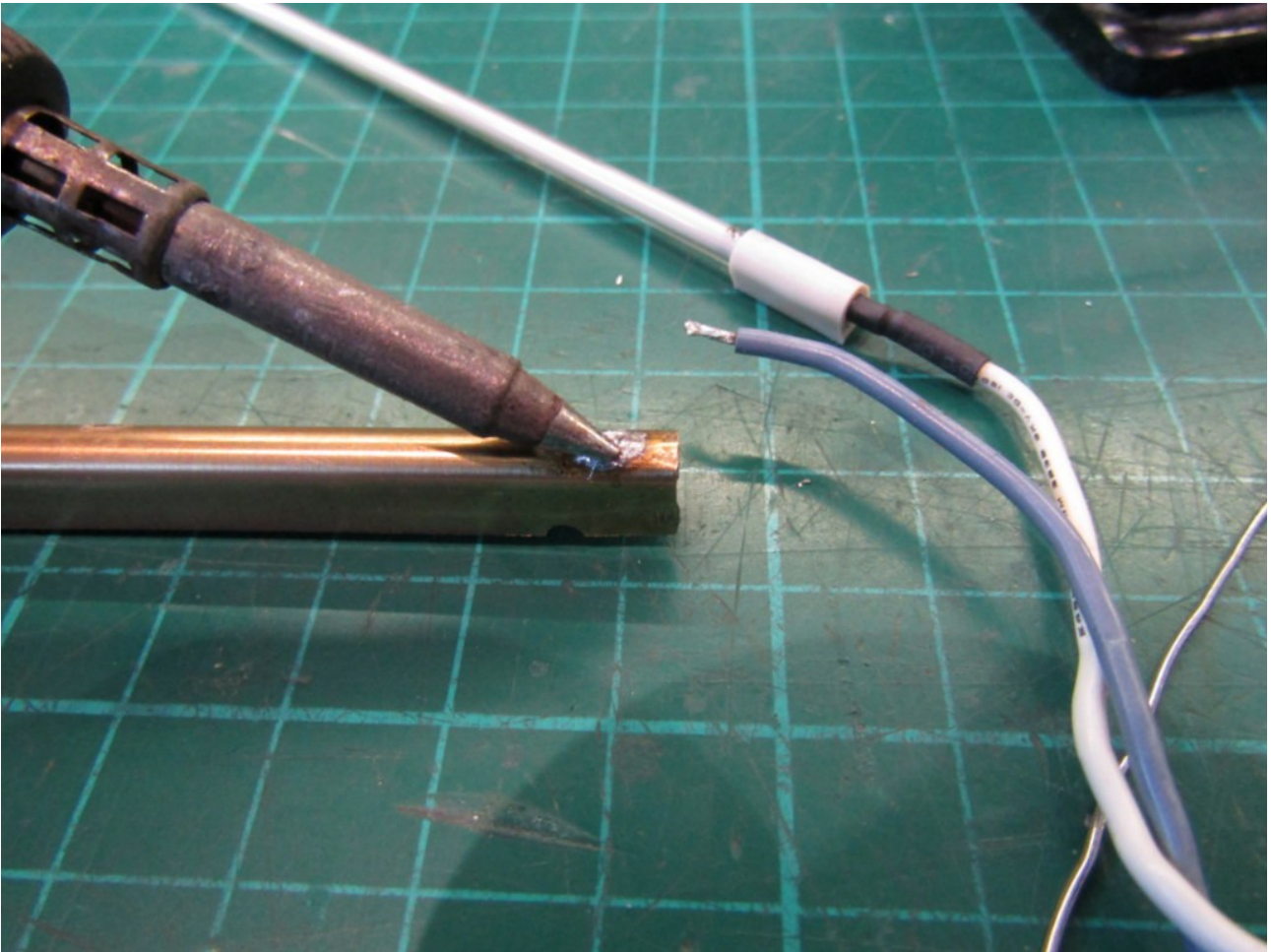
After removing the old backlight assembly from the LCD panel the CCFL tube can be removed. Start by lifting the cable at one end as shown.



The other end of the CCFL tube is soldered in place by a copper wire protruding from the end of it. Using a soldering iron heat the end and melt the solder whilst gently pulling the CCFL tube. If a soldering iron is not available you can use mini side cutters to cut the wire behind the solder joint.



Either de-solder or cut the blue ground wire at the other end of the brass backlight housing. Discard the old CCFL tube and cable, but keep the brass backlight housing.



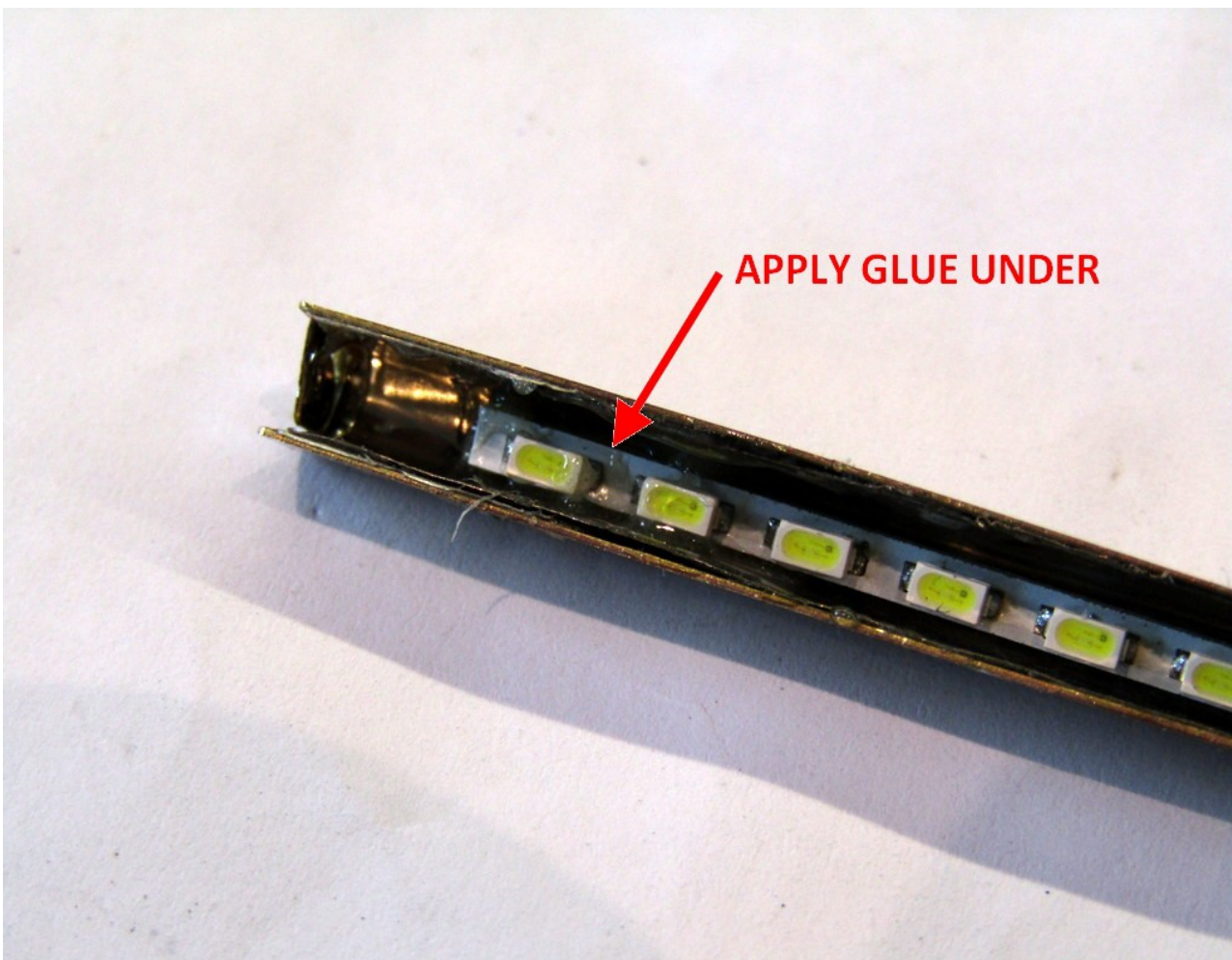
STEP 27

Mix the two-part epoxy glue thoroughly using the mixing paper and wooden stick supplied in the kit. Use the glue to mount the new LED backlight strip in to the brass backlight housing. The LED strip should be mounted centrally with an equal gap at either end.

Make sure the LED backlight strip is positioned so the LEDs shine directly out of the brass housing and they are not angled toward the edges.

A small amount of glue at each end of the LED strip should be sufficient to hold it in place. The LED strip should be held in place for 5 minutes as the glue sets.

Don't worry if some glue covers part of an LED or the strip, this won't affect performance, however try not to get glue on the outside of the brass tube or inside the top edges as it will make sliding it back home more difficult.



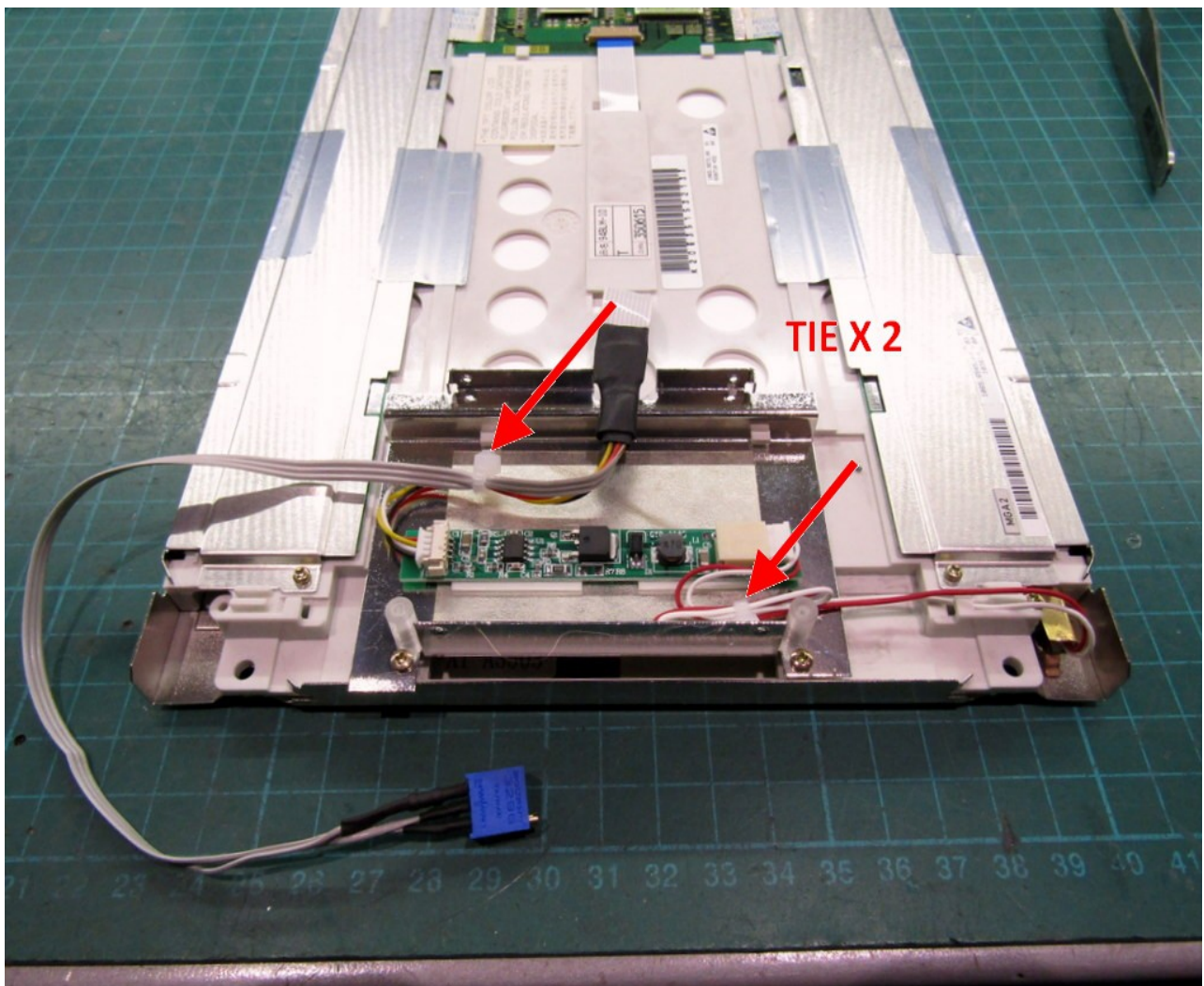
STEP 28

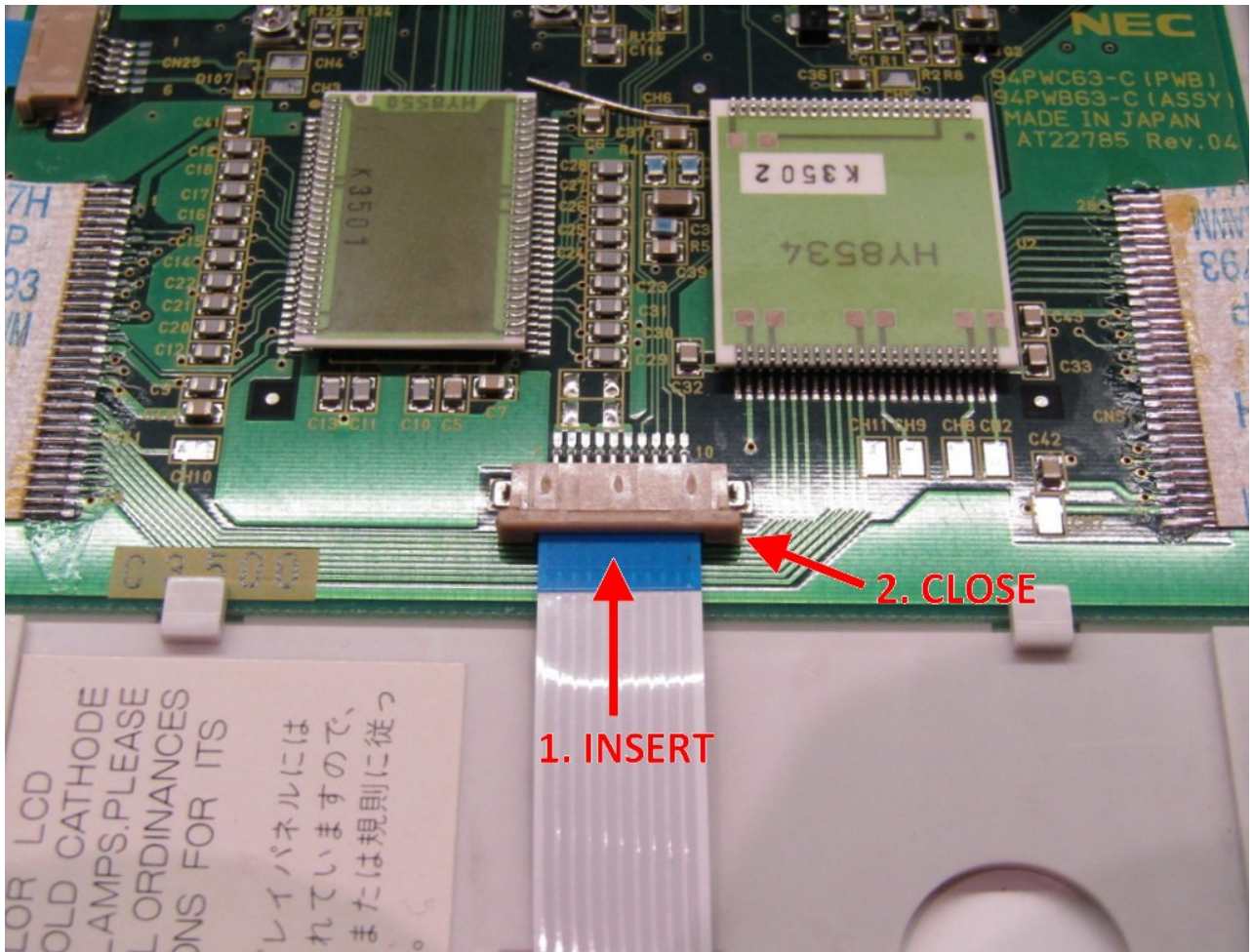
Once the glue is set, slide the backlight housing back in to the LCD panel and replace the screw.

Stick the LED driver board down in to the old backlight driver can using the double-sided foam pads already installed on the back of the board. The exact location is not important, there is plenty of room inside the can.

Fit the new ribbon cable into the LCD driver board and lock it in place with the locking bar.

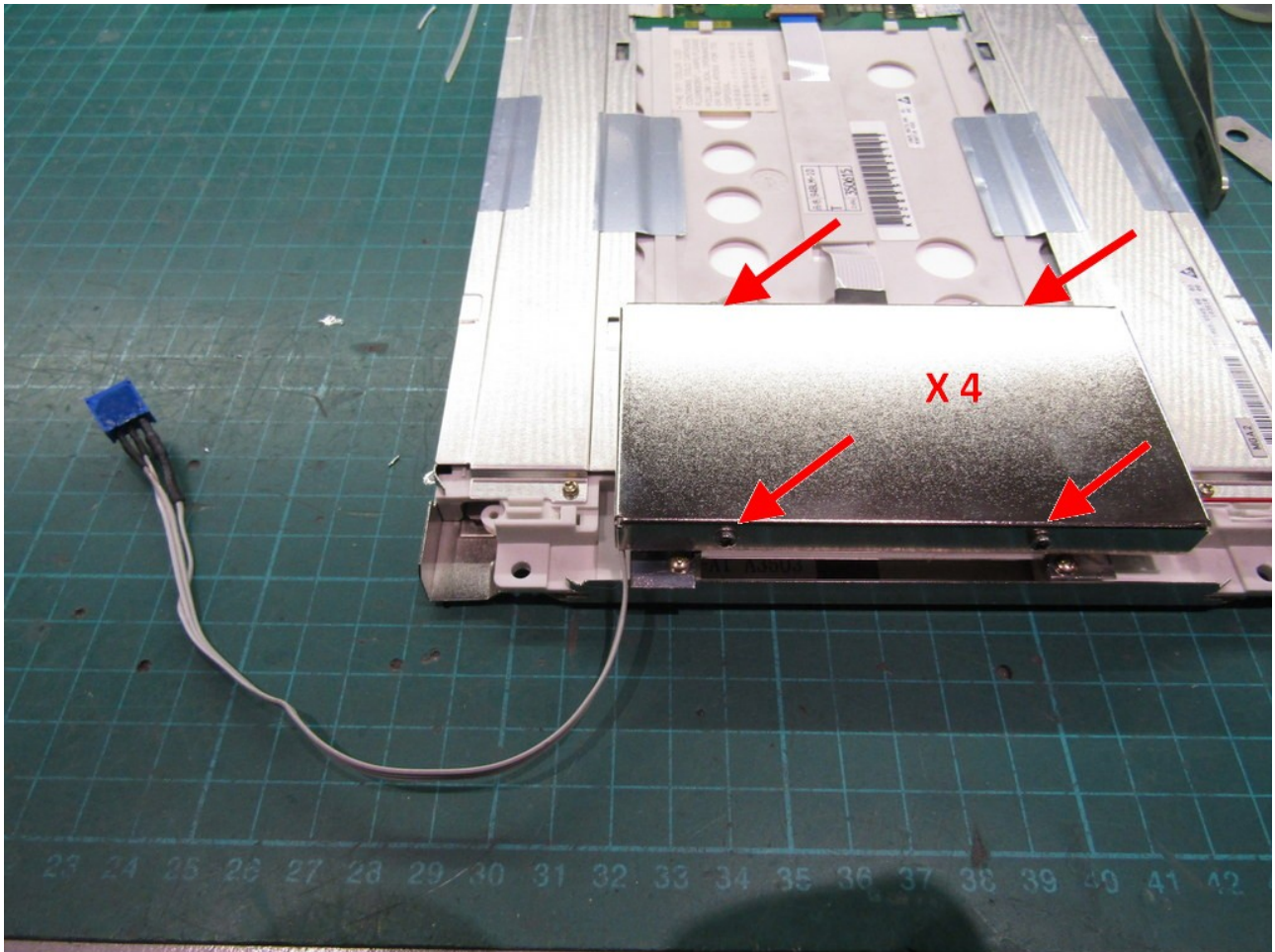
Use two cable ties as shown to tie the wires neatly.





STEP 29

Refit the lid of the backlight can and install the four screws. The cable for the blue brightness adjustment pot can be routed as shown, passed under a gap in the lid.



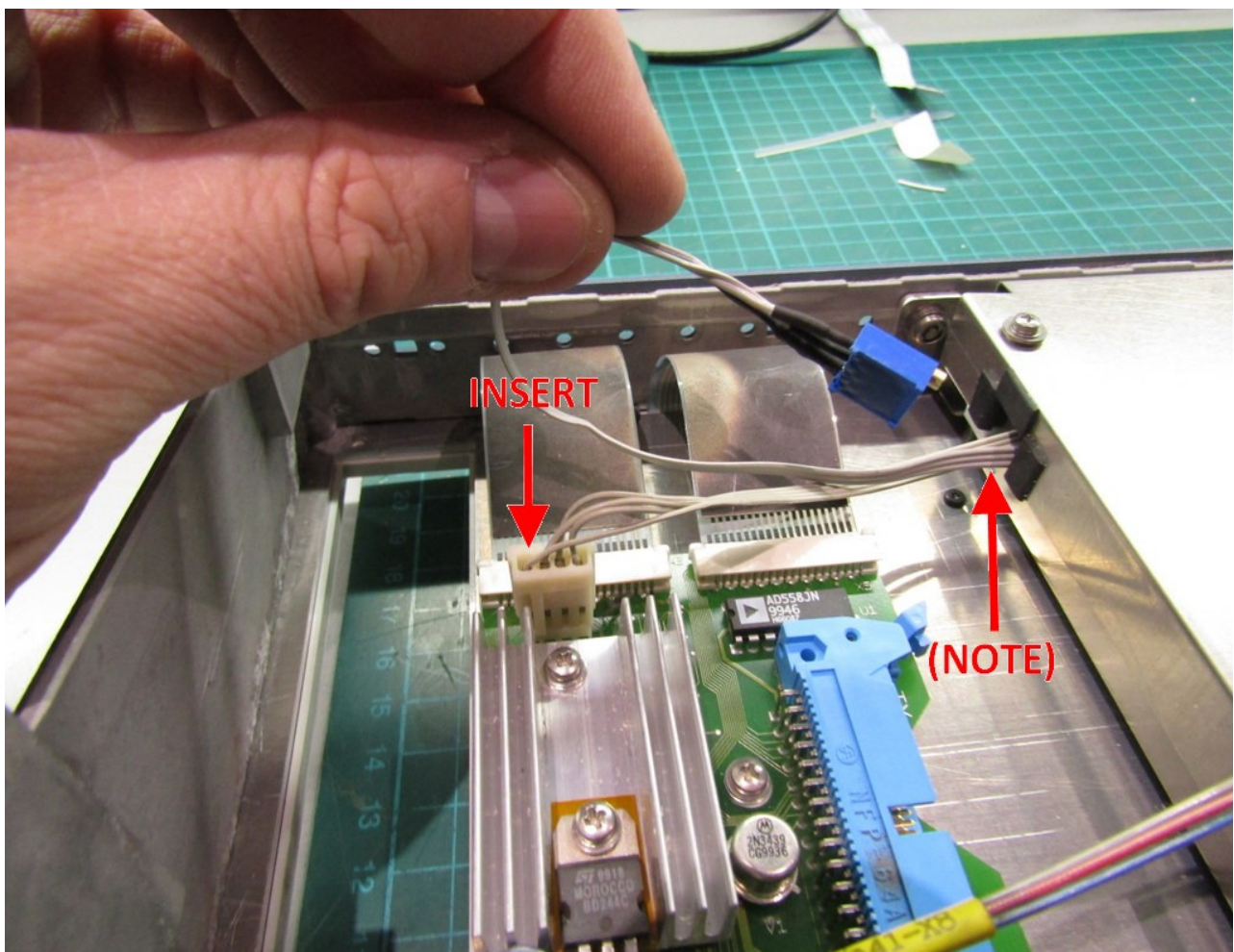
STEP 30

Using the alcohol wipes and lint-free cloths thoroughly clean the inside of the glass inside the front panel of the instrument. Use these to clean the screen on the LCD panel as well.

Refit the LCD panel in to the analyser front panel and replace the large metal cover using the four screws (refer to step 17). When re-fitting this cover, make sure the large main LCD ribbon cable remains outside so that it can be plugged back in to the instrument.

Note the brightness control cable and LCD power cable are routed through a small cut-out as shown in the photo below.

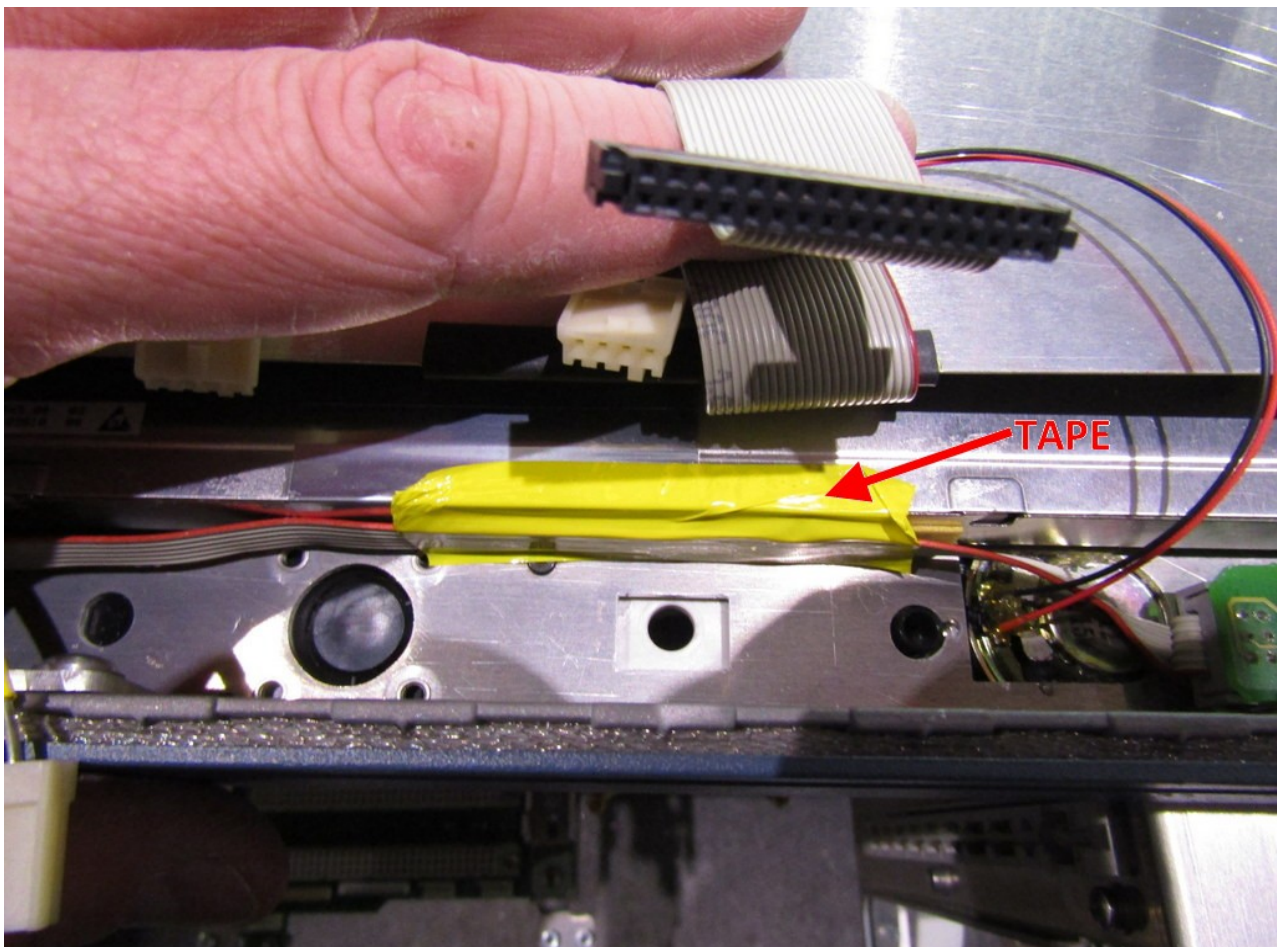
Re-fit the LCD power plug in to the header as shown below.



STEP 31

Using some tape, stick the small ribbon cable to the bottom of the LCD panel so that the cable is clear of the hole below.

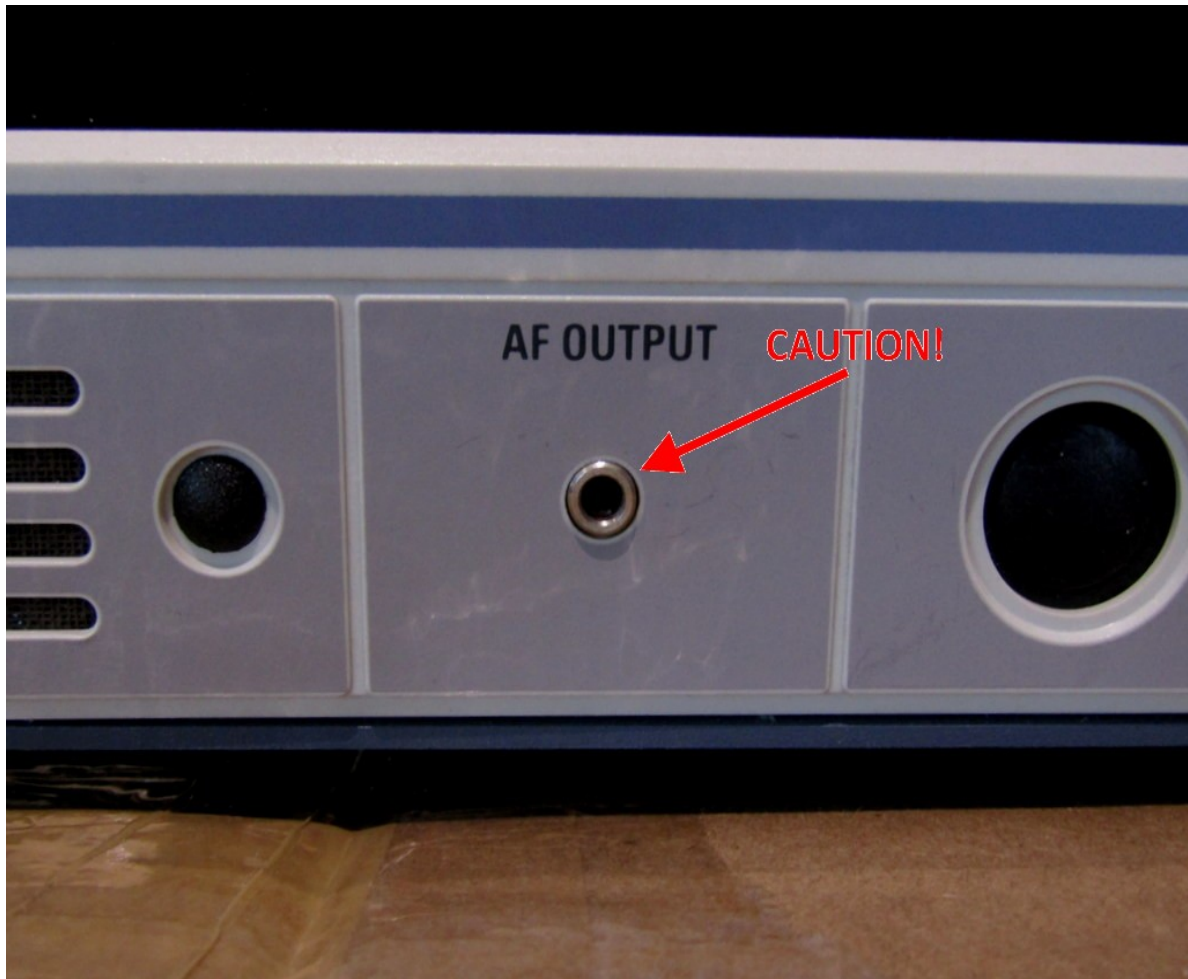
Note: If left loose the ribbon cable can be trapped and shorted to ground by the audio jack when the analyser front panel is re-fitted to the instrument. It is important this cable is held clear of the hole in the front panel.



STEP 32

It's now time to re-assemble the instrument in reverse order, taking note of the following points:

1. Dry fit the front panel on the analyser and test the new LED backlight before screwing the front panel to the chassis. The A120 RF module does not need to be installed for the instrument to power up and show a clear image.
2. When fitting the front panel, carefully check the position of the main LCD ribbon cable. It can be easily be installed incorrectly left or right of the proper position on the header. The cable should be centrally installed on the header with no pins visible at the left or right edges.
3. When fitting the front panel, slide it back on to the chassis gently, and perpendicular to the rest of the instrument. If the front panel is pushed back at an angle it may damage the 3.5mm AF Output jack which fits precisely in to the hole as shown in the photo below.
4. Also check the N-type RF input jack lines up correctly with the hole in the front panel. The attenuator may be slightly loose allowing it to drop before the front panel is re-fitted.

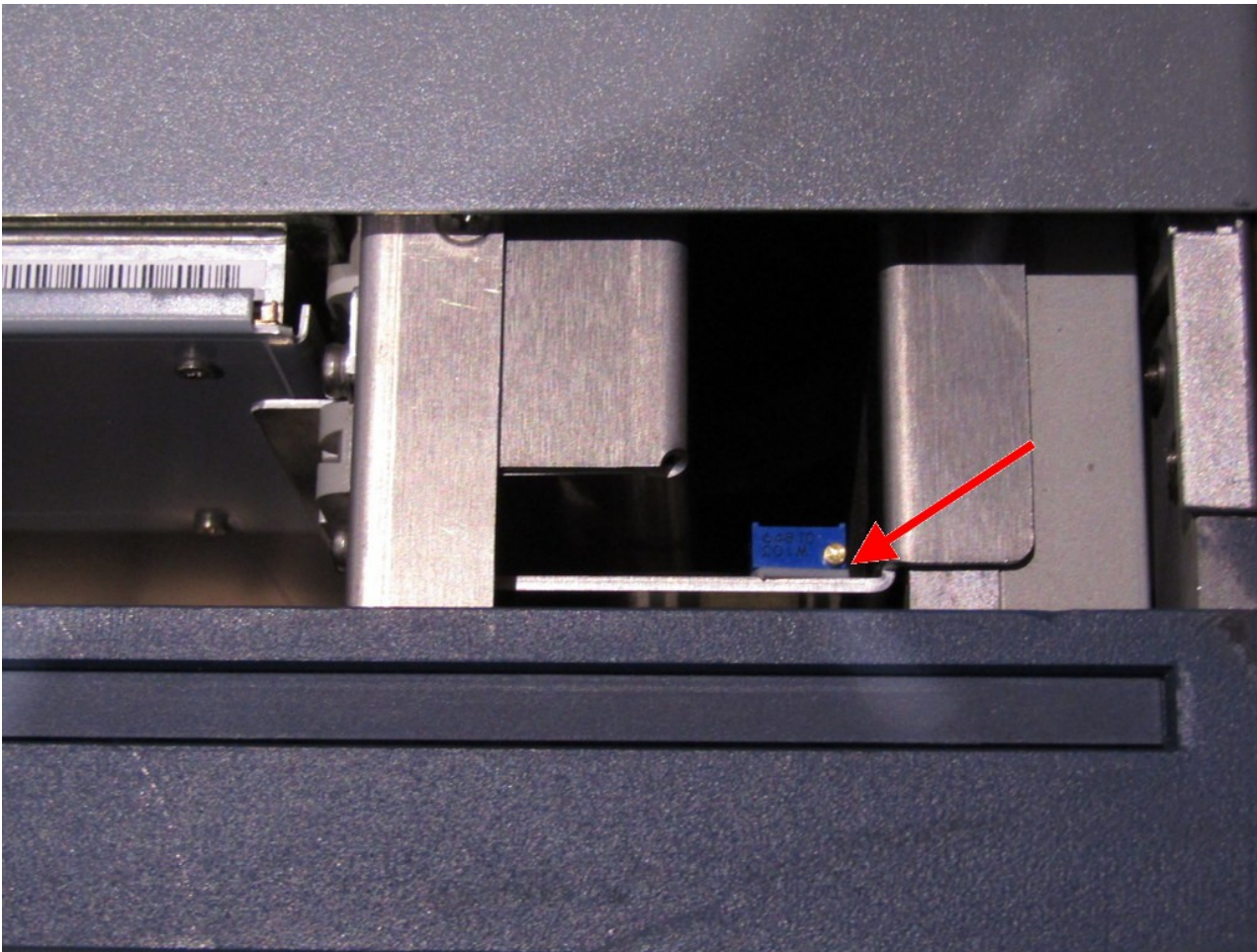


STEP 33

After testing the LCD and refitting the front panel install the brightness control near the top of the analyser to the left of the floppy disk drive using the adhesive foam tape already in place.

The brightness has been set at the factory but can be adjusted by the user to suit particularly dim or bright conditions.

Note: The brightness adjustment pot is a multi-turn device so it may take a few turns of the pot to see a significant change in LCD brightness.



End of installation.

We sincerely hope you enjoy this product which is intended to give long and reliable service.
For any questions or technical advice, please email:
info@enigma-shop.com

Thank You