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Fuchs Resonant Antenna QRP Tuner KIT

Thanks for purchasing Fuchs Resonant Antenna QRP Tuner KIT! We trust that it will serve you very well for many years. Before starting to assemble it we have to warn you that assembling requires soldering, which involves high temperature melted solder at 400 °C (752 °F). You must be skilled with soldering and very careful not to get injured. AX elektronika does not accept any responsibility for eventual injuries of any kind!



Assembly instructions

Fuchs Resonant Antenna QRP Tuner KIT contains all components to build it. Tools required to build it is a soldering iron preferably with adjustable temperature, pair of pliers, solder, sand paper and a sharp knife.

Detail Assembly instructions

Clean all copper on all PCBs with sand paper. If copper is not clean and shiny you might have problems at precise soldering.

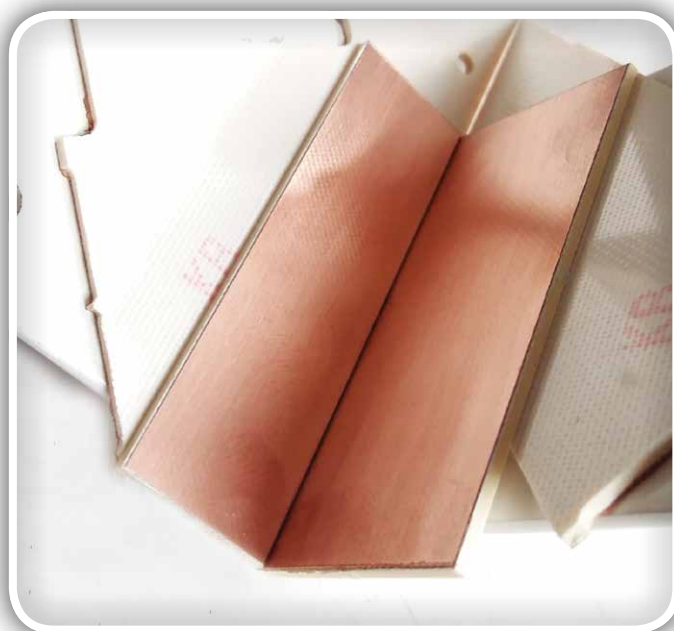


Figure 1



Figure 2

Firstly we recommend to make a rectangular stand, like seen on Fig 1. On this rectangular stand you will place bottom plate and one of the side plates and make one solder blob. Do not overdo with solder, make just one small blob which will enable you to later make small adjustments if needed. But it is important that both sides are soldered at right angle or else you might encounter problems at assembling the box.

Make sure that both plates are soldered at right angle and well aligned and proceed with soldering of the next plate as seen on Fig. 2

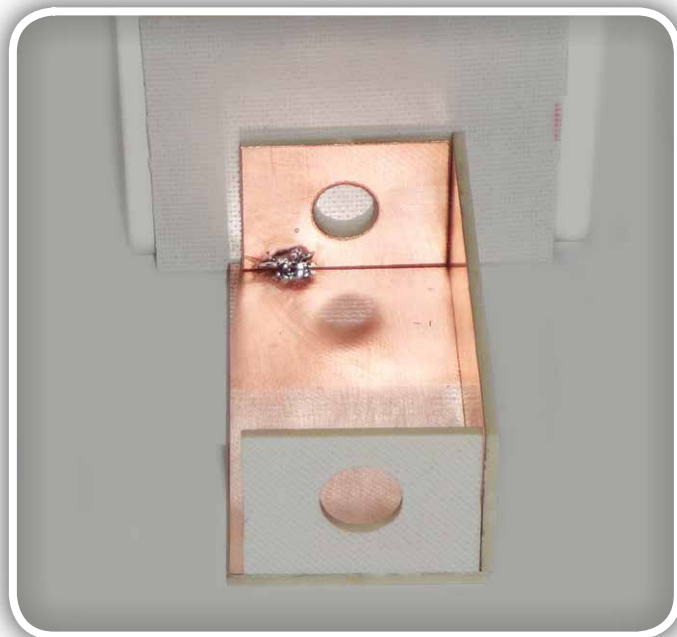


Figure 3

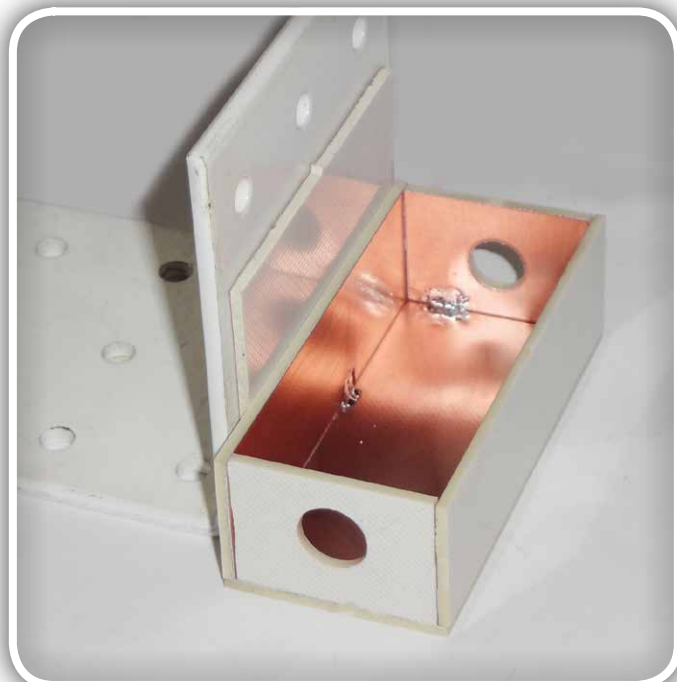


Figure 4

Continue with soldering of sides as seen on Fig. 3 and Fig. 4.

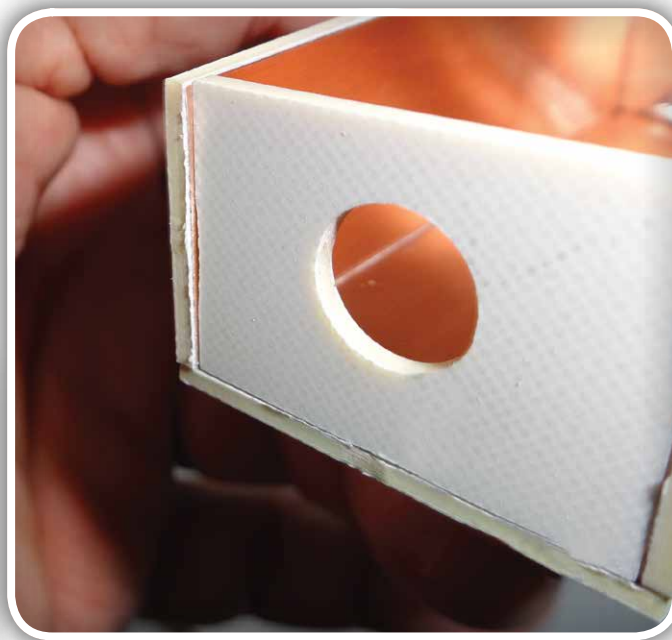


Figure 5

Check all corners if you were precise. See imperfections on Fig. 5. Such an imperfection may cause you problems later on when assembling the box, because the top will be too big and will not slide inside the box. Correct the side with careful adjustment and continue with soldering of small plate. It should be placed a bit closed to the side with smaller hole. See Fig. 6. Exact position is not critical because this plate helps holding variable capacitor in place.



Figure 6

When you are pleased with the box and you have checked that all angles/corners are as they should be place more solder to reinforce the box. But please do not overdo it - see Fig. 7.

Continue with mounting antenna socket and a flat solder lug for screw fastening as seen in Fig. 8.

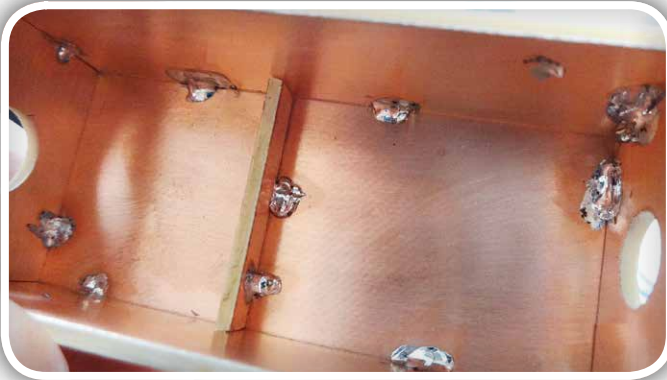


Figure 7



Figure 8

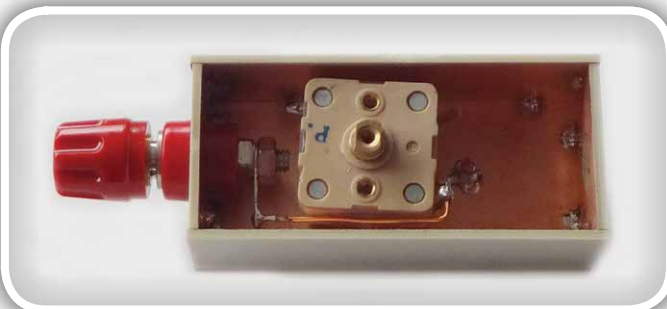


Figure 9

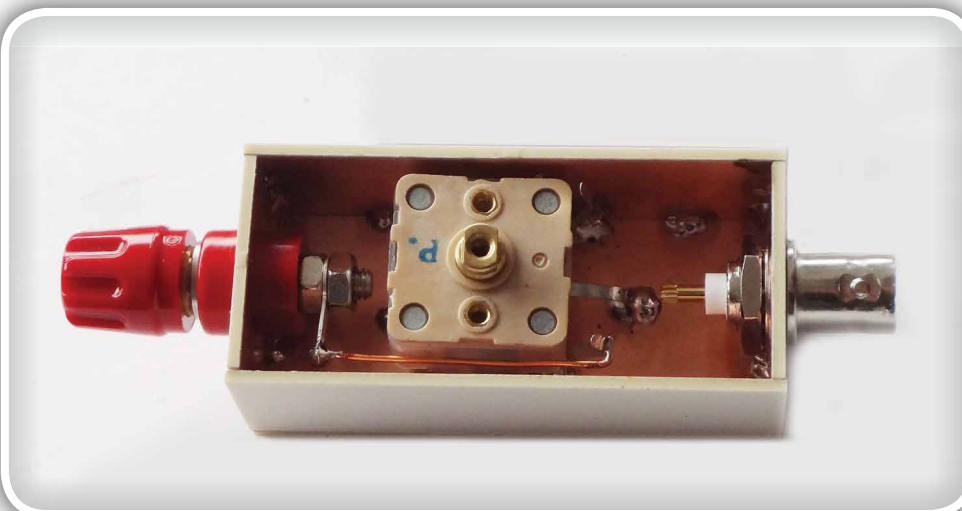


Figure 10



Figure 10a

Now you can mount variable capacitor, as seen on Fig. 9. Note that middle capacitor soldering terminal should be soldered to the case, while one is soldered via a copper wire to the solder lug as seen on Fig. 9.

Now it's time to mount BNC connector, see Fig. 10. Note that you should place solder lug of the BNC connector as seen on Fig. 10_a.

After screwing BNC connector solder the BNC solder lug to the case and hence ensure it's got good connection to the case.

Next you should wind toroid. Toroid has two windings: primary has 28 wounds, secondary has 3 wounds on top of 28 wounds, see image Fig. 10_b.

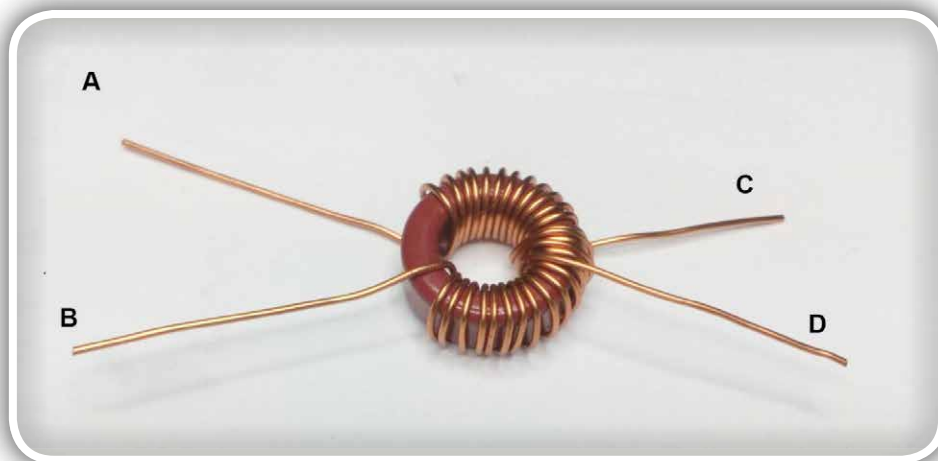


Figure 10b



Toroid

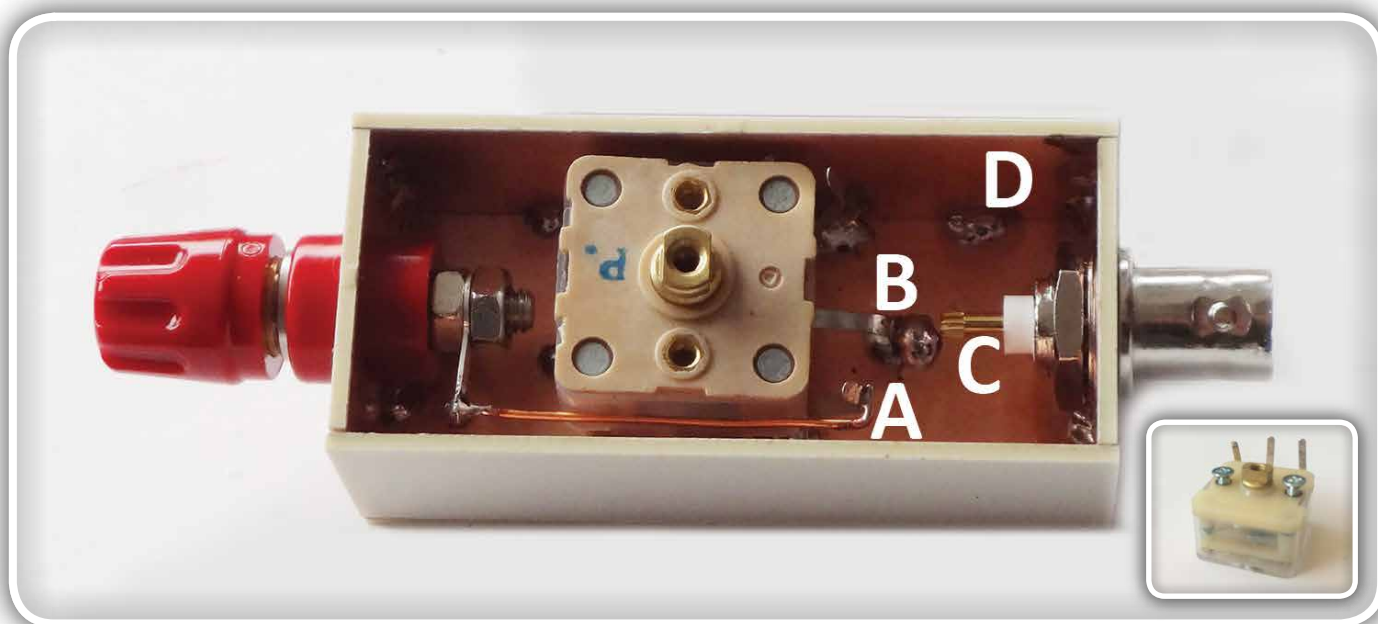


Figure 10_c



Figure 11



Figure 12



Figure 13

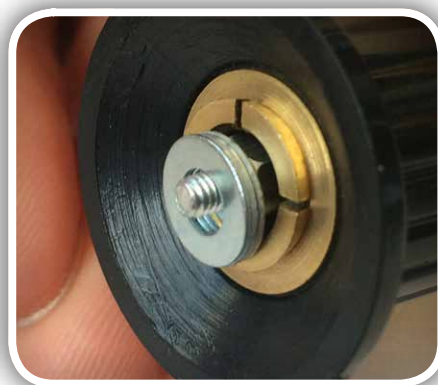


Figure 14

Just to be sure, we add a photo where we undoubtedly made 3 wounds – see figure Toroid. On the image one may see only 2 wounds on the core – which is true however in total we have 3 wounds. Use that rule when making windings on toroid! When windings are done use sand paper or sharp knife and remove insulating cover from end of each wire and solder them.

Note that we have marked winding ends with letters A, B, C and D.

Next you can mount toroid that you have wound. See connection of windings marked with A, B, C and D in Fig. 10_c.

When you're done you will have nearly finished Fuchs Resonant Antenna QRP Tuner, as seen on Fig. 11.

Now you just have to test tuner if it performs well.

Testing

Testing of the Fuchs Resonant Antenna QRP Tuner is very easy. Place a resistor 4k7 between Antenna terminal and GND, connect antenna analyzer or your QRP radio to BNC connector. Select 7 MHz band and start measuring SWR. With turning variable capacitor you will notice that in one point SWR will drop to 1:1 or nearly 1:1. If this is not the case you might not connected elements correctly and you will have to re-check all points of assembly.

If SWR can be lowered, select 10 MHz band and again tune capacitor to lowest SWR. Also here SWR should be near 1:1. Repeat that at 14 MHz band just to be sure that Fuchs Resonant Antenna QRP Tuner covers 40 - 20m bands.

Final assembly

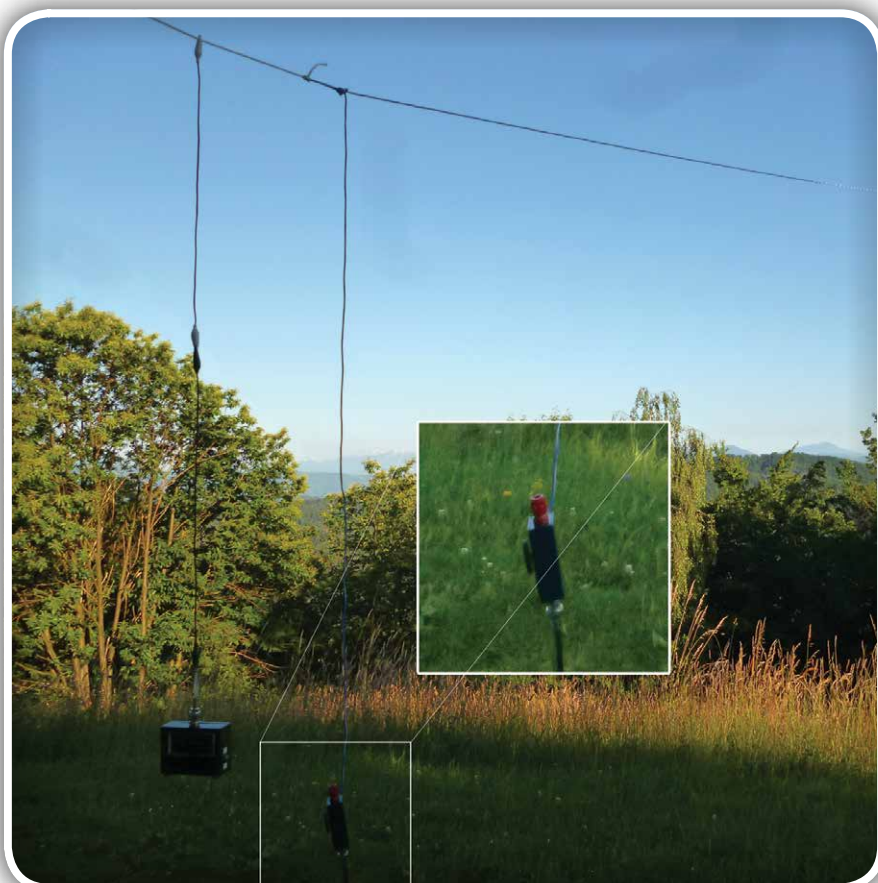
If all testing performed well remove 4k7

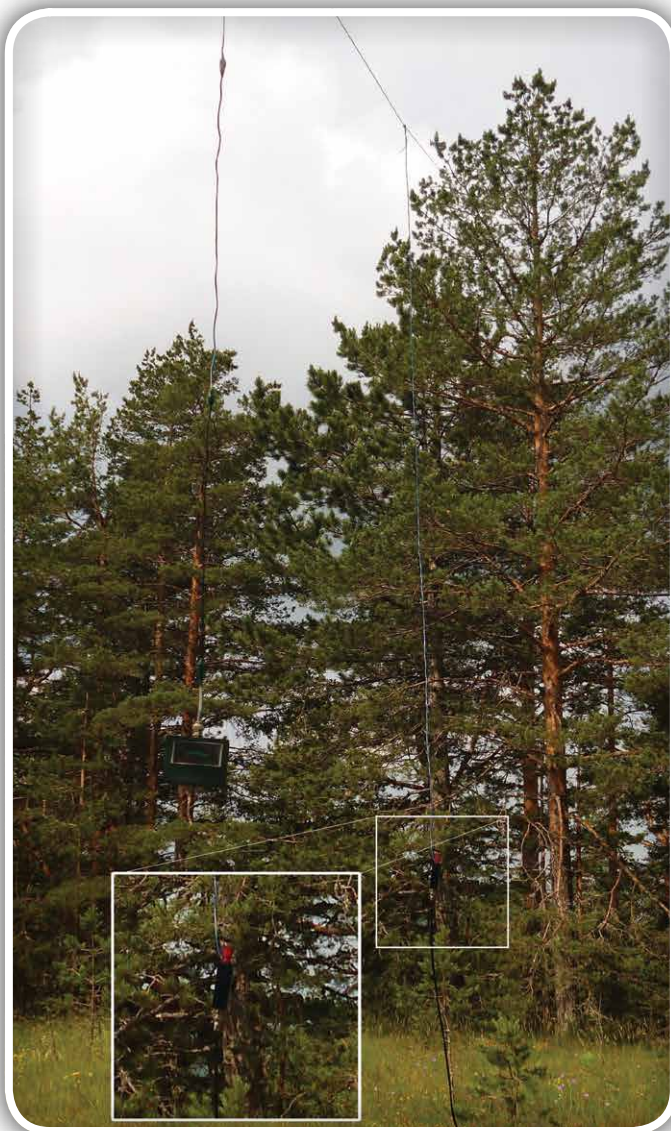
resistor from antenna terminal and GND. Now you may finally close Fuchs Resonant Antenna QRP Tuner with top cover with two small screws that screw to variable capacitor. Push the top gently to enter the box. Do not push too hard!! If the top cover does not slip into the box you may want to adjust side plates! To prevent top cover to slide too low in the box place few solder blobs few mm below the top. This solder will prevent top cover to slide in the box.

Assembling the button may require a bit precise work, but we assure you that buttons can be fixed to small shaft of the variable capacitor.

Remove the cap of the plastic button and place a long screw with a washer – as seen on Fig. 12.

Now mount one bolt on the bottom of the screw for few mm as seen on Fig. 13.





capacitor has turning range of only 180 degrees. When for example turn the button to the left, also the marking should be on the left position (9 o'clock). If the marking is not in the position 9 o'clock gently turn the button to get there. Now gently screw the button a bit more and turn the button to 3 o'clock. If marking on the button is also on 3 o'clock then all is in order and you may screw the button a bit more. **BUT DO NOT OVERDO IT!!!**

Usage of Fuchs Resonant Antenna QRP Tuner

Usage is simple: just take a half lambda wire and secure it between two trees. The feeding point should be near the ground so that you can tune the Tuner as you change the operation frequency.

See examples of wire antenna and tuner use on the photos provided by S53OM, op. Alex.

Now take two (2!!) washers, put them on the screw while holding button upside down (as seen on Fig. 14).

Take Fuchs Resonant Antenna QRP Tuner, turn it upside down and screw button gently to capacitor's shaft. You will screw it tighter later on, now it's important to screw it gently and not too tight. When the screw holds the button on the top of the variable capacitor gently turn screw more. Try to move button left/right. You will notice that

Conclusion

Fuchs Resonant Antenna QRP Tuner is – as the name suggests, a QRP tuner that will tune half lambda wire to a very efficient antenna. Antenna is efficient because it resonates on that particular frequency where you also operate. Hence it also performs as a simple preselector.

During the tests we have noticed up to 2 S better reception on Fuchs Resonant Antenna rather than on a Dipole that was on virtually same height. Fuchs Resonant Antenna QRP Tuner is ideal companion for your SOTA activity and also for fixed antenna, but just bare in mind that it's designed for QRP use.

We trust that you will enjoy using Fuchs Resonant Antenna QRP Tuner!

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