EMI-Spy 2 Step by Step Assembly Instructions of Printed Circuit Board

This kit is produced by Funk Amateur Radio in Germany and comes with a 14 pages Assembly and User information Manual, written in the format of a Technical Article. It is recommended that EMI-Spy 2 kit builders familiarize themselves with this document first prior starting assembly.

This document is written as result of feedback by several buyers who said they prefer to have the PCB assembly instructions in a line by line format which can be ticked off once each step is completed.

Once PCB assembly is done please refer to the EMI-Spy 2 Assembly Manual, starting on page 5 onward and follow the instructions in the chapters: ***First Functional Test,3 Final Assembly*** *and* ***Commissioning and Operations***.

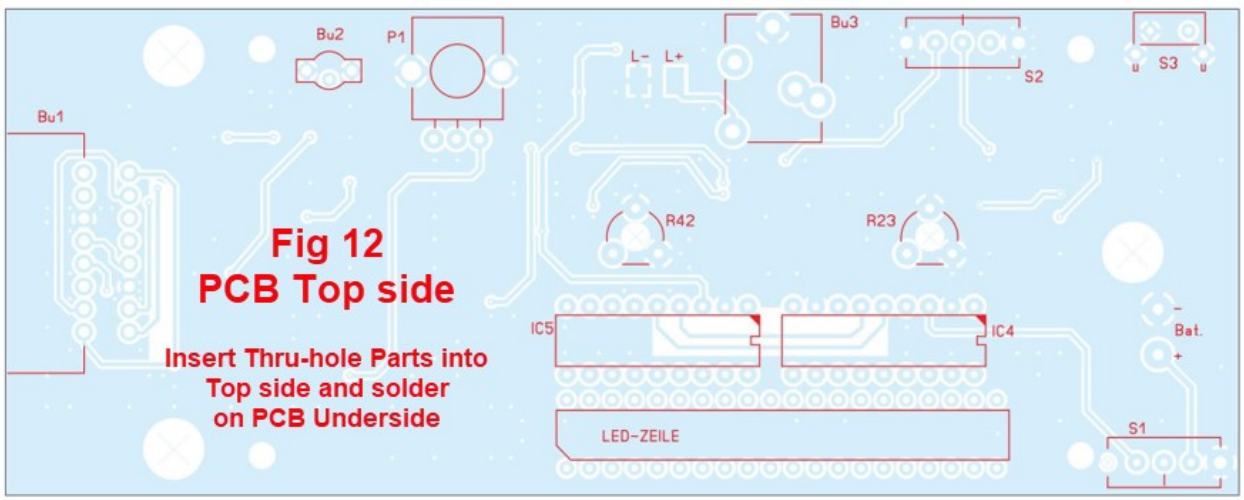
1. Tools required

- Soldering Iron 40-60 Watt soldering iron with suitable pencil or chisel tip
- 0.25mm – 0.5mm solder with flux
- PCB type Side Cutters
- Small flat fliers
- Screw drivers
- Multimeter
- Magnifier Glass x5

2. Assembly prerequisites - Observe standard EMC antistatic handling procedures

2.1 Identify the parts received in your kit and check off quantities against the Parts list of the kit against Table 1 on page 3 of the EMI-Spy 2 manual [ ]

2.2 **IMPORTANT –** Unwrap the main PCB from ESD packaging and compare the layout against Fig. 12 page 12 of the EMI-Spy 2 manual and note the following: [ ]



2.3 Fig 12 shows the **TOPSIDE** of the main PCB which is the side which has the component layout and designation printed. [ ]

2.4 Fig. 12 shows all the **Through Hole** components which are i**nserted** from the **TOPSIDE** of the Main PCB [ ]

2.5 Mark the **TOP** of your PCB side with a written label "**TOPSIDE**" [ ]

2.6 Turn to Fig. 13 on Page 13 Top Right – This is the Main PCB **UNDERSIDE** where the **Through Hole** components are **soldered** after **insertion** from the **TOPSIDE** [ ]

2.7 Mark thet fig 13 PCB side with a label "**UNDERSIDE SOLDER SIDE"** [ ]

3. Printed Circuit Board Component Assembly sequence

3.1 **Solder bridge:** Refer to Figure 3 page 3 in the EMI-Spy 2 Manual**.** The red arrow indicates a solder bridge on the **UNDERSIDE** of the PCB which needs be closed otherwise the EMI-Spy 2 will NOT function! Easiest is to melt some additional solder to bridge the gap. A wire link is not be required to bridge the gap. [ ]

3.2 **R23** Locate **variable resistor** (preset) **R23** 10 kOhm marking 10k on side. If you cannot see this value then identify R23 by measuring value with a multimeter [ ]

3.3 Ref Fig.12 page 12 Insert variable resistor **R23** in the correct position **TOPSIDE** and turn the PCB to **UNDERSIDE** and solder component R23 [ ]

3.4 **R42** Locate **variable resistor** (preset) **R42** 2.5k, marking 2k5 on side, insert on **TOPSIDE**, turn PCB to **UNDERSIDE** and solder component [ ]

3.5 Locate Integrated Circuit **IC4 LM3914** ref Fig.12 and note the notch on IC4 outline On **TOPSIDE**. Insert IC4 with notch pointing to the right on **TOPSIDE** [ ]

3.6 Check position of **IC4** against Fig 4. Turn PCB prior to soldering IC4 **UNDERSIDE** [ ]

3.7 Locate Integrated Circuit **IC5 LM3914** ref Fig. 12 and note notch on IC5 outline on **TOPSIDE**. Insert IC5 with notch pointing to the **right** on **TOPSIDE** [ ]

3.8 Check position of IC5 against Fig. 4. Turn PCB prior soldering IC5 **UNDERSIDE** [ ]

3.9 **LED Socket Assy**: Ref Fig. 7 and note the Red arrow indicating the chamfer on one corner of the LED socket. Use a magnifying glass, if necessary, as the chamfer rounding is much smaller compared to the indication shown in Figure 12. [ ]

3.10 Insert the **LED socket Assy** on Fig. 12 **TOPSIDE** with the chamfer rounding pointing to the bottom left corner. Make sure the LED socket is placed exactly straight and fit into the holes of the PCB and solder the 4 corner pins on the **UNDERSIDE** [ ]

3.11 Inspect the **LED socket Assy** is straight and flat against the PCB, if necessary you can correct this. Next solder the remaining pins whilst checking the LED socket remains flat against the PCB. [ ]

3.12 **SLIDE SWITCHES** - Locate identical switches **S1 and S2** and fit these as shown in ref Fig 12. on **TOPSIDE** of the PCB. Make sure the switches are horizontal and fully pushed against the PCB. It is recommended to solder the center pin on the **UNDERSIDE** first to ensure the switch is in the correct position before soldering the remaining pins quickly.
Caution: Take care not to damage the switches by excessive heat [ ]

3.13 Locate **miniature button switch S3** and plug in fully against the **TOPSIDE** PCB as as shown in Fig. 12. Solder quickly on **UNDERSIDE** to avoid damaging to switch [ ]

3.14 Locate **3.5mm JACK Socket Bu3** and plug in fully home against the **TOPSIDE** circuit board as shown in Fig 12. Turn over PCB and Solder **UNDERSIDE** [ ]

3.15 Locate **Coaxial Socket Bu2** and plug in fully home against the **TOPSIDE** PCB as shown in Fig 12. Solder **UNDERSIDE** [ ]

3.16 Locate **16 Pin Probe Socket Bu1** and insert as shown in Fig 6. flat against the **TOPSIDE** PCB. Turn PCB and Solder 2 corner pins of BU1 to **UNDERSIDE** [ ]

3.17 Ref Fig. 7 check position of **16 Pin Probe Socket Bu1** is correct and flat against PCB. Correct if necessary before soldering all 16 pins **UNDERSIDE** of PCB [ ]

3.18 Locate **Potentiometer P1 50 kOhm P1** and plug in fully home against the **TOPSIDE** PCB as shown in Fig 12. Turn over PCB and solder all 5 tabs UNDERSIDE [ ]

3.19 Locate **9V Battery Clip** Ref Fig. 7. trim back the length of the Battery clip wires if deemed too long and solder the leads as shown in Fig 12. (red = + black = -) [ ]

3.20 **Red and black 7cm wires** Ref Fig 7, solder the two wires connecting the Speaker to the **TOPSIDE PCB** as shown by the yellow arrow in Fig. 7 [ ]

3.20 This is completes the component assembly of the EMI-Spy 2 main PCB.

Now refer to the Assembly Manual, starting from page 5 onward and follow the information in chapters: ***First Functional Test, Final Assembly*** *and* ***Commissioning and Operations***.

We wish you success and having fun with this useful project!

Jan Verduyn G5BBL SDR-Kits
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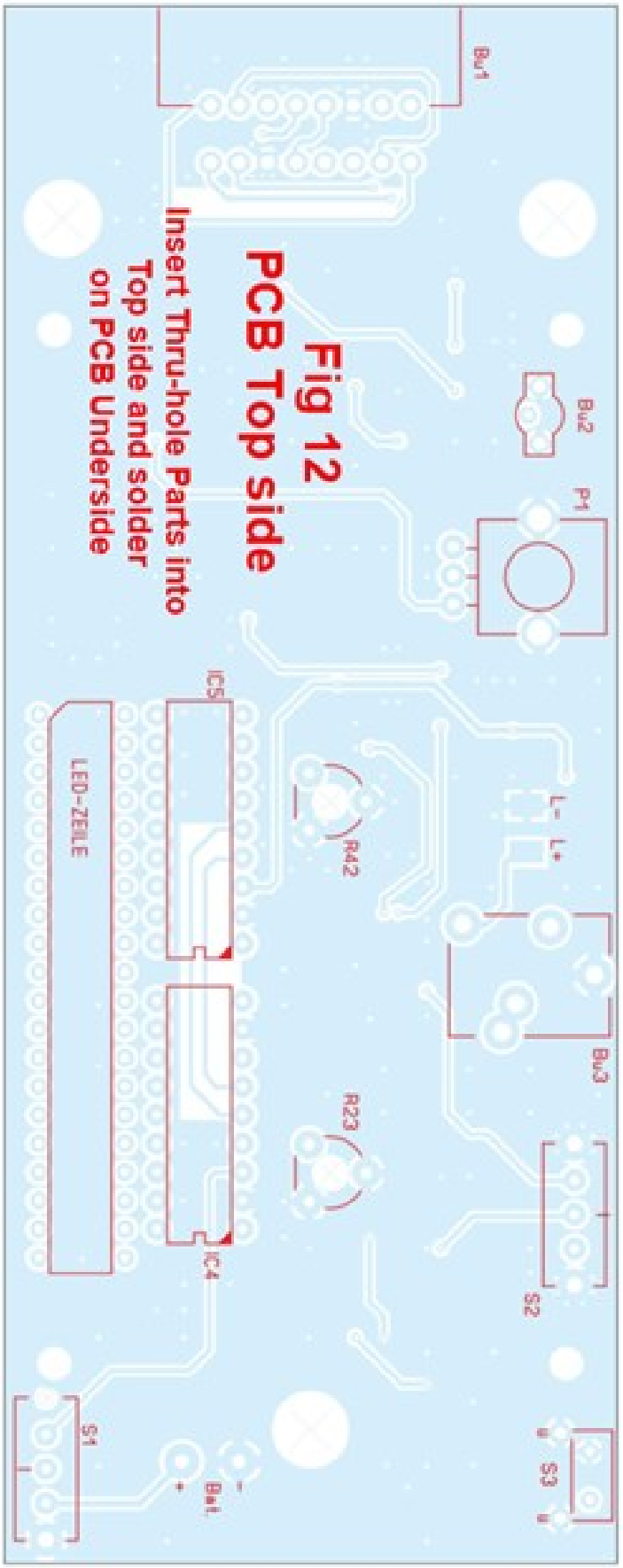

Figure 12 Top side
Insert Through-Hole components on this side