Drake TR-7 – BFO-Leakage

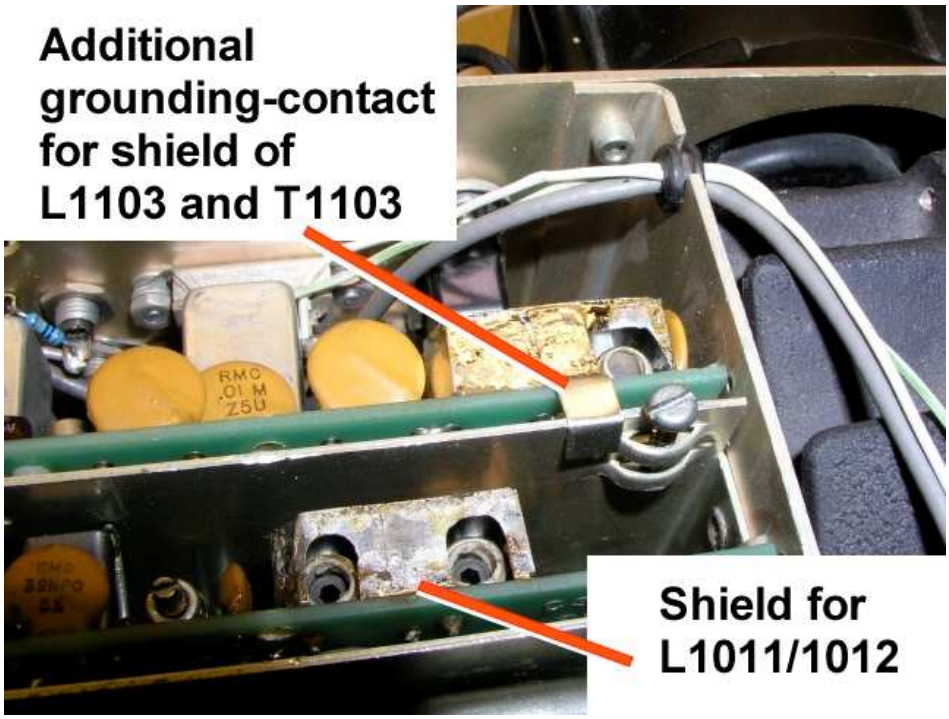
In my TR-7 (rather old unit; s-nr.: 1933) , the BFO-leakage was very high, when the top-cover of the circuits was removed during alignment or troubleshooting. In all modes with running BFO (i.e. all except AM), the S-meter showed more than S9 due to BFO-leakage.
With the top-cover in place and fixed with all screws the S-meter showed S0; but this requires optimum contact, which is sometimes difficult because of the coated aluminum.

To avoid this lekage, it is necessary to
1. delete the sorce(s) of BFO-radiation and to
2. improve shielding of the sensitive stage(s)

1. Deletion of BFO-Radiation

The main sources of the BFO-radiation are L1011/1012 on the PBT/Reference Board and L1103/T1103 on the 2nd IF/Audioboard.. My TR7 had no shields for these coils but the Servicemanual shows shieldings there.
I made shields of metal and soldered them onto the PCB´s (picture 1). It´s not necessary, that the shield is completely closed, but the gaps should be as small as possible.
Solder carefully and look for good ground-contact of the shield.

Picture 1: New shield on 2nd IF/Audioboard



Picture 2: PBT/Reference and 2nd IF/Audio Boards

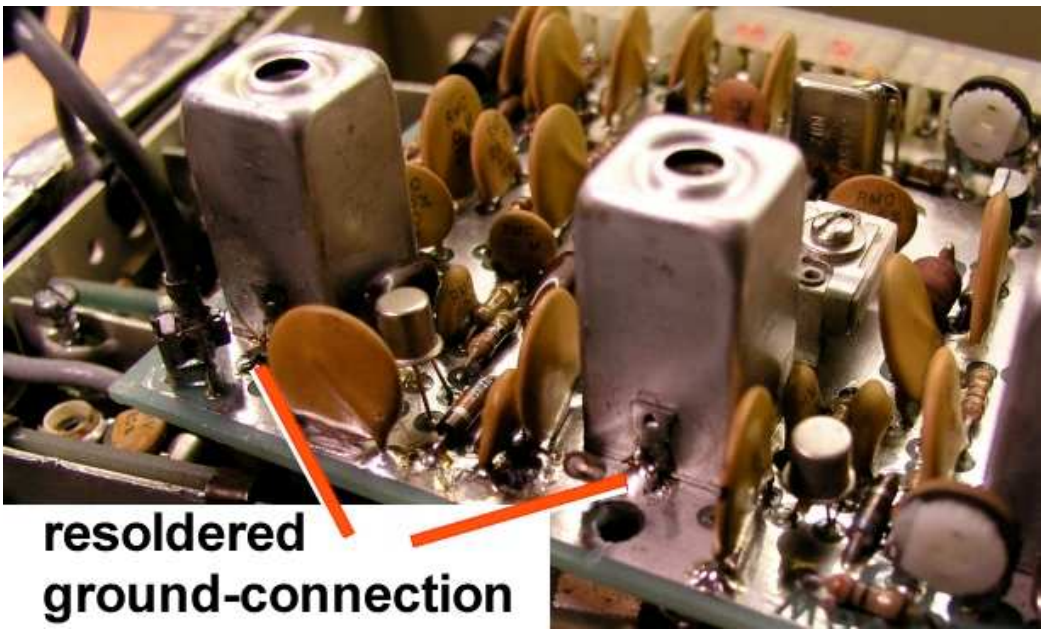
Picture 2 shows an additional ground-contact for the shield on the 2ndIF/Audioboard and the shield on the PBT/Referenceboard.

With theses steps the S-Meter dropped down from over S9 down to approximately S3 to S4 without the top-cover!

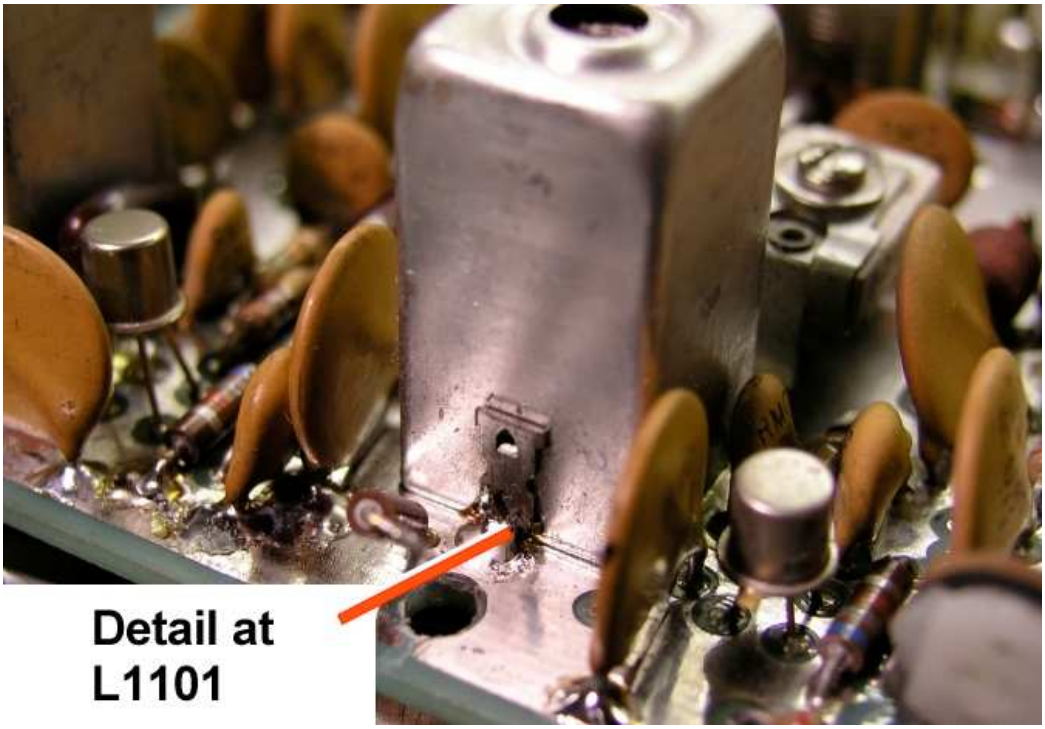
Good – but not good enough!

2. Improvement of the sensitive stage(s)

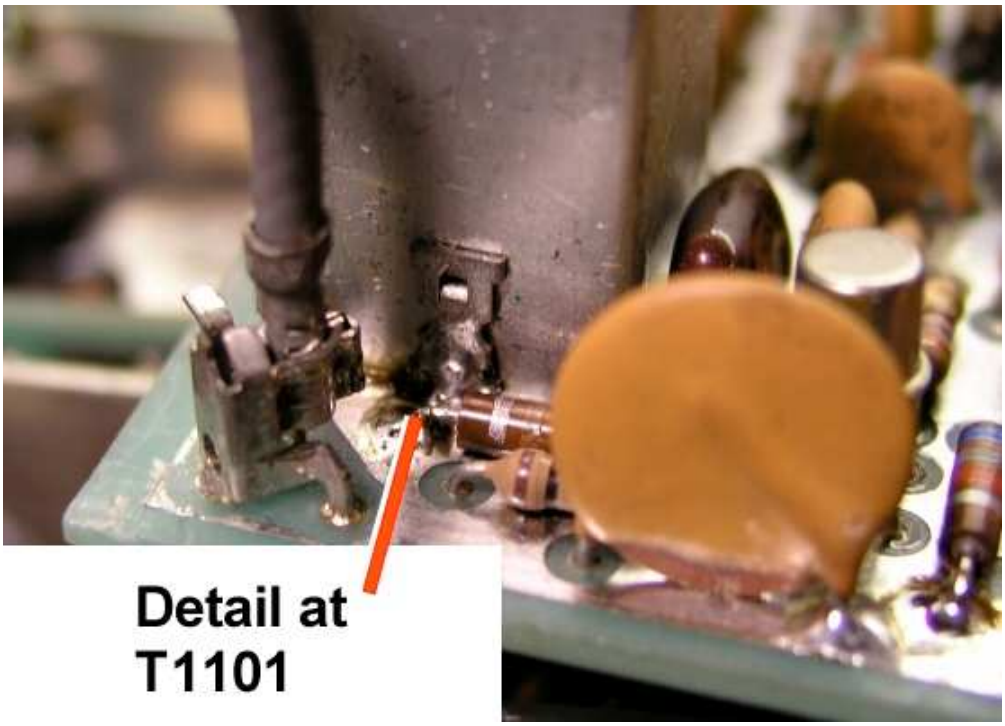
The most sensitive stage for coupling with the BFO-signal ist the first amplifier on the 2ndIF; it´s T1101/Q1101. In the first step, i resoldered all ground-connections of the coil-shields (pictures 3 to 5). For this purpose, it´s necessary to remove temporarily some components (picture 4).



Picture 3: Groundconnection for coil-shields

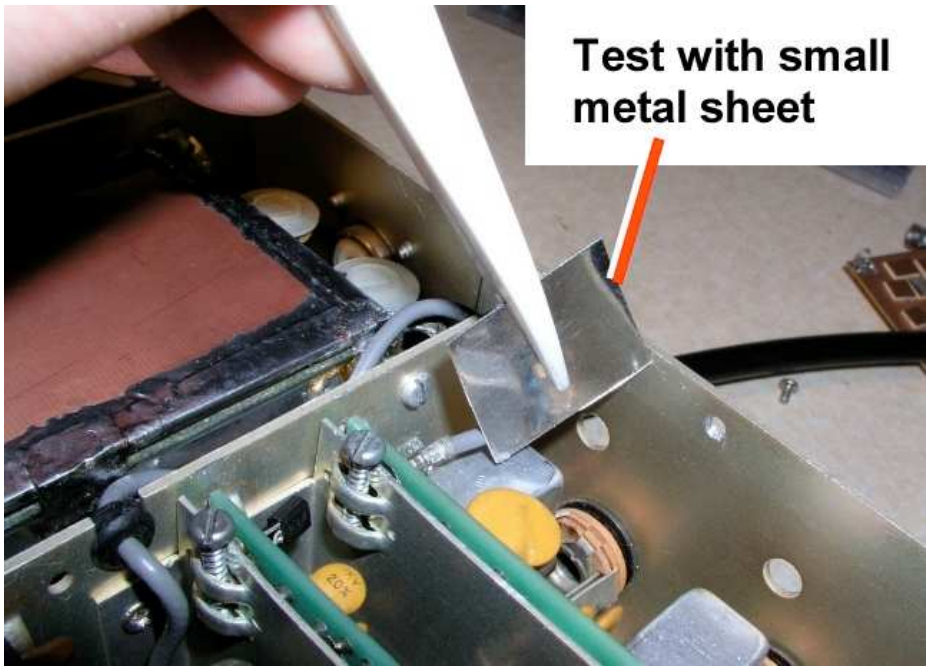


Picture 4: Groundconnection at L1101 (Detail)



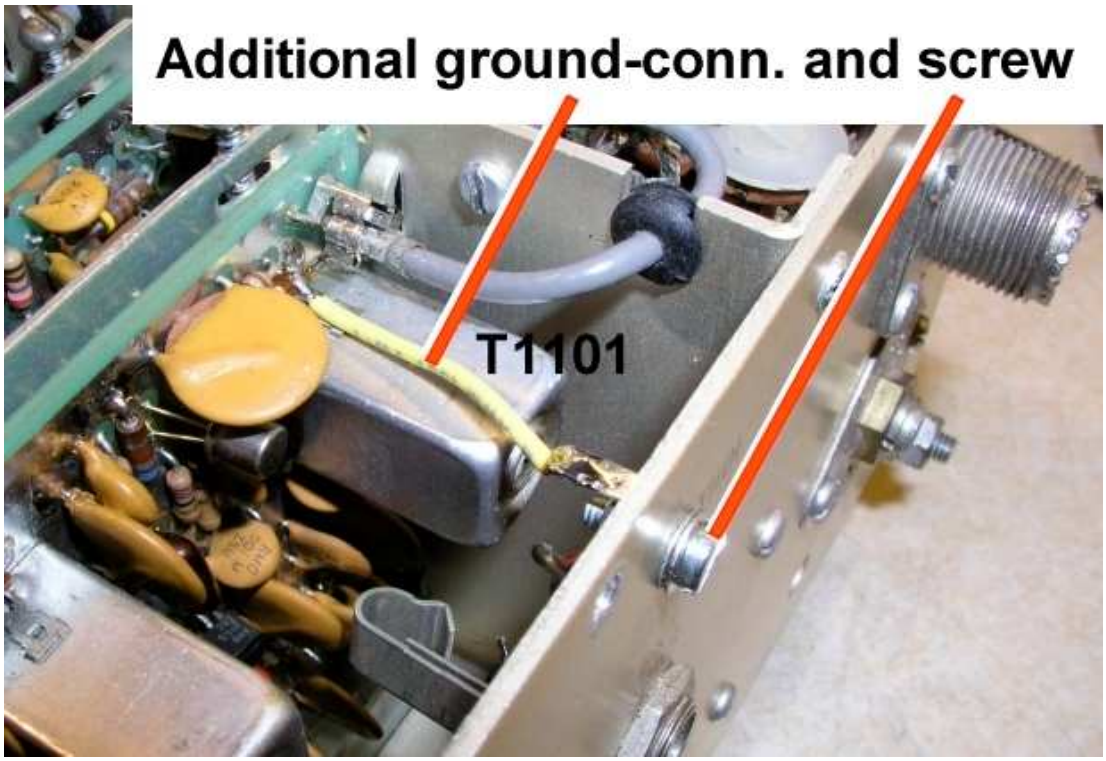
Picture 5: Groundconnection at T1101 (Detail)

This step improved the situation only a little bit; but another step helped much more:



Picture 6: Test at the inputstage T1101

Some tests showed, that additional grounding of the inputstage T1101 improved the situation considerably. With a small metalsheet, moved around with a plastic-tweezer, the optimum place for the groundconnectin was found (picture 6) and realised there (picture 7).
An additional screw gives a secure groundingpoint; remove the coating from the aluminum and use some lockwashers.

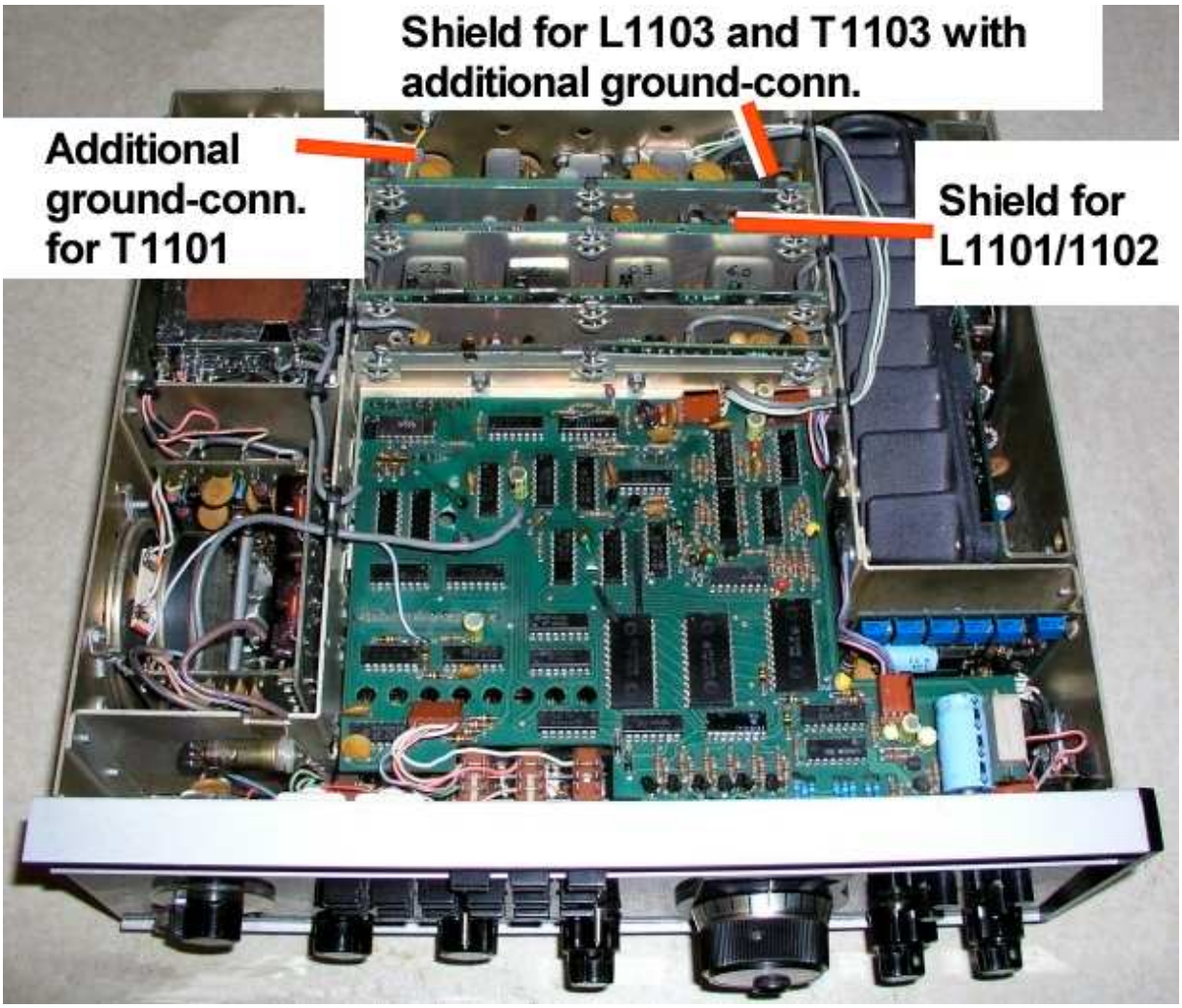


Picture 7: Additional grounding of T1101

I don´t know, why exactly this point is the optimum – maybe you´ll find another point of optimum (i´m sure you will.....).

With this step, the S-meter dropped down to nearly S0 even without the topcover in place!

Picture 8 shows all modifications in my TR7 regarding this theme.



Picture 8: All modifications in one picture

I hope you find these modifications helpful and let me know your experiencies. (please don´t shoot at the pianoman).

If you want to contact the author:
Stefan Steger, DL7MAJ, eMail: dl7maj@darc.de
Homepage: www.dl7maj.de

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