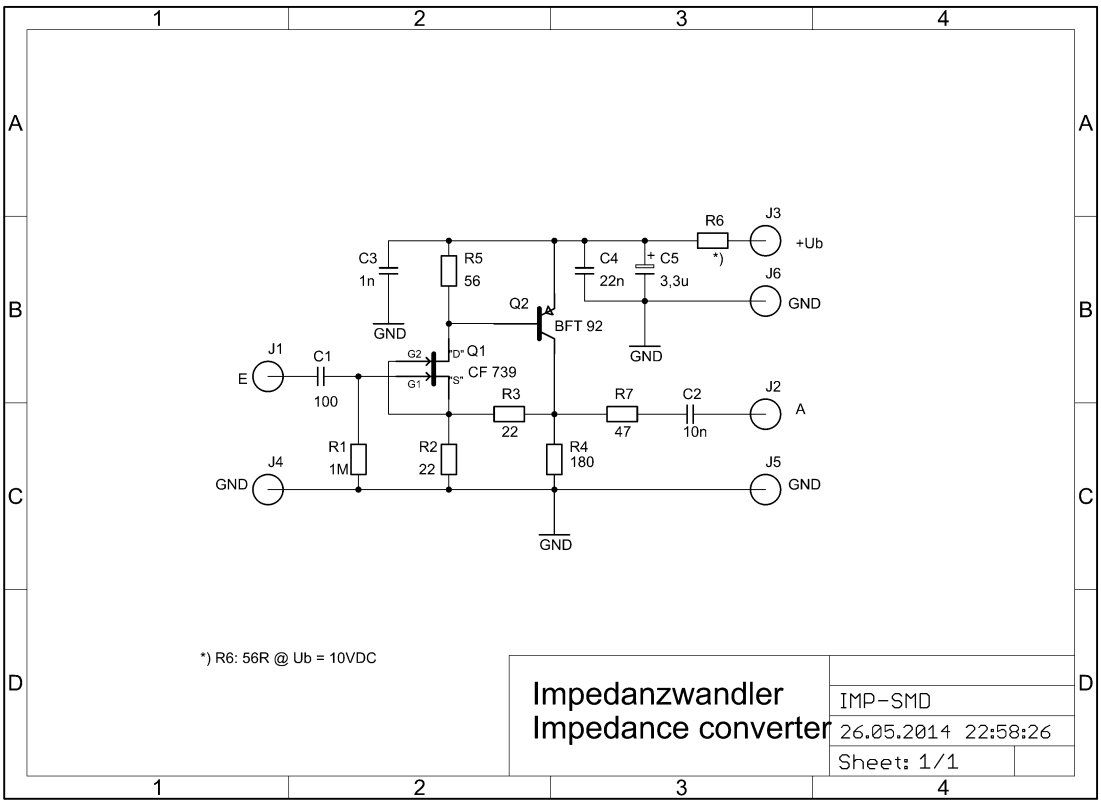
Panoramaadapter for the Drake R7

Introduction

Wanted to connect a panorama adapter to my R7 and looked through the schematic where the best point for the tap could be and which other signals are needed for that.

SMD-Impedance Converter

The first thing to do was to design a small impedance converter to tap the HF signals. The voltage gain should be 1, the input impedance 1MOhm and the output impedance 50 Ohms for direct connection of coaxial cables. Pictures 1 and 2 show the result.
This circuit is built with SMD.

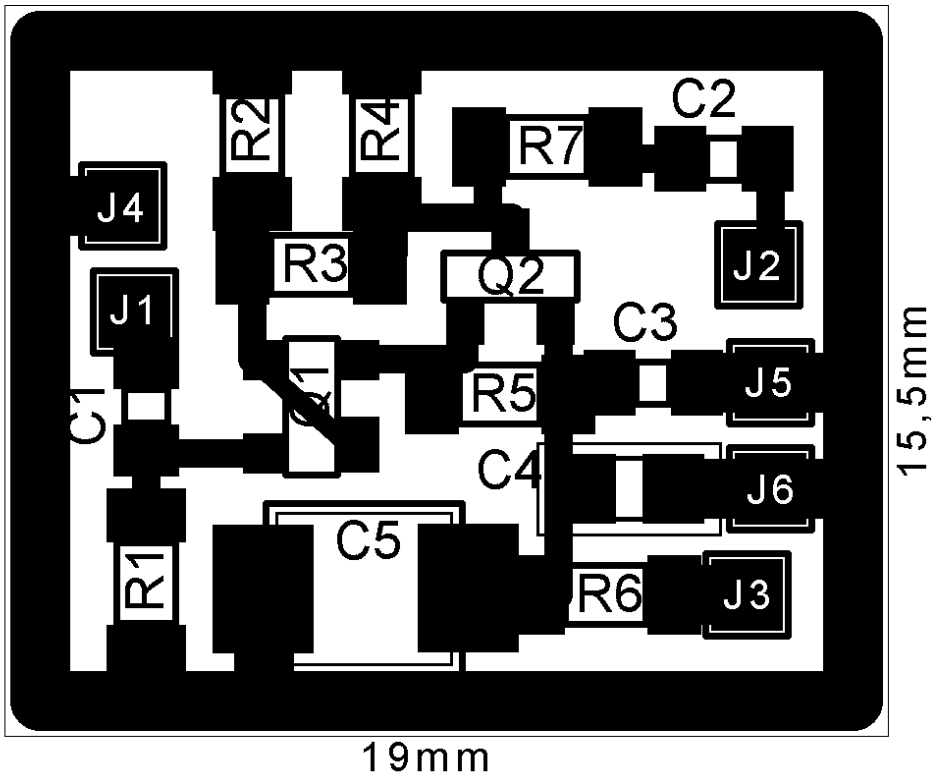


Picture 1 Schematic of Buffer Amplifier (SMD)

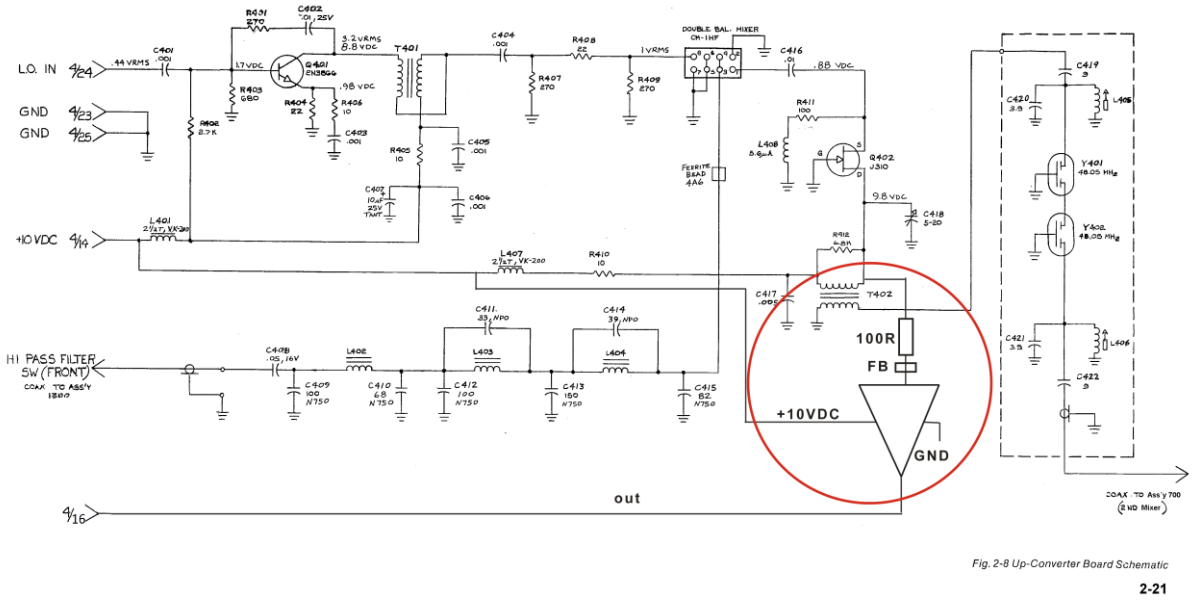
Tap for the 1st IF (48,05MHz)

The 7-Line has a rather narrow roofing filter (app. 15kHz), therefore the tap of the IF has to be in front of this filter to achieve a possible span width of several 100kHz for complete ham bands. The only possible point to tap is the 1st IF (48,05MHz) on the Up-Converter board at Q402/T402 (picture 3). To avoid any parasitic oscillations a ferrite bead (FB) and a 100Ohm resistor is proposed. Picture 4 shows the installation.
Pin 4/16 is not used in the R7 and therefore available for this purpose. On the motherboard at pin 4/16 a coaxial cable is connected and fed to the rear of the R7 (picture 5 and 9).

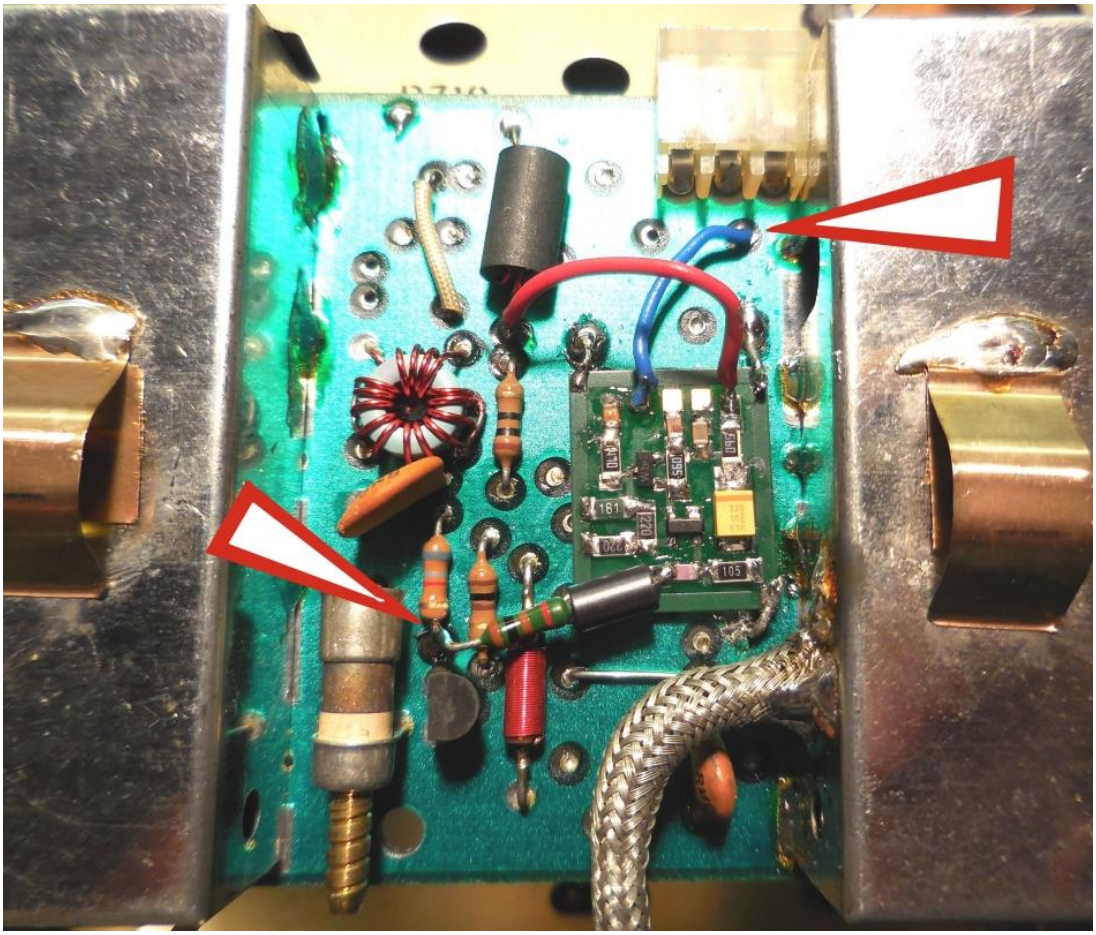
Note: In the TR7 this pin 4/16 and all others are used for the TX-path and this requires an additional output on the Up-Converter board in the TR7.



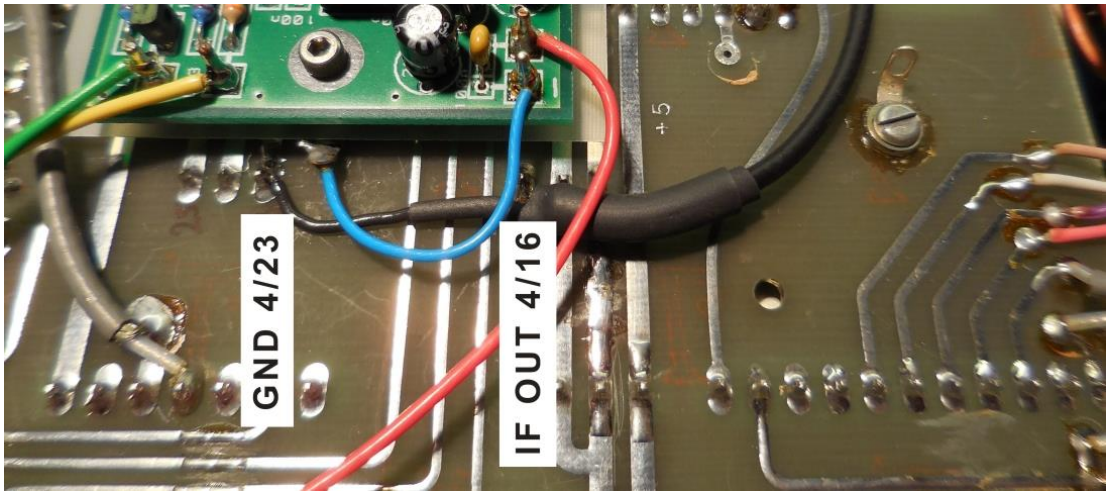
Picture 2 Layout of Buffer Amplifier (SMD)



Picture 3 Connection of output 1st IF



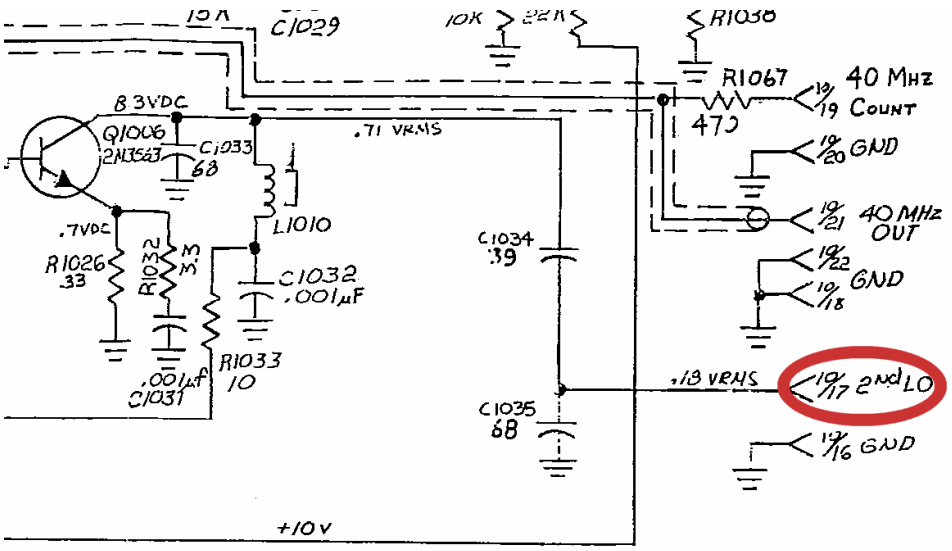
Picture 4 Installation of Buffer for 1st IF



Picture 5 Output of 1st IF (the other board is the DAFC)

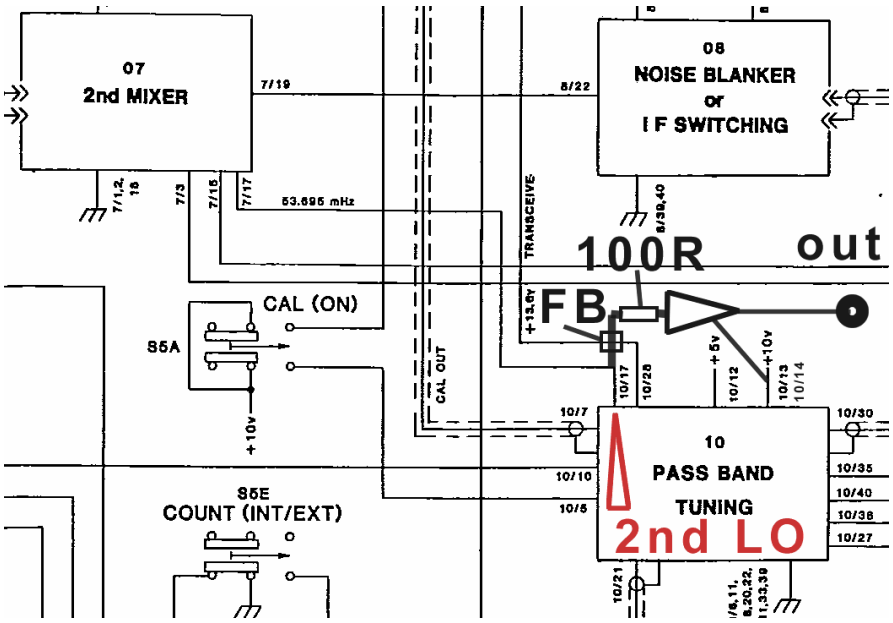
Tap for the 2nd LO (53,695MHz)

The 1st IF (48,05MHz) is sometimes too high for available panorama adapters; this requires a down conversion. The easiest way is to use the internal 2nd LO (53,695MHz), which converts the 1st IF down to 5,645MHz in the 2nd mixer. The 2nd LO can be tapped at pin 10/17 on the PBT/Reference Board (picture 6 and 7).



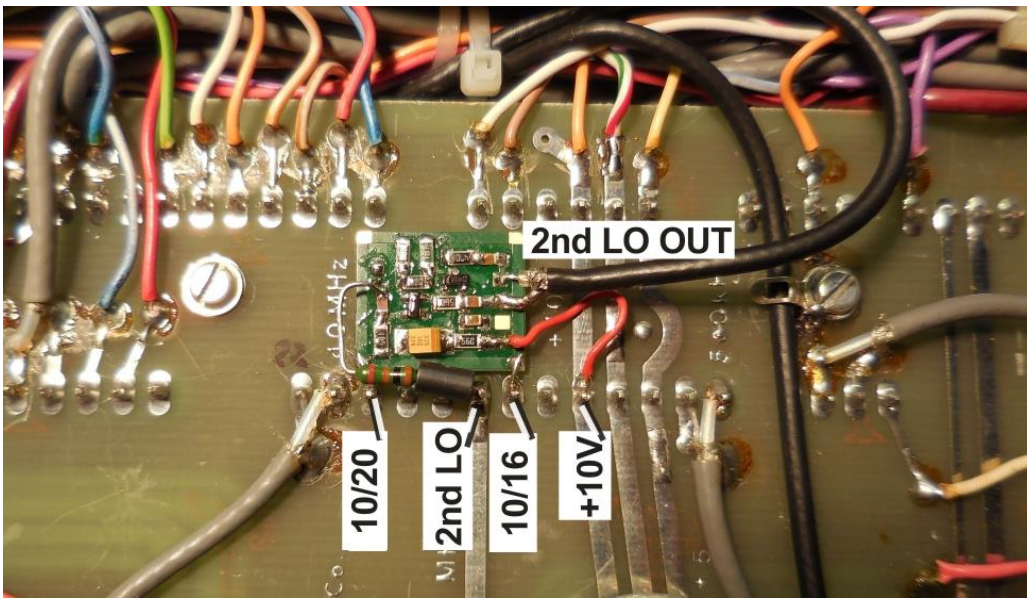
Part of
Fig. 2-20 PBT/Reference Board Schematic

Picture 6 Output of 2nd LO

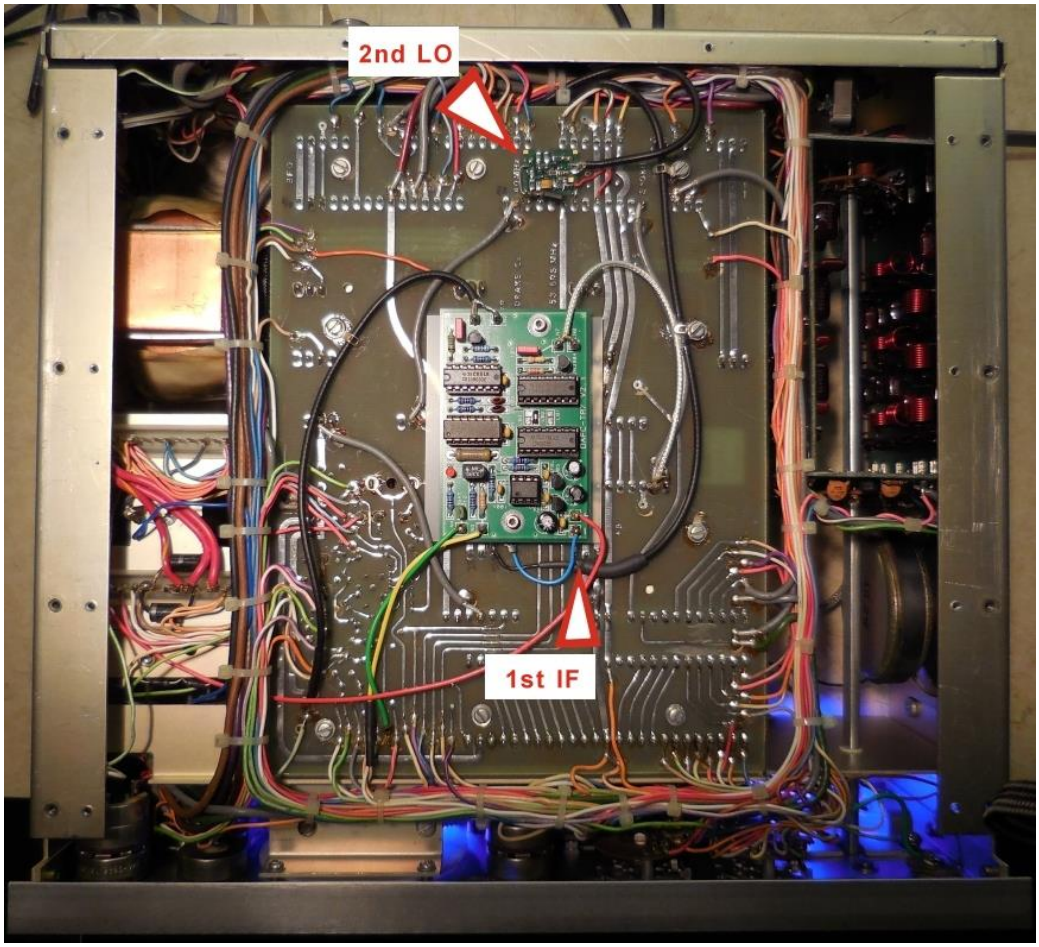


Picture 7 Connection of 2nd LO

To avoid any parasitic oscillations, again a ferrite bead (FB) and a 100Ohm resistor is proposed (Picture 8).



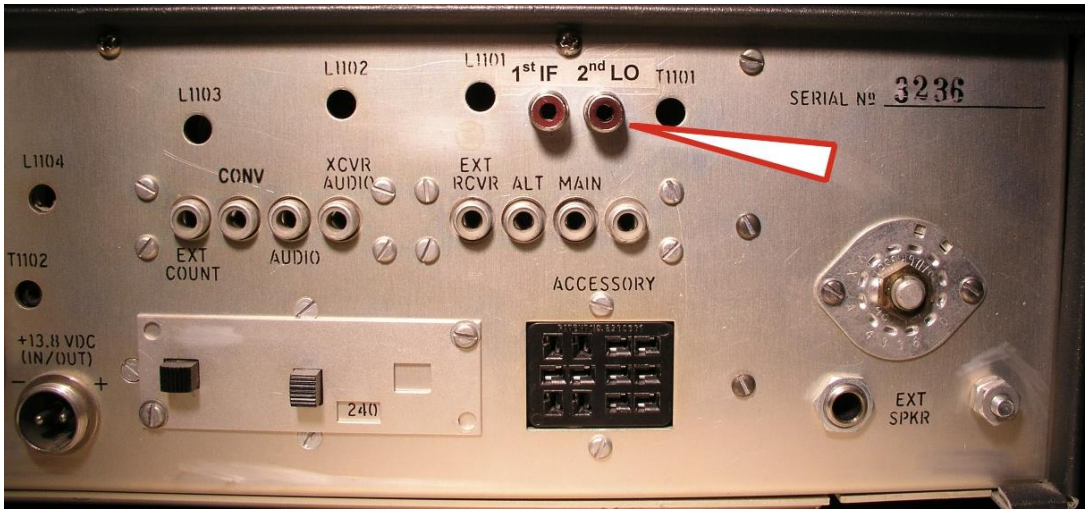
Picture 8 Installation of Buffer for 2nd LO



Picture 9 Output of 1st IF and 2nd LO (family picture)

Outputs at the R7

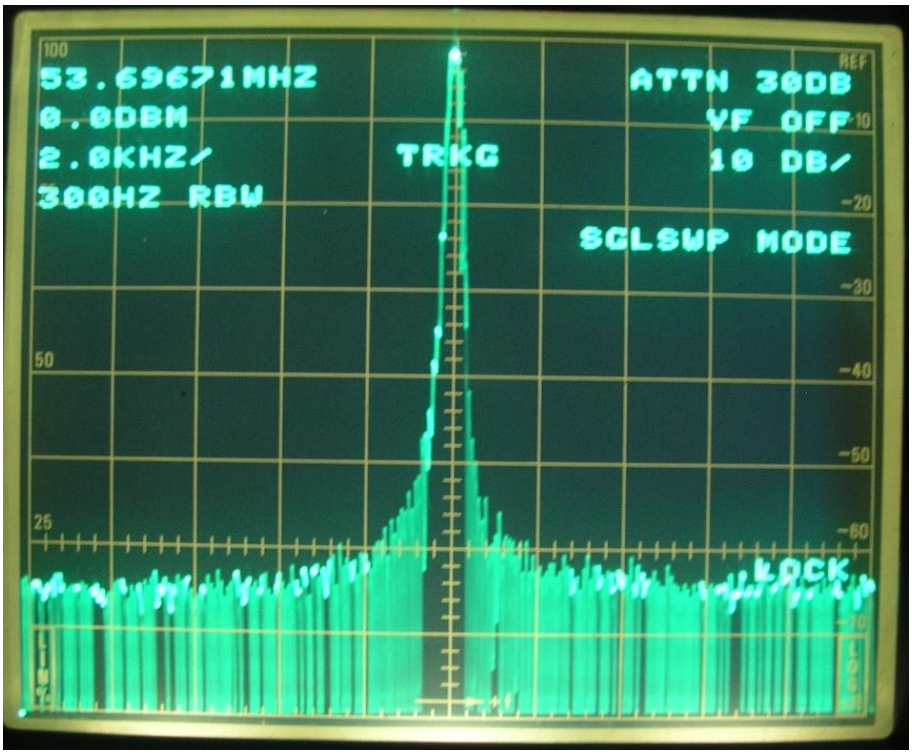
Two connectors are installed at the rear side of the R7 and labelled (picture 10).



Picture 10 Rear Side of R7

Results (Measurements)

The 2nd LO´s output is measured with app. 0dBm (picture 11) and can be used as input for an amplifier driving the external down converter.



Picture 11 Output of 2nd LO

The 1st IF´s output at 48,05MHz (calibrator in the R7 activated) is shown in picture 12. It is important to see that the AGC of the R7 does not affect this IF-output because the AGC is active only for stages “behind”. This is good for a constant output which can be calibrated in S-units. The S-meter showed S9plus for an output of -40dBm.

Picture 12 First Test with Calibrator

The last setup, connected to a small antenna, tuned to 7.100MHz (center frequency) and set to a span of +/-100kHz (20kHz/div) is shown in picture 13.

Picture 13 Complete Setup for 7MHz

Looks very nice but a little bit too expensive for permanent operation……..smile.

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