

Using a PAT as 2nd RX on the TS2000 HF stream

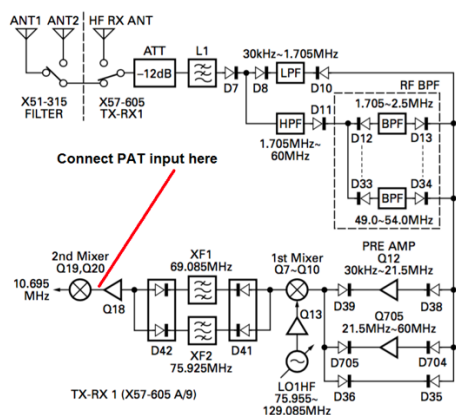
Since the TS2k uses different first IF's for different bands (HF & 50MHz, 144/432MHz and 1.3GHz) there is no common location where either RF signal, or the 1st IF can be picked up, to give full coverage of all frequency options on the rig. Hence, the 2nd IF at 10.695MHz, which is the first common point for all bands, has been the recognised place to pick up the IF tap signals.

Increasingly, there is a need for 2nd independent Rx functions – and on this rig that means separate PAT's for each range. The HF and 50MHz range can be covered with one PAT V, while the 144 and 432 bands can be covered with another one. The problem is not so easy at 1.3GHz, as the PAT board has significant loss at that frequency – it may be better here to pick up the 1st IF for 1.3GHz (135MHz).

For those who only operate (or only wish to use an SDR) on HF bands and 50MHz, an alternative IF tap point can be picked up after the 1st IF filters. As you can see from the diagram below, two different 1st IF's are used in the HF stream of the TS2k, but a PAT85 placed at the input to the second mixer will cover both outputs – the tuned frequency of the SDR will need to be adjusted according to the IF needed.

Installing PAT 85 for HF/50MHz

The RF Front End architecture for HF and 50MHz is shown in Fig 1. Two IF's are used, but picking up the signals at the input to the second mixer means that whichever signal is present, it will be collected.



Connecting a PAT 85 just before the 2nd HF mixer allows the RF signals to be safely extracted to your SDR, and will give coverage of all the HF bands and 50MHz.

Fig 1 – Rx RF Front End Block Diagram

Fig 1 shows the Rx front end for HF/50MHz in detail, with the attenuators, filters and preamps. The PAT signal needs to be picked up at the output of Q18, just at the input to the mixer - Q19-20. Kenwood have thoughtfully provided a test point, CN9, which is exactly in the right place. This connector is a two-pin type on the TX/RX PCB. This test point feeds out via a 1pF capacitor, as shown in Fig 2.

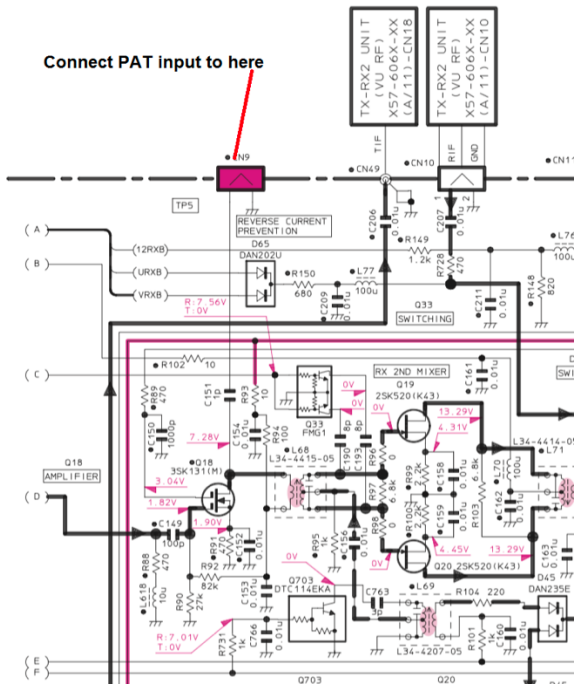


Fig 2 – IF Amp and 2nd Mixer Schematic

In Fig 2 you can see the connection point, CN9 and the 1st IF amplifier, Q18, which follows the split filter path through Fig 1.

Fig 3, below shows the point to connect the PAT Vcc line – ignore the connection shown to CN5

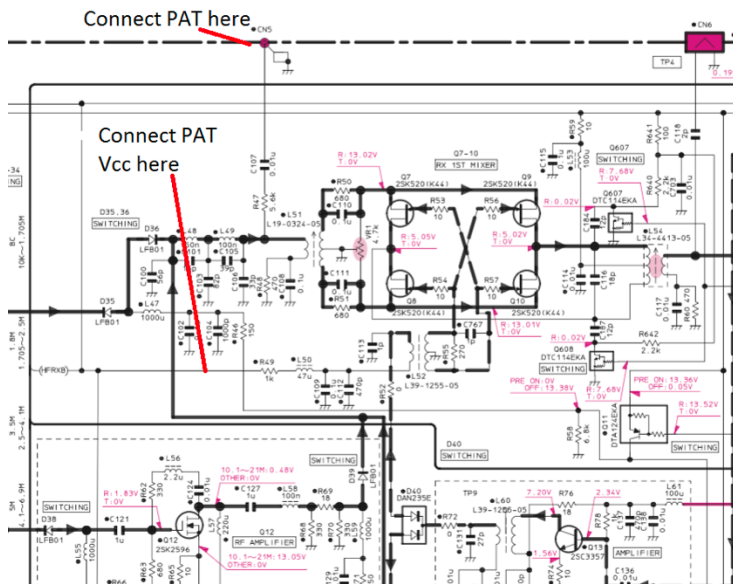


Fig 3 – Rx Mixer Schematic

In Fig 4, below, you can see the connection point CN9 and in Fig 5 you can see the recommended place to connect the PAT Vcc point (the JP1 pad on the PAT board). R49 is on the upper side of the Tx-Rx1 IF PCB, so there is no need to lift the board. As above, ignore the PAT input connection information in Fig 5 – this is not relevant to the IF connection method.

If you are using the HF Ant RCA socket as your output from the TS2K, then there is no need to connect a DC ground to the PAT – it will get this from the output connection.

If you are using a flying lead for the signal output, then you must also make a DC ground connection to the PAT board.

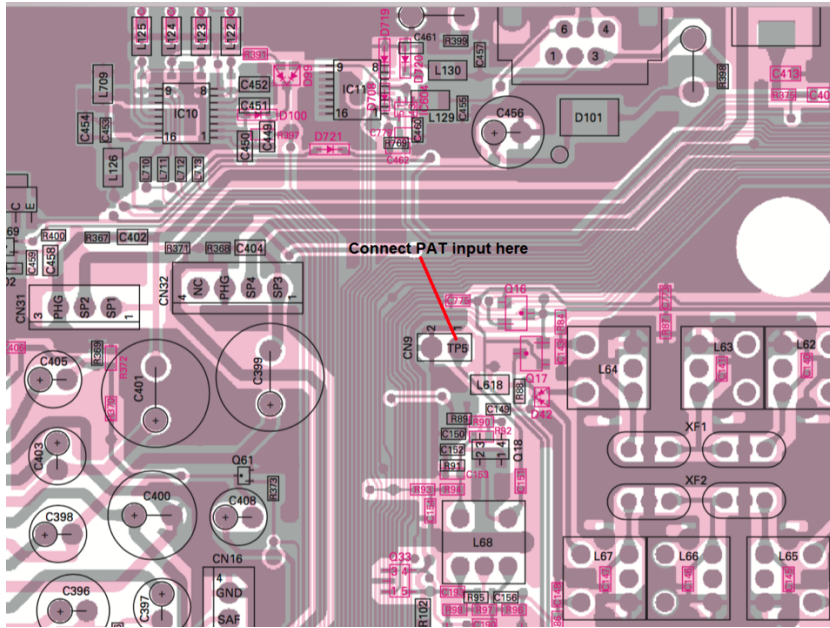


Fig 4 PCB Layout showing CN9 for PAT input connection

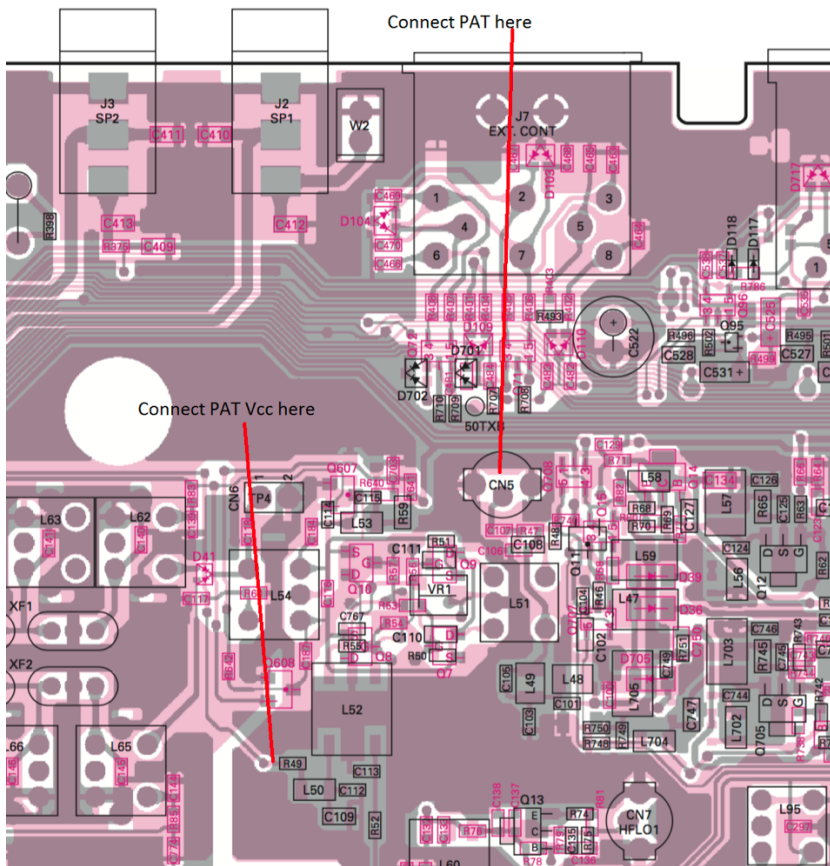


Fig 5 – Vcc connection point for the PAT on the Tx-Rx1 IF Unit PCB Layout (P146 Service Manual)

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