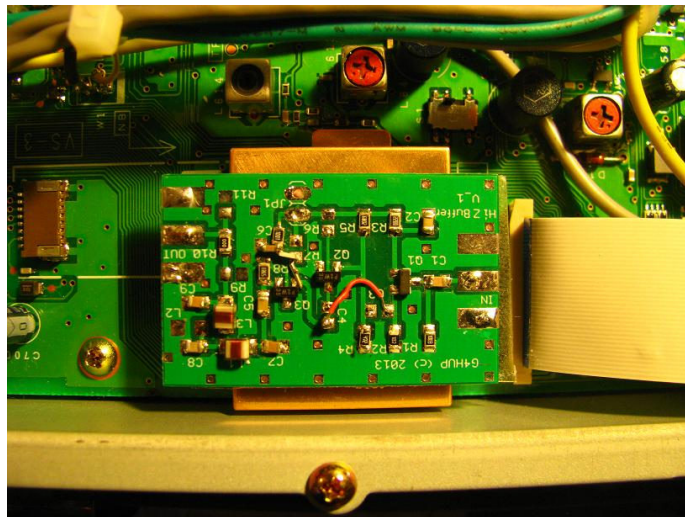


## G4HUP Panoramic Adaptor Installation – TS2000

These instructions cover installation of the PAT board in the 2<sup>nd</sup> IF of the TS2k – 10.695MHz – this gives access to all receiver options on the main receiver, including 23cms for TS2k X versions. The process can be followed regardless of whether the TS2k has the Digital Voice Recorder or Voice Synthesiser options installed.

The TS2k uses different Rx and Tx IF's, due to its Satellite capability, so there is no need to mute the PAT board during transmit.

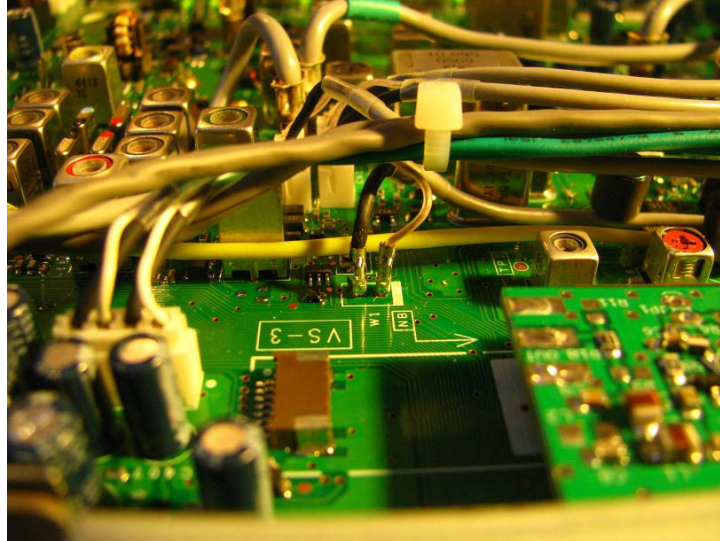
- 1 Build and test the PAT kit – use a 12v supply and you should measure a gain of approx 0dB at 10.7MHz.
- 2 Remove bottom cover from TS2K (10 screws).
- 3 The 2K has an HF RX antenna input jack (RCA) on the back panel. The centre contact of the connector appears a metal plate, central in the rear of the connector. If you do not use this, then it is an ideal method of getting the PAT output from the rig. The use of the socket in the normal mode is controlled by a relay – it is recommended that this is switched out of use by accessing Menu 18 and setting to OFF (p76 of TS2k manual) when using the socket for PAT output. If you do use it for an antenna input, then you will need to find an alternative exit from the rig, either by mounting an SMA or similar on the panel, or running a flying lead out.
- 4 The PAT board mounts conveniently in the space for the DRU-3A, or on top of its screening can, if it is installed - see Fig 1. From this position, the input from the filter is just a short run.



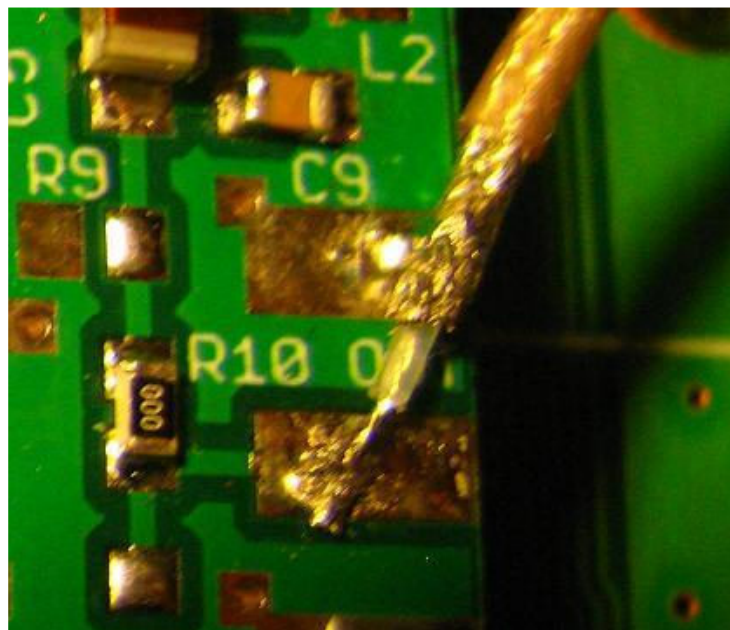
**Fig 1 – Mounting position of the PAT board in TS2k – note that the PAT input is to the right in this picture**

- 5 The PAT board is held in place by double sided tape, so can easily be removed should it become necessary – it will not obstruct anything nearby. It is recommended to use DS tape to hold a layer of card to the screening can or PCB, then a second piece of DS tape to hold the PAT board in place.

- 6 The RF input to the board comes from the W1 connection, adjacent on the PCB. The plastic around the connector must be carefully removed so that the connections can be soldered in place – see Fig 2.
- 7 Prepare a 10cm length of RG178 cable to make the connection between W1 and the PAT input, and a 29cm length to make the output connection to the HF Rx Ant RCA jack. Do not pigtail the ends, but make them off as in Fig 3. See also details at the end of this note.
- 8

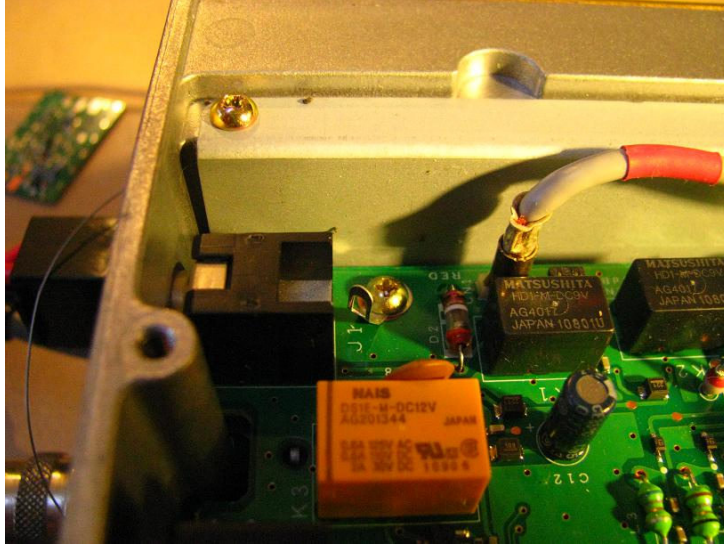


**Fig 2 – W1 connector with plastic housing removed – PAT board in right foreground**



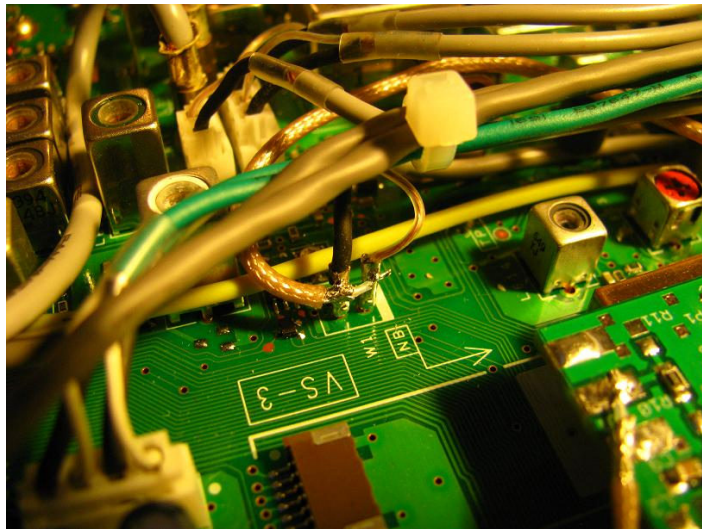
**Fig 3 – RG178 cable termination**

- 9 Fit a solder tag under the PCB mounting screw closest to the RCA jack – bend it up as shown in Fig 4.

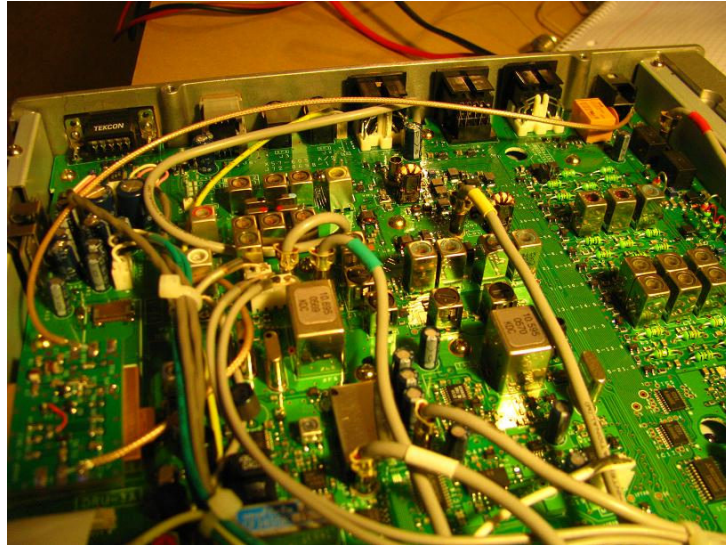


**Fig 4 – Solder tag installed by RCA jack on rear panel**

- 10 Using the cables you have prepared, connect the PAT output to the RCA jack, and connect W1 to the PAT input. On W1, the black wire is ground and the white/translucent wire is signal, as shown in Fig 5 and 6.

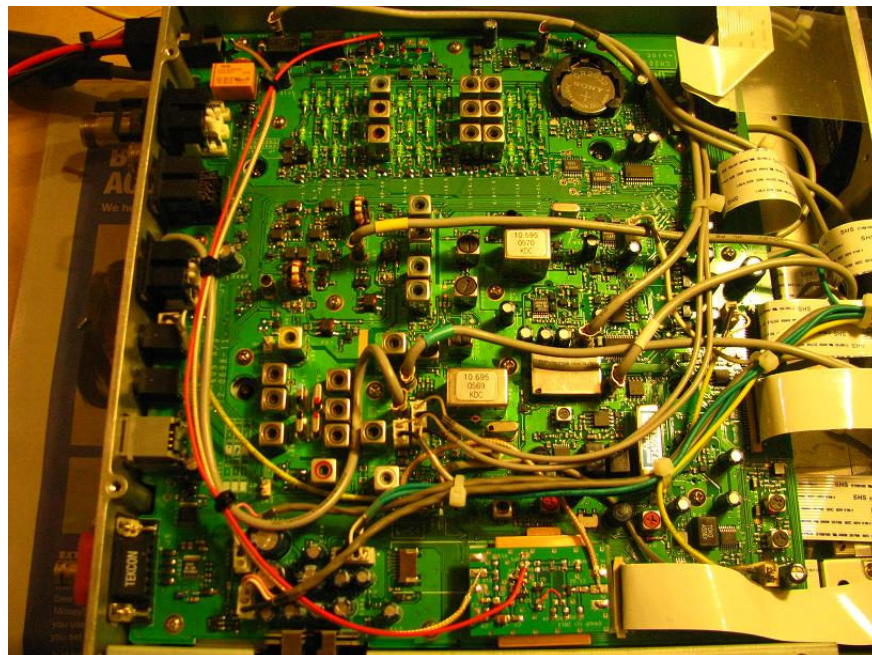


**Fig 5 – W1 connection to PAT input**



**Fig 6 – Routing of output cable from PAT to RCA Jack**

- 11 Power for the PAT board is picked up from the cathode of D9, as in Fig 7. Note that D9 is close to the side wall of the rig, and in front of the two relays. Take care not to confuse it with D5, which is also close by. Only a positive lead is required, since PAT gets its ground connection via the outer of the coaxes.
- 12 Use some small cable ties to secure the output and power cables to the other wires across the back of the chassis.
- 13 Replace the cover, connect and test.



**Fig 7 – Power lead routing.**

## Terminating PTFE Coax cables

These instructions could be used, with suitable modification, to correctly terminate any of the PTFE coax cables, such as RG142, RG178, RG188, RG196, RG316, etc. The termination method ensures good quality RF connections up to higher microwave frequencies

Using a scalpel, cut the sheath back at the required length.

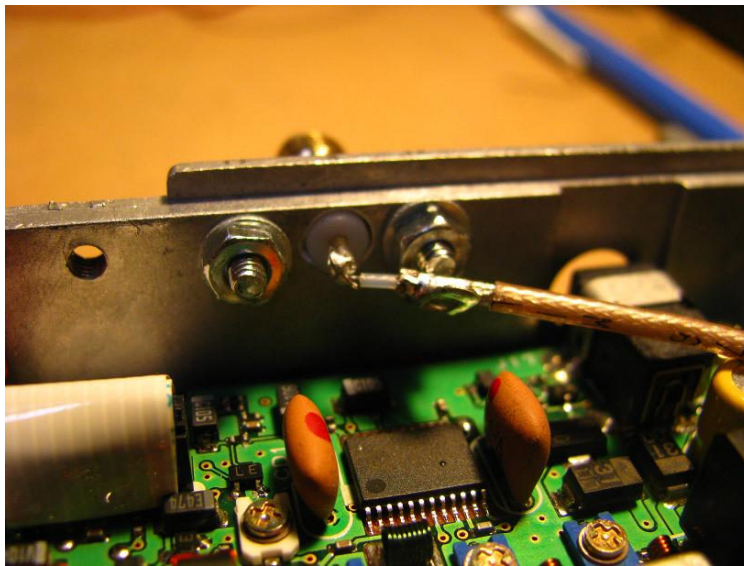
With a hot iron, tin the exposed braid fully.

With the scalpel, score around the point where the screen must end.

Use long-nose pliers to bend the end of the coax outside the score line – the braid will crack on the score and the excess can be slid off the dielectric.

Strip the dielectric to reveal the inner.

Fig 8 shows a correctly terminated cable installed in an FT817, and you can see other examples in Figs 3 and 5 above.



**Fig 8 – Correct method of termination for the RG178 cable**

Table 1 below shows the measurements recommended for the cable end preparation for the TS2k installation and Fig 9 below gives further clarification.

Cable	TS2k Connection	Sheath	Braid	Dielectric	Inner
Input	W1	6.5mm	2.5mm	2mm	2mm
Input	PAT	8mm	3.5mm	2mm	3.5mm
Output	PAT	8mm	3.5mm	2mm	3.5mm
Output	RCA	10mm	4mm	4mm	2mm

**Table 1 – Cable stripping details for TS2k installation**

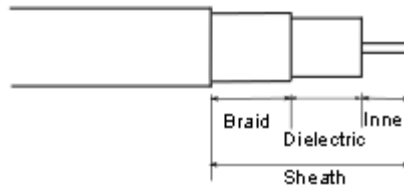


Fig 9 – Cable termination preparation details

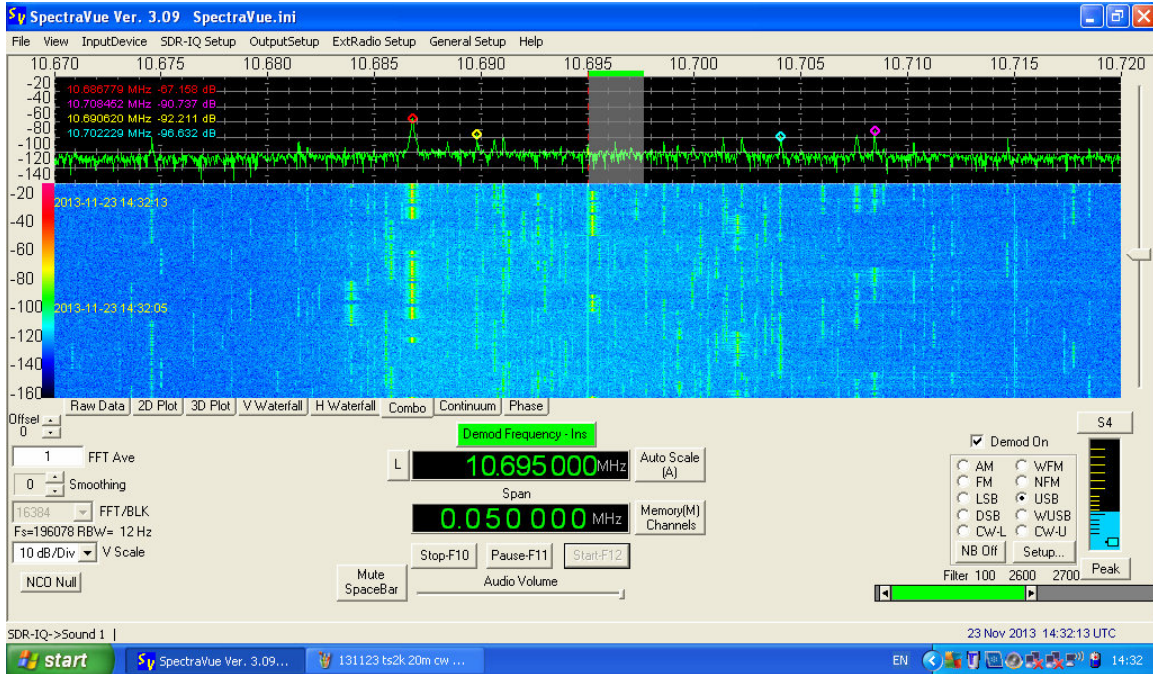


Fig 10 – Screen shot of CW activity on 10m

The screen shot in Fig 10 was taken via an SDR-IQ using the PAT board in the TS2000 connected to a very inefficient antenna. Note that the display is 50kHz wide, and whilst the centre 30kHz is plainly the most sensitive, this demonstrates that useful information can be seen over the full range.

#### Other sources

See also [www.telepostinc.com/Mods/K4DSP-TS-2000-mod.pdf](http://www.telepostinc.com/Mods/K4DSP-TS-2000-mod.pdf) as a useful source of information