## Main Identity

**From:** "TRN Walford" <walfor@globalnet.co.uk>
**To:** "David (M0EZP)" <m0ezp@tiscali.co.uk>
**Sent:** 05 December 2005 21:18
**Subject:** Re: Montis problems

I have spent much of this evening on your Montis. I cannot find anything fundamentally wrong after changing all the RF devices and checked all through - hence I conclude it was too optmisitc of me to expect a fairly reasonable output on the bands above 20m. (Note that I was always a little cautious about that!) However! I have modifed yours in several ways which has lifted the peak output on 15m to 1 Watt on a 13.8 volt supply. These are the mods:-

1. R303 reduced to 82R to increase current in TR302 from 150R — I went for 100R * 9/10/10 changed back to 150R
2. Extra 2N3819 buffer stage interposed between R310 and TR304, it has a 1K5 in the 3819 source to deck and a decoupling 150R/10 nF from the VP point to the drain. The source feeds the BS170 gate direct. This reduces the high frequency loading on the 612 output.
3. I have also shorted out the protective diode D303 to increase the supply voltage as quite a small change in volts produces an increase in output. You might feel that you wish to retain the protection instead!

tx was shutting down!

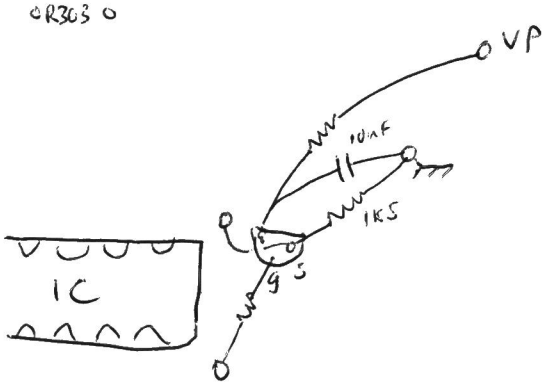
now removed

With these mods and a about 0.5 A in IRF510, with max RF drive it produces a reasonably good 1W peak on mod peaks. I am not sure what the same settings will do on the lower bands (I thought you would rather have the good news first!), they might be overdriven so that a lower compromise setting is needed for RT300 but I doubt many would notice if you did leave that running flat out! The transmitter amp stages do have frequency dependent feedback due to L305R304 so the TX strip gain will be reduced a bit if other things were equal and its possible that reducing R304 might reduce the LF drive without any appreciable effect on the higher bands due to L305.

My suggestion is that I leave it like this. I have not tried the Linear or AMU etc. If you are content I suggest that you let me have a £10 note to cover postage and parts mainly. I appreciate that these diffculties are partly my fault which is why I am not charging you full whack! Incidently I did find the one major error of the source of TR300 being soldered on the wrong side! It was luck that it worked at all in that condition! I will include the replaced devices so you get those for the note!

I am sorry it has taken so long but as you know it happened to coincide with a rather busy time getting Hot Iron out and the need to update my website prior to the articles about the Kilve which will appear in the next PW due out soon. Thank you for your pateince.

Regards, Tim



## Main Identity

**From:** "David (M0EZP)" <m0ezp@tiscali.co.uk>
**To:** "TRN Walford" <walfor@globalnet.co.uk>
**Sent:** 10 December 2005 17:04
**Subject:** Re: Montis problems

Tim,

Yes, very good news on the tx - your mods have done the trick. 15, 40, 80 and 160 are all producing good outputs barefoot (see below). I realigned the tx drive-linear bias following the Linear instructions and was puzzled for a little while with the results - (#1 below). However I then realised I might have to reduce the tx drive a bit as you'd suggested (75% of travel seemed about right) and the power came up nicely - (#2 below).

| | tx | linear#1 | linear#2 |
|---|---|---|---|
| 160m | 1.8w | 4w | 10w |
| 80m | 1.6w | 7.75w | 10w |
| 40m | 1.3w | 8w | 10w |
| 15m | 1.0w | 5w | 5w |

5w is probably fine on 15m, I could get it higher by increasing the Linear bias but I thought that was probably a bad idea!

I'm hoping to have some fun with the Sutton over Christmas. It will be interesting to see the results for the 20m band card when I've build it but I'm pretty confident it will be fine. I'll also sort out the web downloadable Sutton and Sutton+AMU panel layout that I promised, which members might like when customised, printed and laminated.

Regards

David

----- Original Message -----

> **From:** TRN Walford
> **To:** David (M0EZP)
> **Sent:** Monday, December 05, 2005 9:18 PM
> **Subject:** Re: Montis problems
>
> David,
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Regards, Tim

| Freq | S-meter | |
|---|---|---|
| 3208 | 0.1 | |
| 3306 | 0.1 | |
| 3403 | 4.5 | |
| 3500 | 3 | X |
| 3600 | 6 | LO |
| 3698 | 0.1 | |
| 6700 | 0.1 | |
| 6806 | 0.1 | |
| 6904 | 0.1 | |
| 7000 | 0.1 | |
| 7099 | 6 | **X+LO** |
| 7196 | 3 | 2LO |
| 7296 | 2.5 | |
| 7394 | 0.1 | |
| 8215 | 2.7 | FT747-2ndIF |
| 10402 | 3 | |
| 10502 | 3.3 | 3X |
| 10600 | 6 | 2X+LO |
| 10698 | 3 | X+2LO |
| 10795 | 4 | 3LO |
| 10892 | 0.5 | |
| 10990 | 0.1 | |
| 13512 | 0.1 | |
| 13610 | 0.1 | |
| 13707 | 2.8 | |
| 13805 | 2.8 | |
| 13902 | 4.5 | |
| 14000 | 4.5 | 4X |
| 14100 | 0.1 | |
| 14198 | 4.5 | 2(X+LO) |
| 14294 | 6 | X+3LO |
| 14392 | 4.5 | 4LO |
| 14492 | 2.5 | |
| 14585 | 0.1 | |
| 16428 | 0.5 | 2xFT747-2ndIF |

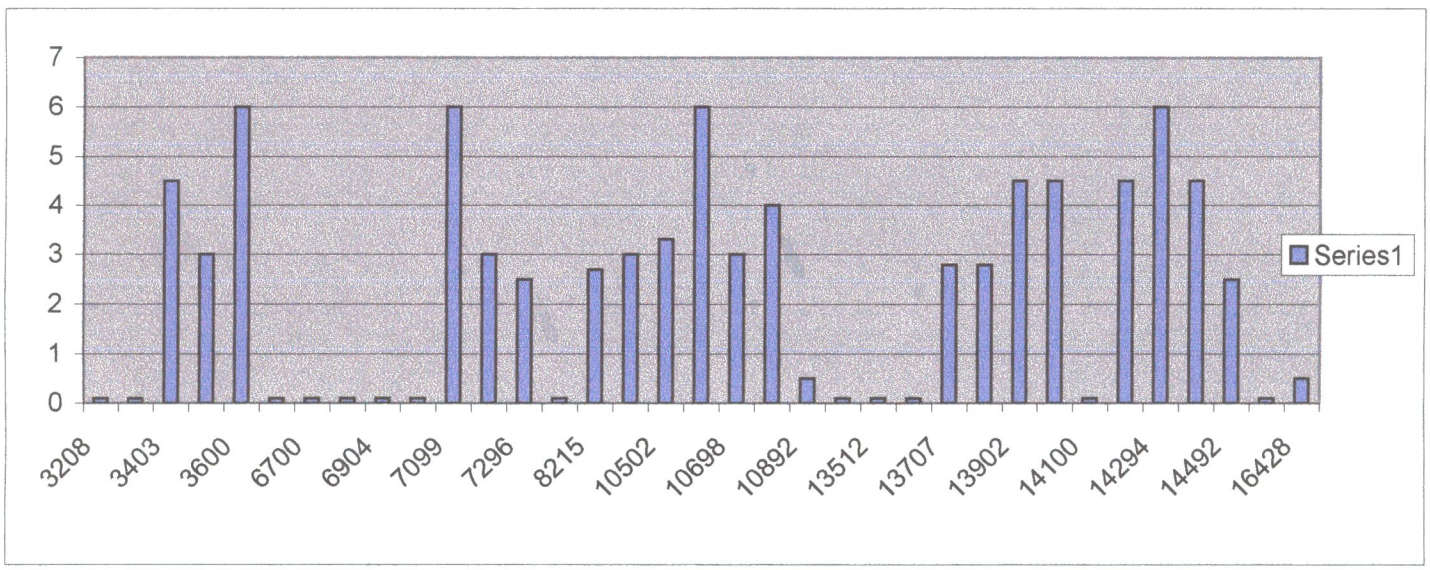
**40m spectrum analysis as measured by small coil RF probe to Y**

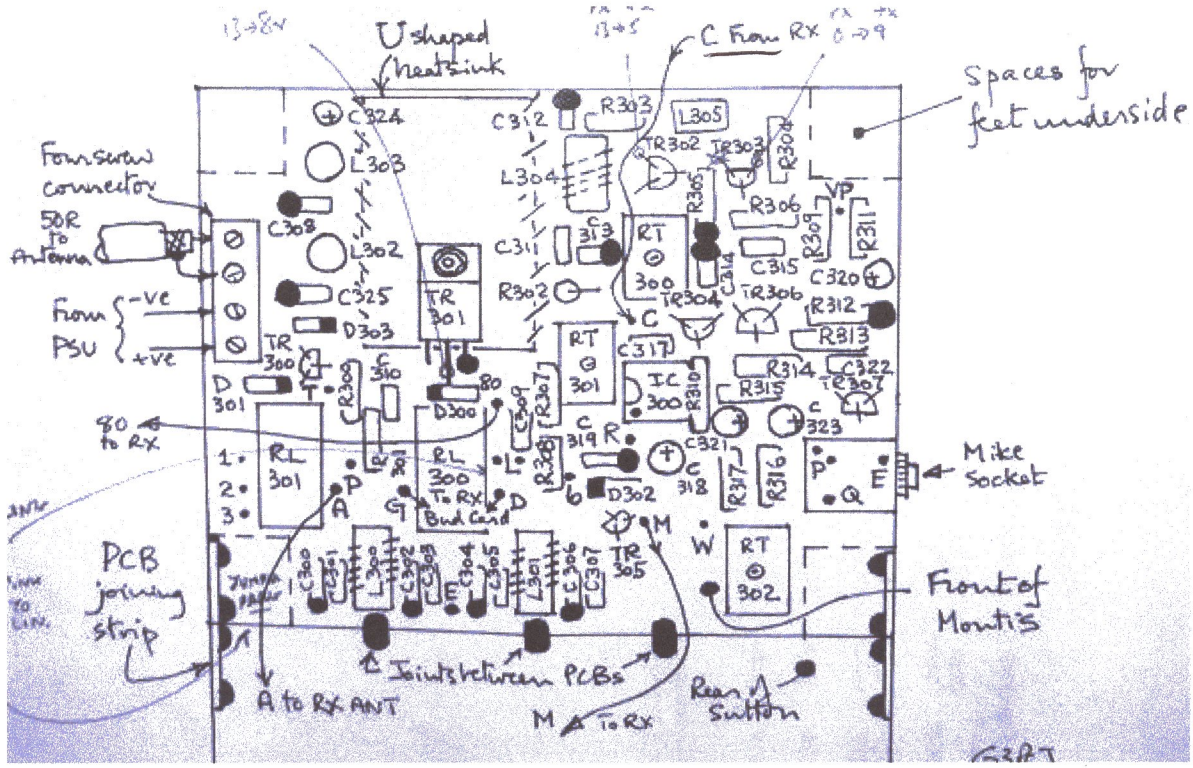
Xtal = 3500kc

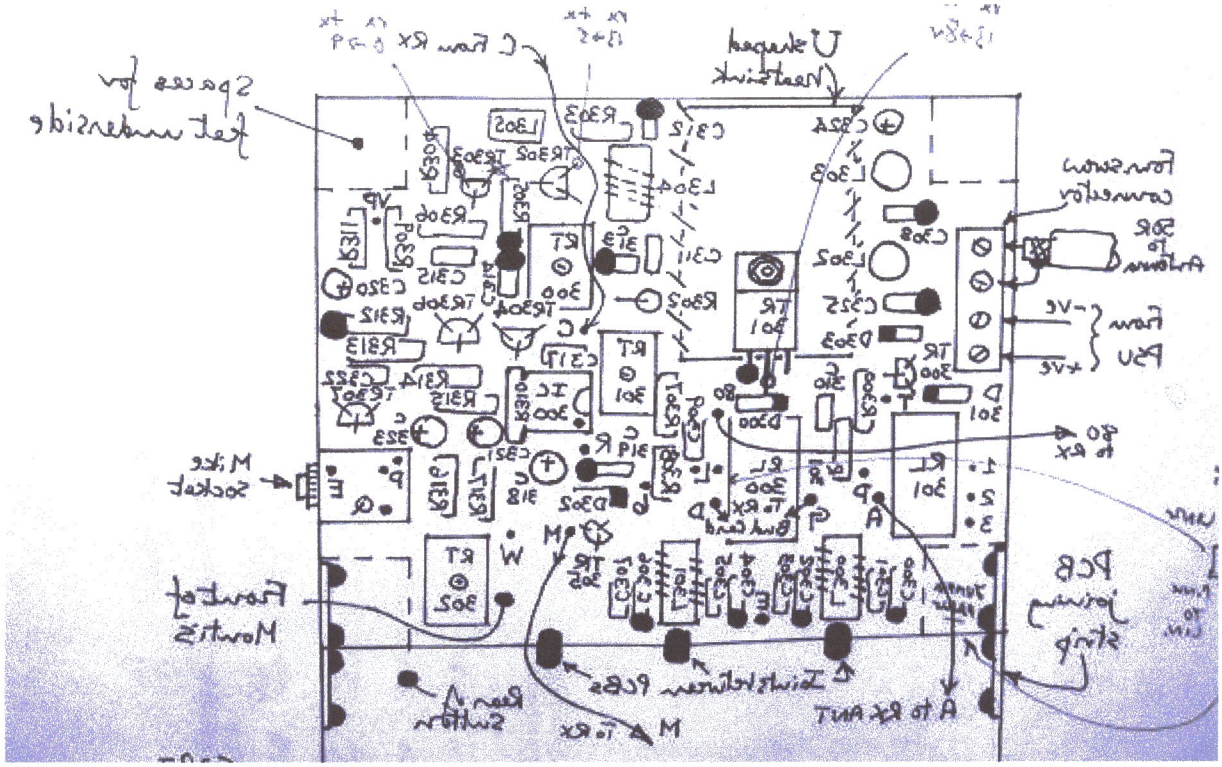
Local Oscillator = 3600kc

Diff product = 100kc

Sum product = 7100kc




U shaped heatsink
C From RX
Spaces for feet underside
Four screw connector
50R To Antenna
From PSU
-ve
+ve
TO RX
Mike Socket
PCB joining strip
Front of Mounts
Joints between PCBs
A to RX ANT
M To RX
Rear Switch
RL 301
RL 300
TR 301
TR 300
TR 305
RT 300
RT 301
RT 302
IC 300
To RX Bud Card



RF volts supplied to Driver Stage (output of Drive ckt to C315)

→ Dummy Load — Linear reduction with Drive | Power red dn

→ Res Ant " " | Power rise @

TR303 → Res Ant

G. Lnear

S. Lnear

TR302

G Lnear — Same. S is grnd ✓ checked

D. Lnear then trips & goes high.

TR301

G — ~~No RF~~ Lnear then goes high

D — Lnear then trips

---

~~C311~~ RF getting to C311 but not then TR302 not then C315 became TR303 Grid dn.

VP side of R303 Lnear

---

IC300 pin 3 to Earth. ✓

## Main Identity

**From:** "David (M0EZP)" <m0ezp@tiscali.co.uk>
**To:** "Tim Walford" <walfor@globalnet.co.uk>
**Sent:** 01 May 2007 08:22
**Subject:** Re: Sutton

Tim,

Thanks for the confirmation. We had a good look at the receiver section last night primarily using a scope (Hameg HM104 Y amp to 100MHz)...Oh ignorance was bliss!

We found a few things which surprised us so I have some observations and questions:-

1. I'd noticed that I could measure frequency with my multimeter from the VXO section as far as C106A but not beyond. I'd tested the cap and it appeared to be the right value. With the scope we could see the power dropped considerably across the cap and then we realised C107 is doing a potential dividing job. Is this to reduce the input the SA602 to about a tenth or so? – Yes but probe also ↑ dividing action through capacitance
2. The waveform coming out of the VXO section is a nice sine wave when using the higher capacitance band segment CV100B+CT100. Using the lower capacitance CV100A, as capacitance is reduced, the waveform quickly declines to something resembling lumpy potato shapes! Should I swap out the polyvaricon or is this a symptom of running with a very low capacitance in series with the resonator? – expected quirk! No action (Ver! Yes.)
3. All further tests were done using the higher capacitance segment...
4. 80m input into Product Detector IC102 looked clean but the output to point C is noticably mushy although essentially a sign wave. Is this what you'd expect? No
5. We tried 40m and 20m band cards for the following tests and both band cards showed similar results...
6. We couldn't detect a signal from the Crystal into the mixer IC100 at point 6, yet the mixer output seems to have found a signal somehow. Is this what you'd expect? No! – effect of the probe ???
7. Checking at point X we see a sinewave but it is rather mushy.
8. Output from Mixer IC100 on pin 5 was very strange - it didn't look at all like a signwave, it more resembled a 3D terrain plot of contours!
9. Output from buffer TR100 to plug in board pin 2 input to RX LO BPF was much cleaner but again a rather mushy signwave.
10. Output from RX LO BPF looked very similar to the input, a mushy signwave. We tried to improve this output by adjusting L153 and L152 but all this seemed to change was the amplitude. Of course around 40m there would be 2xXtal.Xtal+VXO.2xVXO etc and quite difficult to narrow it down to just Xtal+VXO. Is this what you'd expect? will be difficult to filter properly
11. Finally we looked at the transmit output (with band card) into a dummy load to compare it with point C input...
12. Output power seems to rise in a linear manor from zero to max - power meter and swr look reasonable.
13. However, we found three different situations depending on drive level - Is this what you'd expect?
    i) low to medium drive, to about 65% travel - very mushy waveform
    ii) highish drive, quite narrow portion 70-75% travel - clean signwave ← asked about modulation.
    iii) high drive, beyond 75% - waveform in chaos!

Sorry for all the words! Much appreciate any comments Tim.

Best regards

David

> ----- Original Message -----
> **From:** Tim Walford
> **To:** David (M0EZP)
> **Sent:** Monday, April 30, 2007 8:27 AM
> **Subject:** Re: Sutton
>
> David,
> Tha sounds logical but I would put money on the real problem being associated with teh output stage, LPFs, relays and connections to AMU and aerial/earth. I doubt it is in the ealier stages. Thats not to say that feedback is not occuring, but I am pretty sure those strange readings are 'output' related. Tim

Montis voltage measurements - M0EZP 10th March 2007

| | measured between | In Receive volts | In Transmit volts |
|---|---|---|---|
| | Point T - ground | 0.0 | 12.5 |
| | Point 6 - ground | 0.0 | 6.2 |
| unbalance the mixer by grounding point R | | | |
| IC300 output | pin 4 - ground | 0.0 | 5.1 |
| 2N3819 | gate - ground | 0.0 | 5.1 |
| Buffer | source - ground | 1.4 | 5.6 |
| (mod for 15m) | drain - ground | 13.1 | 12.1 |
| BS170 | gate - ground | 1.4 | 5.6 |
| TR304 Buffer | source - ground | 0.0 | 3.1 |
| | drain - ground | 13.2 | 12.1 |
| 220R Drive pot | set half-way | | |
| BS170 | gate - ground | 13.2 | 5.5 |
| TR303 Driver | source - ground | 0.0 | 3.0 |
| | drain - ground | 0.0 | 9.3 |
| BS170 | gate - ground | 0.0 | 3.0 |
| TR302 Driver | source - ground | 0.0 | 0.0 |
| | drain - ground | 13.2 | 5.6 |
| IRF510 | gate - ground | 0.0 | 4.2 |
| TR301 PA | source - ground | 0.0 | 0.0 |
| | drain - ground | 13.2 | 12.4 |

