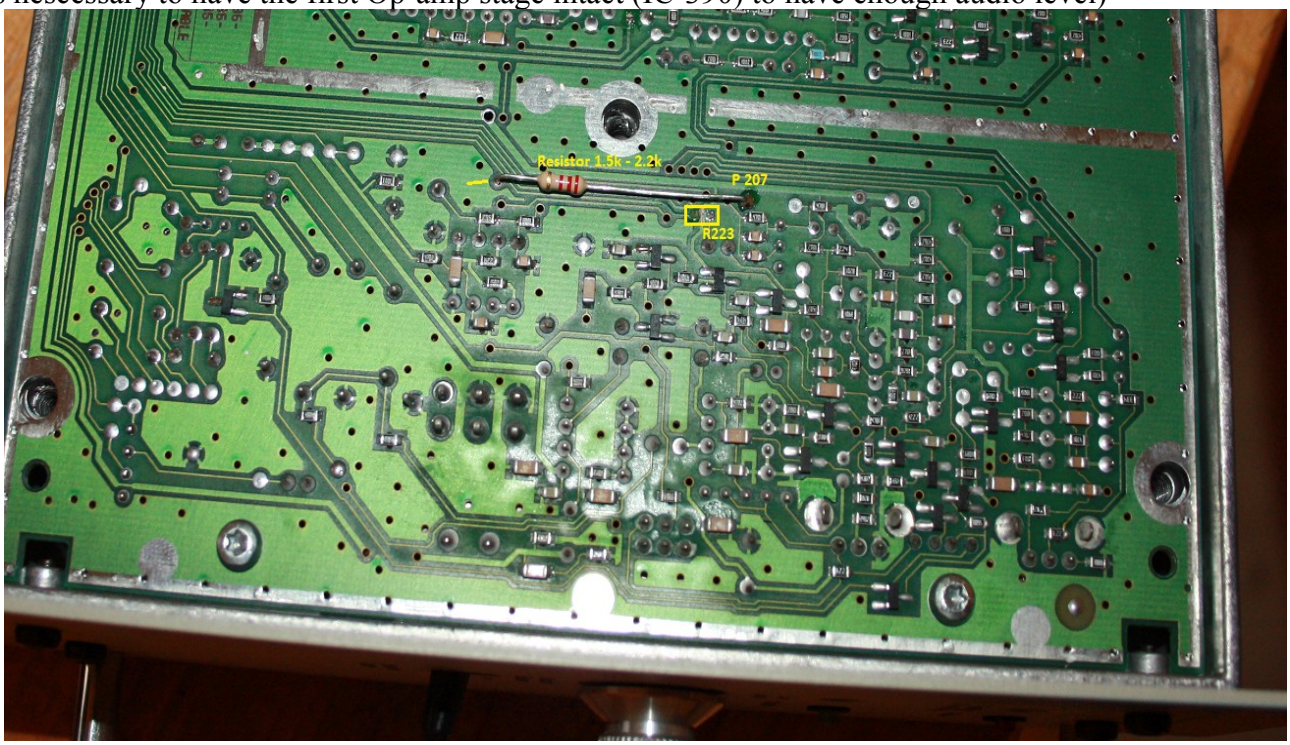
Tait T-800 *II* - modification for digital modes (D-Star, Fusion and DMR)

Hardware modifications on the **T-835** RX (VHF) module only !

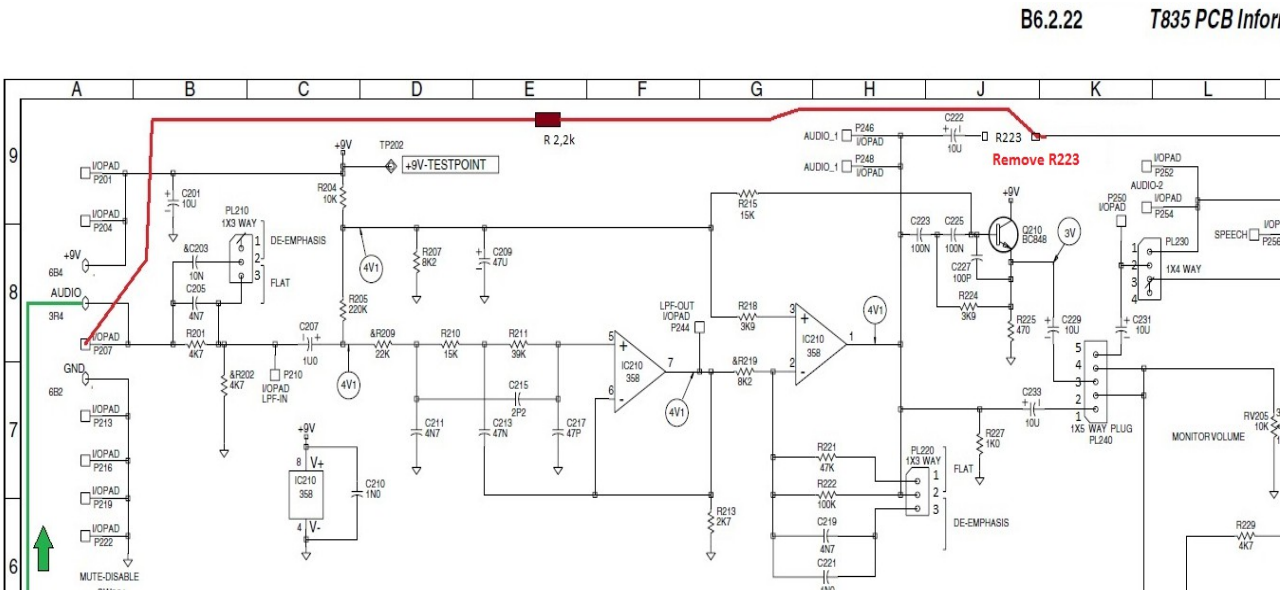
Open the module (take both sidepanels off)

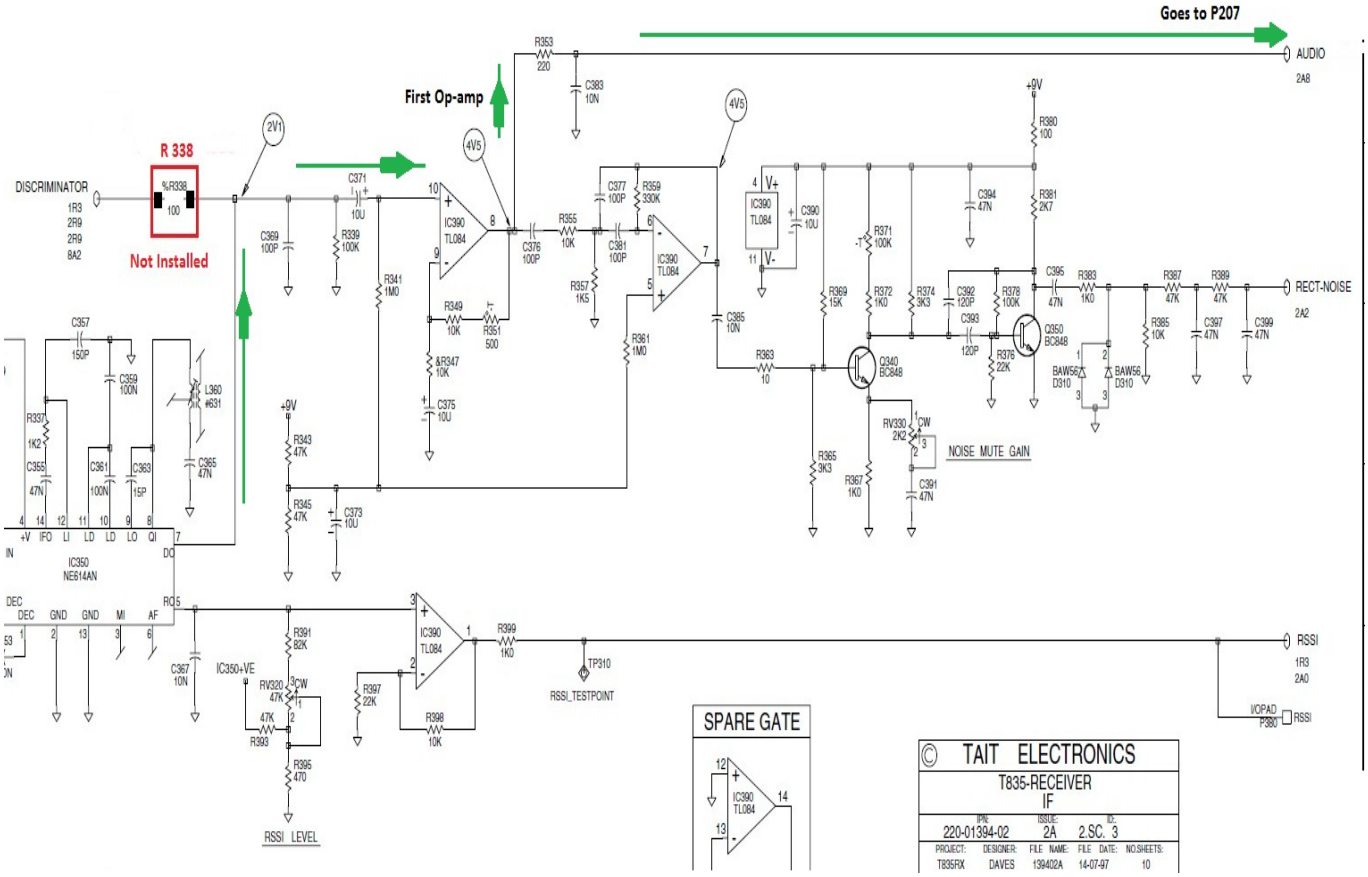
Locate resistor R223, remove it. Do **NOT** add resistor R338 on the open pad (discriminator) !

Solder a 1.5k to 2.2k resistor between PCB hole **P207** and PCB hole on the picture below:
(it is nescessary to have the first Op-amp stage intact (IC-390) to have enough audio level)



This will bypass a lot of the audio circuit (Op-amps etc.) on RX that will lead to delay and phase shift/phase distortion in digital modes. Audio is outputted at 15-pin D-sub at rear panel of module on pin 6 (PL-100). This pin goes to backplane pin 24 (Unbalanced RX Audio Out, with no SQL) on backplane **800-50-0001**




Goes to P207
AUDIO
2A8
First Op-amp
R 338
Not Installed
DISCRIMINATOR
1R3
2R9
2R9
8A2
2V1
4V5
+9V
R353
220
C383
10N
R380
100
R381
2K7
C394
47N
C395
47N
R383
1K0
R387
47K
R389
47K
RECT-NOISE
2A2
C371
10U
R339
100K
C369
100P
R341
1M0
IC390
TL084
R349
10K
R351
500
&R347
10K
C375
10U
C376
100P
R355
10K
C377
100P
R359
330K
C381
100P
R357
1K5
R361
1M0
C385
10N
C390
10U
R371
100K
R372
1K0
R374
3K3
C392
120P
C393
120P
R378
100K
R376
22K
Q350
BC848
R385
10K
C397
47N
C399
47N
BAW56
D310
BAW56
D310
Q340
BC848
R363
10
R369
15K
R365
3K3
R367
1K0
RV330
2K2
CW
NOISE MUTE GAIN
C391
47N
C357
150P
C359
100N
C355
47N
C361
100N
C363
15P
L360
#631
C365
47N
R337
1K2
R343
47K
R345
47K
C373
10U
IC350
NE614AN
+V
IFO
LI
LD
LD
LO
QI
DO
DEC
GND
GND
MI
AF
RO
C367
10N
IC350+VE
R391
82K
RV320
47K
CW
47K
R393
R395
470
RSSI LEVEL
R397
22K
R398
10K
R399
1K0
TP310
RSSI_TESTPOINT
RSSI
1R3
2A0
I/OPAD
P380
RSSI
SPARE GATE
IC390
TL084
© TAIT ELECTRONICS
T835-RECEIVER
IF
IPN: 220-01394-02
ISSUE: 2A
ID: 2.SC. 3
PROJECT: T835RX
DESIGNER: DAVES
FILE NAME: 139402A
FILE DATE: 14-07-97
NO.SHEETS: 10

The discriminator audio (IC350, NE614AN) on T-835 RX (VHF) is very low output, so the first Op-amp stage needs to be intact to have enough audio level. The first Op-amp is a TL 084 (IC390).

The balanced audio path on the module is still fully functional, so you can use this path for ordinary FM mode. In FM mode the SQL (RX Relay or RX Gate) circuit is used with CTCSS so the module will only open SQL when a valid FM signal with correct CTCSS is detected.

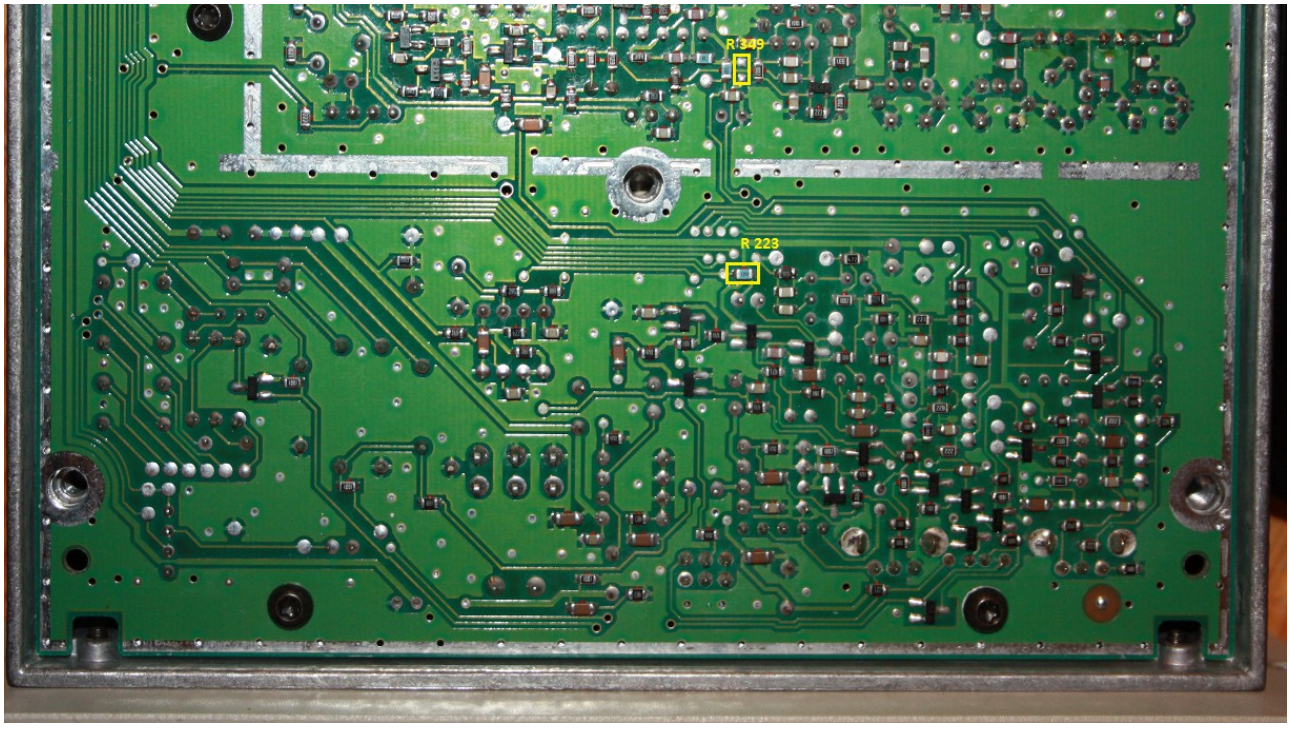
In digital modes the SQL circuit is not used, so the digital path is unaffected by CTCSS etc.

The T-855 RX module (UHF) is different and requires a different modification !

Open the module (take both sidepanels off)

Locate resistor R223, remove it.

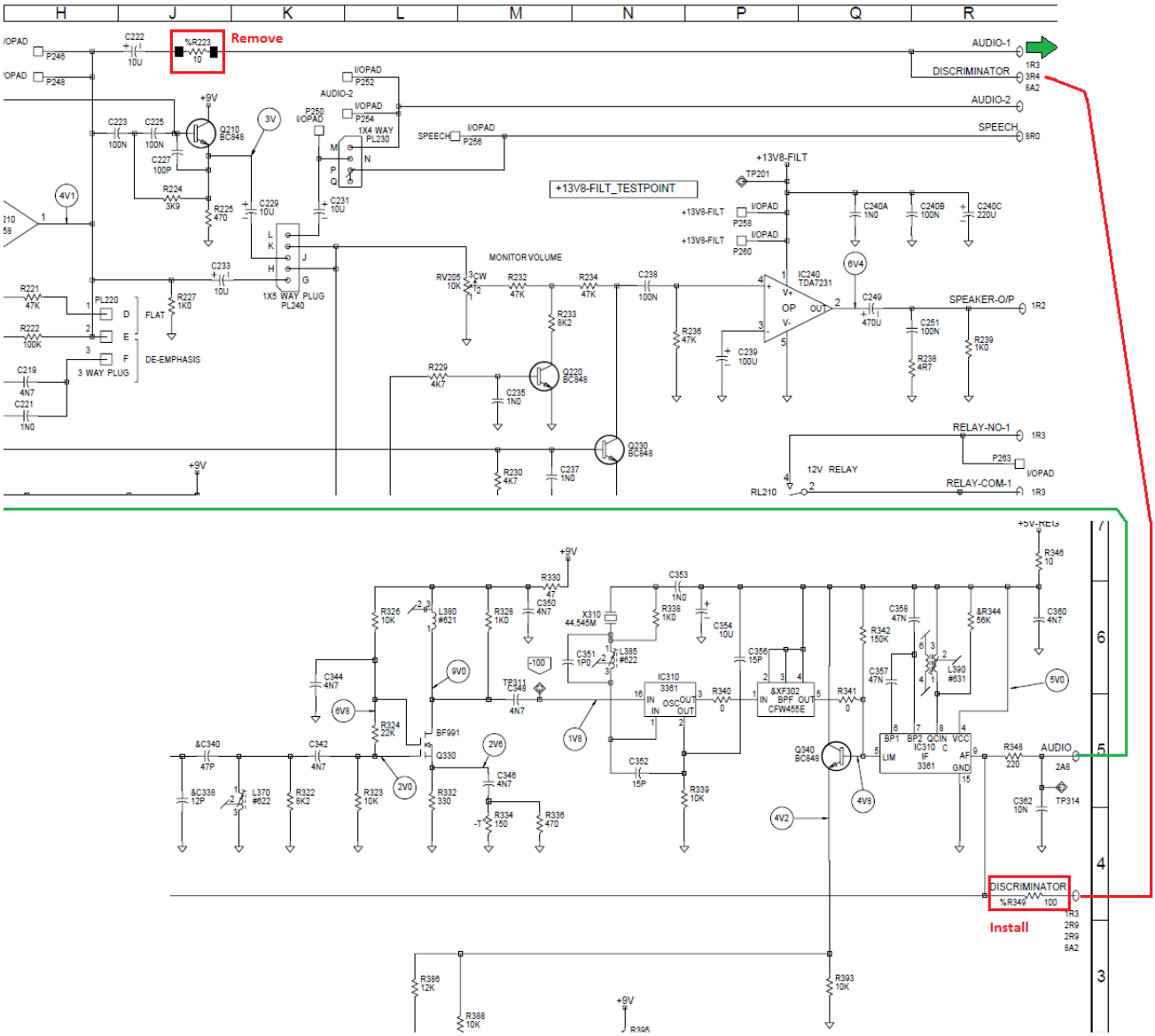
Install resistor R349 (**100 Ω, SMD size 0805**) on the open pad, see picture below:



This will bypass most of the audio circuit and allow discriminator audio to pass directly to Pin 6 on on 15-pin D-sub (PL-100) on rear panel of module. This will eliminate delay and audio phase shift/phase distortion etc. in digital modes.

The Audio Chip (MC3361CP, IC310) in the T-855 (UHF) is a lot more powerful than in the T-835 (VHF), so the first Op-amp stage is not nescessary in the T-855 UHF module. IC310 has an output of 1 Vp-p for 60% system deviation. So it can drive the input of MMDVM Zum board directly.

B6.3.22 *T855 PCB Information*



The balanced audio path on the module is still fully functional, so you can use this path for ordinary FM mode with CTCSS. You MUST use CTCSS in FM, if not the digital audio will also open SQL and go directly from RX to TX via the balanced audio path. That will make a mess out of everything.

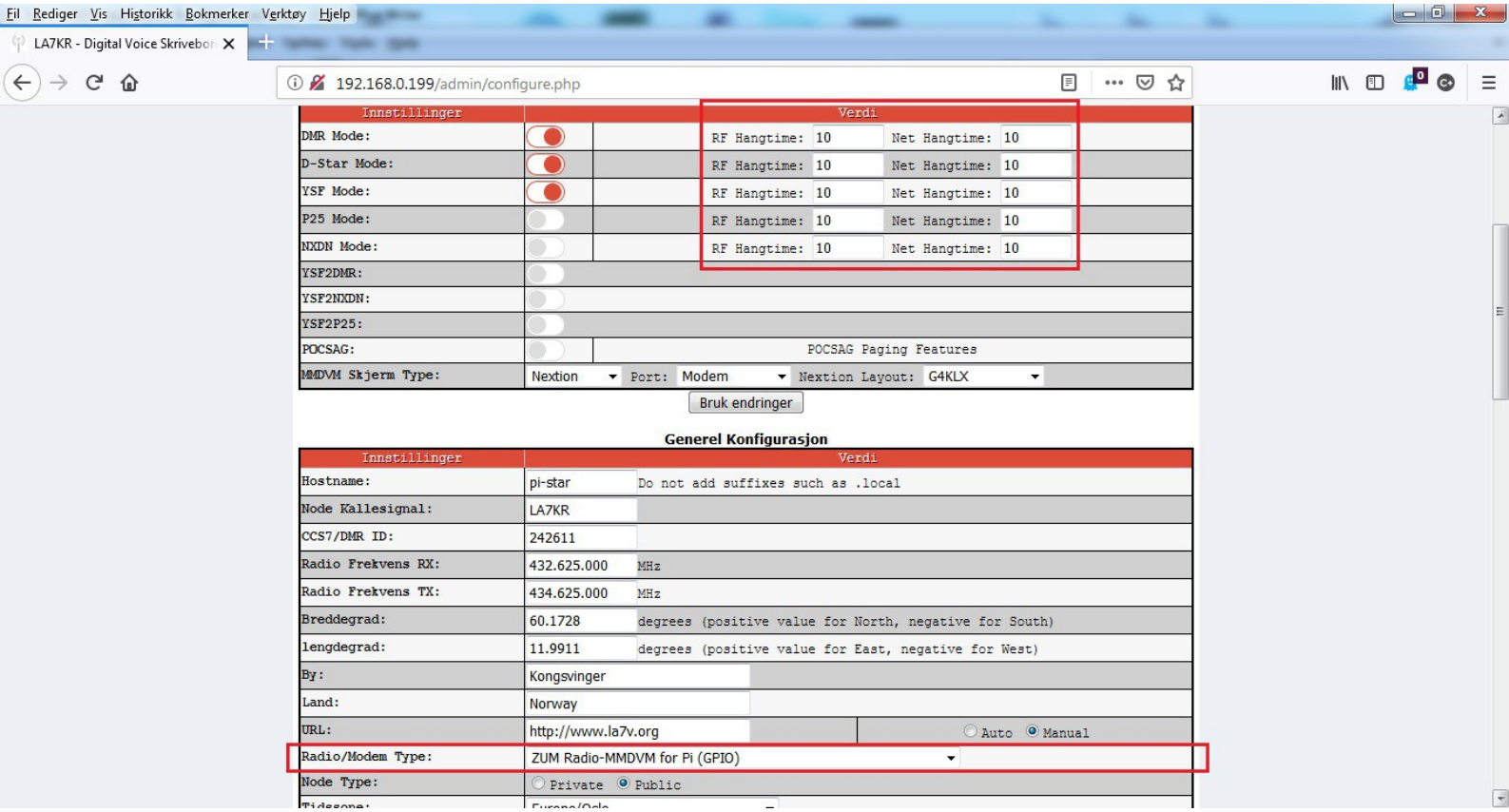
##

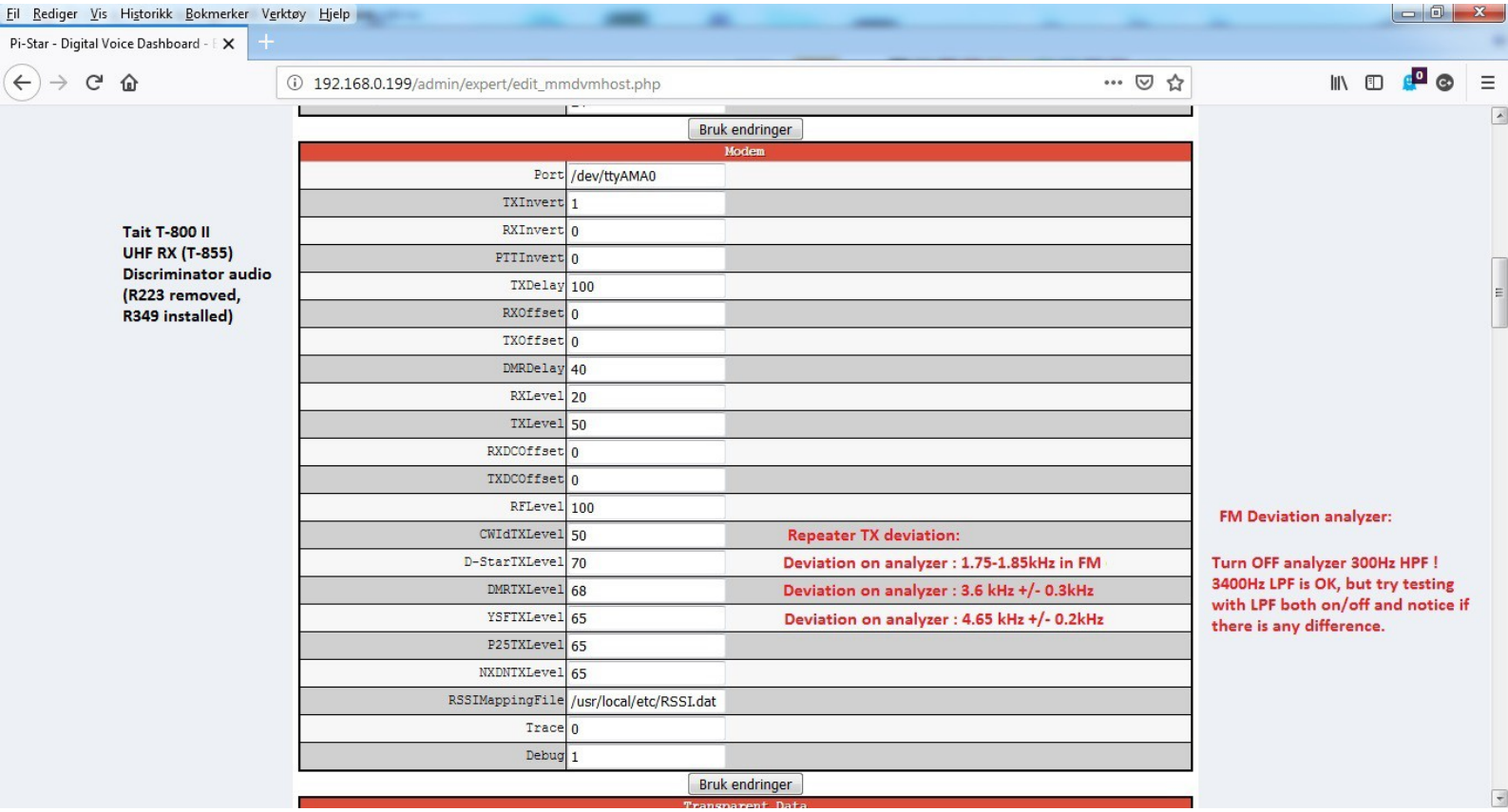
Next, here is a description on settings we used with the T-855 RX/T-856 TX and the **MMDVM Zum** board. Turn MMDVM RX pot (the one to the left) fully **clockwise** (minimum level) until it clicks. Turn MMDVM TX pot (the one to the right) fully **counter-clockwise** until it clicks (max level).

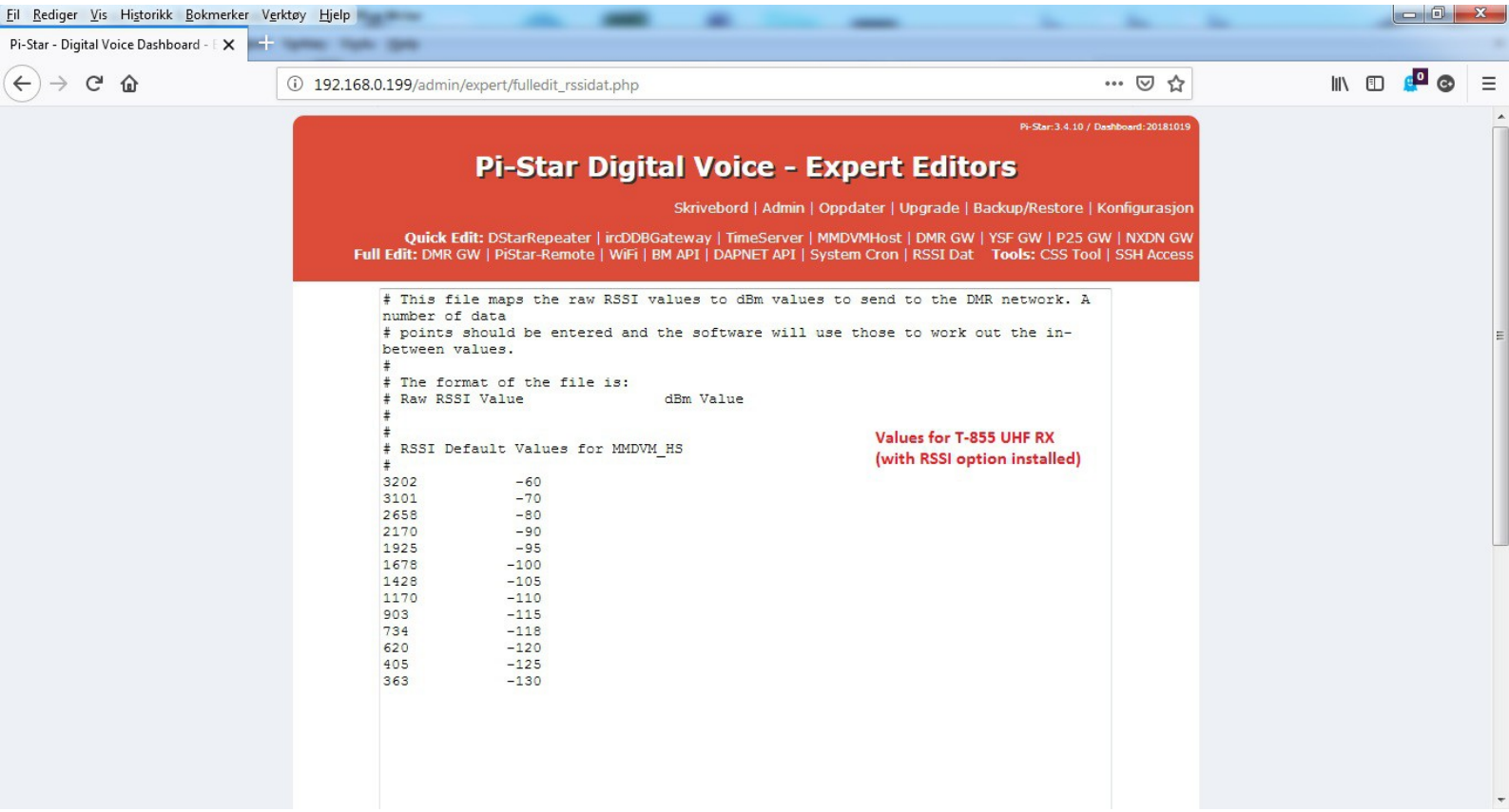
Wiring diagram between MMDVM Zum and T-800 II backplane 800-50-0001 is in a separate file.

Software settings for Pi-star using MMDVM Zum:

For T-855 (UHF) Only:







RSSI value is dependant upon the RSSI level POT inside T-855 RX regarding setting RSSI level to 2.0 V at test point with a signal input on RX of 3.0kHz deviation at level -110dBm.

November 2018 – LA4AMA Roar Dehli