

UserGuide for Repeater Kit Board (LinkerV3)



April 16, 2018

Repeater Kit Board interface definition (for Nano series) #MMDVM#, using with MOTO GM338/GM300/M120/GM3188, Interface definition reference, other devices follow board interface "PTT/TX/GND/RSSI/COR/RX" .

Compared with Duplex hotSPOT, it can provide larger and more stable power output without the need of TX amplifier.

Has verifying radio list ,

by Nano users:

@BD7NJC M120 ,same as GM300,

@BD7ILU GM300 , Can not change TCXO,otherwise (TX) to termail radio not work

@BH3PXX GM300 DR-1X FT-7800 C4FM DMR

@BH1RQN GM338 ,need change pi-star config **TXInvert=0**

@DW4CHZ maxtrac motorola ,two radio are working good without any adjustment on board

@BI7JTA CDM1250/CDM1550 need to do:

- 1) Re program radio follow user guide,
- 2) Change pi-star config **TXInvert=0**

GM3188, SM120 ...

Support Radio station list (Test by Early users)

<https://wiki.brandmeister.network/index.php/Homebrew/MMDVM>

The disadvantage is that there is no NXDN mode. The STM32F105 chip is used.

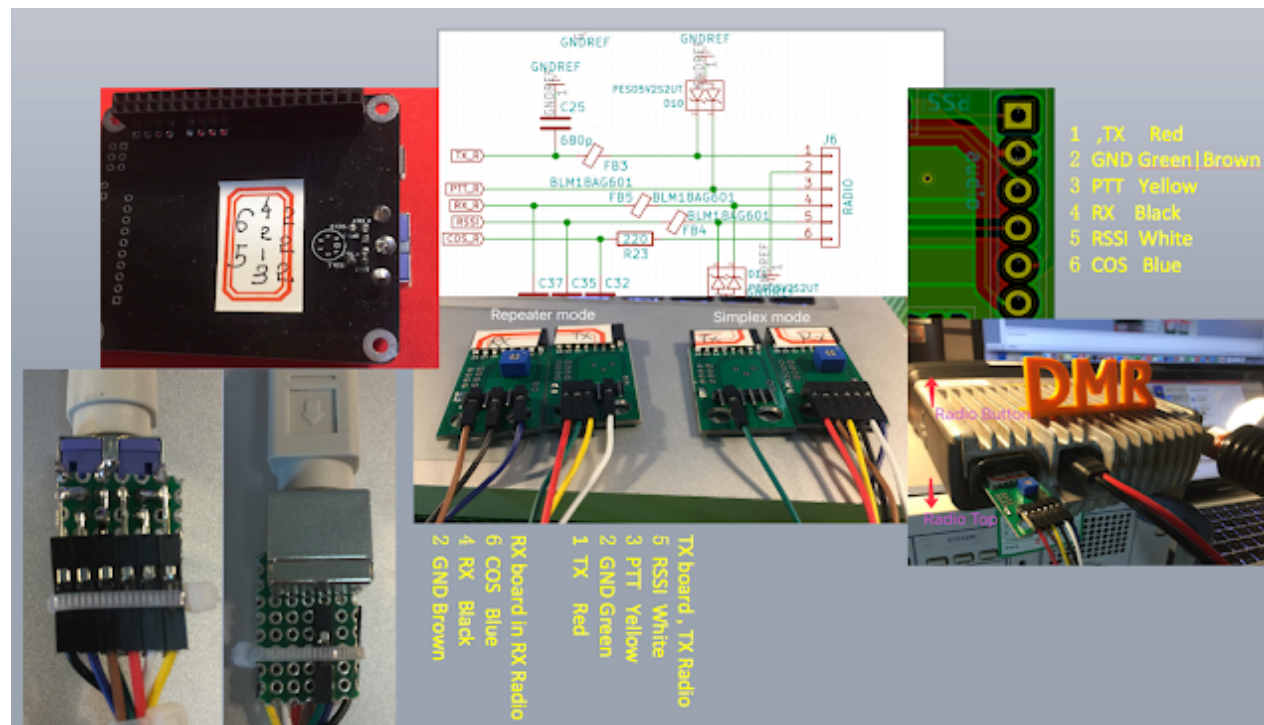
Suggestion:

1 Test simplex first, use 1x radio, when 2x radio can work well in simplex mode, then

2 test duplex with 2 radio + duplexer .

Otherwise, you do not know where is the problem.

Linker V3 define ↓



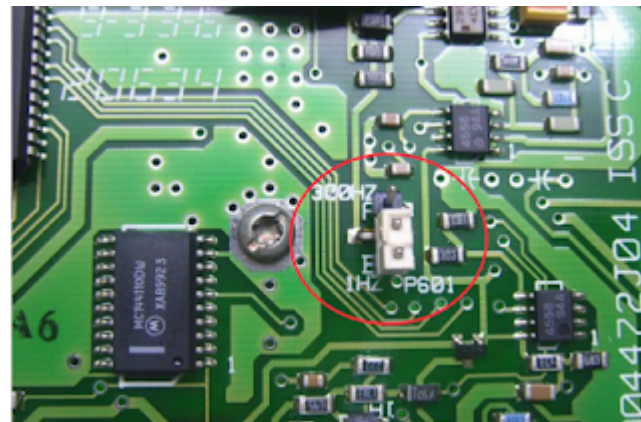
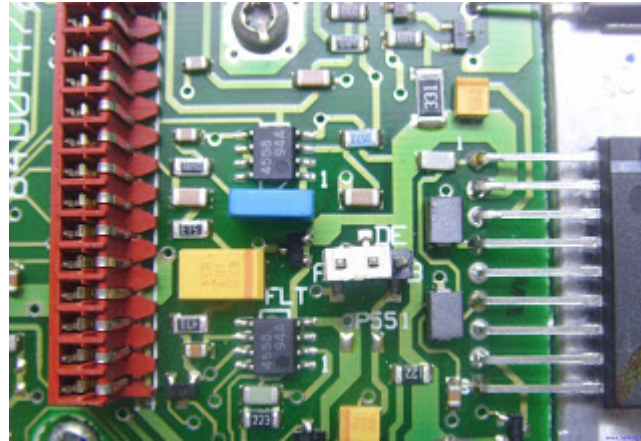
Act as a simplex hotSPOT ↓



Act as a repeater(Duplex) mode ↓



MOTO GM300 need modify the P551 to A, P601 to B, open the case, ↓



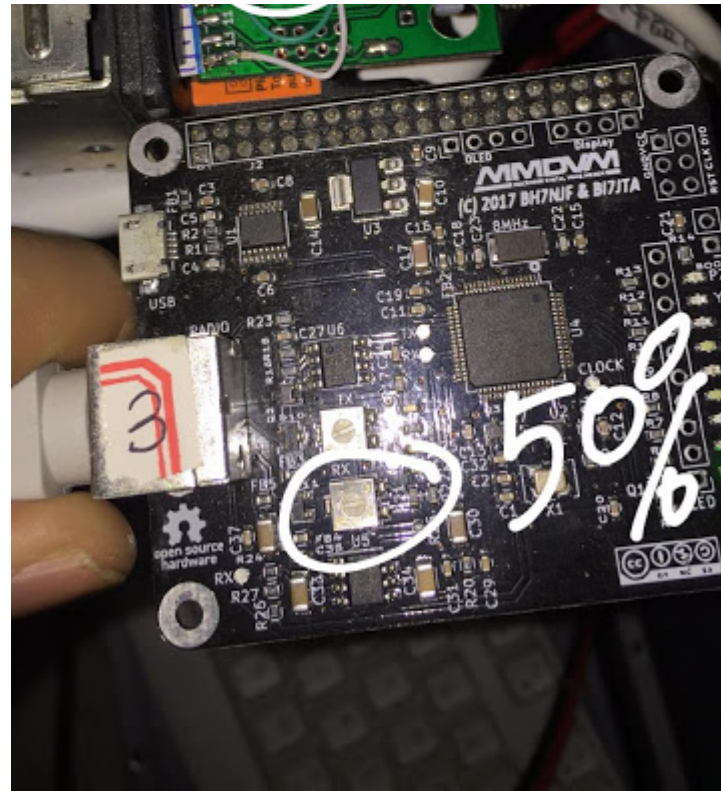
And keep the TCXO factory ,not change it ,otherwise the TX(gm300 to DMR radio can not decode data) ↓



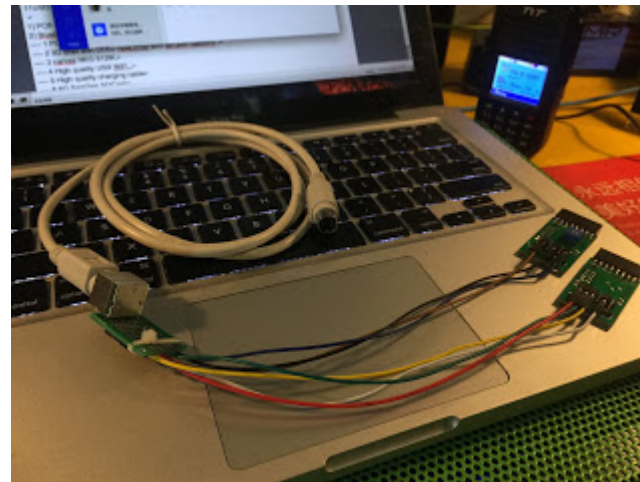


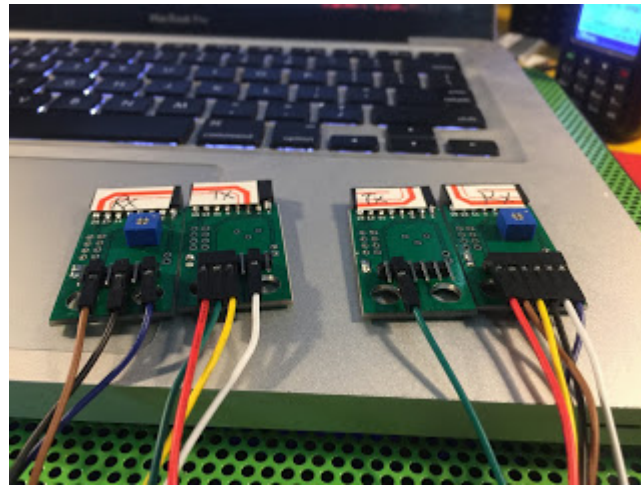
The right radio TCXO has been change, will cause terminal radio can not decode digital voice data ↓



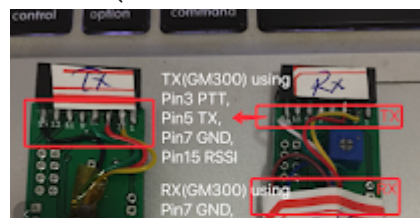


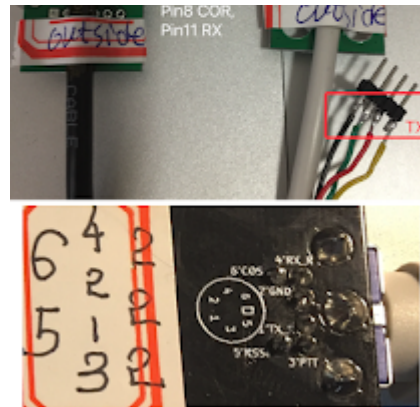
Linker V3 define ↓



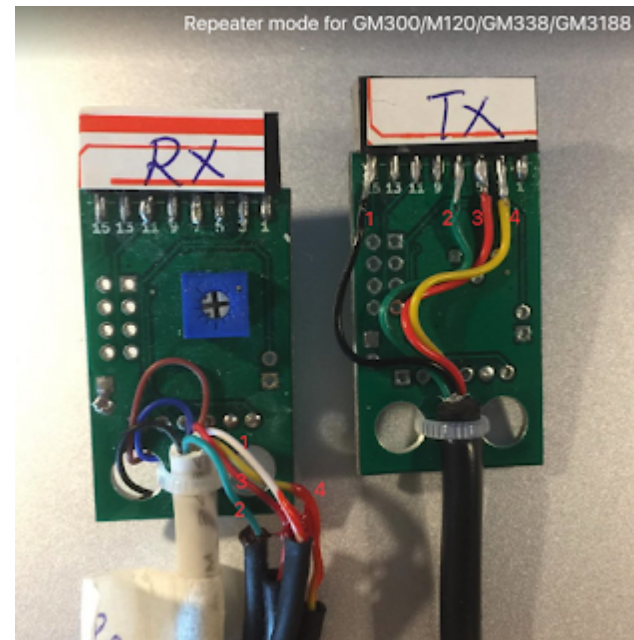


Simplex mode(RX and TX in one board) V2 ↓





Repeater(Duplex) mode (RX and TX split into 2 board) V2



1/1



Connection Motorola transceiver to BMDVM			Motorola 16 pins	
MMDVM Filter shield (FSU0)			GM340, GM350*, GM360	
PS2 Pin N°	Signal	Wire color (PS2 cable shopchip)	RX Receiver	TX Transmitter
3	Data terminal ==> flat TX audio input	Red		pin 5
2	data ground	Orange	pin 7	pin 7
3	PTT TX input	Brown		pin 3 (GP1)
4	Data RX (flat) ==> terminal	Yellow	pin 11	

20	2	4	6	8	10	12	14	16	18
19	1	3	5	7	9	11	13	15	17

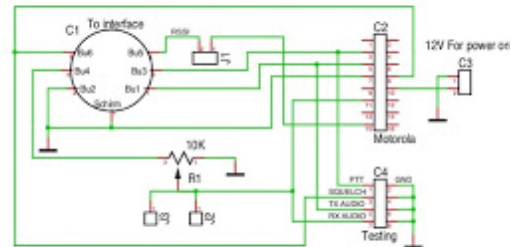
16N0457a - Outside view

PS2 - Outside view

5 **	RSSI => terminat**	Black	pin 15	pin 15
6	squelch radio output (COR)	Green	pin 8 (GP1)	
shielding	Ground	Uninsulated wire		
Connect to the + 12 V to switch on the TRX on voltage return (without activating power button)			pin 10	pin 10

For GM390 pins 17,18,19,20 are not wired
The connector is centered

* For the 4-channel GM350, the wiring on the rear accessory plug is not realized. A mod exists.
** RSSI not provided on the filtering board MMDVM FSUN 07.2016 (future development)



C1 : Mini Din 6 pin to MMDVM (or other) interface
C2 : Motorola GM390 transceiver accessory connector
C3 : Permit to restart the transceiver when power supply is coming back after a hard shutdown. Place the 12V and GND from supply. Attention to polarities
C4 : Is a testing connector. Available by now Ground signal and the useful signal (PTT, SQUELCH, AUDIO TX, AUDIO RX)
R1 : Adjustment for Rx Audio level coming from transceiver and send to the interface
J1 : Allow the RSSI signal coming from transceiver to the Pin 5 of mini Din.
J2, J3 are just holes that can be used to place fixed value resistors instead of R1 potentiometer

Test successful with CDM1250(GM338)





Display interface definition:

OLED: **VCC/GND**/SCL/SDA (left to right)

Nextion: the STM32F105 **not support modem type**, just support ttyUSBX, use USB to TTL Adapter, suggest use CP2102 or CH340,

HS RXD to Nextion TX

HS TXD to Nextion RX

HS 5V to Nextion 5V

HS GND to Nextion GND

引脚定义:

VCC : 3.3-5V

GND : 接地

SCL : 串行时钟

SDA : 串行数据

OLDE: order as this

Nextion: just support USBtoTTL



实物图

VCC GND SCL SDA





PI-Star Digital Voice - Configuration

Dashboard | Admin | Export | Power | Update | Backup/Restore | Factory Reset

Gateway Hardware Information			
Hostname	Kernel	WiFiFirmware	CPU Temp
pi-star	4.9.35-v7+	Pi 3 Model B (218) - Exetec, CR	48.83 / 49.13 / 49.30

Control Software	
Setting	Value
Controller Software:	☐ OstarRepeater ☒ MMDVMHost (2V-Hop Minimum Firmware 3.87 Required)
Controller Mode:	☐ Simplex Mode ☒ Duplex Repeater ☐ Half-Duplex on Hotspots

Keep one mode

MMDVMHost Configuration			
Setting	Value	RF Hangtime	Net Hangtime
DMR Mode:	☒	20	20
D-Star Mode:	☐	20	20
YSF Mode:	☐	20	20
P25 Mode:	☐	20	20
NOM Mode:	☐	20	20
YSF DMR:	☐	20	20

MMDVM Display Type: ☒ Nextion ☐ Part: Nextion Layout: ☐ PiTFT

- kit board Just support USBtoTTL

General Configuration	
Setting	Value
Hostname:	pi-star (Do not add suffixes such as .local)
Node CallSign:	B7JTA
CS17/DMR ID:	48000000
NOM ID:	
Radio Frequency RX:	994.325.000 MHz
Radio Frequency TX:	489.712500 MHz
Latitude:	52.000 degrees (positive value for North, negative for South)
Longitude:	0.000 degrees (positive value for East, negative for West)
Town:	A Town, LC4708
Country:	Country, GB
URL:	http://www.qrz.com/db/B7JTA ☒ Auto ☐ Manual
Radio/Modem Type:	STM32-DVM / MMDVM-LHS - Raspberry Pi Hat (GPIO)
Mode Type:	☐ Private ☒ Public
System Time Zone:	Europe/London

Duplexer you can find here,
<http://mmdvm.bi7jta.org/2018/06/duplexer-preview-made-by-my-friend.html>





Extended reading

Add whitelist Talkgroup to TS1,TS2 #DMR

<http://mmdvm.bi7jta.org/2018/05/mmdvm-uses-experience-and-skills.html>

Got it

<http://mmdvm.bi7jta.org/2018/05/about-nano-series-diy-project-for-mmdvm.html>

How to flash Pi-Star OS

http://wiki.pistar.uk/Main_Page

Download the new version Pi-Star IMG

<http://www.pistar.uk/downloads>

Add whitelist Talkgroup to TS1,TS2 #DMR

<https://mmdvm.bi7jta.org/2018/05/mmdvm-uses-experience-and-skills.html>

Useful resource reference,

Radio tested list,G4KLX

<https://wiki.brandmeister.network/index.php/Homebrew/MMDVM>

Some link for reference,

By f5uii

<https://www.f5uii.net/en/tuning-mmdvm-dmr-tait-tm8100-tm8115/>

By OH1E

<https://www.youtube.com/watch?v=zqs4NVBvNHE&t=0s&list=PLe3vAuVeEGj-iVT4INsΔehVkh7FDV2PHo&index=4>

Ajuste de desviación en frecuencia en MMDVM, parte 1 (teoría)

<https://www.youtube.com/watch?v=-m8CcLH4Kil>

Ajuste de desviación en frecuencia en MMDVM, parte 2 (práctica)

<https://www.youtube.com/watch?v=fM3NYKRlak8&t=5s>

Recommend for Motorola radio

<https://wiki.brandmeister.network/index.php/Homebrew/MMDVM>

installation-calibration-adjustment-tunning-mmdvm-mmdvmhost-raspberry-motorola-gm360

<https://www.f5uui.net/en/installation-calibration-adjustment-tunning-mmdvm-mmdvmhost-raspberry-motorola-gm360/5/>



Repeater_Kit

UserGuide



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for HAT Ver1.0,Ver1.0.1
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May 05, 2018



The follow content I will show my project.

About Duplex hotSPOT 65\$

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