

# DVSwitch Mobile



## Installation and Setup

## Preface

The Zingman brothers (Mike, N4IRR and Steve, N4IRS) have done the amateur radio community a great service in the creation of DVSwitch Mobile (DVSM). The Raspberry Pi DVSM host server, Android app and the newly released pyUC multi-platform USRP client give amateur radio operators easy access to any of the modes supported by Analog\_Bridge / MMDVM\_Bridge (i.e., DMR, NXDN, P25 & Dstar). This document is intended as a “getting started” guide. DVSwitch Mobile will certainly contribute to your leaning and exploration of digital voice modes used in amateur radio.

73 de Joe W8RIK

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(Mobile Host Running Analog Bridge and dvswitch.sh)

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### Introduction

Welcome to the DVSwitch Mobile Installation & Initial Setup Guide. This guide focuses on USRP connections. **Do not let the SIZE of this document SCARE you!** It is not that bad honest! DVSwitch-System-Builder does most of the work. After the system is up and running, to better suit your operating needs, you can customize talkgroup lists, menus and macros.

This guide covers setting up the DVSwitch Mobile host server via the DVSwitch-System-Builder on a Raspberry Pi (RPi) 3 Model B+ running the Buster-Lite operating system (OS). Setup should be similar on other RPi models and Raspbian operating systems (e.g., RPi 3, Model B, Buster-Lite, etc.).

This document also includes managing database files, macro commands, ad hoc menus and setting up the DVSwitch Mobile Android application (version 1.53). DVSwitch Mobile is available for download on the Google Play Store.

This is NOT an in-depth guide to DVSwitch Mobile. There is no substitute for experience. It's always better to go out there and play! Learn by doing. If you haven't already, join the DVSwitch mobile subgroup at <https://dvswitch.groups.io/g/Mobile> where you will find experts who are more than happy to help you troubleshoot issues or answer questions. Keep in mind that DVSwitch Mobile is an active development project. On the forum, you can pick up other valuable tips from questions that others submit and stay abreast of changes!

### Registration

**Note:** Registration is for licensed amateur radio operators only.

To maintain command and control of networked amateur radio repeater systems, the DMR, NXDN and D-Star registrations are required.

1. To obtain a DMR and NXDN registration (I.D.) numbers see <https://www.radioid.net>.
2. For D-Star registration see [https://www.dstargateway.org/D-Star\\_Registration.html](https://www.dstargateway.org/D-Star_Registration.html).

### NW Digital DV3000/ThumbDV

**Note:** The DV3000/ThumbDV is the best vocoder available (<http://nwdigitalradio.com/>). If you have one available use it. It is the best vocoder to use for D-Star, DMR, YSFn and NXDN .

For D-star, communications quality audio is achieved with a DV3000/ThumbDV vocoder plugged into the RPi DVSwitch mobile host.

### Static IP Address

It is recommended that the Raspberry Pi have a static IP address. Many routers allow users to set static IP addresses for devices on the network. If your router will not assign a static IP address, you can configure the Raspberry Pi with a static IP address by editing the dhcpd.conf file (instructions can be found on the internet).

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### Port Forwarding

Forward the following UDP ports, in addition to your USRP port, to your RPi DVSwitch mobile host.

20001-20009,30051-30059,30061-30065,40000,50001

### DVSM Host Server Pi

1. Do a clean install and setup of the Buster-Lite operating system on a Raspberry Pi Model 3 B+.
2. Login to the RPi open Terminal and obtain root privileges.

**Run:**

```
sudo -s
```

3. Install DVSwitch-System\_Builder.

**Run:**

```
apt-get update
```

```
apt-get upgrade -y
```

```
cd /tmp
```

```
wget https://github.com/DVSwitch/DVSwitch-System-Builder/archive/master.zip
```

```
cd /srv
```

```
unzip /tmp/master.zip
```

```
mv DVSwitch-System-Builder-master DVSwitch-System-Builder
```

```
cd DVSwitch-System-Builder
```

```
./DVSwitch-System-Builder.sh
```

**Note:** At this point most of the programs are on the sd card and unconfigured.

Frequently accessed files can be found in the following directories:

<u>Directory</u>	<u>Contents</u>
/opt/program_name	Programs and config files. Example /opt/MMDVM_Bridge.
/var/lib/mmdvm	Data files. Example /var/lib/mmdvm/DMRIDs.dat.
/var/log/mmdvm	Program log files.
/usr/local/sbin	Needed scripts.
/lib/systemd/system	systemd unit files for start / stop.
/etc/cron.daily	Symbolic links to the scripts that need to run daily.
/srv	Needed git repositories.

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4. Update binaries from github

**Run:**

```
/usr/local/sbin/update-from-github.sh
```

5. Verify that the contents of the MMDVM\_Bridge directory.

**Run:**

```
cd /opt/MMDVM_Bridge  
dir
```

```
DVSwitch.ini MMDVM_Bridge MMDVM_Bridge.ini
```

6. To configure the MMDVM\_Bridge, edit the MMDVM\_Bridge.ini file.

**Note:** Parenthetical expressions shown in the examples are intended to be helpful in determining values, they should not be inserted into the configuration/script file.

**Run:**

```
nano MMDVM_Bridge.ini
```

- a) To the **[General]** stanza, make the following changes:

```
[General]  
Callsign=(Your callsign.)  
Id=(Your DMR ID plus a unique 2-digit BM login number.)  
Timeout=180  
Duplex=0
```

- b) To the **[Info]** stanza, make the following optional changes:

```
[Info]  
RXFrequency=(9 zero digits.)  
TXFrequency=(9 zero digits.)  
Power=1  
Latitude=(Your decimal latitude.)  
Longitude=(Your decimal longitude.)  
Height=0  
Location=(Your location: city, state or grid square.)  
Description=MMDVM_Bridge  
URL=(http://qrz.com/db/(your callsign))
```

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---

- c) Locate the stanza for each mode you are going to use. In the following example all modes are enabled,

```
[D-Star]
Enable=1
Module=B

[DMR]
Enable=1
ColorCode=1
EmbeddedLCOnly=1
DumpTADData=0

[System Fusion]
Enable=1

[P25]
Enable=1
NAC=293

[NXDN]
Enable=1
RAN=1
Id=(Your NXDN ID number.)
```

- d) Locate the **Network** stanza for each of the enabled modes. In the following example all modes have been enabled,

```
[D-Star Network]
Enable=1
GatewayAddress=127.0.0.1
GatewayPort=20010
LocalPort=20011
Debug=0

[DMR Network]
Enable=1
Address=(BM server (e.g., 3108.repeater.net))
Port=62031
Jitter=360
Local=62032
Password=passw0rd (Change to personalized BM password, if applicable. Otherwise leave as default.)
Slot1=0
Slot2=1
Debug=0
```

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```
[System Fusion Network]
Enable=1
LocalAddress=0
LocalPort=3200
GatewayAddress=ysf.glorb.com
GatewayPort=42000
Debug=0

[P25 Network]
Enable=1
GatewayAddress=127.0.0.1
GatewayPort=42020
LocalPort=32010
Debug=0

[NXDN Network]
Enable=1
#LocalAddress=127.0.0.1
Debug=0
LocalPort=14021
GatewayAddress=127.0.0.1
GatewayPort=14020
```

- e) Exit the nano editor (CTRL-X) and **save** changes to the **MMDVM\_Bridge.ini** file.
- f) Enable the MMDVM\_Bridge service to start at boot:

**Run:**

```
systemctl enable mmdvm_bridge
```

- 7. Verify the contents of the Analog\_Bridge directory.

**Run:**

```
cd /opt/Analog_Bridge
dir
```

```
Analog_Bridge Analog_Bridge.ini dvsm.macro dvswitch.sh parrot.sh
```

- 8. To configure Analog\_Bridge, edit the configuration (.ini) file.

**Run:**

```
nano Analog_Bridge.ini
```

- a) To the **[AMBE\_AUDIO]** stanza, make the following changes:

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---

```
[AMBE_AUDIO]

address = 127.0.0.1
TXPort = 31103
RXPort = 31100
ambeMode = DMR
minTxTimeMS = 2500

; The metadata below is used when ASL is the source since it does not have
any concept of digital modes

gatewayDmrId =(Your 7-digit DMR ID.)
repeaterID =(Your DMR ID plus a unique 2-digit BM login number.)
txTg = 9
txTs = 2
colorCode = 1
```

- b) To the [USRP] stanza, make the following changes:

```
[USRP]
address = 127.0.0.1

(Replace 12345 with a user selected firewall port number. To avoid
conflicts with other applications, it's best to choose a port between
50000 and 59999 (e.g., 50111). The same port number will be entered for
both txPort and rxPort.)

txPort = 50111
rxPort = 50111

usrpAudio = AUDIO_UNITY
usrpGain = 1.10
tlvAudio = AUDIO_UNITY
tlvGain = 0.35
```

- c) In the [DV3000] stanza, verify vocoder selection.

- (a) If using the AMBEServer decoder:

```
[DV3000]
address = 127.0.0.1
rxPort = 2460
;address = /dev/ttyUSB0
;baud = 460800
;serial = true
```



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(b) If using the DV3000/ThumbDV:

```
[DV3000]
; address = 127.0.0.1
; rxPort = 2460
address = /dev/ttyUSB0
baud = 460800
serial = true
```

d) Exit the nano editor (CTRL-X) and **save** changes to the **Analog\_Bridge.ini** file.

e) Enable the Analog\_Bridge service to start at boot:

**Run:**

```
systemctl enable analog_bridge
```

9. Verify the contents of the P25Gateway directory.

**Run:**

```
cd /opt/P25Gateway
dir
```

```
Audio P25Gateway P25Gateway.ini P25Hosts.txt Private_P25Hosts.txt
```

10. To configure the P25 Gateway, edit the P25Gateway.ini file.

**Note:** Parenthetical expressions shown in the examples are intended to be helpful in determining values, they should not be inserted into the configuration/script file.

**Run:**

```
nano P25Gateway.ini
```

a) To the **[General]** stanza, make the following changes:

```
[General]
Callsign=(Your callsign.)
RptAddress=127.0.0.1
RptPort=32010
LocalPort=42020
Daemon=0
```

b) Exit the nano editor (CTRL-X) and **save** changes to the **P25Gateway.ini** file.

c) Enable the P25 Gateway service to start at boot:

**Run:**

```
systemctl enable p25gateway
```

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11. Verify the contents of the NXDNGateway directory.

**Run:**

```
cd /opt/NXDNGateway
dir
```

```
AUDIO  NXDNGateway  NXDNGateway.ini
```

12. To configure the NXDN Gateway, edit the NXDNGateway.ini file.

**Note:** Parenthetical expressions shown in the examples are intended to be helpful in determining values, they should not be inserted into the configuration/script file.

**Run:**

```
nano NXDNGateway.ini
```

a) To the **[General]** stanza, make the following changes:

```
[General]
Callsign=(Your callsign.)
Suffix=NXDN
RptAddress=127.0.0.1
RptPort=14021
LocalPort=14020
Debug=0
Daemon=0
```

b) To the **[Info]** stanza, make the following optional changes:

```
[Info]
RXFrequency=(9 zero digits.)
TXFrequency=(9 zero digits.)
Power=1
Latitude=(Your decimal latitude.)
Longitude=(Your decimal longitude.)
Height=0
Location=(Your location: city, state or grid square.)
Description=NXDNGateway DVSwitch Mobile
URL=(http://qrz.com/db/(your callsign))
```

c) Exit the nano editor (CTRL-X) and **save** changes to the **NXDNGateway.ini** file.

13. Configure NXDN Gateway to Start at Boot:

**Run:**

```
systemctl enable nxdngateway
```

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14. Verify the contents of the YSFGateway directory.

**Run:**

```
cd /opt/YSFGateway
dir
```

```
README.md  YSFGateway  YSFGateway.ini
```

15. To configure the YSF Gateway, edit the YSFGateway.ini file.

**Note:** Parenthetical expressions shown in the examples are intended to be helpful in determining values, they should not be inserted into the configuration/script file.

**Run:**

```
nano YSFGateway.ini
```

d) To the **[General]** stanza, make the following changes:

```
[General]
Callsign=(Your callsign.)
Suffix=RPT
# Suffix=ND
Id=(Your DMR ID plus a unique 2-digit BM login number.)
RptAddress=127.0.0.1
RptPort=3200
LocalAddress=127.0.0.1
LocalPort=4200
Daemon=0
```

e) To the **[Info]** stanza, make the following optional changes:

```
[Info]
RXFrequency=(9 zero digits.)
TXFrequency=(9 zero digits.)
Power=1
Latitude=(Your decimal latitude.)
Longitude=(Your decimal longitude.)
Height=0
Location=(Your location: city, state or grid square.)
Description=YSFGateway DVSwitch Mobile
URL=(http://qrz.com/db/(your callsign))
```

f) Exit the nano editor (CTRL-X) and **save** changes to the **YSFGateway.ini** file.

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16. Configure YSF Gateway to Start at Boot:

**Run:**  
`systemctl enable ysfgateway`

17. Verify the contents of the Quantar\_Bridge directory.

**Run:**  
`cd /opt/Quantar_Bridge`  
`dir`

```
Quantar_Bridge  Quantar_Bridge.ini
```

18. To configure the Quantar\_Bridge, edit the Quantar\_Bridge.ini file.

**Note:** Parenthetical expressions shown in the examples are intended to be helpful in determining values, they should not be inserted into the configuration/script file.

**Run:**  
`nano Quantar_Bridge.ini`

a) To the **[Quantar]** stanza, make the following changes:

```
[QUANTAR]
logFilePath = /var/log/Quantar_Bridge.log
logLevel = 2
debug = 0
Address = 127.0.0.1
TXPort = 34103
RXPort = 34100
quantarPort = 1994
```

b) Exit the nano editor (CTRL-X) and **save** changes to the **Quantar.ini** file.

19. Configure Quantar\_Bridge to Start at Boot:

**Run:**  
`systemctl enable quantar_bridge`

20. To configure the ircDDB Gateway, edit the ircDDB Gateway.configuration file:

**Note:** Parenthetical expressions shown in the examples are intended to be helpful in determining values, they should not be inserted into the configuration/script file.

**Run:**  
`cd /etc`  
`nano ircddbgateway`

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- a) Scroll the document and make the following changes:

```
gatewayCallsign=(Your callsign.)
repeaterCall1=(Your callsign.)
ircddbUsername=(Your callsign.)
ircddbPassword=(Your callsign.)
dplusEnabled=1
dplusLogin=(Your callsign.)
language=0
logEnabled=1
```

- b) Exit the nano editor (CTRL-X) and **save** changes to the **ircddbgateway** file.

### 21. Configure ircDDB Gateway to Start at Boot:

**Run:**

```
systemctl enable ircddbgatewayd.service
```

### 22. Restart the Raspberry Pi DVSwitch server.

**Run:**

```
shutdown -r now
```

**Note:** After initial configuration, for the system to completely initialize it may be necessary to repeat Step 22.

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### DVSwitch Mobile – Android Application

1. Download and install the DVSwitch Mobile application from the Google Play Store.

#### Dialer Screen



#### Notes

- This is the main window for the Android app. Across the top of the screen find the tab menu (**Dialer, Status, Accounts** and **Config**).
- To connect to a host, check it on the Accounts tab.
- After you have selected an account, the selected mode for that account (e.g., \*YSF) will be displayed in the dial string window above the **Send** button.
- **Hangup** will toggle (disconnect/reconnect) connection with the host server.
- Long press **A**-key to bring up **Mode Select** menu.
- Long press **B**-key to bring up mode specific **Talkgroups** selection menu.
- Long press star (\*) key will display the standard macro menu. If uploaded, a mode specific ad hoc menu will be displayed (see **Ad hoc Menu and Macro Magic**, page 25).
- To talk, when connected to a talkgroup select and release **PTT** (the button will go red), speak through the Android microphone, and then select and release (the button will return to white). Other PTT options (e.g., **Headset PTT, Volume PTT**) can be selected from the **Config** tab.

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2. From the main menu, select **Accounts** and then select the first profile and configure the account.

a) Select **Protocol USRP**.

b) For **Hostname** enter the LAN IP address of the Raspberry Pi where the MMDVM and Analog bridge are running.

c) For **Port** and **TX Port**, enter the firewall port number reflected in **USRP stanza** of the mode configuration files. These values should be identical.

### Note

To access your DVSwitch from the outside world. configure your router to forward this port (UDP protocol) to the LAN IP address assigned to the RPi. Then create a separate account using your public (ISP assigned) IP address as the Hostname. DO NOT add the port number to the Hostname.

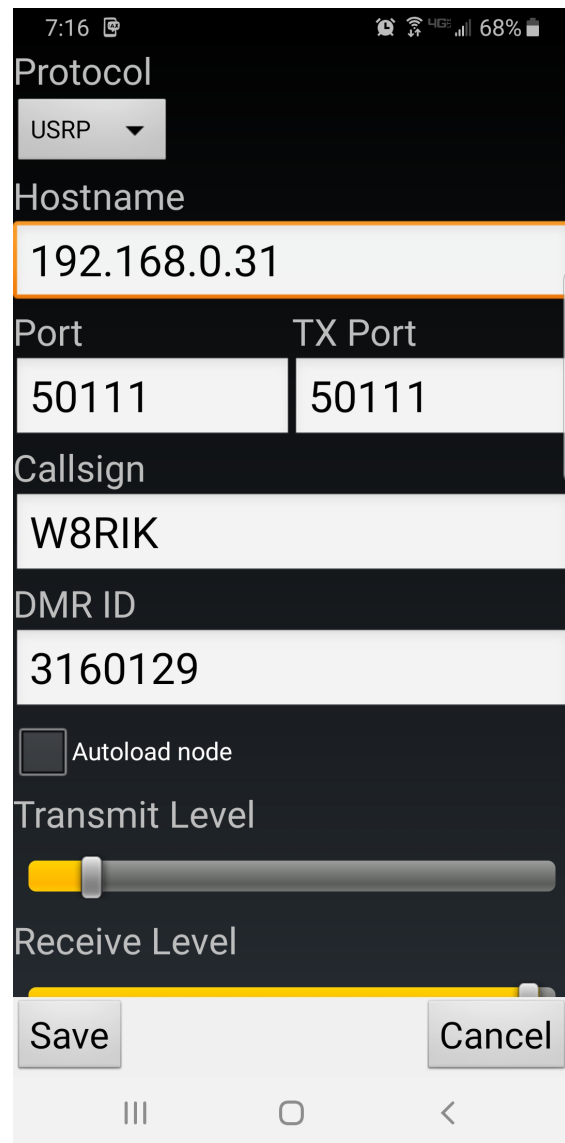
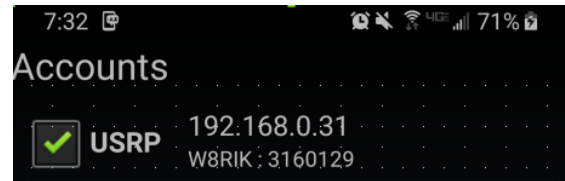
d) Finally, enter your **Callsign** and 7-digit **DMR ID** registration number.

e) Initially set **Transmit Level** to about 20 percent and the **Receive Level** at 100 percent. Later audio levels can be adjusted, as needed.

f) Scroll up to view **Codec Types** and verify that it is set to **Server Selected** (default).

g) **Save** and return to the **Dialer** screen by pressing the back arrow (<) button.

**Note:** All pages except the "Accounts" page allow you to navigate between screen pages via the tab menu.



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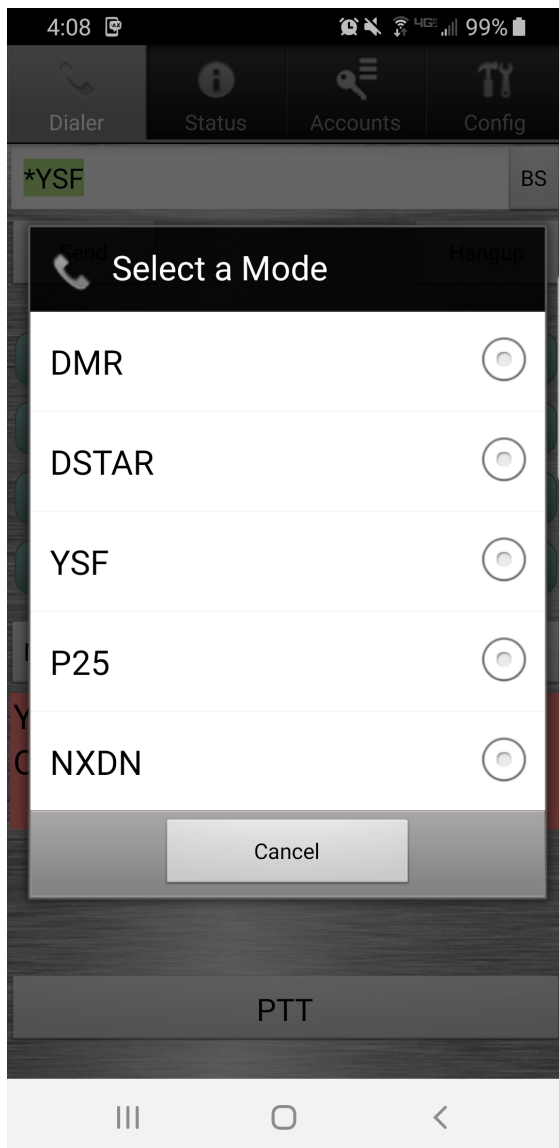
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3. **To select/change modes**, from the **Dialer** screen long press the **A** key. The Mode Select screen displays a list of digital voice modes DVSM supports.

### Mode Select Screen



### Notes

- Simply tap the desired mode.
- When mode selection is accomplished the display returns to the Dialer screen.
- The selected mode (e.g., \*DMR) will be displayed on the Dialer screen.



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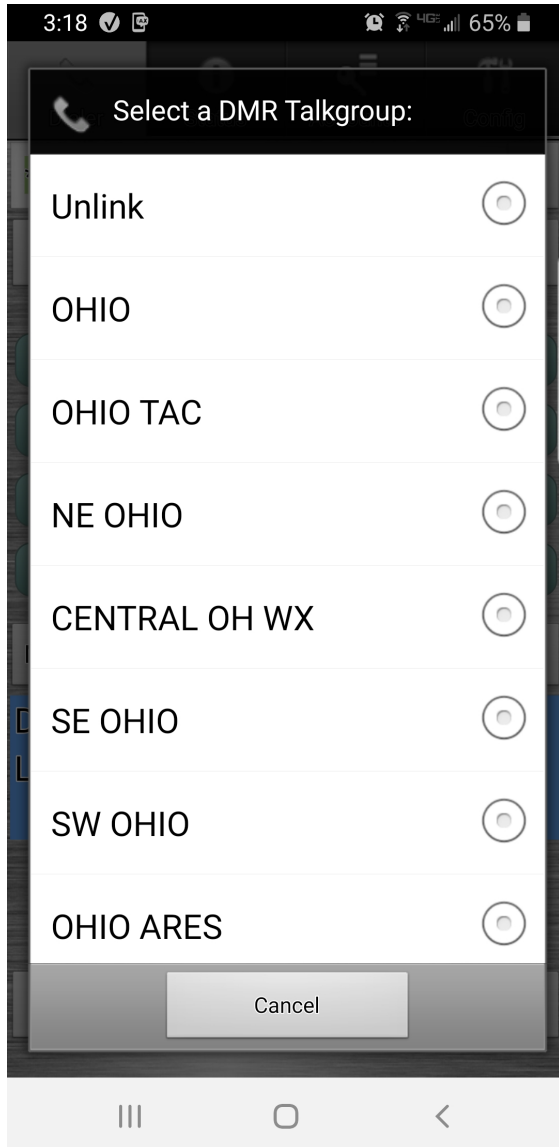
(Mobile Host Running Analog Bridge and dvswitch.sh)

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4. **To select/change a talkgroup**, from the **Dialer** screen long press the **B** key. The display will show a list of mode specific talkgroups (reflectors).

**Note:** In DMR, P25 and NXDN mode, you can change talkgroups by entering the talkgroup number (e.g., 3139, 31399, 313966, etc.) and pressing the **Send** button.

## Talkgroup Listing



## Notes

- The first 10 entries in each database are tied to the long press function of the dial pad buttons 0-9. These entries can be customized to reflect the users' favorite talkgroups. The DMR Talkgroup shown at left has been customized (see page 19, **Manage Database Files**).
- Simply scroll through the list and select.
- When mode selection is accomplished the display returns to the Dialer screen, the node name will appear in the window below the PTT button (e.g., DMR TG 3190 OHIO TAC) and the connection dial string will appear in the window above the **Send** button (e.g., 31390).

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The **Status** Display for:

- Registration
- Connection State
- Codec
- Sample Rate
- Amount of Data Transferred
- Talkgroup Activity

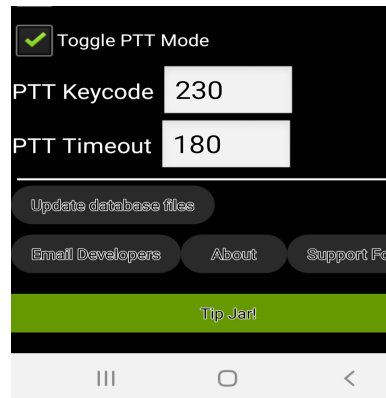
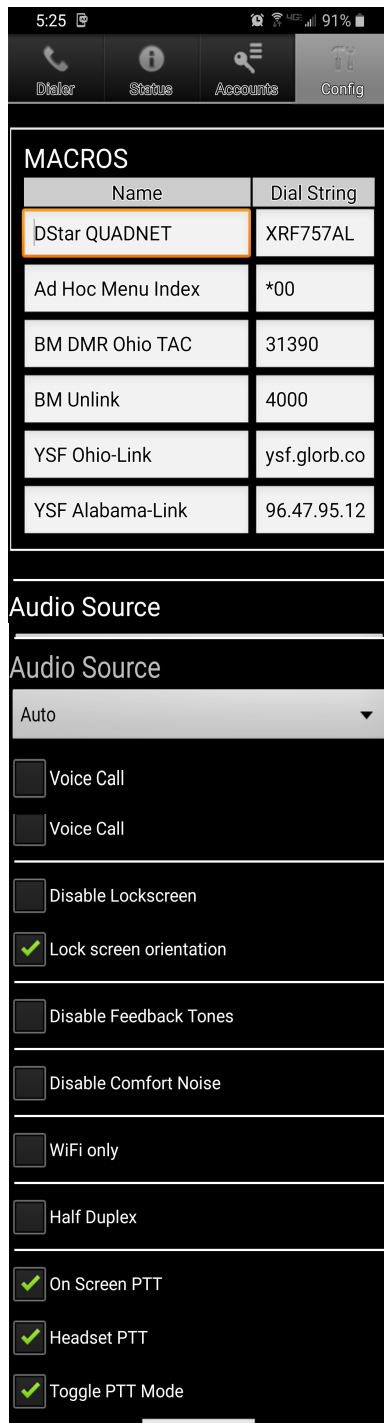


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### Config Screen



- MACROS are accessible by selecting the MACROS drop-down window (see next page). Both the Macro Name and Dial String are editable.

For example:

Name = YSF Ohio-Link

Dial String = ♦

- ♦ Enter dvsm.macro command (e.g., \*22).
- ♦ For DSTAR enter reflector type, number, module, L (e.g., REF030CL).
- ♦ For DMR, P25 & NXDN enter just the tg number (e.g., 3139).
- ♦ For YSF enter IP:port (e.g., 94.47.95.121:42000).
- Audio Source selections are Auto, Audio, Bluetooth and Speaker.
- **Lock screen orientation** is **checked** to prevent losing connection when orientation of the screen is changed.
- At the bottom are buttons to **Update data files**, (see Manage Database Files) **Email the developers** (tell them what you think), version info (**About**) and a link to the **Support Forum**.

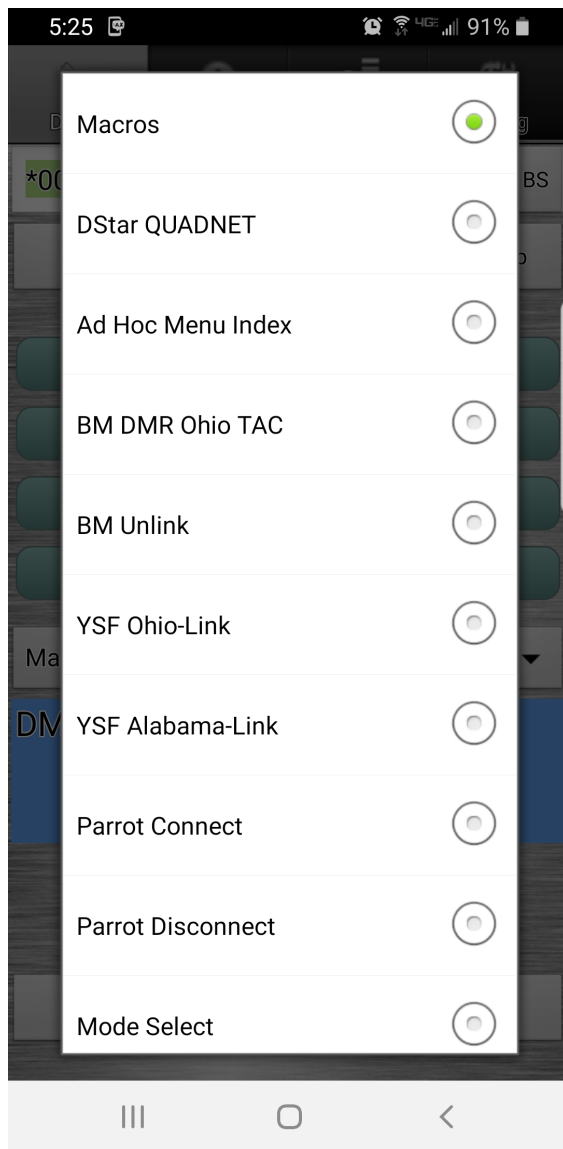
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### Macros Window



- To access the Macros Window, from the Dialer screen **tap** the **Macros** button located below the keypad.
- To execute, simply tap the selection.
- Six of the selections (after Macros and before Parrot Connect) can be edited via the Config tab.

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### Manage Database Files

dvswitch.sh scripts upload mode specific database files to the DVSM client (refer to **dvswitch.sh Command Line Options**, page 20). The first 10 entries in each of the following database files (i.e., node list) are tied to the long press function of the dial pad buttons 0-9.

```
DMR_node_list.txt      NXDN_node_list.txt
DSTAR_node_list.txt   P25_node_list.txt
                    YSF_node_list.txt
```

These entries can be customized to reflect the users' favorite talkgroups. To update the DVSM client, run **collectProcessDataFiles**, you then edit the node file(s) and then run **pushfile** to send the edited file to the DVSM client. Before running a command, make sure the **DVSM is connected to the host and disconnected from any active talkgroup**. For example, to customize the DMR node list you would run the following commands:

```
cd/opt/Analog_Bridge
./dvswitch.sh collectProcessDataFiles
cd /tmp
nano DMR_node_list.txt (Edit, keeping the same format, and then save CTRL-X)
cd/opt/Analog_Bridge
./dvswitch.sh pushfile /tmp/DMR_node_list.txt
```

The table below shows the first 12 entries of the DMR node list file before (left column) and after (right column) customization.

/tmp/DMR\_node\_list.txt

First 12 Entries	Dial Pad Button	Edited First 12 Entries*
4000   Unlink	0	4000   Unlink
1   LOCAL	1	3139   OHIO
2   LOCAL/CLUSTER	2	31390   OHIO TAC
8   REGIONAL	3	31391   NE OHIO
9   LOCAL OR REFLECTOR	4	31392   CENTRAL OH WX
91   WORLD-WIDE	5	31393   SE OHIO
92   EUROPE	6	31394   SW OHIO
93   NORTH AMERICA	7	31395   OHIO ARES
94   ASIA MIDDLE EAST	8	31398   OHIO EMCOMM
95   AUSTRALIA NEW ZELAND	9	31399   OHIO-LINK-YSF
202		202
204   NEDERLAND		204   NEDERLAND

\* These edited entries will show on the Talkgroup Listing (dialer screen long press B; see page 15).

**Note:** Always keep Unlink as the first entry in the list.

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### dvswitch.sh Command Line Options

“dvswitch.sh” gives users a simple command line interface to change parameters on the fly. Below is a list of the comand line options available at the time of writing. The examples shown are executed from the current directory (.). If the commands are executed from another directory or in a macro (see **Ad hoc Menus and Macro Magic**, page 25), the full directory path is used (e.g., /opt/Analog\_Bridge/dvswith.sh mode DMR).

dvswitch.sh Command Line Option	Description
version {AB}	Show version of dvswitch.sh or Analog_Bridge <b>Run:</b> ./dvswitch.sh version dvswitch.sh 1.5.2 ./dvswitch.sh version AB 1.4.2
mode {DMR NXDN P25 YSF DSTAR}	Set Analog_Bridge digital mode <b>Run:</b> ./dvswitch.sh mode DMR The selected mode will appear on the DVSM client dialer screen.
tune tg	Tune to specific TG/Reflector <b>Run:</b> ./dvswitch.sh tune ysf.glorb.com:42000 <b>Examples of tune values for each mode:</b> DSTAR: (Reflector type, Number, Module, L) REF030CL XRF012AL DCS006ZL DMR, P25, NXDN: (Just the tg number) 10200 310 3166 YSF: (IP:PORT) amlink.alabamalink.info:42001 96.47.95.121:42000
ambesize {72 88 49}	Set number of bits for ambe data <b>Run:</b> ./dvswitch.sh ambesize 72
ambemode {DMR NXDN P25 YSFN YSFW DSTAR}	Set AMBE mode <b>Run:</b> ./dvswitch.sh ambemode DMR

## DVSwitch Mobile

### Installation & Setup

(Mobile Host Running Analog Bridge and dvswitch.sh)

---

dvswitch.sh Command Line Option	Description
slot {1 2}	<p>Set DMR slot to transmit on.</p> <p><b>Run:</b> ./dvswitch.sh slot 2</p>
update	<p>Update callsign databases.</p> <p><b>Run:</b> ./dvswitch.sh update</p>
tlvAudio mode gain	<p>Set AMBE audio mode and gain (0.0-1.0). Audio from ASL.</p> <p><b>Modes:</b> AUDIO_UNITY, AUDIO_USE_GAIN, AUDIO_BPF</p> <p>AUDIO_UNITY no change in level. For best results use AUDIO_USE_GAIN between 0.0 and 1.0. A number less than 1.0 is a reduction in level. .35 is 35 percent of AUDIO_UNITY .5 is 50 percent AUDIO_UNITY.</p> <p>The startup default value is that set in the [USRP] stanza of the <b>Analog_Bridge.ini</b> file.</p> <p><b>Run:</b> ./dvswitch.sh tlvAudio AUDIO_USE_GAIN .1</p>
usrpAudio mode gain	<p>Set PCM audio mode and gain (0.0 to 10.0). Audio to ASL.</p> <p><b>Modes:</b> AUDIO_UNITY, AUDIO_USE_AGC, AUDIO_USE_GAIN</p> <p>AUDIO_UNITY no change in level. For best results use AUDIO_USE_GAIN between 0.0 and 10.0. A number greater than 1 is a multiplier. 3.0 is 3 times AUDIO_UNITY 5.0 is 5 times AUDIO_UNITY.</p> <p>The startup default value is that set in the [USRP] stanza of the <b>Analog_Bridge.ini</b> file.</p> <p><b>Run:</b> ./dvswitch.sh usrpAudio AUDIO_USE_GAIN 3.0</p>
usrpCodec {SLIN ULAW ADPCM}	<p>Set AB -&gt; DVSM/UC audio codec.</p> <p><b>Run:</b> ./dvswitch.sh usrpCodec SLIN</p>

## DVSwitch Mobile Installation & Setup

(Mobile Host Running Analog Bridge and dvswitch.sh)

---

dvswitch.sh Command Line Option	Description
tlvPorts rxport txport	Set Analog_Bridge receive and transmit ports. <b>Run:</b> ./dvswitch.sh tlvPorts 31100 31103
info	Update ABInfo and send to DVSM/UC. <b>Run:</b> ./dvswitch.sh info
show	Print the ABInfo json file <b>Run:</b> ./dvswitch.sh show
lookup	Lookup a DMR ID/call in the local database. <b>Run:</b> ./dvswitch.sh lookup W8RIK 3160129 W8RIK JOSEPH
mute {OFF USRP TLV BOTH}	Cause Analog_Bridge to mute a stream. <b>Run:</b> ./dvswitch.sh mute USRP ./dvswitch.sh mute OFF
message msg	Send a text message to DVSM/UC <b>Run:</b> ./dvswitch.sh message Hello_Joe "Hello_Joe" displayed on dialer screen.
macro {file text}	Send a macro collection to DVSM. This command will upload an ad hoc menu to the mobile client. Long pressing on the star (*) key will activate the menu. <b>Run:</b> ./dvswitch.sh macro macro_index.txt
pushfile {file_name.txt}	Push a single node list to the DVSM client. <b>Run:</b> ./dvswitch.sh pushfile /tmp/DMR_node_list.txt
pushurl url	The pushurl command tells the client (Mobile, Puck) to download the data files from the URL. <a href="http://dvswitch.org/DVSM/">http://dvswitch.org/DVSM/</a> is updated once a day. <b>Run:</b> ./dvswitch.sh pushurl <a href="http://dvswitch.org/DVSM/">http://dvswitch.org/DVSM/</a>



# DVSwitch Mobile

## Installation & Setup

(Mobile Host Running Analog Bridge and dvswitch.sh)

---

dvswitch.sh Command Line Option	Description
collectProcessDataFiles	<p>Collect and prepare DVSM data files. Download the raw data files from multiple sources, prepare DVSM data files (node lists) from the raw files.</p> <p><b>Run:</b></p> <pre>./dvswitch.sh collectProcessDataFiles     Processing NXDN     Processing P25     Processing DMR     Processing YSF     Processing Dstar     Processing ASL</pre>
collectProcessPushDataFiles	<p>Does <b>collectProcess DataFiles</b> (see above) AND uploads DVSM data files to client (i.e., your Android device). This script will overwrite all changes and push fresh node lists to DVSM client.</p> <p><b>Run:</b></p> <pre>./dvswitch.sh collectProcessPushDataFiles     Processing NXDN     Processing P25     Processing DMR     Processing YSF     Processing Dstar     Processing ASL     Pushing NXDN     Pushing P25     Pushing DMR     Pushing YSF     Pushing Dstar     Pushing ASL</pre>
collectProcessPushDataFilesHTTP	<p>Collect and prepare and upload DVSM data files over http.</p> <p><b>Run:</b></p> <pre>./dvswitch.sh collectProcessPushDataFilesHTTP</pre>

# DVSwitch Mobile

## Installation & Setup

(Mobile Host Running Analog Bridge and dvswitch.sh)

---

### Macro Commands

Macro commands are defined in the dvsm.macro file (i.e., /opt/Analog\_Bridge/dvsm.macro). Macro commands, when entered from the dialer keypad or contained in a dvswitch.sh macro argument file, are always preceded by the star key (\*). The star key (\*) identifies it as a macro command rather than a talkgroup or reflector value.

- Macro commands can be alphanumeric (e.g. \*13, \*ohio, \*oh64, \*ares, etc.).
- Macro commands will be displayed as a dial string (e.g., \*21) on the main (Dialer) screen.
- When entered from the dialer keypad, the user must tap the **Send** key to execute the command.
- It is not necessary to tap the **Send** key when the command is executed from a macro file.

The dvsm.macro file shown below includes the macro commands used in the examples shown in **Ad hoc Menus and Macro Magic**, see page 25.)

/opt/Analog\_Bridge/dvsm.macro

```
; dvsm.macro
; This is a macro include file for Analog_Bridge(AB)
; The purpose of this file is to provide macro commands for use by DVSwitch
Mobile(DVSM)
; These macros execute scripts when a DVSM user requests a mode change.

[MACROS]
; Example: When a DVSM user selects the DMR mode, AB will look for the mode below and
execute the script and pass the parameter.
; In this case, AB will execute the script "/opt/Analog_Bridge/dvswitch.sh" and pass
the parameters of "mode DMR" to the script.

DMR = /opt/Analog_Bridge/dvswitch.sh mode DMR
DSTAR = /opt/Analog_Bridge/dvswitch.sh mode DSTAR
NXDN = /opt/Analog_Bridge/dvswitch.sh mode NXDN
P25 = /opt/Analog_Bridge/dvswitch.sh mode P25
YSF = /opt/Analog_Bridge/dvswitch.sh mode YSF

; Ask AB to pull fresh data files and send to DVSM/UC
dbupdate = /opt/Analog_Bridge/dvswitch.sh collectProcessPushDataFiles

; Example TG / Reflector Macro
9876 = /opt/Analog_Bridge/parrot.sh

00 = /opt/Analog_Bridge/dvswitch.sh macro index.txt

20 = /opt/Analog_Bridge/dvswitch.sh macro audio.txt
21 = /opt/Analog_Bridge/dvswitch.sh tlvAudio AUDIO_USE_GAIN .25
22 = /opt/Analog_Bridge/dvswitch.sh tlvAudio AUDIO_USE_GAIN .15
23 = /opt/Analog_Bridge/dvswitch.sh tlvAudio AUDIO_USE_GAIN .05
24 = /opt/Analog_Bridge/dvswitch.sh usrpAudio AUDIO_USE_GAIN 2.1
25 = /opt/Analog_Bridge/dvswitch.sh usrpAudio AUDIO_USE_GAIN 3.1
26 = /opt/Analog_Bridge/dvswitch.sh usrpAudio AUDIO_USE_GAIN 4.1

99 = /opt/Analog_Bridge/dvswitch.sh macro macros.txt

BM = /opt/Analog_Bridge/BM_chng.sh
ohio = /opt/Analog_Bridge/dvswitch.sh macro oh_ares.txt
tgif = /opt/Analog_Bridge/dvswitch.sh macro tgif.txt
TGIF = /opt/Analog_Bridge/TGIF_chng.sh
```

# DVSwitch Mobile

## Installation & Setup

(Mobile Host Running Analog Bridge and dvswitch.sh)

---

### Ad hoc Menus and Macro Magic

The dvswitch.sh/AB/Mobile feature allows for the uploading of an ah hoc menu to the Mobile client. The menu is designed to aid users who want a transient/mode specific menu on a button press. Long pressing on the star (\*) key will activate the menu. The user selects an option from a list with a tap.

The intent is to have mode specific or even network specific menus on demand. For example, DMR has three networks you could elect to join (BM, DMR+, TGIF). The ad hoc menu would let you have a custom menu that lets you swap between the networks by invoking a macro that does the job.

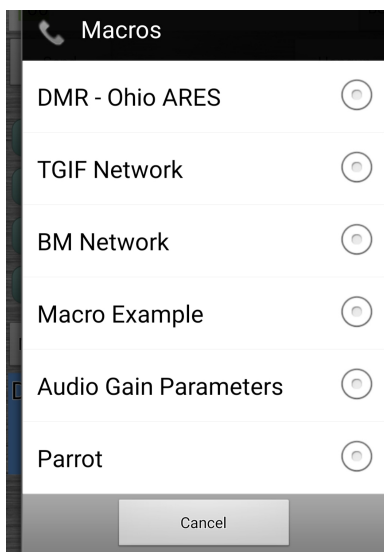
Other uses might be for ASL where a specific node you connect to has different commands to execute common functions. This menu may only help a few, but it will be very welcome by that few.

By default, with no uploads the menu will duplicate the items in the standard macro menu, but easier to access. If a menu is uploaded to the device, the long press will activate the custom menu. This menu is not stored anywhere in flash, it is transient.

How do it use it?

- In dvswitch.sh there is a command called: macro {argument}, where {argument} may be a file name or a set of delimited macros.
- Save this in a file (named for example **index.txt**) and then use dvswitch.sh to upload it to a connected Mobile app:
- On the following pages find example of a simple menu with submenus. To activate the menu the user keys \*00 (star (\*) zero (0) zero(0)), taps the **Send** key, and then a long press on the star (\*) key. The user then taps the desired selection.

### Index of Submenus (\*00)



#### index.txt

```
-----Start of File-----
*ohio,DMR - Ohio ARES
*tgif,TGIF Network
*BM,BM Network
*99,Macro Example
*20,Audio Gain Parameters
*9876,Parrot
-----End of File-----
```

**Remarks:** The macro file format is a set of line delimited values. Each value is a comma delimited value and name.

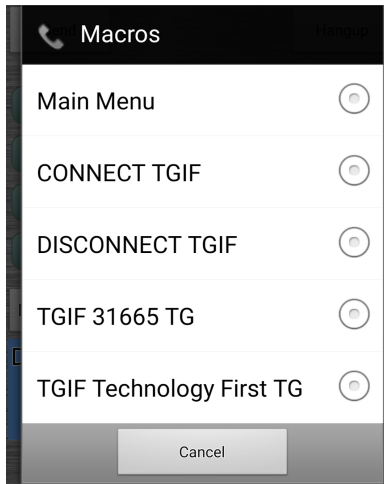
# DVSwitch Mobile

## Installation & Setup

(Mobile Host Running Analog Bridge and dvswitch.sh)

---

### TGIF Network (\*tgif)



#### tgif.txt

```
-----Start of File-----
*00,Main Menu
*TGIF,CONNECT TGIF
*BM,DISCONNECT TGIF
31665,TGIF 31665 TG
204,TGIF Technology First TG
-----End of File-----
```

#### Remarks:

- Connect to DMR TGIF network
- Disconnect from TGIF network and connect to BM network.
- List your favorite TGIF talkgroups.

1. To connect your DVSM Mobile to the DMR TGIF network it is necessary to modify the DMR Network Stanza of MMDVM\_Bridge configuration to reflect the TGIF network address and password. In addition, two scripts are needed; one connects and the other disconnects the TGIF network. With a little macro magic this can be accomplished on the fly.
  - a) Three MMDVM\_Bridge configuration files (MMDVM\_Bridge.ini, MMDVM\_Bridge\_BM.ini and MMDVM\_Bridge\_TGIF.ini) are required:

#### Run:

```
cd /opt/MMDVM_Bridge
cp MMDVM_Bridge.ini MMDVM_Bridge_BM.ini
cp MMDVM_Bridge.ini MMDVM_Bridge_TGIF.ini
nano MMDVM_Bridge_TGIF.ini
```

Locate the **[DMR Network]** stanza and make the following change to the **Address** and **Password** parameters:

```
[DMR Network]
Enable=1
Address=tgif.network
Port=62031
Jitter=360
Local=62032
Password=passw0rd
Slot1=0
Slot2=1
Debug=0
```

- b) Exit the nano editor (CTRL-X) and **save** changes to the **MMDVM\_Bridge\_TGIF.ini** file.

# DVSwitch Mobile

## Installation & Setup

(Mobile Host Running Analog Bridge and dvswitch.sh)

---

- c) Create a TGIF connect script (TGIF\_chng.sh). In this example, we make sure the system is in DMR mode, change the MMDVM\_Bridge to TGIF, restart the MMDVM\_Bridge and send a “BM\_to\_TGIF” message to the DVSM client.

**Run:**

```
cd /opt/Analog_Bridge
nano TGIF_chng.sh
```

```
#!/bin/bash
/opt/Analog_Bridge/dvswitch.sh mode DMR
Note: Enter the following command as one string.
cp /opt/MMDVM_Bridge/MMDVM_Bridge_TGIF.ini
/opt/MMDVM_Bridge/MMDVM_Bridge.ini
/opt/Analog_Bridge/dvswitch.sh message BM_to_TGIF
service mmdvm_bridge restart
```

- d) Exit the nano editor (CTRL-X) and **save** changes to the **TGIF\_chng.sh** file.
- e) Create a disconnect script (BM\_chng.sh). In this example, we make sure the system is in DMR mode, change the MMDVM\_Bridge to BM, restart the MMDVM Bridge and send a “Setting\_to\_BM” message to the DVSM client.

**Run:**

```
nano BM_chng.sh
```

```
#!/bin/bash
#/opt/Analog_Bridge/dvswitch.sh mode DMR
Note: Enter the following command as one string.
cp /opt/MMDVM_Bridge/MMDVM_Bridge_BM.ini
/opt/MMDVM_Bridge/MMDVM_Bridge.ini
/opt/Analog_Bridge/dvswitch.sh message Setting_to_BM
service mmdvm_bridge restart
```

- f) Exit the nano editor (CTRL-X) and **save** changes to the **BM\_chng.sh** file.
2. Macro commands to execute these defined in the DVSM.macro file as shown on page 24..

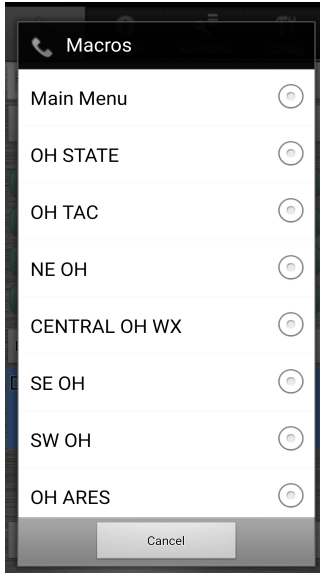
# DVSwitch Mobile

## Installation & Setup

(Mobile Host Running Analog Bridge and dvswitch.sh)

---

### DMR – Ohio ARES (\*ohio)

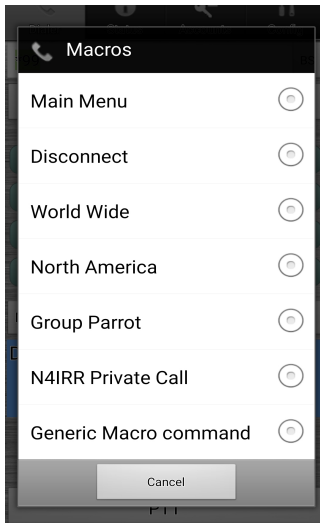


#### oh\_ares.txt

```
-----Start of File-----  
*00,Main Menu  
3139,OH STATE  
31390,OH TAC  
31391,NE OH  
31392,CENTRAL OH WX  
31393,SE OH  
31394,SW OH  
31395,OH ARES  
31398,OH EMCOMM  
310385,DELAWARE COUNTY  
-----End of File-----
```

**Remarks:** Listing of Ohio DMR ARES related talkgroups.

### Macro Example (\*99)



#### macros.txt

```
-----Start of File-----  
*00,Main Menu  
4000, Disconnect  
91, World Wide  
3100, North America  
31000, Group Parrot  
3113043#, N4IRR Private Call  
*macro1, Generic Macro command  
-----End of File-----
```

**Remarks:** DMR Talkgroups, Note that DVSM supports private calls between two DMR IDs (see entry "3113043#,N4IRR Private Call").

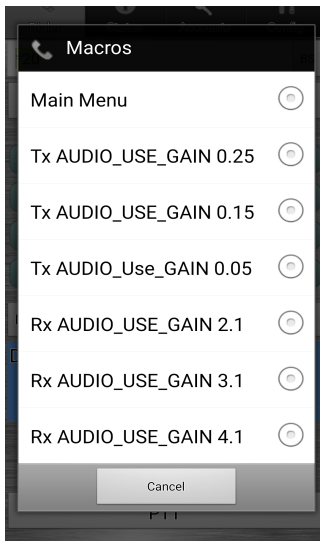
# DVSwitch Mobile

## Installation & Setup

(Mobile Host Running Analog Bridge and dvswitch.sh)

---

### Audio Gain Parameters (\*20)



audio.txt

-----Start of File-----

\*00,Main Menu

\*21,Tx AUDIO\_USE\_GAIN 0.25

\*22,Tx AUDIO\_USE\_GAIN 0.15

\*23,Tx AUDIO\_Use\_GAIN 0.05

\*24,Rx AUDIO\_USE\_GAIN 2.1

\*25,Rx AUDIO\_USE\_GAIN 3.1

\*26,Rx AUDIO\_USE\_GAIN 4.1

-----End of File-----

Remarks: An example of changing parameters on the fly (see dvswitch.sh Command Line Options, page 20).

# DVSwitch Mobile

## Installation & Setup

(Mobile Host Running Analog Bridge and dvswitch.sh)

---

### ASL DVSwitch Demo

A demo ASL (IAX2) account has been setup on demo.dvswitch.org. The node is 100 and has NO access to any other ASL node. The idea here is so that a new user will have a working account as a reference. The demo account has the call sign set to "No Call"

- To view the demo account configuration, from the main menu, select Accounts tab and then select the last profile.
- To access the demo, check demo account profile (the last entry).
- A Parrot node is accessible from the demo node (100).
- Press **"Connect"** and then, after you are connected, touch **"PTT"**, say your call sign, a few words and toggle **PTT** off..
- Check out the node list with a long press of the B key.
- Detailed information is available on the support forum <https://dvswitch.groups.io/g/Mobile>.

