Update your MD-380 / Retevis RT3 or

MD-390 with GPS / Retevis RT8 with GPS

using a Windows machine and Linux VM

This project is a fork of https://github.com/kd0kkv/md380tools-vm. Thanks go to KD0KKV for releasing the first VirtualBox image that got me interested in doing updates under Windows in the first place. It appears that Travis Goodspeed and Friends may be creating actual Windows binaries, so the usefulness of this VM may be reduced in the near future.

These steps allow you to use MD380tools to keep your radio up-to-date using a Windows based system instead of a linux or Raspberry Pi machine. Actually, you will be running linux in a Virtual Machine to do this.

I've been asked time and time again, "How do I do this with Windows" and so here it goes. I've just documented this stuff as text for now in order to get it out there. As time permits, I'll add screen shots and make it pretty later.

You could freshly install any Linux distribution you like in VirtualBox, however I recently ran across the image made by KD0KKV, and thought it was useful. I created this fork to enhance the image to support MD-390 radios with GPS and provide more detailed instructions in its use.

At this point, if you haven't ever had your radio connected to your Windows machine yet, do so now with the radio power on. Let it sit while you are doing the other steps. It takes Windows a long time to install the USB driver the very first time.

***** Downloads *****

Step 1:

You need to download the Appliance image file.

Browse to: **https://github.com/KD4Z/md380tools-vm**

And download the image file from the Dropbox link mentioned on that site.

Currently it links to: https://dl.dropboxusercontent.com/u/24789865/VM/tyt_kd4z.ova

You will end up with the file named tyt_kd4z.ova. It's 810MB, so it may take a while to download. Save it where you can find it again.

Step 2:

Install Virtual Box on your system

It's free from: **https://www.virtualbox.org/**

Install the appropriate version for your OS. If you are reading this, you likely are interested in the Windows version. At the time I wrote this, version 5.0.30 was the current version.

I had trouble installing version 5.x when I was upgrading it from 4.x that I already was using. See **Known Issues** below for what I had to do to get past a rather nasty blockage.

***** Import the VM into VirtualBox *****

Launch VirtualBox Manager.

From the File menu choose "Import Appliance."

Navigate to where you saved the md380tools.ova file and choose OK.

Take the defaults for everything else.

You will see the VM listed as a linux VM having the name "tyt" when completed.

Don't start the VM yet. You need to check the configuration of the network adapter. These settings worked for my situation, however you may need to tinker to get it to work on your hardware.

With the tyt VM selected,

Click on Settings in the VirtualBox Manager

Click on "Network" on the left side menu.

Click on "Advanced so you can see everything.

Change the values for Adapter 1 to:

Attached to : **NAT**

And under advanced,

Adapter Type: **PCnet-FAST III (Am79C)**

Click OK.

As far as System memory, this image is very small and actually will run at the default setting of 256MB, so no need to adjust it higher.

Now start the VM. After it launches, you will be left at a linux prompt. You should be automatically logged in with the user “tyt.” The “@DmR” indicates the host name of the VM is “DmR.” The prompt will look like this:

tyt@DmR:~$

If you are new to linux, note that commands are CaSeSensitive! In this VM, every command is in lowercase.

***** For reference *****

The VM has a screen saver that completely blanks the screen. When the screen go all black, don't panic. Press the ESC key to get back to your screen.

To safely shutdown the VM, try not to “X” the window away. Instead, choose "ACPI Shutdown" from the “Machine” menu .

***** Check your internet connectivity *****

You will need to verify that you have the network adapter working and can get to the internet.

Try pinging a well-known host. Type this at the prompt.

ping www.google.com

Press Ctrl+C to stop the ping command after a few lines go by.

If you get successful ping replies, you are good to go. If not, look to see if your network adapter received an IP address from your router.

/sbin/ifconfig

The network adapter is "eth0". The ifconfig command should show that you have an IP address associated to eth0. If not, you will need to tinker with the Network adapter settings until you get connectivity. Start Googling if this is the case.

In order to run the commands in the VM, you will need to have the VM successfully connected to the Internet. Don't bother continuing until you can get ping responses.

The VM can be used to manually run any of the available commands provided by the MDtools project. However, a menu of commands has been provided to make operations simpler.

***** MENU OPTIONS (for noobs) *****

glv - downloads or updates the md380tools project files from github. Nothing happens to the radio with this command. You must always do this step first, and watch out for any errors before continuing to the next command.

flash - builds and flashes the firmware to NON GPS radios. Use this for MD-380 and MD-390 radios that do NOT have a GPS. Your radio must be in DFU mode for this command. See the next section "DFU Mode" for the correct procedure.

Check the USB Device menu to make sure the device for the radio is selected, before executing this command.

When actually writing to the radio, a value indicating percentage of completion will indicate progress. It should take less than a minute to complete this process.

flashgps - builds and flashes the firmware to GPS enabled radios. Use this for radios that do have a GPS. Your radio must be in DFU mode for this command. Like the flash command, check the USB Device menu to make sure the device for the radio is selected, before executing.

flashdb - download and flash the user database to radio. You can use this command on any supported model of the radio.

The radio is in the turned on state, not in DFU mode. But you still need to check that the USB device as noted before entering the flashdb command.

The USB device may display differently than in DFU mode. It will be listed something like @00000010:ffffffff Patched MD380

When running, it will first erase the flash area for the user contact data, then flash in the new user contact data.

Your recipe will be to run three commands, one at a time, in sequence. Follow any directions displayed to restart the radio when done with the **flash, flashgps and flashdb** commands.

After running a command, you can execute the **menu** command to see the menu options again.

MD-380 Recipe: **glv**, **flash**, **flashdb**

MD-390 with GPS: **glv**, **flashgps**, **flashdb**

At this point, you are done!

The remaining commands on the menu, **flashlast**, **flashlastgps**, and **flashlastdb,** can be used to repeat the similarly named commands. The use of these functions requires a successful run the **flash**, **flashgps**, and **flashdb** commands prior to use however. Their purpose is to be able to prepare for updating radios when you know that you won't have Internet connectivity. I'm still tweaking these commands so if they don't work, you can always run the primary command that require internet connectivity.

**** DFU Mode (aka Download Firmware Mode or Bootloader Mode) ****

If your radio is ON, turn it off and connect the USB cable to your radio and your computer's USB port.

Hold down PTT and the Upper user programmable button at the same time, then power the radio back ON. The busy LED should be flashing Red/Green. If the busy LED isn't flashing, turn the radio off and try again.

From Devices menu in the select USB, then "AnyRoad Techology Digital Radio" if you see it, or anything mentioning the MD-380. The menu should show a checkmark in front of the radio selection if you were successful.

I received an error every time I tried this setup the very first time. See the Known Issues section below for possible tips to get past issues I encountered. You must have the USB port selected before continuing with the rest of the firmware update steps.

Note that when the radio is simply powered on, the USB device may display differently than in DFU mode. It will be listed something like @00000010:ffffffff Patched MD380. This is normal, and you would want to have it selected so you can perform run the **flashdb** command.

***** Power users *****

If you aren't into using hardwired menus. You can forgo using the menu commands completely and follow the notes that Travis has clearly documented here:

https://github.com/travisgoodspeed/md380tools/blob/master/README.md

In a nutshell, this VM will have all the of the MDtools project files, so you can build, and flash new firmware and users by following the directions starting with "Flash updated firmware for linux based installations" in the README.md file on Travis' github page. (This should be required reading by the way.)

Just change to the MD380tools directory if you want to manually invoke the commands.

***** Known issues *****

When installing VirtualBox 5.x, the installer got stuck with an error dialog that stated:

> *"The application "iphlpsvc.dll" needs to be closed for the installation to continue"*

If you run into this message, you may be able to solve it without cancelling the installation.

Go to your search box in Windows and search for "*View local Services*" Launch the Services Snap-in. Scroll down and find "*IP Helper*", Click on "*Stop Service*"

Then click on Retry. You also may cancel the installation and run the VirtualBox installer again. It will likely think the last install was partially finished and offer up "*Repair*" or "*Remove*" options. Choose "**Repai**r" and it will run the installer for you again and finish things up. You can restart the IP Helper service after Virtual Box has finished installing.

You might just want to stop the IP Helper service ahead of time to avoid this issue.

I ran into another issue where I couldn't get the USB port to attached to the radio. USB devices seem to be the hardest issue to overcome with Virtual Machines in general. The USB driver for the MD-380 was no exception.

You may have to do these steps with the radio connected and turned on:

> From the Devices menu in the tyt VM window:
>
> Choose Settings | Ports | USB | USB Settings ...
>
> Click the icon on the right side with a USB plug and a + sign, to add a new USB Filter
>
> Choose the device which cannot be attached. (*Patched MD380*)
>
> Click on the next icon down from the + icon, it looks like it is a USB plug with a dot.
>
> This should bring up a window that allows editing of the USB device properties.
>
> Clear all fields **except the name**, and click Save.
>
> Unplug the USB device. (***You must do this!***)
>
> Plug in the USB device again.
>
> Go back to the Devices | USB menu, and try to attach the USB device again.

If this doesn't work, I'm out of ideas, start Googling.

I had to do the unplug / plug back in dance a few times in order to get the USB Device selected.

When you get a check mark in front of the radio device, you are good to go.

***** Fun Times *****

If this is the first time you have flashed the MD380tools firmware into your radio, you will need to enable a few new settings to fully utilize the new abilities. Go into the radio *Utilities* menu and navigate to the new sub menu item *MD380tools.*

You will need to enable the menu item *UsersCSV,* so the massive contact database can be used. This enables contact look-ups from the 48 thousand plus records from the DMR-MARC user registry. When this option is disabled, the contacts embedded in the code plug are used as with the stock firmware.

Other fun things to do in the MD380tools menu:

Change Date Format to: **Alt. Status**

> It's all the way down at the end of the scrolling list of date formats. This turns off the Date and Time display and shows you Last Heard information instead. Trust me, you will like this.
>
> You will notice the date and time display will be gone, to be replaced by: "lh" followed by the call sign, and an arrow pointing to the Talkgroup number they were using.

Promiscuous Mode: **Enabled**

> This is the feature that started it all. Enable it to hear any activity on the time slice of the channel you have selected. Any talkgroup will come in, so be sure to look at the Last Heard data to see where they were talking before going back to them. It's a lot like having Scan enabled all the time.

Edit DMR ID:

> You can now change the radio's DMR ID without using the CPS software. Handy if you need to switch identities in the field.

Mic Bargraph: **Enabled**

> This enables a cute flashing VU Meter when you are transmitting. Use it to see how hot your voice level is and adjust your mouth-to-radio distance or voice to make it consistent. Digital radio voices that are too hot sound awful, so use this feature as a reference for good operating practice.

Good luck and your mileage may vary! Note that you are responsible for issues experienced with any of this. Use the MD380tools Yahoo forum to post questions.

73 de KD4Z

Version History:

> 1.0 December 9, 2016 Release of documentation only.
>
> 2.0 December 13, 2016 Initial release of forked project.