Personalización de radio de red ZX

Después de ver el video de Ringway Manchester en la radio de red portátil YiNiTone B5 y luego descubrir que ejecuta Android y solo cuesta £ 45, solo tuve que conseguir uno, incluso si es solo para jugar y no para usarlo correctamente.

https://youtu.be/0jO9ahnC7Ek

Avance rápido poco más de una semana, tengo uno en mis manos, ejecutando EchoLink en lugar del Zello predeterminado. De ninguna manera es perfecto, y si lo apaga o deja que se agote, deberá conectarlo a su computadora para, al menos, eliminar la aplicación Zello nuevamente (se explica más adelante), pero creo que es un buen comienza y deja mucho espacio para que las personas con más conocimientos que yo lo amplíen.

Entonces, ¿qué es esta cosa, de todos modos?

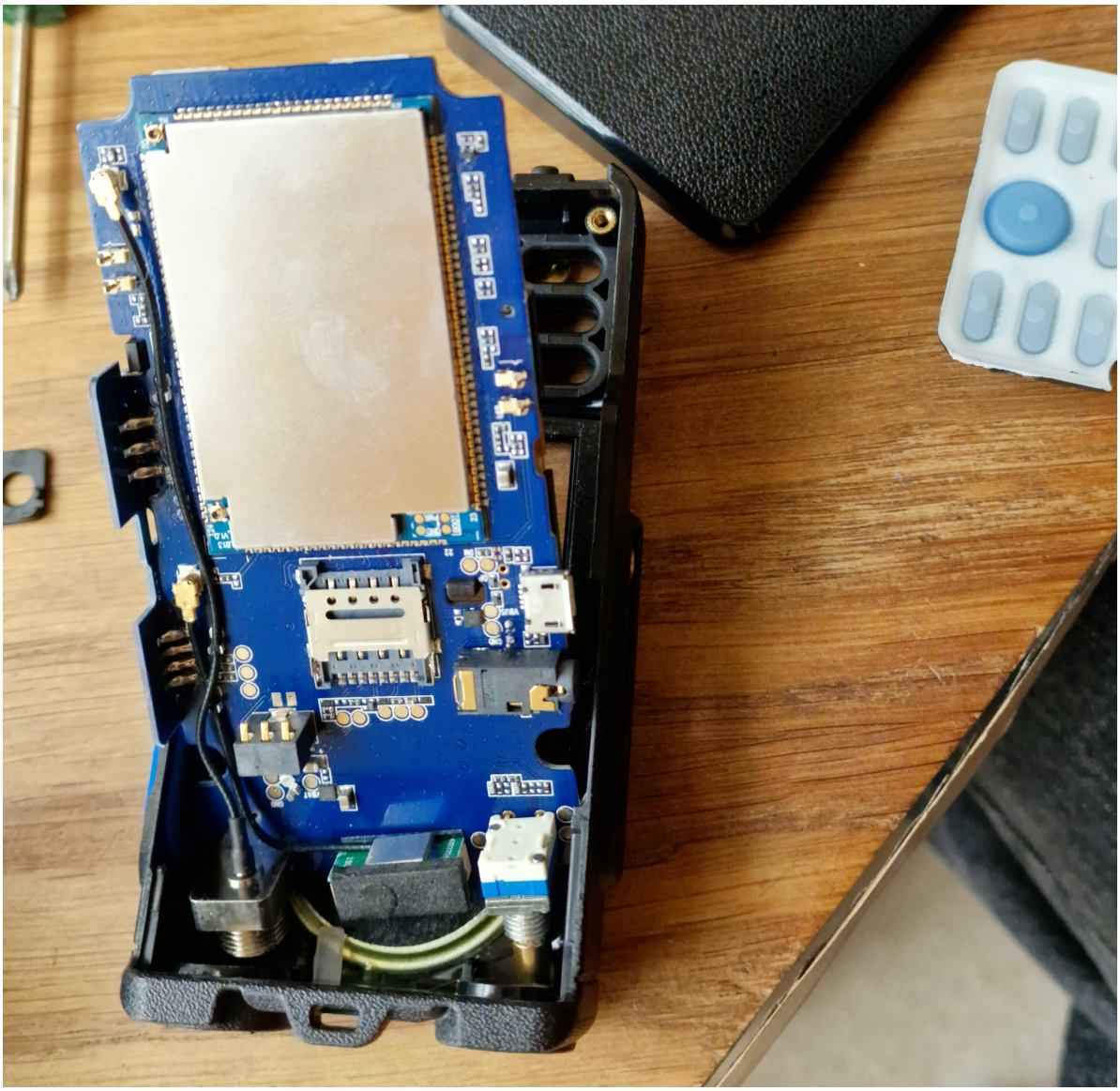
La pequeña radio, que está pegada en todo AliExpress y BangGood bajo diferentes marcas con materiales de marketing comunes, es esencialmente solo una tableta Android (no teléfono, ni texto ni aplicación de teléfono) con una SIM de datos en un factor de forma de radio que tiene hardware adicional. botones accesibles para el sistema operativo.

Especificaciones

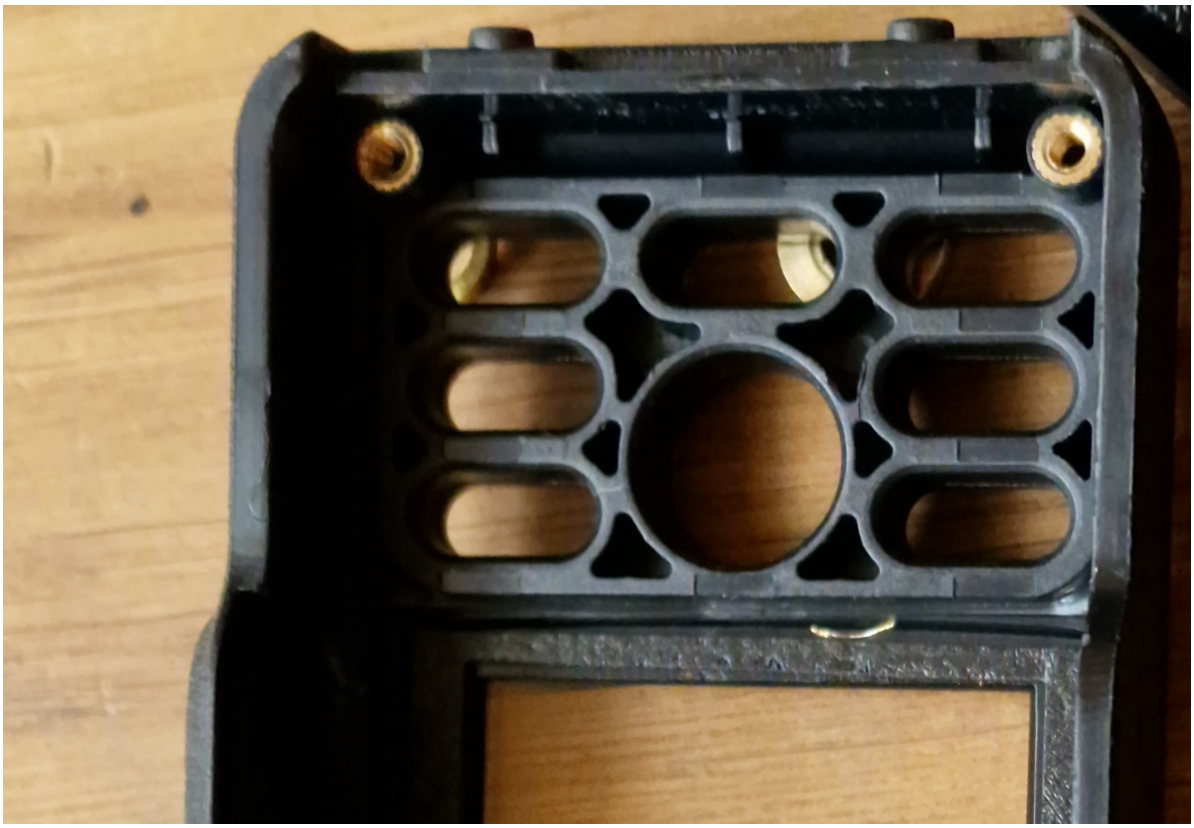
- 512 MB de memoria RAM
- Almacenamiento flash de 1GB
- Procesador Qualcomm MSM8909
- Redes 2/3/4G
- Wi-Fi de 2,4 GHz
- Android 5.1.1 (sin rootear, modo desarrollador activado de forma predeterminada)
  - Nivel de parche de seguridad 2016-06-01
  - Número de compilación T56
  - Kernel 3.10.49 creado el martes 8 de octubre de 2019 a las 17:43:51 CST
  - Banda base LANSUS1-L809V0.02.01
- LCD a color de 160×128 sin contacto
- Antena externa para 4G
- PTT de hardware
- Paquete de batería de 6800 mAh con provisión para base de acoplamiento (no incluida)
- Altavoz frontal y micrófono

Demoler

No hice un desmontaje completo adecuado de esta unidad, pero sí tomé algunas fotos mientras limpiaba la pantalla LCD internamente. También noté que la carcasa trasera tiene una cinta de metal que hace contacto con dos pines en el tablero en dos lugares (arriba a la izquierda y en el centro a la derecha en la primera imagen) y aunque abrir la radio con la energía desconectada y volver a armar no mató no confiaría en tratar de encender la radio sin estos contactos conectados. Podría ser una función de autodestrucción, pero no voy a probarla.



Parte trasera del tablero



DA009_MB_V1.3

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Marketing y Marca

I have seen this radio advertised across AliExpress and BangGood under various brand names using the same marketing. Internally, the radio calls itself the ZX, however the external branding variations I have spotted are:

- Vtesping B5
- Vtesping WG-98
- YiNiTone B5
- Camoro K25
- HamGeek HG-369
- Kereia V597 Plus
- Anysecu T56
- Koleeg KLJ-910
- KSUN ZL10
- Just completely unbranded

Accessing via USB

When connected to a PC, the radio does not present itself as a media storage device like many Android devices do. This means you cannot see the contents of the Android directories nor the storage available.

The USB cable the radio comes with is only for power, not data. If you plug the radio into a PC with the stock cable, the radio will charge but it will not connect. Use a different known-working USB cable to connect the radio to your PC and you will find it makes a connect sound but presents no storage medium.

Required Software

In order to access the radio over USB, we will be using ADB (Android Debug Bridge). This requires developer mode on the radio to be turned on, but conveniently it is already on for us by default.

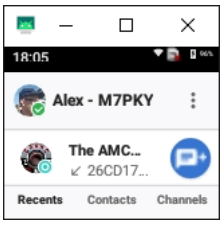
No additional drivers are needed for this process. You only need the scrcpy software which includes all the tools you'll need to complete all the customisations in this guide. You can download the latest stable version of scrcpy from here https://github.com/Genymobile/scrcpy/releases

Once extracted, the contents of the scrcpy folder should look like so:

Name	File ownership	Date modified	Type	Size
adb.exe		26/05/2022 14:17	Application	5,854 KB
AdbWinApi.dll		26/05/2022 14:17	Application exten...	96 KB
AdbWinUsbApi.dll		26/05/2022 14:17	Application exten...	62 KB
avcodec-59.dll		26/05/2022 14:17	Application exten...	68,881 KB
avformat-59.dll		26/05/2022 14:17	Application exten...	15,199 KB
avutil-57.dll		26/05/2022 14:17	Application exten...	941 KB
icon.png		26/05/2022 14:17	PNG File	7 KB
msys-usb-1.0.dll		26/05/2022 14:17	Application exten...	217 KB
open_a_terminal_here.bat		26/05/2022 14:17	Windows Batch File	1 KB
scrcpy.exe		26/05/2022 14:17	Application	709 KB
scrcpy-console.bat		26/05/2022 14:17	Windows Batch File	1 KB
scrcpy-noconsole.vbs		26/05/2022 14:17	VBScript Script File	1 KB
scrcpy-server		26/05/2022 14:17	File	41 KB
SDL2.dll		26/05/2022 14:17	Application exten...	2,203 KB
swresample-4.dll		26/05/2022 14:17	Application exten...	424 KB
swscale-6.dll		26/05/2022 14:17	Application exten...	589 KB

The scrcpy package contents

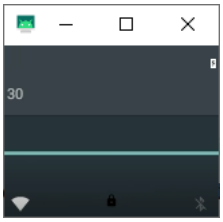
The first thing to do to test your setup is to launch the scrcpy.exe which should after a few seconds pop open a command prompt window and then a display which mirrors that of your radio:



The radio display

You can interact with this display using your mouse and keyboard, just like you would any Android device, just over your PC! Immediate things to note here are that you can grab the black bar at the top and pull down (you may need to do this twice) to access the system toggles, something usually inaccessible when using the radio's keypad:

First pull down



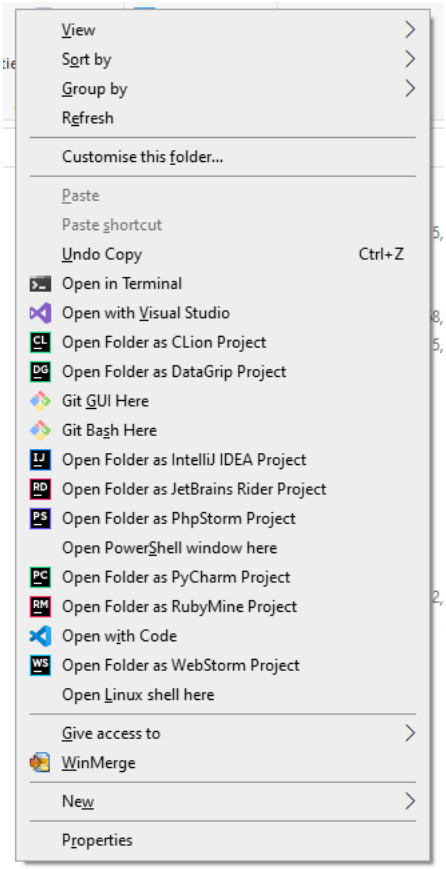
Second pull down

Just pull in the opposite direction to hide this menu again.

Adjusting the Screen Size

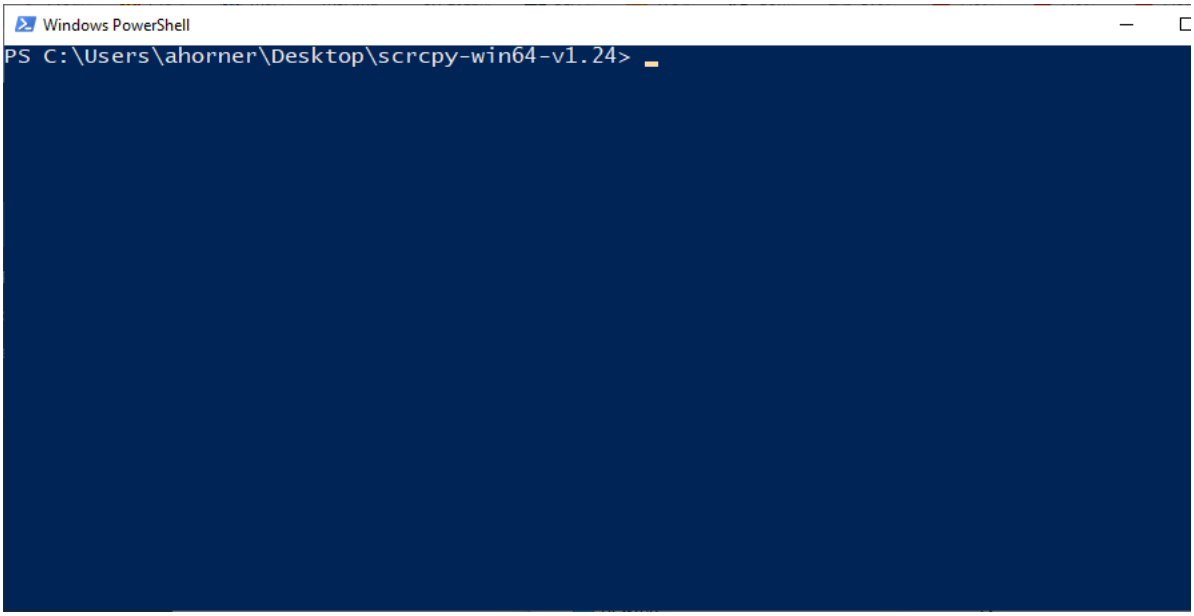
As you can see above, everything is very cramped. This is due to the very small 160×128 LCD panel of the radio. It is in fact possible to adjust the screen resolution so that you may see more on the screen and things will be less cramped, however I must note that this comes at the comprimise of quality. The more you try to fit on a screen with few pixels, the more fuzzy it is going to look! For me, this is okay as I only want to do basic navigation and not much reading, but for others this could be an issue.

First of all, go back to your list of scrcpy files, and in a blank space in the file explorer (not on top of a file) hold SHIFT and right click to open the expanded context menu:



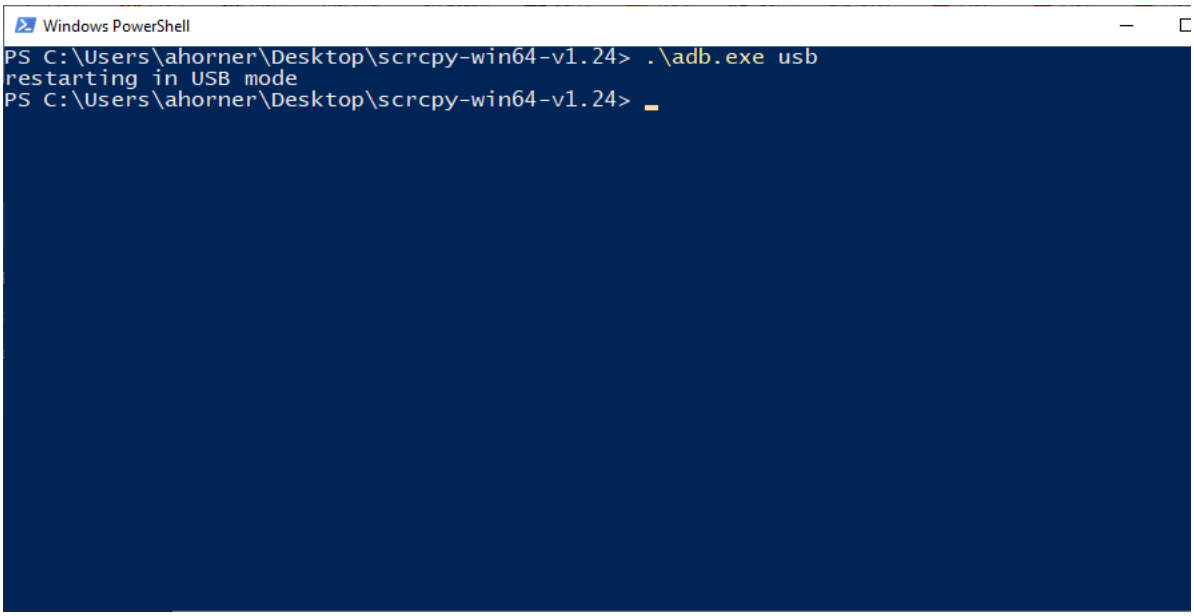
My context menu

As you can see, I have a lot of menu options. You probably won't have as many! The one you want to click is **Open PowerShell window here** :



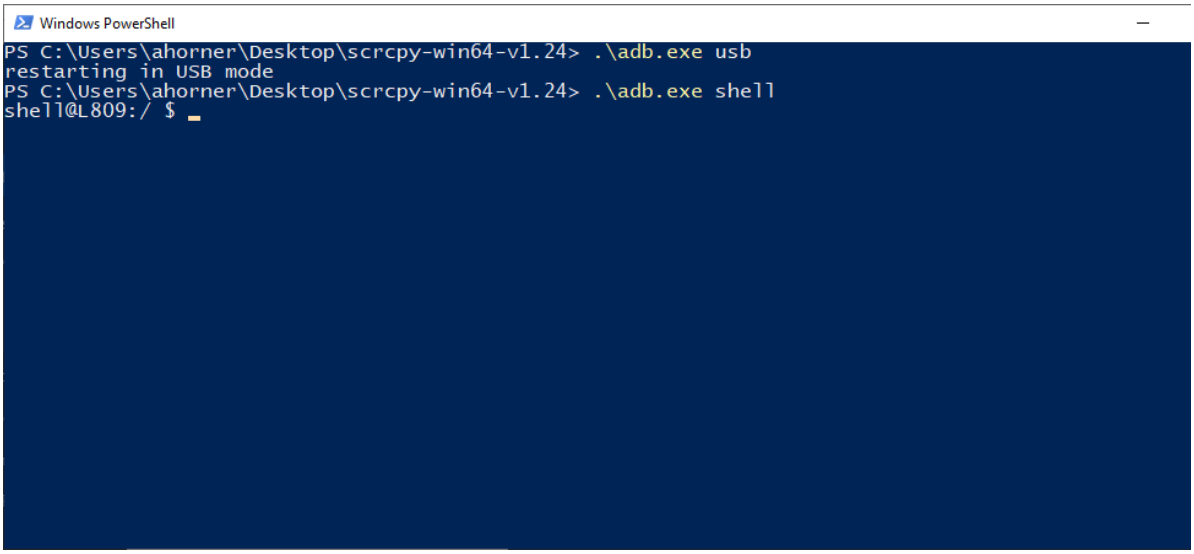
The PowerShell window

Now, don't be put off by the command prompt in front of you! All the steps you need to take are documented here for you. The first thing to do is tell ADB that you want to connect over USB, like so:



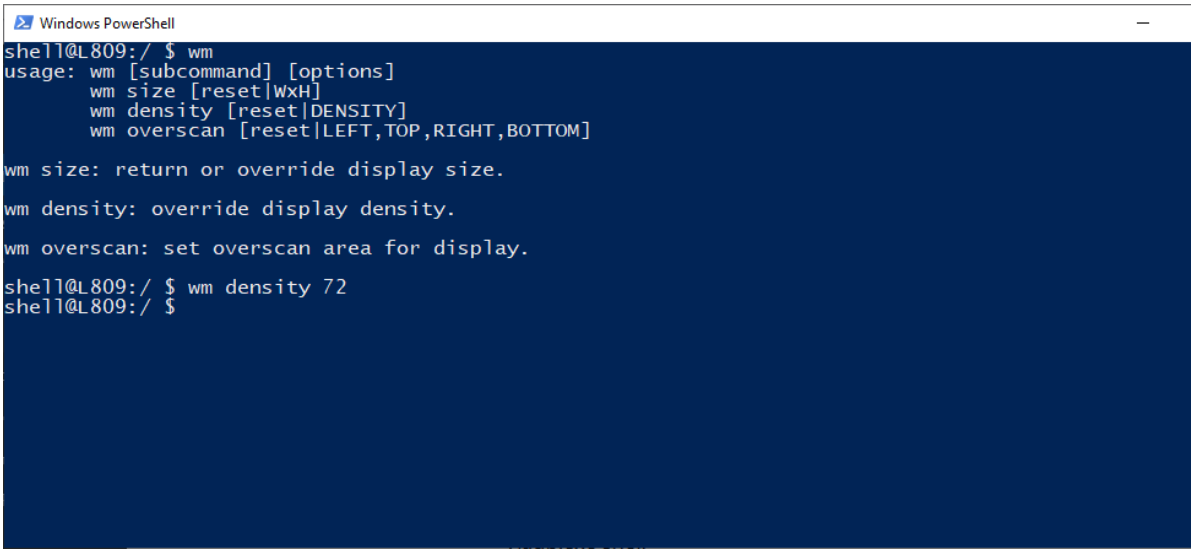
.\adb.exe usb

Then we want to log into the command prompt of the radio like so:



.\adb.exe shell

Now we're in the radio command prompt, we can use commands to change the screen resolution. My preference is to keep the resolution the same and instead change the display scaling to fit as much as possible on the display, like so:

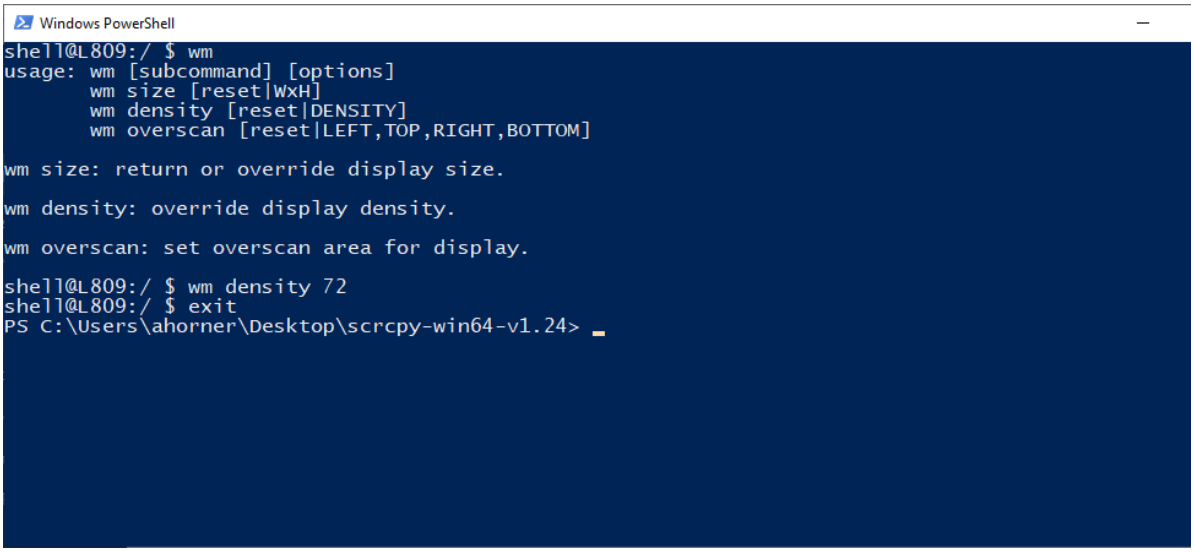


wm density 72

As you can see, 72 is the density (scaling) I chose. I could also do **wm density reset** as the instructions say, or I could change the screen size with **wm size WxH** and example being **wm size 1920×1080** and of course I can also reset again with **wm size reset** .

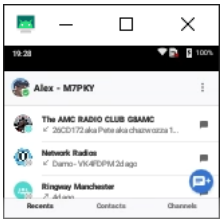
The reason I prefer to set density instead of size, is because size seems to bug out when restarting the device sometimes. It will ignore what you set but try to size the contents of the screen anyway, cutting everything off. Density seems to consistently work fine though!

You can type exit to exit your radio command prompt and return back to the PowerShell command prompt:

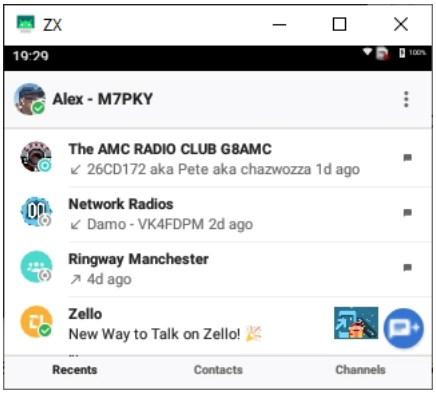


exit

If we run scrcpy again (make sure to close it first), we will see things fit much better:

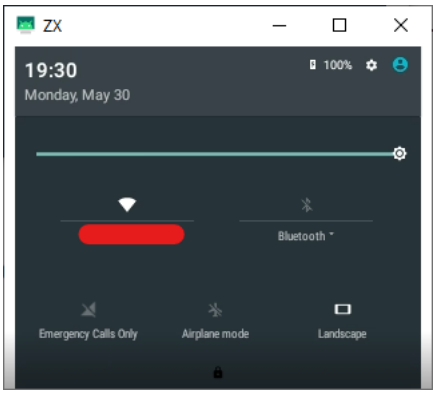

Zello, bigger

If you find the text to small, go back into the adb shell and change the size instead of the density, then restart scrcpy again. Here, I have reset the density and increased the size to 1920×1080:



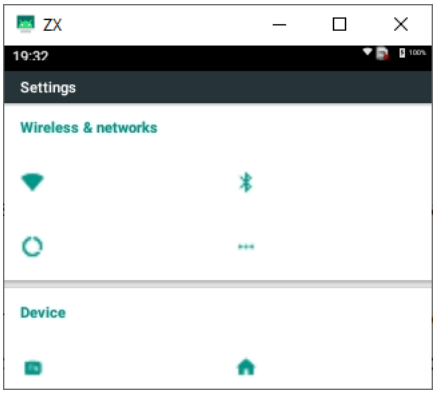
Density reset, size 1920×1080

And as you can see, the system toggles are now much easier to access:



System toggles

And if you have a little explore around, you'll see you can click the settings god in the top right of the system toggles, and instead of getting the radio settings menu you're used to, you get the full, proper Android 5.1.1 settings menu!



The real settings menu

Running EchoLink

Now we have a way to access the radio using ADB, we can use ADB to install new apps! For this, I have decided to update the existing Zello app, and also install a new Launcher and also EchoLink.

For those who do not know, the Launcher app is the app which runs on your Android device to display the available list of apps on your home screen. The built in launcher on the radio, called **Launcher3**, limits the apps you can access to the radio settings screen and Zello, which is no good for us. My preferred Launcher for this device is **Nova**, which is what we will be installing today.

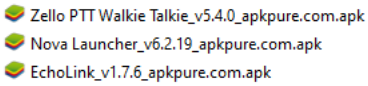
First of all, we need to download the apps we're going to install. I personally got my apps from ApkPure.com however I do not endorse them and cannot guarantee the safety of any apps you download from them. I just know the ones I downloaded worked.

When downloading APK files, which are Android app files, make sure they are compatible with Android 5.1.1 or older. Any app which requires a newer version of Android will not work. For example, I had to download an old version of Nova, version 6.2.19, because this was the newest version capable of working with Android 5.1.1

Here are the links to the apps I downloaded:

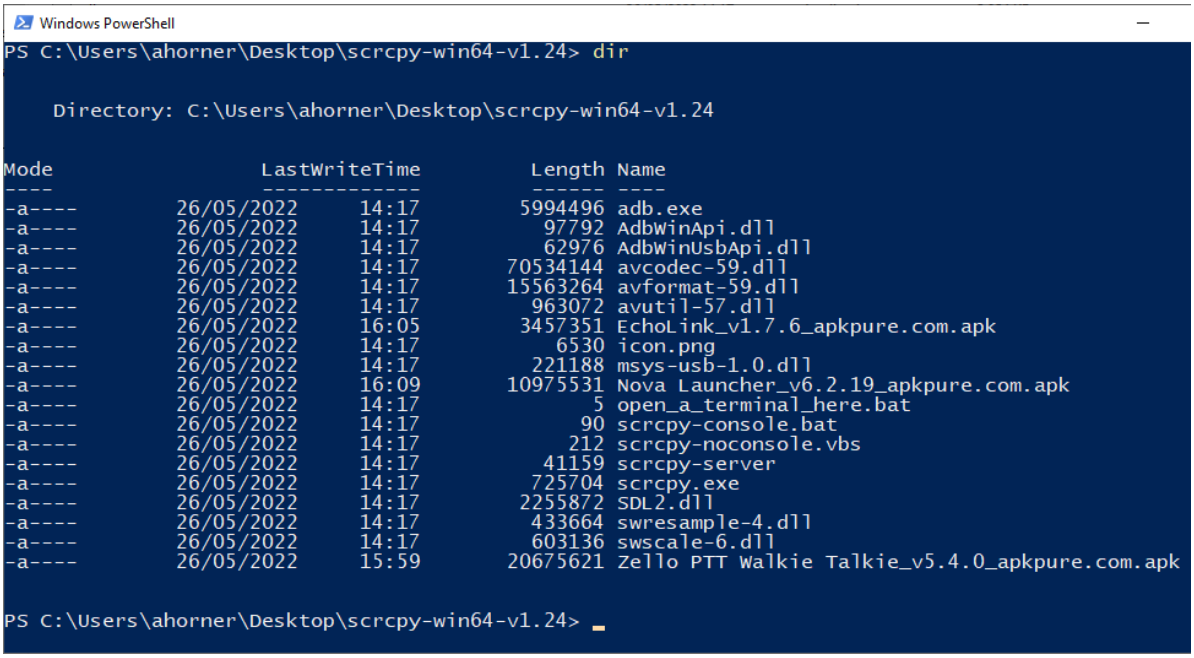
- Zello – https://apkpure.com/zello-ptt-walkie-talkie/com.loudtalks
- Nova – https://apkpure.com/nova-launcher/com.teslacoilsw.launcher/download/62019-APK
- EchoLink – https://apkpure.com/echolink/org.echolink.android

I suggest you download these to the scrcpy folder for easy access using ADB. I would suggest you install all 3, as Nova Launcher or an alternative will absolutely be required to open apps other than settings and Zello, as the default Launcher3 launcher blocks other apps from showing.



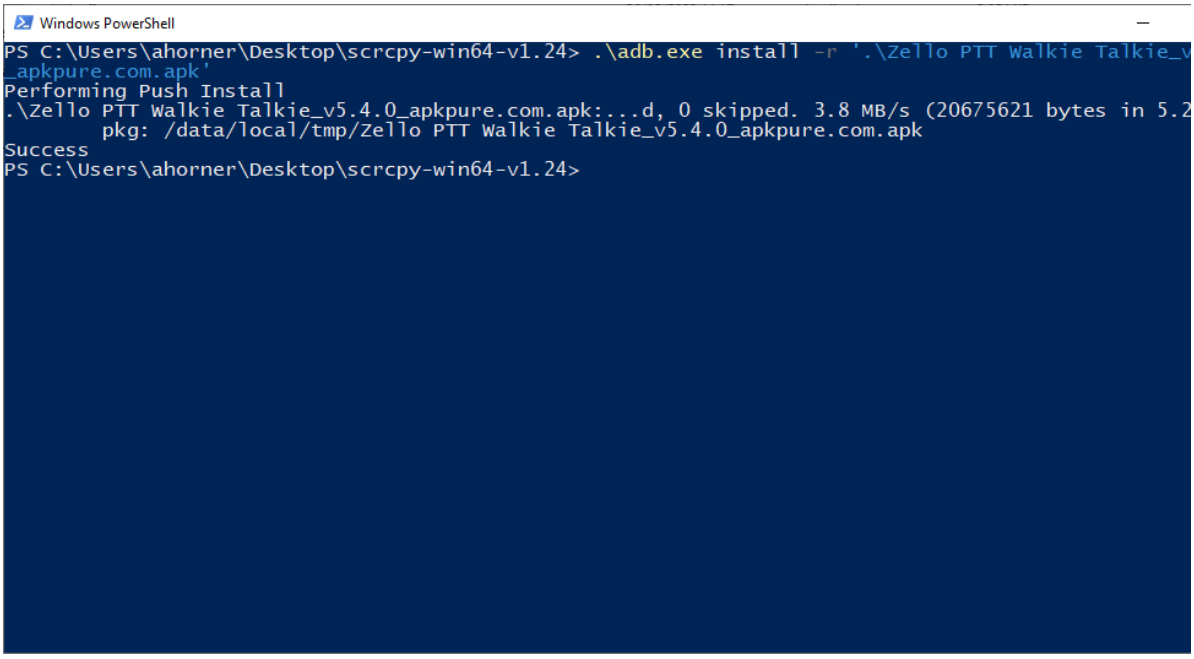
Apps downloaded to my scrcpy folder

Going back to our PowerShell, if we run the dir command, we will see our APKs listed alongside the other scrcpy files:



dir

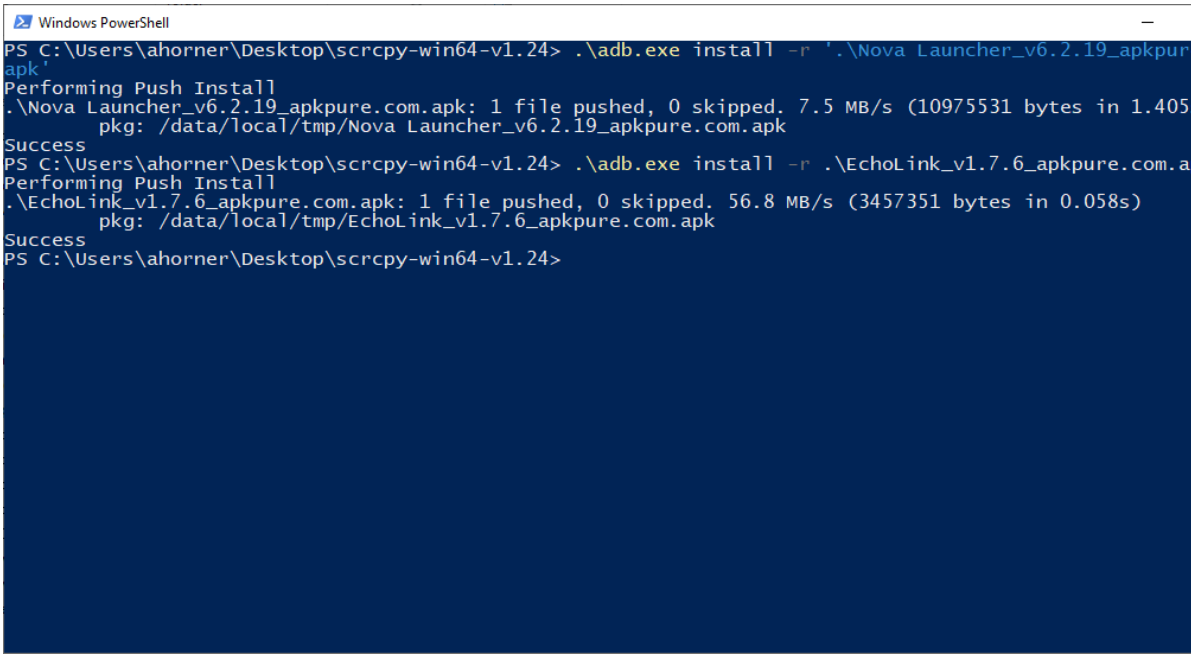
The first thing we're going to do is update Zello! To do this, we must run the ADB install command, making sure to add -r which means Replace. This is because Zello is already installed and we want to replace it with a newer version. If we did not add the Replace option, ADB would refuse the install. If you include the Replace option when you don't need to, it really doesn't matter, an app will still install:



.\adb.exe install -r '.\Zello PTT Walkie Talkie_v5.4.0_apkpure.com.apk'

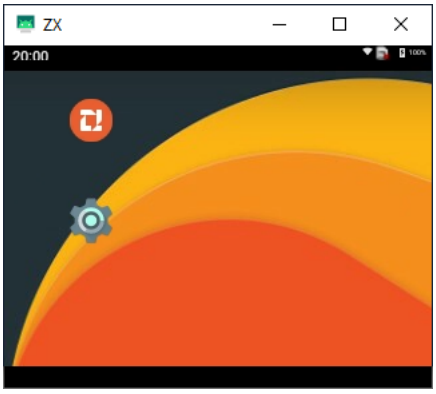
A little tip: You probably do not want to type all of the APK name out. Type the first word or two (making sure to get capital letters correct!) and hit the TAB key and PowerShell will type the rest out for you.

Next, let's install Nova and EchoLink:



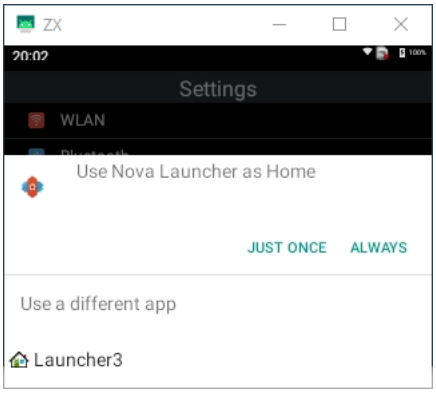
Installing Nova and EchoLink

Now, all we need to do is set Nova to be our default launcher. Here is the old Launcher3:



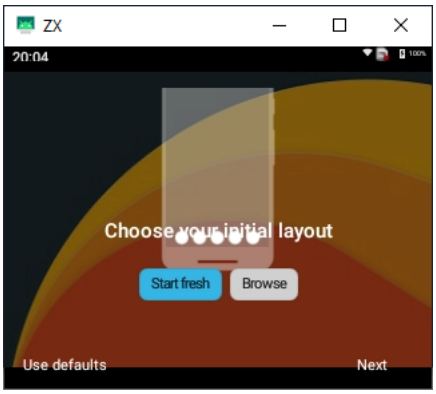
Launcher3

Whilst on Launcher3, press the MENU button on the device. It may take one or two presses, but you should be presented with the Launcher Select menu:



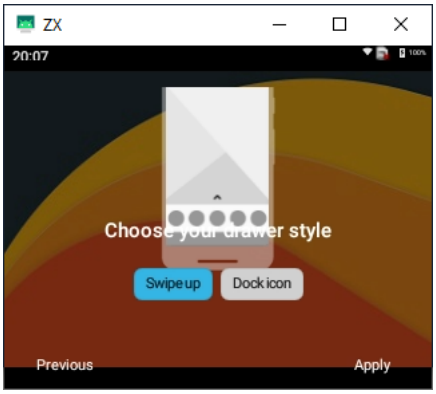
Launcher Select

I am using scrcpy to control the radio here for convenience. Obviously, you want to select Nova here. Once you do so, you'll be presented with the Nova welcome screen:



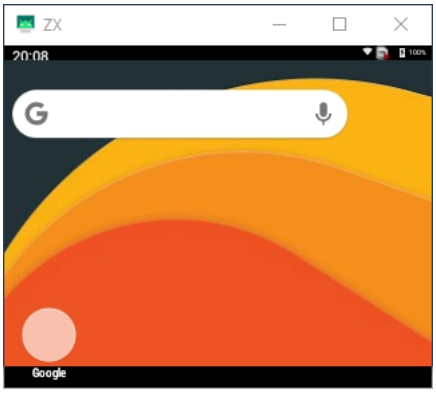
Welcome screen

At this menu, I suggest you choose Start fresh then click Next. When you get to drawer style, you want to choose Swipe up because Dock Icon does not work:

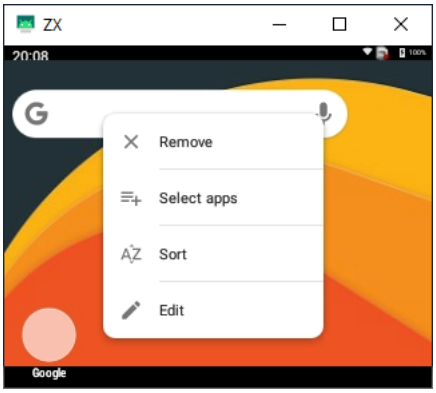


Swipe Up

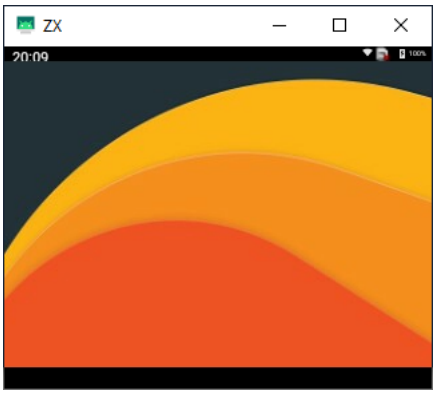
You will then be placed on the home screen. You can edit this using the mouse just like you would any other Android device. I decided to remove the search bar and default (broken) Google icon:



Default layout

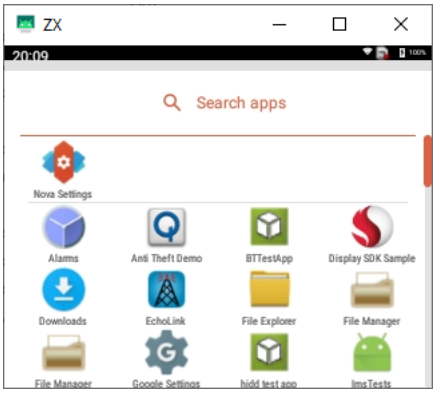


Removing bits



Empty Home

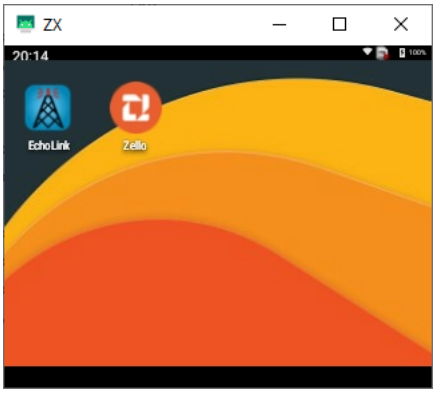
To access the app drawer, click and drag up from the bottom:



App drawer

As you can see, theres actually quite a few apps here which would usually be hidden, including some Chinese social media apps, stock Android apps and various testing apps used in the factory for testing the device. You can scroll though these using the scroll wheel or by clicking and dragging.

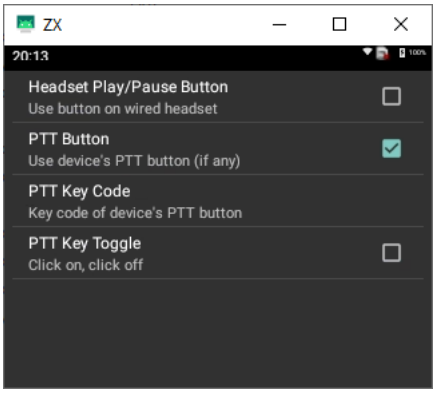
As you can see, EchoLink is right there. Click and hold it until the home screen appears, then drag and drop it to a free spot like so:



EchoLink and Zello added

EchoLink launched and connected

You can also go into the EchoLink settings, and if you enable PTT, the blue PTT button on the side of the radio will work!



PTT in settings

Conclusion

This radio works very well if you set aside about an hour to do these customisations. Here are a few additional notes I would like to make:

- When you first turn the radio on, Zello will start up automatically. I have not yet worked out how to stop this. Make sure you quit Zello before using EchoLink, otherwise your PTT button will trigger both! Do this from the 3 dots menu in the top right of Zello and click Exit!
- DO NOT turn of developer mode or USB debugging from settings. YOU WILL lock yourself out the radio and I DO NOT have any known way to get back in.

Thank you Ringway Manchester for your video on this radio, and for your continued interest in what I have achieved here! If anyone feels I have missed anything, feel free to contact me either via this website, or even better, on twitter at @LookItsAHorner