

Motorola Radius Programming in Windows with RSS and DOSBox

by KK6JYT | Mar 21, 2015 | Computers, Programming, Transceivers | 53 comments



Programming the Motorola Radius

Programming the Motorola Radius was not easy to learn. It took me about a week to figure out how to accomplish this dreadful task. Let's jump right in and start programming your Motorola Radius series (GM300/GR300/M10/M120/M130) radio!

Cables Required to Program the Motorola Radius

The cables and connectors required to program your Motorola Radius will vary from computer to computer. If you have a newer model computer, chances are that you do not have a



serial port. If you have an older model computer, you are probably in luck.

To see if you have a serial port on your computer, look at the connections for a port labeled "Serial". It will have nine pins and look like the picture.

If you do have a serial port, you do not need to purchase the USB Serial Port Adapter listed below.

Recommended Cables & Connectors

Listed below are the recommended programming cables and connectors required to program the Motorola Radius. I have received a few conformations from others that they do work as expected.

- **RIB for Motorola** – <https://amzn.to/2OsHVrD>
- **Power Supply for RIB** – <https://amzn.to/2AO1PK4>
- **Radio Programming Cable** – <https://amzn.to/2RzrQSQ>
- **USB to Serial Port Adapter** – <https://amzn.to/2Dp4koy> (only needed if you don't have a serial port connection on your computer)

Other Cables & Connectors

There are other programming cables that may or may not work to program your Motorola Radius. It is best to use the recommended cables and connectors listed above.

WARNING! – Some cheap USB serial port adapters do not work to program your Motorola Radius. I had to trash two different USB serial port adapters before I found one that worked for me.

Getting Setup to Program the Motorola Radius

The first thing you need to do is get your hardware setup. Plug in your USB Serial Port Adapter to your computer. Attach the Motorola RIB to the USB Serial Port Adapter. Finally, attach the programming cable to the RIB and your transceiver.

Note: If you have an existing serial port on your computer, just plug your Motorola RIB to the computer and the Motorola programming cable to the RIB and your transceiver.

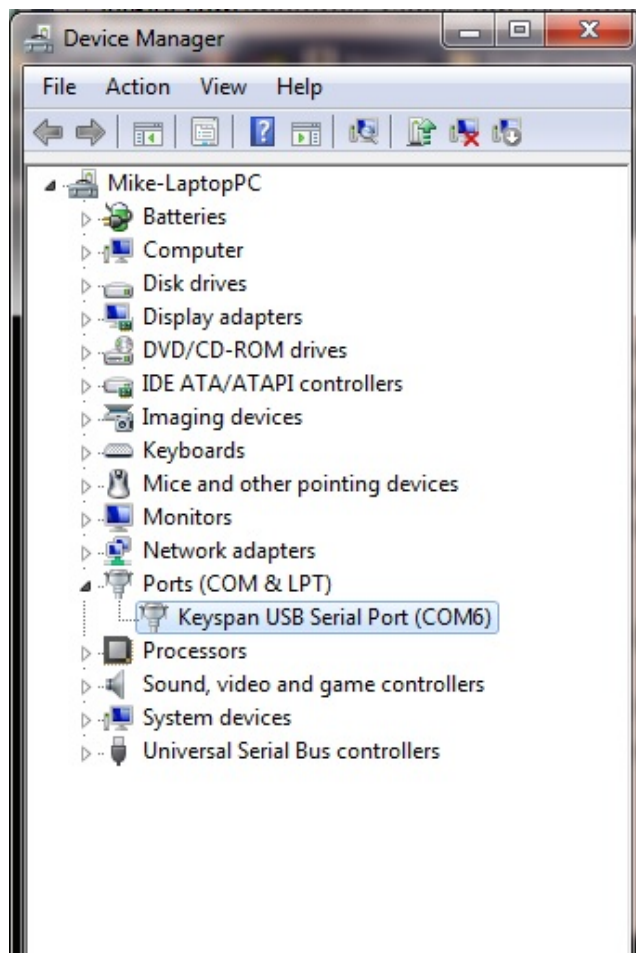
We now need to make sure that the USB Serial Port Adapter has been assigned port COM1 or COM2. This can be accomplished by checking the Device Manager. The Device Manager can be accessed by bringing up the Start Menu and typing "Device Manager" in the Search Programs and Files area.

How to Change the COM Port Number

If you plugged in your USB Serial Port Adapter and a COM port other than COM1 or COM2 was assigned in the Device Manager, follow the steps below.

Step #1 - (Changing the COM Port Number)

Open the "Device Manager".



Step #2 - (Changing the COM Port Number)



Step #3 - (Changing the COM Port Number)



Step #4 - (Changing the COM Port Number)

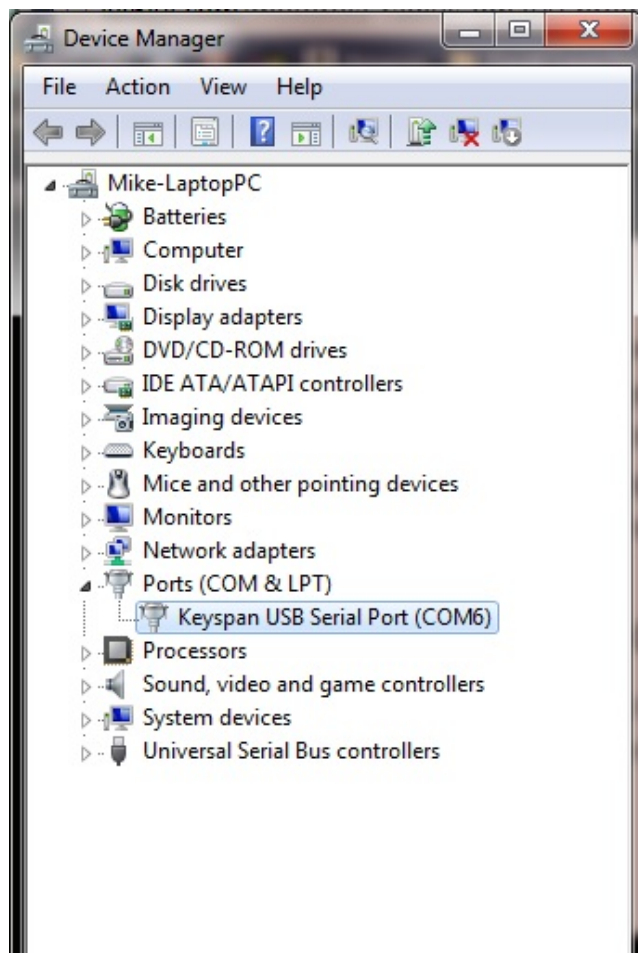


Adjusting the COM Port Settings

The COM Port Settings will need to be adjusted in order to communicate with your Motorola Radius.

Step #1 - (Adjusting the COM Port Settings)

If you are not already there, open the "Device Manager", right click on the USB Serial Port and select "Properties".



Step #2 - (Adjusting the COM Port Settings)



Step #3 - (Adjusting the COM Port Settings)



Step #4 - (Adjusting the COM Port Settings)

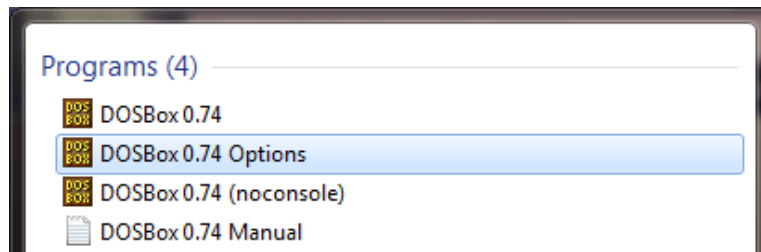


Configuring DOSBox to Run Motorola RSS

Now it's time to configure DOSBox to run the Motorola RSS program. If you have not done so yet, download and install the DOSBox program. ([Download link](#))

Step #1 - (Configuring DOSBox for Motorola RSS)

Click the "Start Menu" and in the "Search Programs and Files" area, type and select "DOSBox Options".



Step #2 - (Configuring DOSBox for Motorola RSS)



Step #3 - (Configuring DOSBox for Motorola RSS)

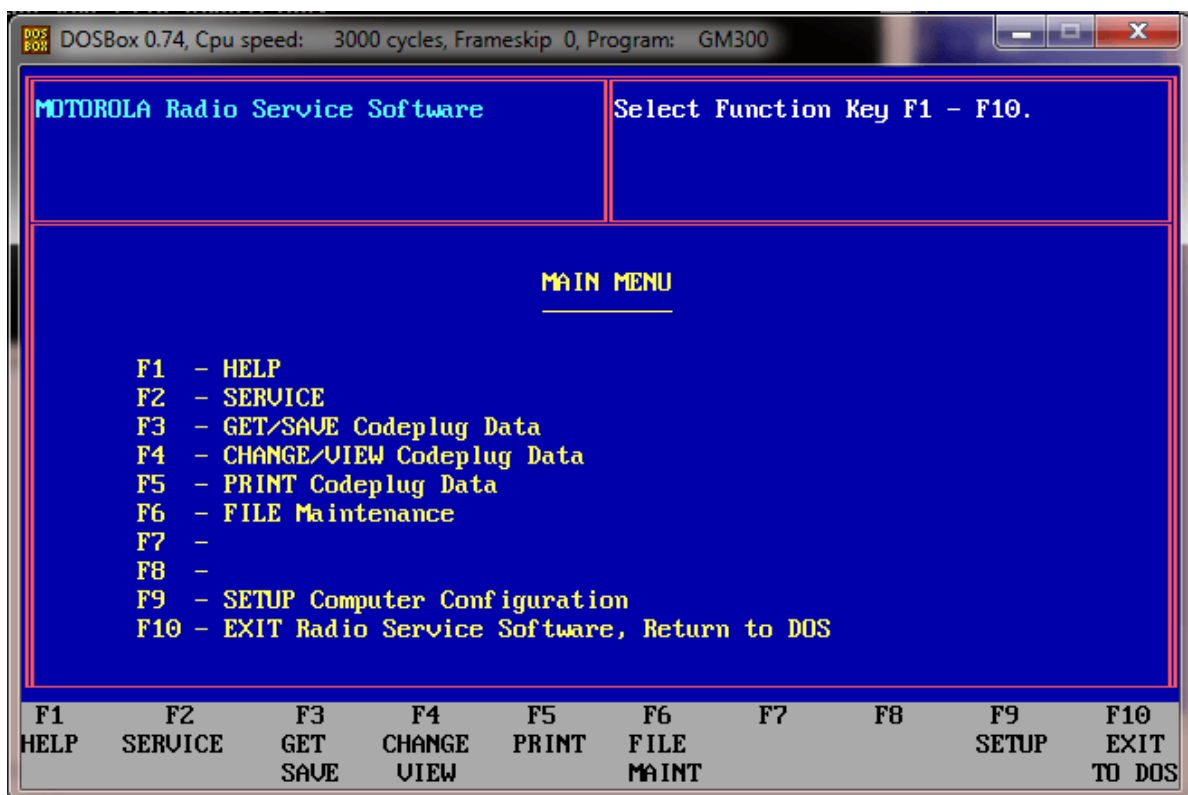


Step #4 - (Configuring DOSBox for Motorola RSS)



Starting Motorola's Radio Service Software

Now it's time to see if we did so far is correct. Let's start DOSBox and see what happens. You should see a welcome screen that tells you to push any button, and then the following screen below.

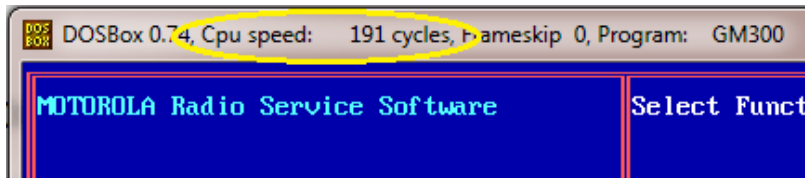


If you see this screen above, congratulate yourself! You have successfully configured DOSBox to run Motorola's Radio Service Software.

Now comes the part that just about everyone has trouble with . . . getting your Motorola Radius to communicate with your computer. Cheap programming cables, and too fast of a CPU speed (on your computer/DOSBox) are the main cause of this problem. We already discussed what cables worked for me. Now let's go over how to slow down the CPU speed.

Slowing Down the CPU Speed in DOSBox

While DOSBox is running, hold down the "Ctrl" key and press "F11" until the CPU Speed (displayed in the title bar) reaches somewhere around 191 cycles. If you went too far, hold down the "Ctrl" key and press "F12" to raise the speed back up. I was able to successfully program with a CPU Speed of up to 400 cycles.

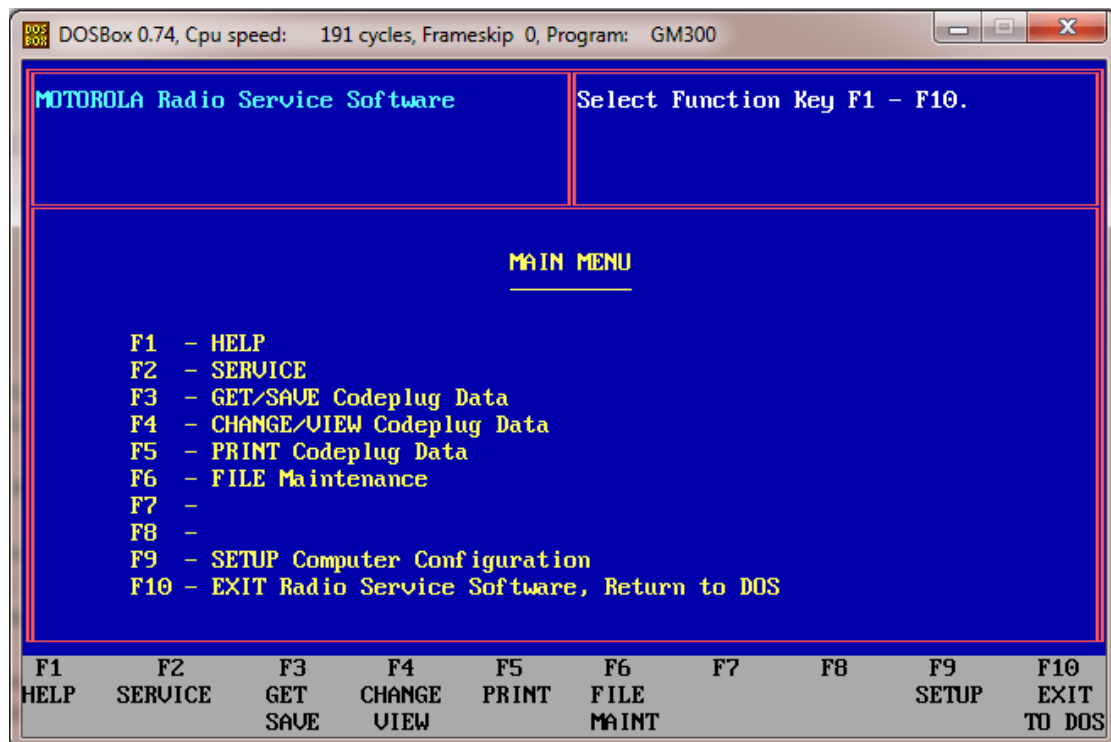


Configuring and Testing the Motorola RSS

Now it's time to configure the RSS, and test the connection between your computer and your Motorola Radius.

Step #1 - (Configuring and Testing the Motorola RSS)

From the "Main Menu" of the Motorola RSS, press "F9" to get into the "Setup Computer Configuration Menu".



Step #2 - (Configuring and Testing the Motorola RSS)



Step #3 - (Configuring and Testing the Motorola RSS)



Step #4 - (Configuring and Testing the Motorola RSS)



Step #5 - (Configuring and Testing the Motorola RSS)

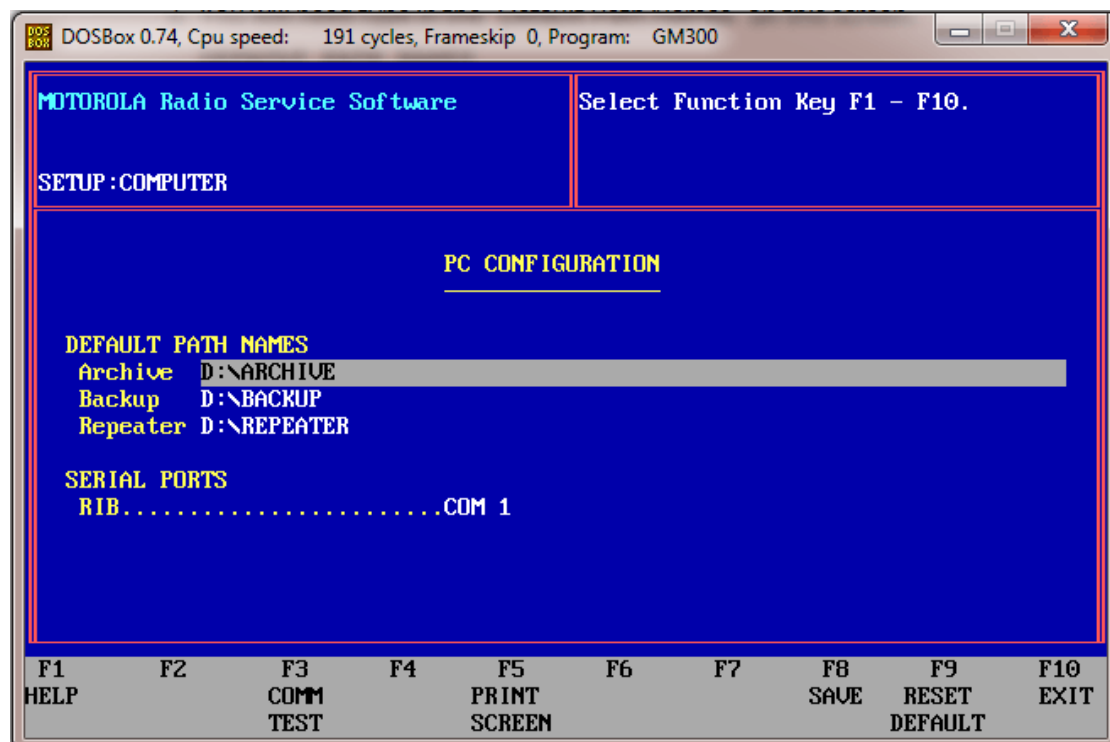


Programming Frequencies, Tones, Offset, and the Time Out Timer

In this section, I will show you how to program frequencies, tones, offset, and the time-out-timer.

Step #1 - (Frequencies, Tones, Offset, and the Time Out Timer)

If you are not at the Main Menu, press "F10" until you get there. Press "F3" to "GET/SAVE Codeplug Data".



Step #2 - (Frequencies, Tones, Offset, and the Time Out Timer)



Step #3 - (Frequencies, Tones, Offset, and the Time Out Timer)



Step #4 - (Frequencies, Tones, Offset, and the Time Out Timer)



Step #5 - (Frequencies, Tones, Offset, and the Time Out Timer)



Step #6 - (Frequencies, Tones, Offset, and the Time Out Timer)



Step #7 - (Frequencies, Tones, Offset, and the Time Out Timer)



Notable Resources

- A good source of [information about Motorola Maxtrac / Radius / GM300 radios](#) is at the [repeater-builder.com](#) website.
- [Common RSS error codes](#) (and what they mean) for the Radius series transceivers.
- Find [used Motorola Maxtrac / Radius radios](#) on eBay.

53 Comments

KK6JYT on March 21, 2015 at 2:15 PM

I have heard that turning the transceiver off and back on again (power cycle) just before attempting to initiate communication from the computer has helped, for some people.

Reply

Joseph Neale on September 18, 2015 at 6:40 PM

I need a little help I have followed all the steps up to the comm test. I have tried the comm test and get 'Accessing Serial Bus.' but it stays on that. I don't get an error or anything else. I even tried reading the codeplug and got the same message. Reading codeblock does not come up. I even left it there for 10 minutes. I using a computer with Windows Vista Business. Thanks in advance for any help.

Reply

KK6JYT on September 18, 2015 at 7:03 PM

What cable(s) are you using? If you are using cheap cables that's where you will get stuck. The only cable(s) that I have found to work are the ones mentioned in the article. If you have those exact cables, try changing the CPU cycles (probably up in your case being it's an older Vista computer). Hope that helps.

Reply

Joseph Neale on September 19, 2015 at 5:40 PM

The cable is probably the problem. I did order a programming cable with the serial plug off of eBay but I think it was one of the cheaper ones. I clicked on the link for programming cables on your site and it sent me to one on Amazon that was sold out.

Reply

KK6JYT on September 19, 2015 at 6:11 PM

That really stinks! You will probably have to just do what I did and keep ordering different cables until you find one that works. Try to search for [GM300 RIBless cable schematics](#) if you are capable of modifying your current

cable, or even better – build your own RIB and “dumb” cable. The RIB is a lot better way to go.

Reply

Joseph Neale on September 22, 2015 at 1:05 PM

I haven't gotten my new cable yet but I tried changing a couple of setting on my computer and not it is giving me “#7 INVALID OPP CODE” when I try to read the radio. When I just do the COMM TEST it gives me that error for a second then tells me Radio Communications good. Is there a setting that needs changing or do you know anything about that? Thanks for your help and Thank you for this site too.

jim on April 26, 2017 at 12:18 PM

I have had good luck building my own cables. A chunk of Cat 5, an RJ45 end and a DB 15 (or 9, depending on the rib).

Reply

Joseph Neale on September 22, 2015 at 1:12 PM

Adding to my last comment I had switched it from COM1 to COM2 in all the settings above because it was giving me that at first when I switched it to COM2 that is when it wouldn't do anything. I had forgotten what the error was because it flashed up too quick that is why I didn't include it in my first question.

Reply

KK6JYT on September 23, 2015 at 10:10 AM

Try to Get/Save Codeplug Data (F3) > Read Radio (F2). If that works, you succeeded. Don't drive yourself crazy when there's a good chance it's the cable.

Reply

KK6JYT on September 23, 2015 at 10:13 AM

Reply

AD0JA on October 5, 2015 at 7:54 PM

I am having the same issue as Joseph. I wonder if it's the programming cable because I also got a cheap one off Amazon.

KK6JYT – your recommended cable is STILL out of stock on Amazon. Do you have a different one to recommend or does someone else know of one that ACTUALLY works?

I don't have the time (or knowledge) to build a cable.

73

Reply

KK6JYT on October 6, 2015 at 8:26 PM

Sorry, I do not know of one that is in stock and works. I will update the listing as soon as someone can verify a good cable.

Reply

Clifford on February 10, 2016 at 3:29 AM

Same issues here as with others. Error 7. Dell E5500 w native com port, tried DOSBox, boot to DOS, etc. Only thing that worked for me was a Maxton model RPC-MM RIB-less cable loaned to me. Works perfectly. I just ordered this one as the photo shows same cable we shall see – <https://amzn.to/2BJOI4>

Reply

Clifford on February 14, 2016 at 10:01 PM

I got the above referenced cable today and it works perfectly.C

Reply

KJ4VOV on May 4, 2016 at 4:27 PM

I followed your advice and also was now able to program both of the radios I have with no problems or issues. This cable WORKS!

(short URL to the cable on Amazon)

<https://amzn.to/2JBjOl4>

Reply

Jack on February 15, 2016 at 7:03 AM

The multicable from KaWaMall works fine. The only problem I have had is getting it to save to my archive file. It says "Path does not exist".

Reply

KJ4VOV on May 4, 2016 at 4:33 PM

If it's the first time saving that file then that will pop up, since there's no such file created yet. Go ahead and save it anyway and that will fix the problem.

Another reason this can happen is the drive letter not being correct for how the drive was mounted. For example, if I mount my D: drive as the C: in DOSbox, I have to make sure the path I set corresponds to that and set the path as going to drive C:, not drive D: (because DOSbox will change it to the correct drive when it comes through).

Reply

mike on March 15, 2016 at 2:24 PM

nice, i do the same via DOSBox for Radius GP300 (old type) via Homemade MAX232 Com/TTI programmer (<http://batlabs.com/images/mrib.gif>) and it works fine on P4 2Ghz CPU.

For GP300 with LCD and keyb, the sw R05.03.00 (r other versions) does not work , i have 057 on the lcd when pressing 2 sidekeys and PTT at turning on the TRX. Do i need other sw for this GP300 2T/DTMF version? or other start-up keys to press ?? vy73

mike on6jf

Reply

KK6JYT on March 15, 2016 at 3:39 PM

Have a look here – [website link](#)

Reply

AA1PR on March 16, 2016 at 1:55 PM

GM300.EXE illegal command is the prompt I'm getting

Reply

KK6JYT on March 16, 2016 at 2:47 PM

Try to change it to this:

mount d c:\gm300.exe

I updated the post.

Reply

KJ4VOV on April 27, 2016 at 5:54 PM

First, my compliments on a great resource you've created here. Your work on it is much appreciated. Second, like many others here I'm also encountering the "Error #7 INVALID OP CODE" problem. The PC I'm using is one I built myself, specifically for amateur radio, so it does have a native serial port. The cable is from KJ6ZWL, as is the RSS software. Under Win 7 and the latest DOSbox I get the error flashing on the screen very briefly and then the "Radio Communications OK" message when testing the comms. Attempts to read the radio result in the same error displayed and failure. At the same time, in the DOSbox status window I'm seeing a serial port error that the RX buffer overflowed. This makes me believe the problem is a handshaking issue, that either the radio or the computer is not pausing when it should. I've tried experimenting with the handshaking (XON/XOFF, hardware, none) to no effect, but this was with DOSbox and RSS running, so changing the settings without exiting and restarting DOSbox may not have any effect. I'll experiment further and report back. It would help a lot though to know what ALL of your port settings are set at, not just baud and FIFO. Regarding FIFO, Windows 7 advanced settings do not permit setting RX to zero. It uses sliders and RX is 1-14 (because that's the size of the buffer in the UART chip) and the TX buffer is 1-16 characters. You can untick the checkbox, which would turn off the buffering completely, but that does not seem to have any effect on this problem (so far).

Reply

Brandon on October 18, 2017 at 5:43 PM

I'm having the exact same problem. Did you find a solution?

Reply

Rick on April 30, 2016 at 8:28 PM

Thanks to all ""good guys

Reply

KJ4VOV on May 4, 2016 at 4:25 PM

Just an update to my previous post:

I did what Clifford (above) did and ordered the same cable he did from Amazon. It arrived today and, with no other changes to the system, read and programmed both radios without a problem. Evidently, there is a problem with some programming cables, even ones that aren't cheap junk from China (mine was from KJ6ZWL – custom made) but this one from Amazon works beautifully!

<https://amzn.to/2JBjOI4>

Reply

faisal on May 15, 2016 at 7:56 PM

i have error #2 aknowledge how to fix it

Reply

Gino Faucher on May 30, 2016 at 5:40 PM

I read code plug sm50 Radius. I used win 8.1 or win 10, dosbox and Tripple-lite cable usa-19sh. I didn't meet any problem. No power cycle needed. When I used prolific usb serial cable, I had to power cycle between read/write code plug. Thanks for your advices on this blog.

Reply

KG5GBR on August 10, 2016 at 9:19 AM

if your going to use it very often..just build a DOS computer from an old 486 etc.....you can also change cables and do EF JOHNSON...DO IT RIGHT AND YOU DONT NEED BOOT DISKS!.....

Reply

KG5GBR on August 10, 2016 at 9:26 AM

I have maxtrac lab, gm300/m120, sm50/120, and one of the ef Johnson rss,,all on an old 486....works great....had to go old school to get the hard drive right, but now just turn it on and program!!!!

Reply

Gleiber PU4GMC on September 4, 2016 at 12:58 PM

TKS so consegui Programar um GM 300 gracias as sua dicas

Reply

KK6JYT on September 4, 2016 at 1:34 PM

não há de quê

Reply

Mitch on December 2, 2016 at 11:54 PM

I appreciate the shout out :).
73s! KF5RRX.

Reply

K5CG on October 20, 2017 at 10:23 AM

Thanks for the post!

TIP: Once you figure out the CPU speed that works for you it can be saved into the configuration file in the cpu section:

```
[cpu]
cycles=fixed 191
```

Reply

Ryan on November 1, 2017 at 7:18 AM

I am Getting "no acknowledgment" when trying to read my radio. Running windows 10 with dos box. any ideas

Reply

Jeff on February 9, 2018 at 5:15 PM

Hello Michael:

I am using DOSBox on my Windows computer. I have a known working RIB box. I'm trying to read a Radius M208. I also have the correct RSS ver R07.20.01. I have DOSBox configured to use COM1. DOSBox starts my RSS perfectly. I use the CNTRL F11 and F12 keys to adjust the CPU to about 275. Now when I run the COM TEST it responds perfectly with RADIO ACESS OK. Now when I go to read the radios codeplug I get the status bar and the computer attempts to read the radio but after a minute or less I start seeing Overrun RX errors on my DOSBox window. After reading about Overrun RX issues I tried playing with the FIFO buffers by first turning it off, by adjusting for various settings, and still get the overrun errors on RX. I also set the COM1 port to 2400 baud, 8, N, 1.

Not sure what else to try. Can you send some light on what else I might need to do?

Thanks for any help!

73's

Jeff
WB8REI

Reply

KK6JYT on February 9, 2018 at 8:49 PM

Try adding **rxdelay=200** to your **[serialports]** section in the DOSBox configuration file. Increase or decrease the number if 200 doesn't work to see if it helps.

rxdelay: How long (milliseconds) to delay received data if the interface is not ready. Increase this value if you encounter overrun errors in the

DOSBox Status Window. Default: 100

<https://www.dosbox.com/DOSBoxManual.html>

Reply

Jeff on February 10, 2018 at 4:12 AM

Thanks for the suggestions Michael, I will try them out.

Jeff

Reply

Jeff on February 10, 2018 at 2:46 PM

Thanks Michael!

I set the CPU to 191 cycles and added the "rxdelay=200" and I am now able to read the codeplug! Just wrote new codeplug to radio and checked out radio with service monitor, ALL GOOD! I really appreciate you taking the time to respond so quickly. I was going to give up when I decided to send you the e-mail with my issue, sure glad I did!

Thanks again,

Jeff

Reply

KK6JYT on February 10, 2018 at 5:22 PM

Excellent! Glad I could help.

Reply

Juan on May 28, 2018 at 3:53 PM

Hi, where exactly did you paste the rxdelay=200? I'm having similar problems programming the GR300.

Reply

KK6JYT on May 30, 2018 at 8:08 PM

In the DOSBox Options file. The file name will be something like "dosbox-0.74.conf". Read the section above labeled "Configuring DOSBox to Run Motorola RSS" to see how to get to that file.

Reply

Steve on April 6, 2018 at 6:50 AM

Getglitched seems to have gone ☹ cannot find the software to program a GM900

Reply

KK6JYT on April 6, 2018 at 12:51 PM

I do not know if the software source is safe, but you can try to find it here – http://www.hackersrussia.ru/Radio/m_motorola.php

Reply

Les on June 8, 2018 at 7:54 AM

I can read the codeplug but I get error 58 and have had no luck on fixing it.... Any Help on this ?

Reply

KK6JYT on June 8, 2018 at 10:47 AM

The error might be because the model number is for an 8 channel but there are 16 frequencies programmed and it is confusing the software. You may have to use a hex editor to make it look like a 16 channel. Check out this link – <http://batboard.batlabs.com/viewtopic.php?t=28352>

Reply

Steve on October 2, 2018 at 3:56 PM

I am trying to program a GM300 with a 486 laptop, RSS, and known good RIB, as I have programmed my Jedi series radios with no problem. I am getting an error message, . I have more than one Radius (M120), and have the same issue with all.

Reply

KK6JYT on October 6, 2018 at 2:58 PM

What error are you getting and at what point are you getting the error?

Reply

Jack on November 1, 2018 at 5:01 PM

I've got an LRA radius that won't program. Dosbox -> usb to serial = code 2 no response.

Dosbox on windows XP with a real com port gives the invalid opcode error. Radio doctor gets somewhere but then it errors and says "com port already open"

Thing is, I see the TX light of the cable going and this cable using the same USB to serial adapter programmed an M1225 just fine. I also get RX and TX overruns on dosbox XP no matter how high I set both delays. The radio is getting the commands because I hear it beep. Completely lost ☹

Reply

KK6JYT on November 1, 2018 at 5:27 PM

That's a tough one. Look at this page and try some of the different settings in the configuration file.

<https://www.dosbox.com/wiki/Configuration:CPU>

Reply

Jack on November 2, 2018 at 7:27 AM

Got it done on XP with no dosbox. CPU speed was around 2ghz which goes to show that on some radios this setup will not be needed with a newer 90s RSS.

Reply

KK6JYT on November 3, 2018 at 10:04 AM

EXCELLENT! Thanks for the update.