

Problems When Running IRFD Programs and MicroSmith in an XP DOS Window.

© Wes Hayward, December 4, 2005.

July 22, 2005 with a **Major Update** on Dec 4, 2005
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The Problem:

Some users are encountering problems with programs distributed with the ARRL version of Introduction to Radio Frequency Design, a.k.a. IRFD, on a computer running the Microsoft© XP© operating system. These programs were written to run in DOS©, but will all function in XP. When a program is called by double clicking on it from a listing with Microsoft Windows Explorer©, the program comes up in a DOS window and functions as designed. Both text and graphic functions work as designed. Just click the ".exe" file.

As an aside, the DOS version of GPLA is very fussy with regard to the nature of the data it reads. If there is something extra, or something missing, GPLA merely coughs and kicks you out of the program. The very first number in a .cir file that describes a circuit to be read by GPLA is the number of components in that circuit. That number is then used in the program to go through the file to look for values and codes that describe the part to load into the program. If it does not find the right numbers in the right positions, the data does not load and the system goes back to DOS. Let's just be pleased that the program crashes gracefully in XP rather than hanging the computer up the way systems did in some very early years.

Here's what I did today (July 22, 2005) to test operation of GPLA in a DOS window. The test was done on a Dell 700 MHz Pentium computer. The operating system is XP, Home Edition, with Service Pack 2 installed and up to date with the latest Microsoft downloads. I went into the file with the software from IRFD and called B.exe, a general purpose program for the design of bandpass LC filters up to the 8th order. I entered N=3 and designed a filter and then saved it with the name B3. The file was automatically modified with .cir by the program. I exited B and clicked on G87.exe where I called up B3 by pressing R from the menu. It ran just fine, producing graphs of amplitude (gain) and return loss, phase, and group delay. I then exited G87, called

Notepad © from the Desktop, and examined B3. I was able to see the structure of the file related to the filter just designed. This all seemed to work OK in the DOS windows that come up in Windows XP.

There is a major problem that I have not found a way around, and that is to obtain a screen printout of any graphics generated in the DOS windows. With earlier versions of Windows you could get a printout of ANY screen merely by hitting Print Screen when the desired graphic was in place. This would capture the screen to the clipboard where you could then use it. I usually called the Windows Paint © program and did a "paste" of the clipboard file. It then appears in Paint where you can crop it, save it, print it, and do whatever else desired. This does not work with any of the IRFD programs. The reason seems to relate to the graphic drivers provided by Borland when my original software was written, in Turbo Pascal ©. The Print Screen function works fine with most other graphic screen I've tried -- that is, anything generated with a "proper" Windows program.

Other DOS programs that I run in DOS Windows on XP have the same problems. One example is MicroSmith, the Smith Chart Program I wrote and sold, eventually through ARRL. Another is Super-Star Professional © from Eagleware, a microwave linear analysis and optimization program. When I need a printout from any of these programs, I write the related circuit file to a floppy disc and then carry the result to an older laptop computer running Windows 95 where I can again run the analysis. But I then generate a file in Paint and convert it to a .GIF format. That graphic, now XP compatible, is stored on the floppy and returned to my main computer where it can be used on the web or printed. This inconvenient, but it does solve the problem.

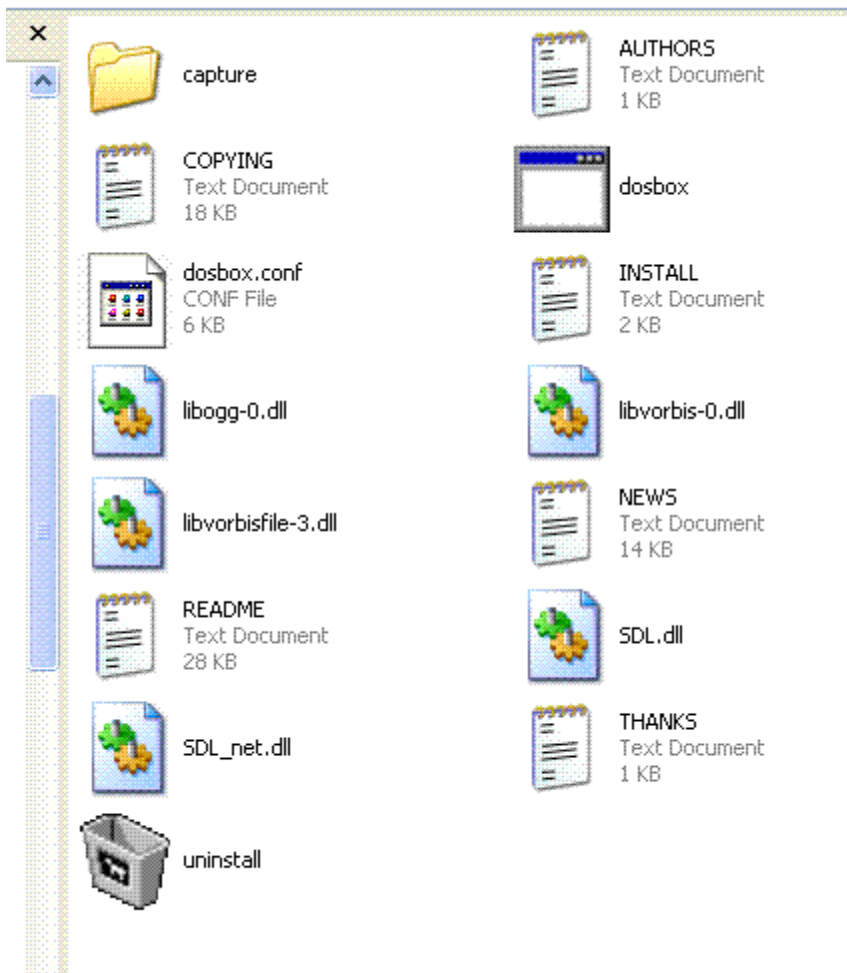
Some of the programs included in the IRFD collection have been rewritten in a Windows form and are now included with our new League book, Experimental Methods in RF Design, a.k.a. EMRFD. Programs here include GPLA, which does the same things as before, DTC and TTC, which design double and triple tuned LC bandpass filters, and XLAD, which is aimed at the design of crystal ladder filters up to the 10th order. You can go to even higher order if you take advantage of some common symmetries. The program LowHi allows the design of low and high pass filters up to 60th order. An additional program, LADBUILD, allows arbitrary filters with up to 30th order to be assembled. All of these programs work fine with Print Screen when a graphic output is needed. This version of GPLA does not include phase or group delay output. It also does not include some of the more complicated elements found in the earlier version.

"Update, a Solution" (4 Dec 05)

A solution to our problem was provided in an email from Ted Bruce, KX4OM.

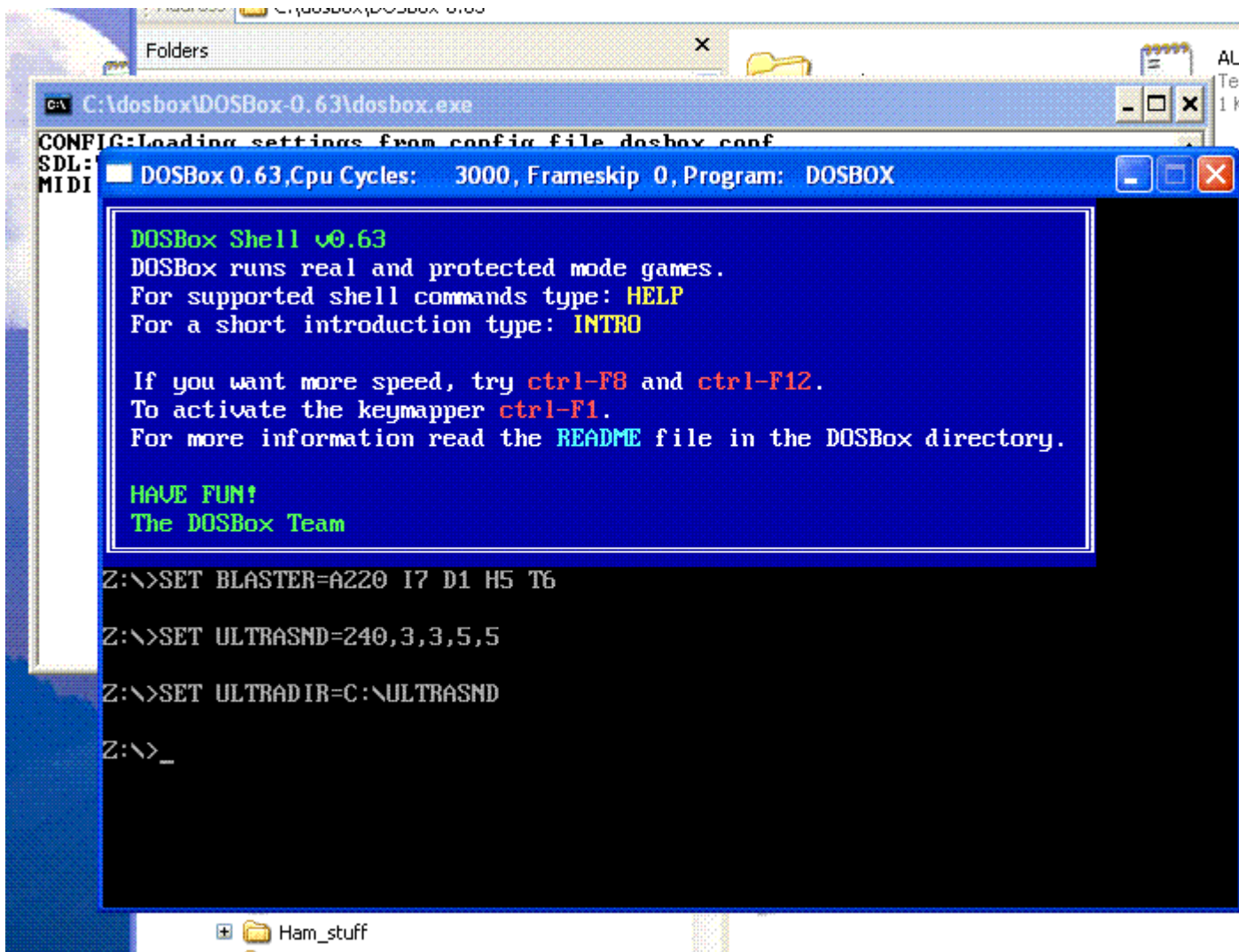
Ted noted that he was able to run the DOS programs by running them with a DOS emulator called DOSBox. This program is much like the DOS emulator that is built into Windows XP, but allows a screen capture to occur.

Here's what I did to get this solution into my system. First, I went to Google and ask for a listing for DOSBox. This brought the url needed for the download from the web that then produced a 1 Meg file. Installation produces the following directory as viewed from Windows Explorer.



You run DOSBox merely by double clicking the icon with the blue bar across

the top. This produces the following Window:

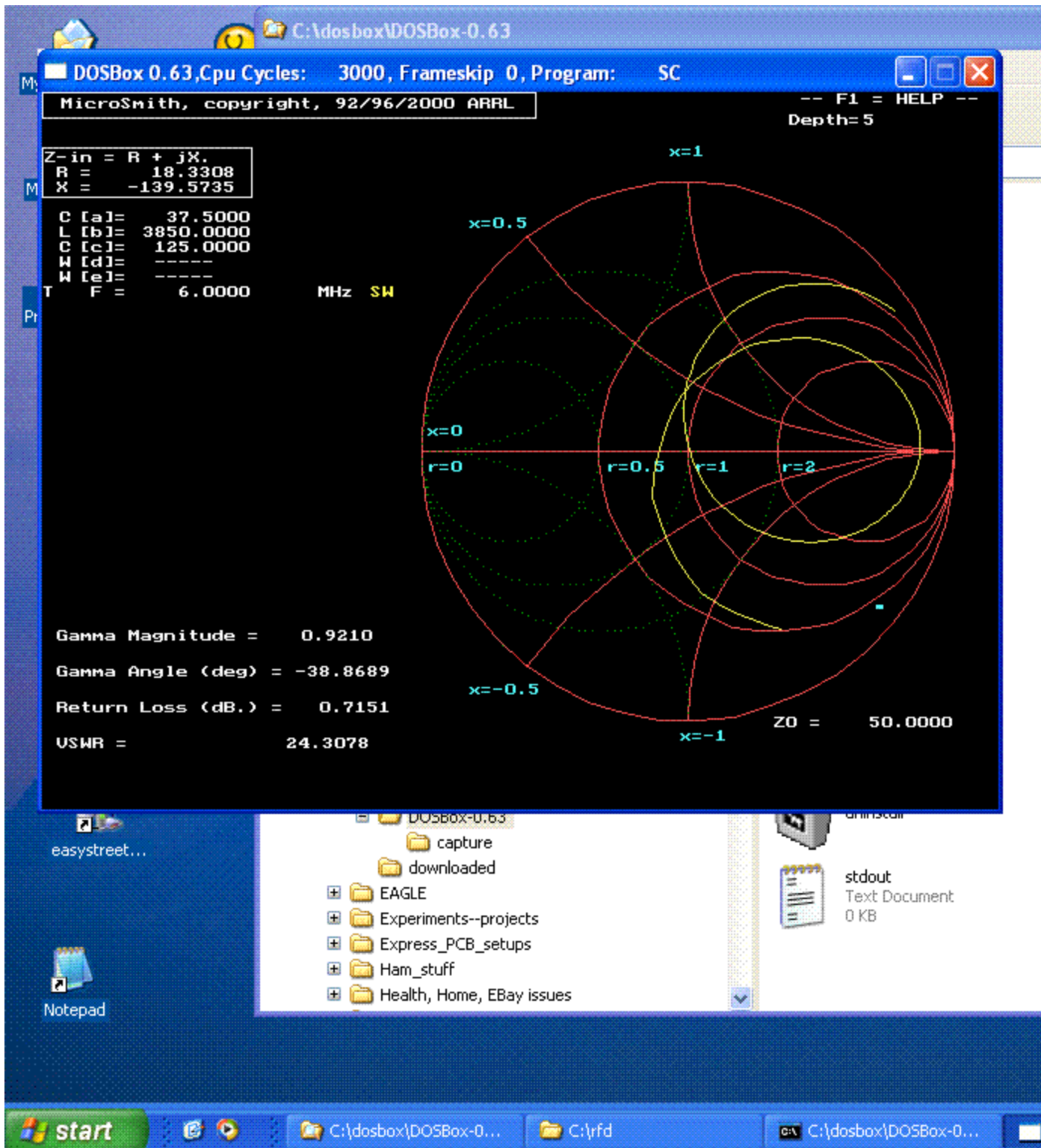


So, what next? The window has a look like the DOS environment that we used to use, but by now have largely forgotten. To run a program from this new environment, here are the steps I took: First, type "mount C C:\rfd" after the Z:\>. (rfd happens to be the directory on my computer where I keep "rf design" programs that are normally run, either in Windows, or in an XP DOS Window.) I then typed C: to get to the newly defined C drive. (Upper case seemed to work best.) This produced the following information:

The DOSBox Team

```
Z:\>SET BLASTER=A220 I7 D1 H5 T6  
Z:\>SET ULTRASND=240,3,3,5,5  
Z:\>SET ULTRADIR=C:\ULTRASND  
Z:\>mount C C:\rfd  
Drive C is mounted as local directory C:\rfd\  
Z:\>C:  
C:\>_
```

Now to run a program: I decided to give the old Smith Chart program a try, so I typed SC and hit the Enter key. Here's the result:



This is the total screen and not just the window of interest. Incidentally, the yellow trace on the chart is the result of hitting F5 to cause a frequency sweep,

in this case showing a good impedance match for a dual band vertical antenna at both 7 and 14 MHz. The file is one distributed with the Smith Chart.

There are at least two ways to now extract a file that can be printed and saved, etc. Here's the scheme I used and I'll talk later about Ted's method.

I'll present this in perhaps more detail than is needed, for it's a useful scheme for building relatively small GIF type files that can be used for communications over the web or internet.

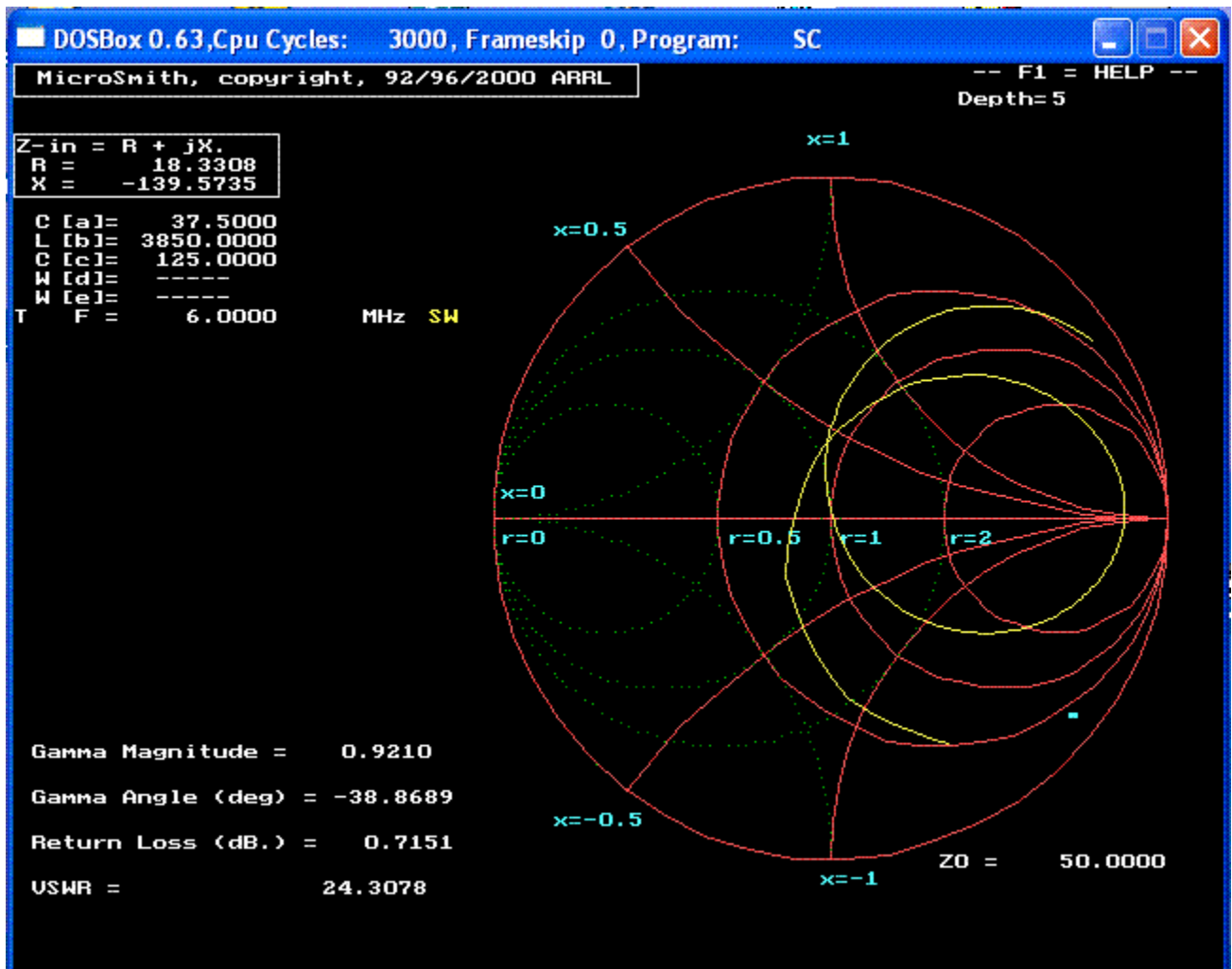
I started with the screen shown above by pressing "Print Screen." This captures all of the information shown above to the clip board where it can be used. I then dropped down to the toolbar at the bottom of the screen and clicked the icon that produced my desktop. From the desktop (or from Start Accessories Paint) I clicked on Paint. Edit-Paste (or ctrl-V) puts the clipboard data on screen. I clicked on the box of dots at screen left called "select."

This was used to place a box around the Smith Chart contained in the DOSBox. Then click on the Edit box at the top of the screen and then go to the "Copy To..." selection in the pull down menu. Type "Chart" (or whatever) and you now have the Smith Chart saved in the "My Pictures" directory, but in a very large bit-map file.

The last thing in the world you would want to do is to send this to someone as an email attachment, or to put it on the web. The file size is just too large. But that is easily fixed. Once you have performed the "Copy-To..." mentioned, click on "Select All" in the Edit pull-down Window. Then press the Delete key. Having done this, go to File in the upper left corner and click on Open and then pick the previously saved "Chart." A window will appear at this point asking if you want to save changes to "untitled"; just answer "no."

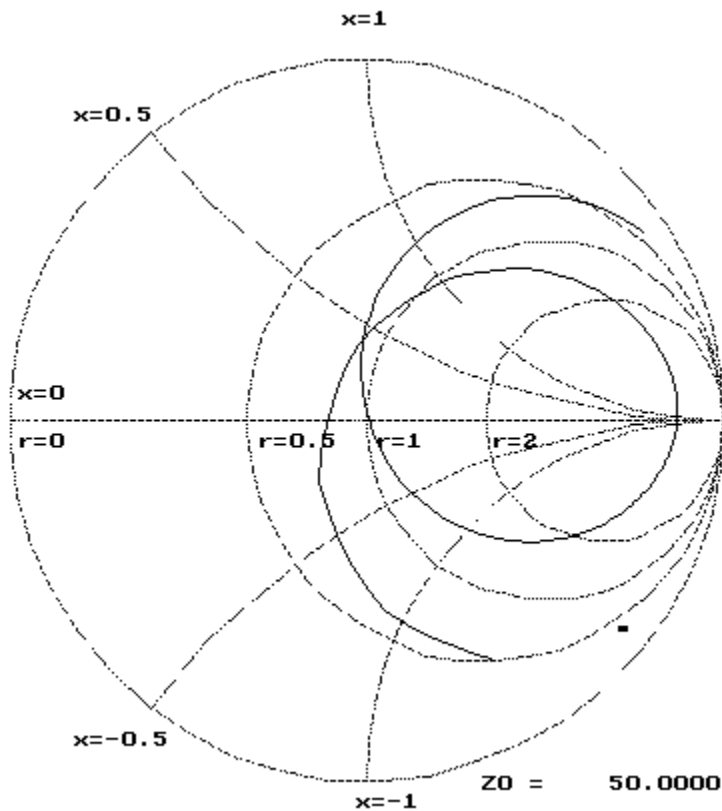
You now have nothing but the desired "Chart" on screen. Go again to the File menu and pick Save-As. There is no need to enter a new name, but what is important is to change the file type to GIF (or perhaps JPG.) A window will warn you that saving to a GIF format may bring some loss of color and do you want to continue. Click "Yes" and you are done.

Now go into the "My Pictures" directory with Windows Explorer and you will see two files named "Chart." One will be a large bitmap and the other will be a small one, "Chart.GIF." Here's an example:



Once a file has been generated and saved, you can get out of DOSBox with ease. Merely close it from the Toolbar at the bottom of the XP screen. I found the operation of the DOS programs to be extremely slow in the DOSBox window, although there are ways to increase this speed a bit. Read up on this in the information distributed with DOSBox. I found that the better solution was to do my analysis and "tuning" from a DOS Window running in XP. Once I had a result that I liked, I could save it, and then get into the Smith chart program via DOSBox for a printout.

The Paint program above has some additional useful capabilities. For one, you can do further editing of results. I took the chart shown above and saved it as a monochrome bit map. I then cropped it with the now familiar "Save-To" function and inverted the colors. This produced a black on white display that is easily printed on a printer without causing you to run off to the local office supply to get a new printer cartridge or ink supply. This is the result:



I'm not sure why it is not possible to import a file into PAINt and to then directly save it to a GIF or JPG format without jumping through the hoops described. I guess this is just the "Microsoft Way."

Ted, KX4OM, came up with another solution to the file issue with a program called MWSnap. This is freeware available from www.mirekw.com/winfreeware/mwsnap.html. I tried this program and it seemed to work well, especially after Ted suggested using the selective screen area capture function. I have not, however, shifted over to this program just yet. The reason is that I am accustomed to using Paint to generate the many small files needed for a web page and publications.

DOSBox is a new program for me, so I have generated a short text file that is in with the executable titled dosbox_use.txt. A double click on this immediately brings up the basic information needed to get me started. Guess it's a geezer thing.

DOSBox is not the solution to all problems of this sort. One example is the

program listed above in the "The Problem" section, Superstar Professional.

This DOS program has a hardware key and does not function without the hardware key, or "dongle," as they are sometimes called. When I entered the appropriate directory in the "mount C" DOSBox procedure described above and then attempted to run the program, it started, but then produced an error indicating that the key was not found. I get no such error when running the program in a DOS window from XP.

Many thanks to Ted, KX4OM, for letting us know about his discovery.

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