RMK Problem Status 1

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1   Status of the effort to fix the RMK

I have been attempting to fix/improve the PC version of the RMK software for the past few weeks. When I started there were several problems which worked out to be in two different areas. One problem area was in getting a USB/RS-232 converter to work and the other was fixing/improving the software.

At this point some of the hardware problems are understood well enough that methods of working around them exist. Although the hardware problems have not "gone away", at least we now know what to look for and can get the PC based RMK software to work.

The PC based RMK software has been fixed/improved in several areas. These areas are fixing some bugs, design over sites and opening the serial port correctly so that the port will work as expected. There are some additional areas that need improvement, but if we can "live with" the current state of the software, there is no immediate reason to fix/improve them.

Conclusion: The software has been improved and if the old problems that are left in it are acceptable, then all will be OK. Warts and all. With careful selection the USB/RS-232 adapters seem to work.

My Plans: Unless there are some other ideas, **I plan to stop work** on this version of the PC Downloader and start to work on getting a new version of the GlassKeyboard (Figure 7, page 14) modified to support downloading of **all** Pelco units. It will auto-baud and auto-detect the unit that is it's host.

1.1   Hardware Problems

The primary hardware problem is that the Spectra IV has a limited capability UART in it that services the RJ-45 port. The primary limitation of the RJ-45 port is that it does not work reliably with asynchronous data that has two stop bits per character. It does appear to work well with one stop bit per character.

The other hardware problem is getting a "working" USB/RS-232 adapter. Several different adapters, 12, have been tested and some have worked every time, others have never worked and still others work on one day and not the next.

From the first testing in December we were able to draw the following conclusions:

1. The voltage levels from several USB/RS-232 converters were within specification.

2. Examining the serial output of the USB/RS-232 converter reveled that the timing of the signals was OK.

3. Through use of an internal data tap on the serial input circuits in the Spectra IV, we were able to verify that the Spectra IV receiver/driver chips were operating correctly.

4. The "problem" could be reproduced with quite short messages. The download messages are over 100 bytes in length. We were able to get failures with seven byte messages.

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[5]`$Header:  d:/0rmk/RCS/Status1.inc,v 1.1 2010-04-23 12:17:37-07 Hamilton Exp Hamilton $`

1.1.1   USB/RS-232 Adapters Tested

During this effort 12 USB/RS-232 adapters were used. For some of them the installation CD had been misplaced and could not be tested. All of the adapters, and all of the "stuff" that came with them, were marked with a letter from A → L.

Adapter	Description
A	A small USB/RS-232 converter with an install CD. Supplied by Steve Harris. The only model number is on the package and it is "ADL-USB-D9MS".
B	A similar to **A** USB/RS-232 converter with an install CD. This was found in Tess's old office. The only model number is on the package and it is "SBT-USC1M".
C	A Belkin USB/RS-232 converter with an install CD. It was found in Tess's office. The closest to a model number comes from the CD and it is "P73754-B F5U409-CU F5U109". The other model number might be "USB/Serial Portable Adapter".
D	A MicroInnovations USB/RS-232 converter, no CD or instructions. It was found in Tess's office. According to Steve Harris, it has the best reputation for being able to download with. No obvious model number is available. Steve Harris had borrowed it from another Pelco employee.
E	An unknown USB/RS-232 converter with no CD or instructions. It was fond in Tess's office. There is no indicated manufacturer or model number. Steve Harris had borrowed it from another Pelco employee.
F	An IO gear 2 port USB/RS-232 converter with an install CD. Eric brought this in from home. It is model number"GUC2322" and is made by "IO Gear". Craig Hannen used it with communicating to some hardware from Colorado. No other of our USB/RS-232 converters worked with the Colorado equipment.
G	A small USB/RS-232 converter with an install CD. Is very similar to **A**. Eric bought it some time ago from a "CompUSA" going out of business sale. Model number is "Item # 60466".
H	This is identical to item **C** above which Eric brought from home. It has an install CD. At one point Siva used it for working with Linux and Windows on his system. He said that none of the other units worked at all.
I	A small USB/RS-232 converter with an install CD. It is very similar to item **A** above. Eric brought it from home for this testing. It is made by "IO Gear", the same manufacturer as item **F**. It is model number "Model GUC232A".
J	Identical to unit A, above. This was found in the Dome Lab inside a filing cabinet during the week of 19 May and was not used in previous testing.
K	This unit was also found in the Dome Lab during the week of 19 May and was not used in previous testing. It was made by "USI, Ultimate Solutions, Inc, `WWW.ULTSOL.COM`" model #2105-2072.
L	This is identical to unit K above and found at the same time.

1.1.2   USB/RS-232 Adapters Test Results

Adapters A → I were tested about three weeks ago. Yesterday I made an attempt to retest all adapters. The results are shown below.

There was an unexpected increase of the number of USB/RS-232 adapters that started to work. I think that this might be related to having power cycled the computer in the last few weeks.

Adapter	March Test Results	April Test Results
A	Did not work	Worked with no problems
B	Worked with no problems	Worked with no problems
C	PTZ OK, No Download	No PTZ, Starts Download and stops
D	Worked with no problems	Worked with no problems
E	Worked with no problems	Worked with no problems
F	Did not work	Could not access
G	Crashed the computer	Worked with no problems
H	Did not work	No PTZ, Starts Download and stops
I	Did not work	Could not access
J	—	Worked with no problems
K	—	No driver
L	—	No driver

Note

Could not access   The COM# was too high to access through the RMK software.

Crashed the computer   Computer died with a "blue screen of death".

Did not work   The RMK software could not get any results with this unit.

No Driver   Indicates that the install CD was missing and a driver could not be found to use with it.

No PTZ, Starts Download and stops   No PTZ functions, but when a download is attempted the Spectra IV goes into download mode and the RMK software hangs up.

PTZ OK, No Download   All PTZ options worked, but would not download the Spectra IV.

Worked with no problems   PTZ functions including auto-baud rate detection, parity choice and COM# selection worked.

1.2   Software Problems

As received the PC version of the RMK software had several problems. Some of these problems are also in the Palm and iPaq versions of the RMK software suite while most of the problems are unique to the PC version.

1. In all versions of the RMK software there is a coding error in the PTZ logic (Figure 6, page 13) that generates partially invalid commands when movement is wanted in the upper left hand quadrant of the screen. This has been fixed for the PC version only.

2. Parity was always selected as "No" and the on screen selection was ignored. (Figure 3, page 10) This has been fixed.

3. The serial port was always opened with "2 stop bits". This was fixed by opening it with "1 stop bit".

4. Error handling is a little strange. For most PTZ operations a generic error message is generated. I have improved the error messages by calling the MicroSoft error message decoder and displaying the MicroSoft error explanation. Some of the MicroSoft error descriptions are not clear, but they are better than before.

5. When communications is made in PTZ mode, if the communications are cut (the wire is unplugged) the software never detects this problem. This is in the original software and is still there.

   In working with the Arizona Department of Transportation, they use the PTZ mode of the Downloader to configure their Esprits. Their problem is that they run their Esprits with a non-Pelco head end that can not send preset 95 to access the menu system. Thus they only need the PTZ function.

6. When communications is made in Downloader mode, if the communications are cut (the wire is unplugged) the software puts out a small message saying "Done" and just sits there. This has not been fixed.

7. In the original software, when a COM port is opened it was opened with a "`CREATE_NEW`" attribute. This resulted in a file being generated if the COM port requested did not exist. I changed the opening attribute to "`OPEN_EXISTING`" which solved the problem. Now I can open any COM port as long as its number is less than 9. The software will not open COM ports 10 and above.

8. The main display has an invalid baud rate of 28800 indicated. I make it so that the invalid baud rate may not be selected, but it is still indicated as being there.

9. It is unknown how the actual display is generated. Thus no changes can be made to it.

10. Auto-bauding for PTZ RS-422 port, always works with the Esprit, Spectra II, Spectra III and Mini Spectra.

    It does not work with the Spectra IV, however if the software is set to the baud rate that the Spectra IV is expecting to run at, then normal communications will be had.

    It should be noted that changing the baud rate is an integral part of doing a download through the RS-422 port. Having it also work for PTZ operation is a "nice" thing.

11. Auto-bauding for Download through the RJ port is not needed because the RJ port only works at 115200 baud, so that is automatically selected and can not be over ridden.

1.2.1   Software Improvements

1. What I believe are the most likely to be used communications options are now automatically selected at start up.

    1.1 D Protocol

    1.2 Unit Address 1

    1.3 No Parity

    1.4 COM1

    1.5 115200 baud

2. When Auto-bauding, the baud rate being tested is now displayed on the screen. This is to let the user know that the software has not hung up, but that it is actually doing something useful. The basic auto-baud logic was in the software when I got it, I just fixed some problems and made the current baud rate be obvious.

1.2.2   Recommended Software Improvements

1. The error handling should be improved.

2. Time outs in communication should be properly identified.

3. The software should use a Query command when establishing communications with a unit. There are at least two different versions of the downloader software, one for the Spectra series and one for the ExSite series. The fixes discussed in this note only apply to the Spectra version of the software. They will have to be repeated for the ExSite version. By reading the reply to the Query command the following may be automatically determined:

    3.1 Unit address, this will get rid of one field on the main screen.

    3.2 Baud rate, this will get rid of one set of eight buttons on the main screen.

    3.3 Parity, this will get rid of one set of three buttons on the main screen.

    3.4 Protocol type, this will get rid of one set of two buttons on the main screen. In the current system, all commands are sent in D Protocol. The only use of this field is so that a user can set the Downloader to the same address as the unit is set to. By reading the reply to the Query command, we get the address automatically.

    3.5 Type of unit that the software is connected to. Then any special handling required for the Spectra/ExSite/Other may be automatically selected. This would get rid of one full version of the software.

1.2.3   Downloader screens

1. The original Downloader screen is shown in Figure 1, page 8. Note that this screen has selection one of two COM ports, no parity selection and no ability to select a baud rate.

   Note the actual look of the screen. It consists of a custom BMP image(s) that are placed on "top of" a standard dull gray MicroSoft image. Also note the "shadow" around the right hand edge and bottom. The lettering is nice too.

2. The next Downloader screen is in shown in Figure 2, page 9. Here support for different baud rates, three types of parity and one of four different COM ports was added in. The parity and baud rate support was added in to support the TXB-Hernis board. The indicated baud rates are: 1200, 2400, 4800, 9600, 14400, 19200, 28800, 57600 and 115200. There is an error here in that MicroSoft does not support 28800 as a "standard" baud rate. MicroSoft does have an option for a user specified speed, but that option was not used in the downloader software.

3. The Downloader screen that I started with is in Figure 3, page 10. In this version support for a numbered COM port was added in. The invalid baud rate is still there.

4. The current Downloader screen is shown in Figure 4, page 11. Now the some of the changes that I have put in are visible in that the most likely to be use "radio button" options have been selected and the COM port has been set to 1. The address field has always been setup.

   When looking at the image, note that I "lost" the shadow around the right hand side and the bottom and I don't know how to get it back. I also was unable to get the "right" color for the ".2" in the rev number. (I could have gotten it, but the work to do it didn't seem to be worthwhile.)

5. The current IPSXM version of the Downloader screen is shown in Figure 5, page 12. The ExSite has three different downloadable processors internally. Thus it is a somewhat more complex display. This display is similar to the rev 1.20 display in its range of options.

6. The PTZ screen is shown in Figure 6, page 13. Again note that the screen has been overlayed with a nice looking BMP.
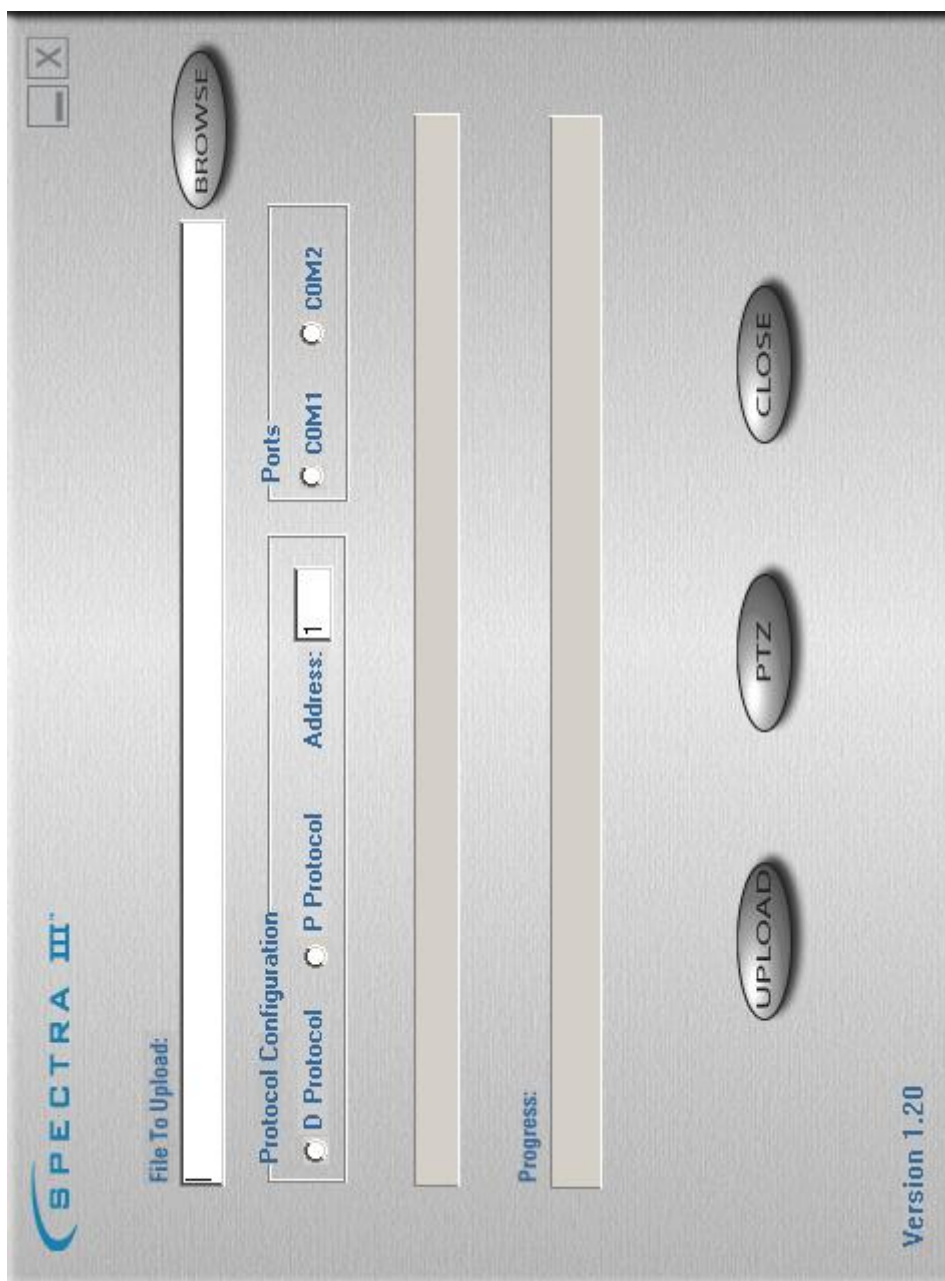
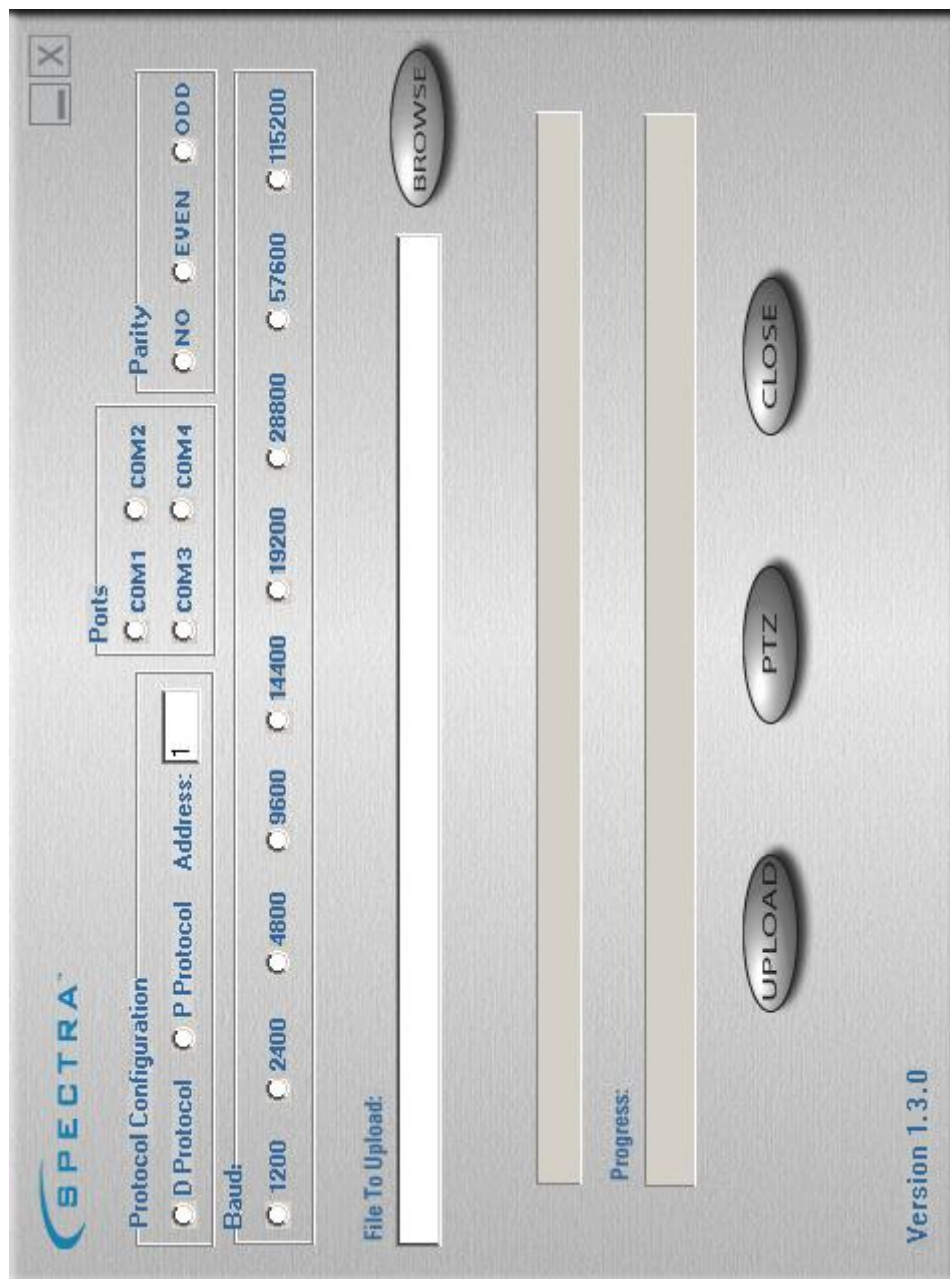Figure 1: Main screen of the downloader for rev 1.20

Figure 2: Main screen of the downloader for rev 1.3.0
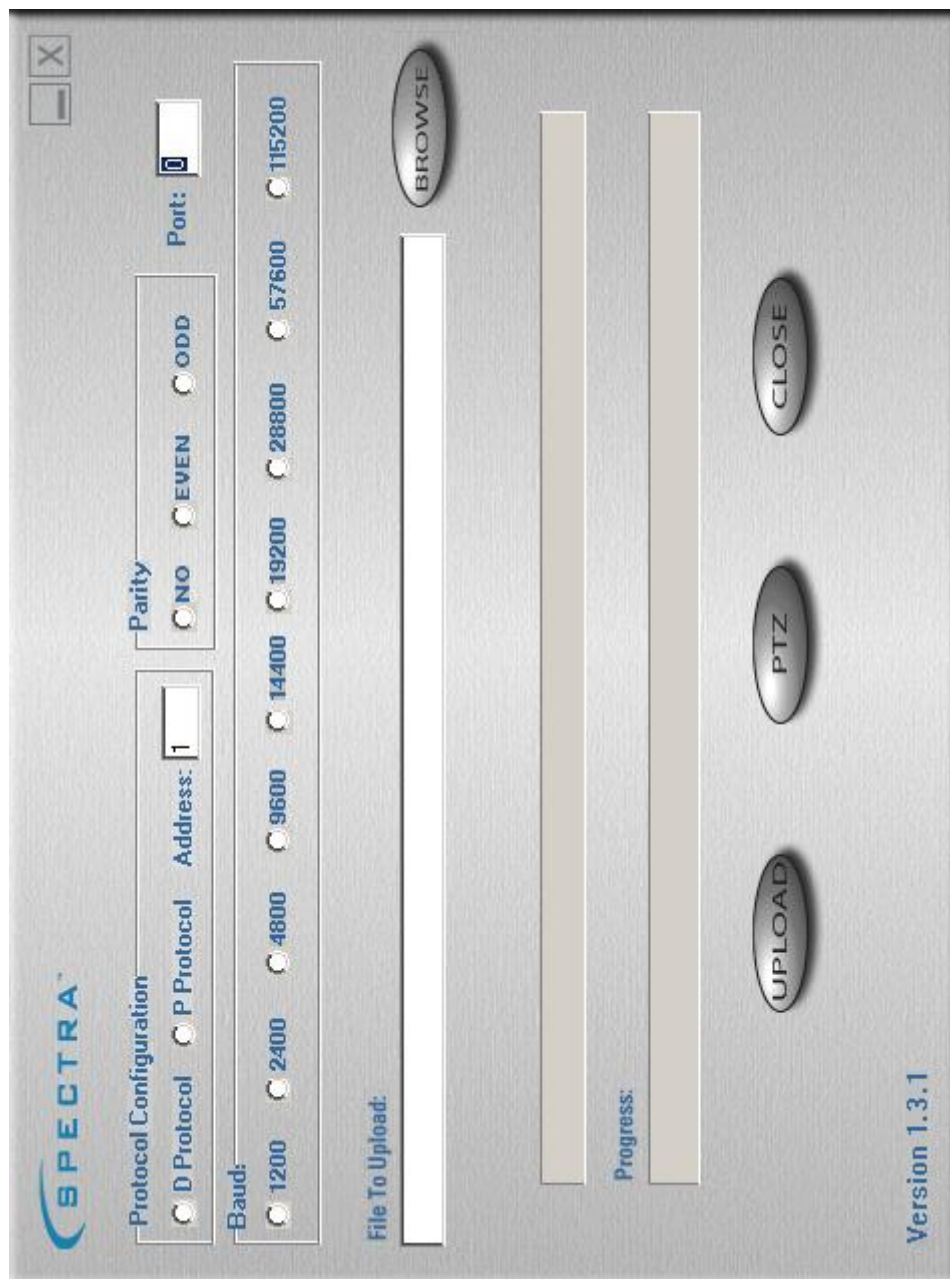
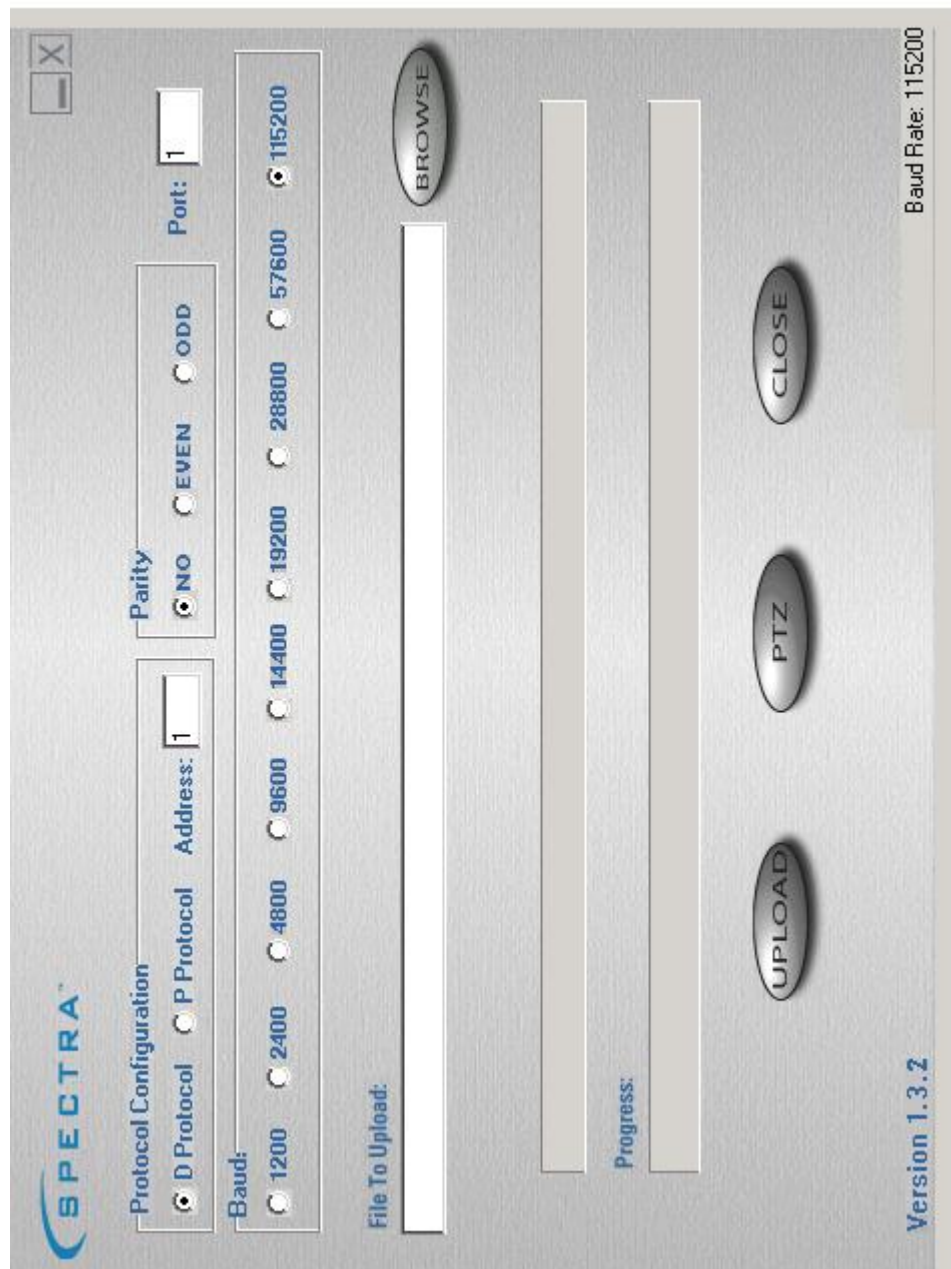Figure 3: Main screen of the downloader for rev 1.3.1

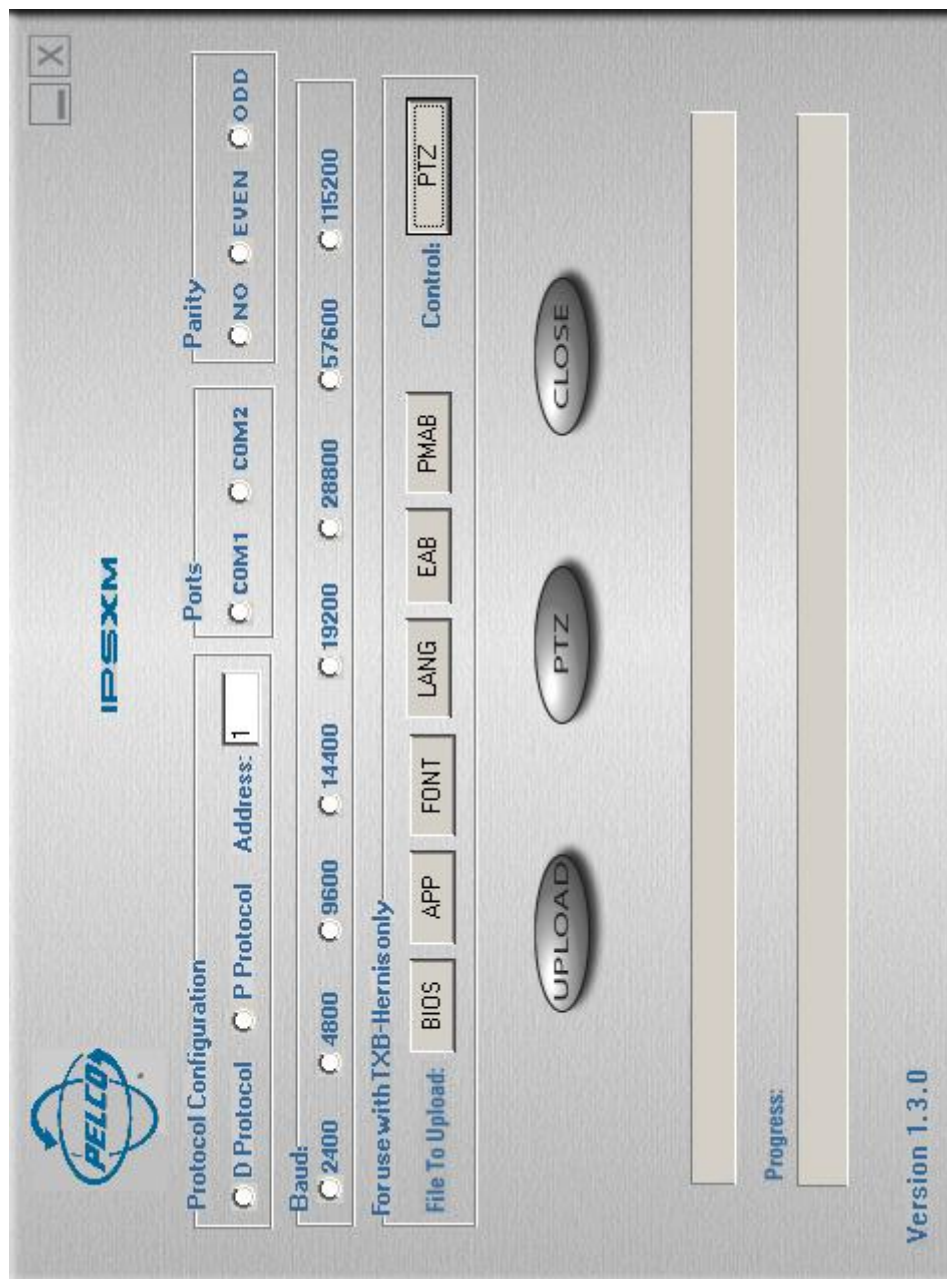Figure 4: Main screen of the downloader for rev 1.3.2

Figure 5: Main screen of the IPSXM downloader for rev 1.3.0
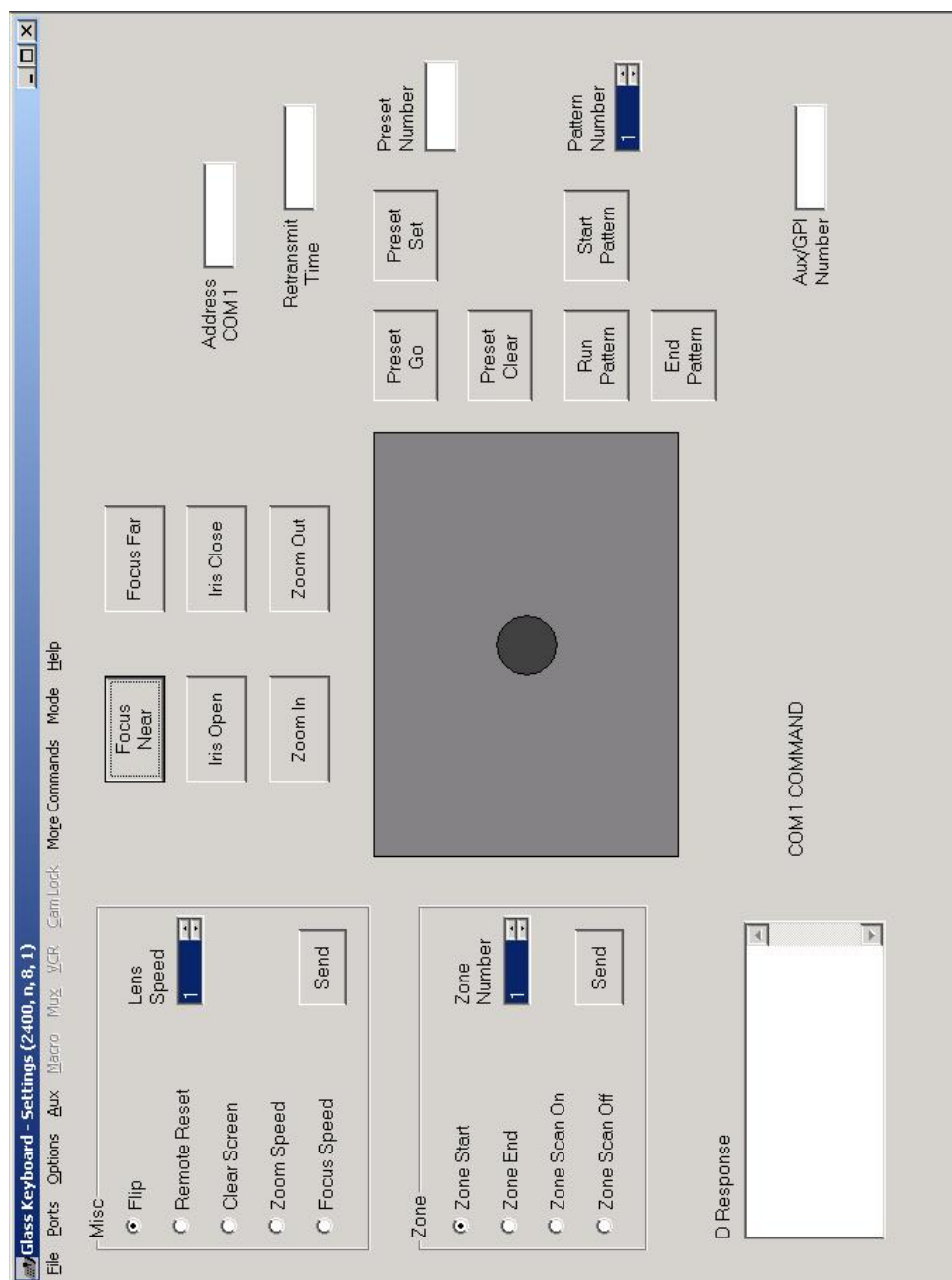
Figure 6: PTZ screen of the downloader

Figure 7: GlassKeyboard main screen

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