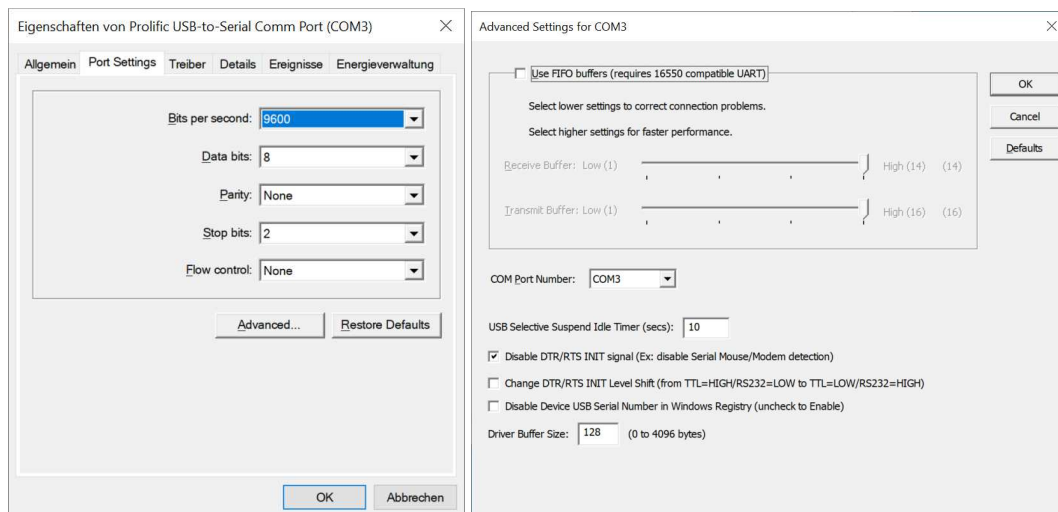


HOW TO CONNECT A NORTHSTAR ADVANTAGE TO A PC AND HOW TO EXCHANGE FILES

1. On the PC side you need a standard computer with USB ports. This how-to assumes that you are running Windows 10.
2. On the Advantage side this how-to assumes that your computer is running CP/M. The machine needs at least one floppy disk drive and a SIO board in slot 1 or 2. For a SIO board in port 2 you have to set IO parameters accordingly. Use CPMGEN.COM to set the baud rate to 9.600.
3. Connect both computers over a serial cable. For the PC you will need an USB-Serial Adapter. Prolific USB – to –Serial Adapters work well (Prolific PL2303 chipset).



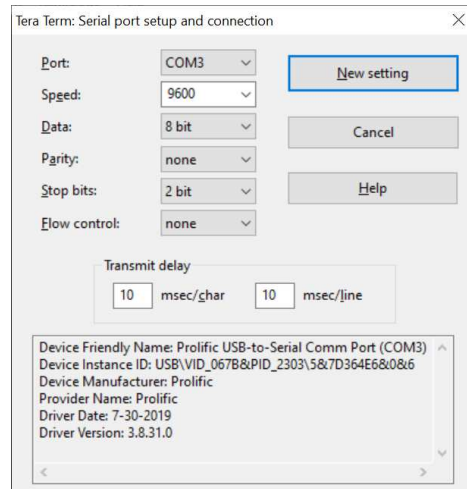
4. For the connection to the Advantage your cable has to have a 25pin male plug. Since the USB adapter normally has a 9 pin male plug you will need an adapter with a 9-pin female connector on the PC side and a 25-pin male connector on the Advantage side. Optionally you can use an expansion cable. All components must have a standard wiring (RS232). No wire crossings, no NULL modem adapter or cable.



5. The communication parameters are:

9600 baud, 8 data bits, no parity, 2 stop bits, no flow control

6. For transferring files over the serial line you need at your PC a terminal emulation. Tera Term is a full featured terminal emulation which comes with all that we need. Version 4.105 works perfect. (<https://osdn.net/projects/ttssh2/downloads/72009/teraterm-4.105.zip>) Set the parameters for the serial port analog to the settings for the Windows driver.



7. Additionally you should increase the timeout values for the XMODEM protocol in the TERATERM.INI file:

```
XmodemTimeouts=10,3,60,600,1200
```

8. To make receiving files on the Advantage easier you should patch pip to use the „INP:“ device.

```
A>DDT PIP.COM <enter>
```

```
(Enter following code)
```

```
0103 JMP 110 (to start of input routine)
..
0110 IN 51 (read USART STATUS, SIO Board in 1)
0112 ANI 02 (Get ready bit)
0114 JZ 110 (wait until character ready)
0117 IN 50 (read character)
0119 ANI 7F (clear bit)
0116 STA 109 (store character for PIP)
011E RET (return to PIP)
```

```
(leave DDT with Control-C and enter)
```

```
A>SAVE 29 PIPSI01.COM <enter>
```

```

A>DDT PIP.COM
DDT VERS 2.2
NEXT PC
1E00 0100
-A100
0100 JMP 110
0103 .
-A110
0110 IN 51
0112 ANI 02
0114 JZ 110
0117 IN 50
0119 ANI 7F
011B STA 109
011E RET
011F ^C
A>SAVE 29 PIPSIO1.COM
A>
A>
A>
A>
A>
A>

```

If your SIO board is not in slot 1 you have to change the IO addresses 50 and 51 accordingly.

9. With pip you cannot receive COM files. Using the patched PIP we transmit therefore at first „PCGET.HEX“ to the Advantage:

```
A>PIPSIO1 PCGET.HEX=INP:[BEH]<enter>
```

Meaning of the parameters:

B = Block mode transfer (PIP buffers data and writes a full buffer to disk)

H = HEX data transfer (all data are checked for proper Intel hex format)

E = incoming bytes are echoed to the console

10. At Tera Term you go to „File->Send File...“ and select „PCGET.HEX“ on your hard disk. Sending starts and at the Advantage you can see the incoming hex codes. If no further bytes come in you type at TERA TERM „Strg-Z“. Then PIPSIO1 saves the file to disk.

11. Convert the hex file to a program file:

```
A>LOAD PCGET<enter>
```

12. You now have PCGET.COM on your system.

```

64K Graphics CP/M vers 2.2 rev A for Advantage QD from North Star Computers, Inc.

A>PCGET
PCGET Ver 1.0 for North Star Advantage
Receives a file from a PC through a serial port
using the XMODEM protocol.
Usage: PCGET file.ext [S]
      S = SIO slot (1 or 2)
A>PCGET PCPUT.COM
Start XMODEM send now... (SIO slot 1)

```

You can now receive files of any type from your PC. First transfer PCPUT:

```
A>PCGET PCPUT.COM<enter>
```

PCGET starts and asks for sending the file by XMODEM.

13. At Tera Term go to „File->Transfer->XMODEM->Send...” and select „PCPUT.COM” on your PC. When transfer ends you have PCPUT.COM on your Advantage. Now you can send to (PCPUT.COM) and receive from (PCGET.COM) your PC any files.

```

64K Graphics CP/M vers 2.2 rev A for Advantage QD from North Star Computers, Inc.

A>PCPUT
PCPUT Ver 1.0 for North Star Advantage
Transmits a file to a PC through a serial port
using the XMODEM protocol.
Usage: PCPUT File.ext [S]
      S = SIO slot (1 or 2)

A>PCPUT PCGET.COM
Start XMODEM receive now... (SIO slot 1) █

```

14. Many people use Kermit for file transfer. If you don't want to use PCGET/PCPUT transfer the Kermit HEX files to your Advantage and create the COM file:

```

A>PIPSIO1 MLOAD.HEX=INP:[BEH] <enter>

A>LOAD MLOAD <enter>

A>PIPSIO1 CPSKER.HEX=INP:[BEH] <enter>

A>PIPSIO1 CPVADV.HEX=INP:[BEH] <enter>

A>MLOAD KERM411=CPSKER,CPVADV <enter>

```

Transfer each file with TERA TERM by „File->Send File...”. There is no need to split larger files into smaller ones as described elsewhere. You can find the Kermit files at <http://www.columbia.edu/kermit/cpm.html>.

15. To create floppy disks from Northstar Advantage NSI image files use the program „PC2ADV.COM”.

```

64K Graphics CP/M vers 2.2 rev A for Advantage QD from North Star Computers, Inc.

A>PC2ADV

==== PC to Northstar Advantage Image Transfer v1.0 ====

This program writes a North Star Advantage floppy from
a disk image received through a serial port via XMODEM.

Insert and specify destination drive (A-B) or X to exit: A

Specify the port of the SIO card to use for the image
transfer (1-2) or X to exit: 1

Start XMODEM send now... █

```

With „ADV2PC.COM” you can save your floppy disks to your PC as Northstar Advantage NSI image files.

```

64K Graphics CP/M vers 2.2 rev A for Advantage 80 from North Star Computers, Inc.

A>ADV2PC

==== Northstar Advantage to PC Image Transfer, v1.0 ====
This program transfers an image of a Northstar Advantage
to a PC through a serial port using XMODEM.
Insert Floppy and specify source drive (A-B) or X to exit: A
Specify the port of the SIO card to use for the image
transfer (1-2) or X to exit: 1
Start XMODEM receive operation on the PC now...

```

The disk images have standard NSI format (raw data of double-sided, double-density disk, 512 bytes per sector, 10 sectors per track, 70 tracks). The disk image is the linear sequence of the 512 byte sectors from track 0, sector 0 through track 69, sector 9 and can be used with the North Star Advantage Z80 Computer Emulator (ADE) by Jack Strangio (http://www.itelsoft.com.au/north_star_advantage_emulator.html). The image transfer uses for both directions the XMODEM protocol.

Credits:

The CP/M screenshots were made with the North Star Advantage Z80 Computer Emulator (ADE) by Jack Strangio (<http://www.itelsoft.com.au>). PCGET, PCPUT, ADV2PC and PC2ADV are based on code and ideas of Mike Douglas (<https://deramp.com/>).

Holger Linning
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