Amstrad CPC Serial Interface II (USIfAC II)
User’s Guide v3.0

(John Konstantopoulos, July. 2021)

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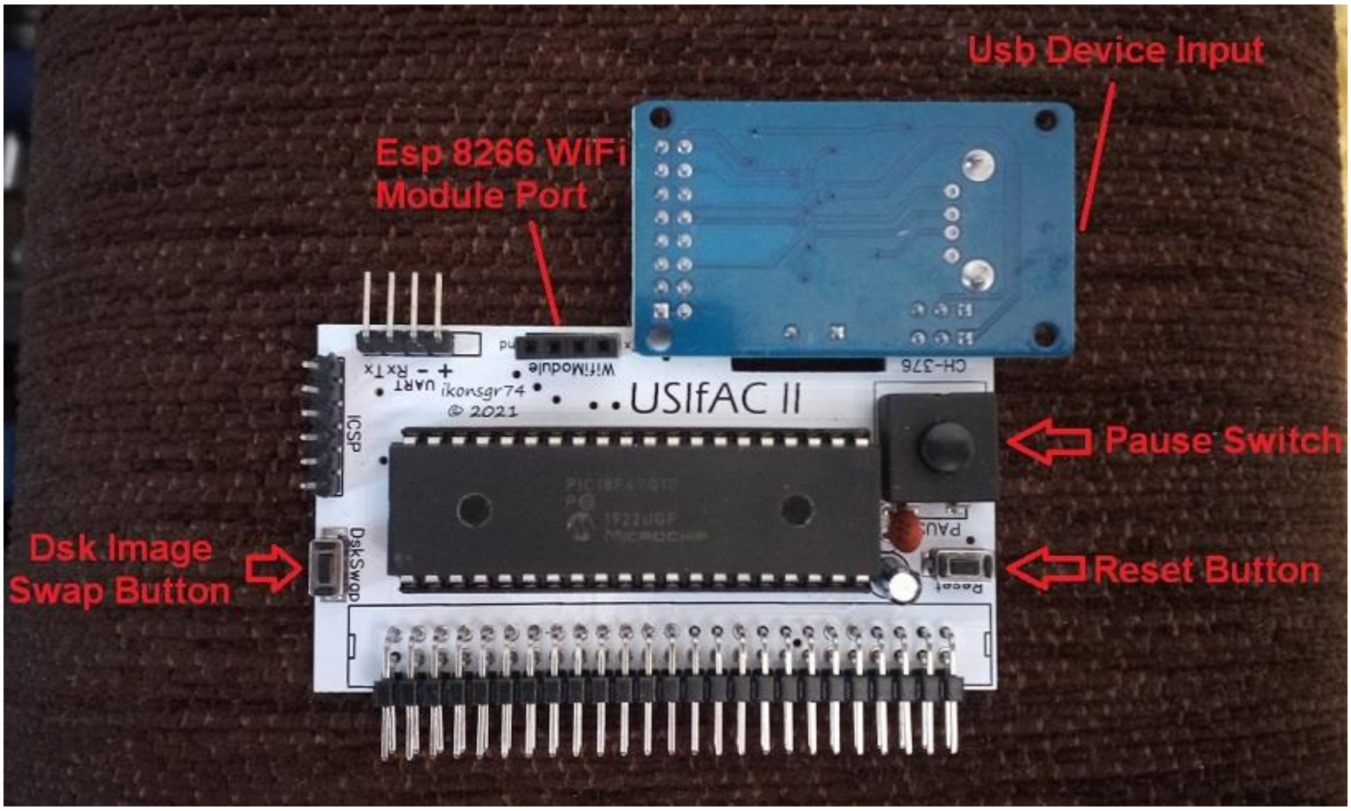
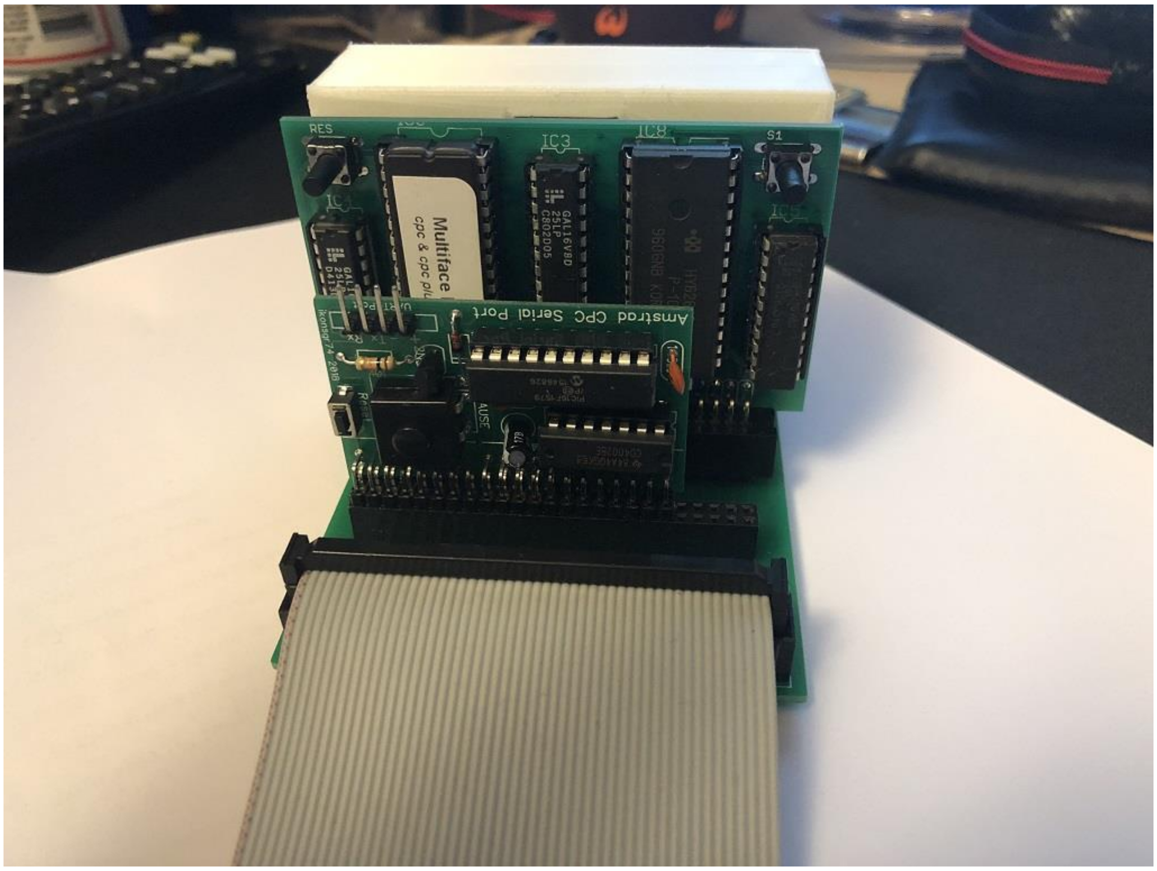
Introduction

Amstrad CPC Serial interface II (USIfAC II), is an evolution of a previous Design, based on a modern powerful **18F47Q10@64Mhz 8bit PIC microcontroller**, which offers many new amazing features:

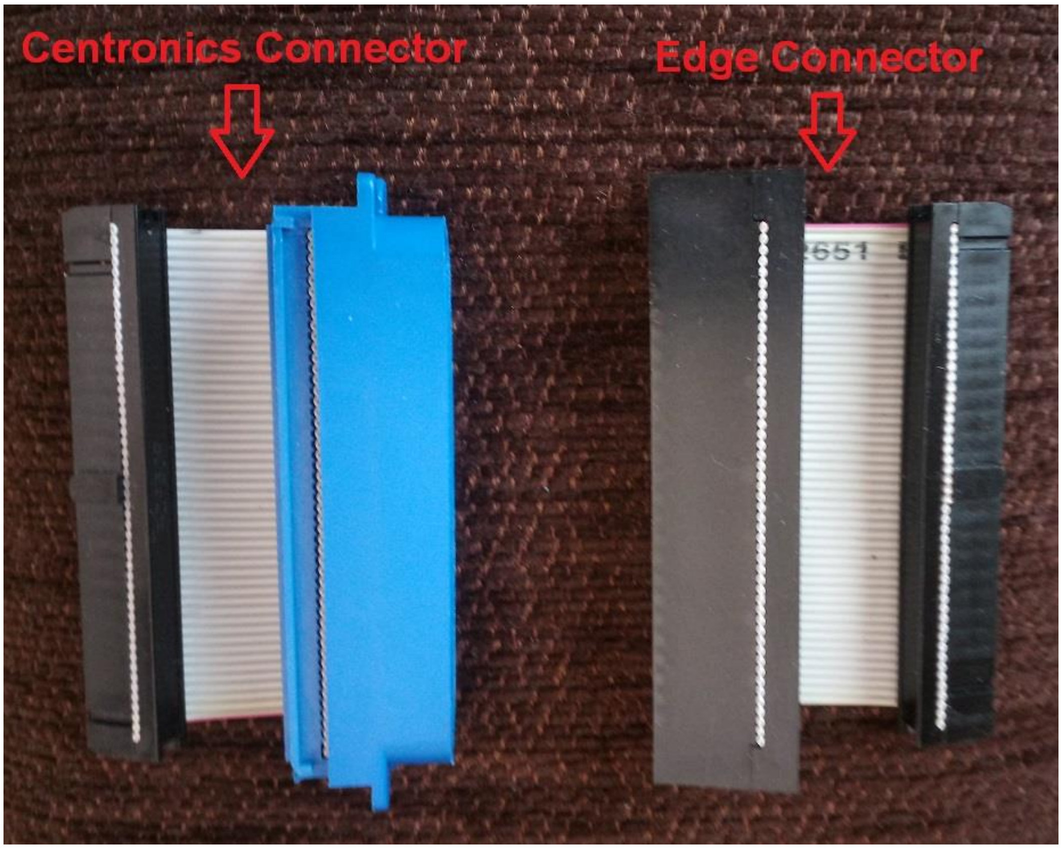
- **Receive buffer of 3100bytes** (~3,5times than of previous interface)
- Serial port speeds of up to **1.065.000bps**!
- Full 16bit address decoding,
- **AMSDOS and PARADOS** ROM emulation,
- **765 Floppy Disk Controller emulation**,
- Ability to **use a Usb storage device**, by utilizing a cheap CH376 usb host module.
- New RSX commands that **offer full access of PC's Hard Drive or usb storage drive**, for **change/create/delete directories and load/save/delete programs/games even Ascii files!**
- **Incredible loading speeds** of up to ~23kb/sec (**5+ times faster than a real disk drive**)!
- **Full read/write access to DSK images** of both AMSODS and PARADOS formats!
- **Access up to four DSK images and choose them "on the fly",**to support all multi-image Games!
- **Load .SNA snapshot files!**
- Extra RSX commands to **copy files from/to floppy disks, transfer DSK images to floppy disks, backup floppy disks to dsk image files, and quick Format disks.**
- 1kb EEPROM for use as extra memory or for storing/executing your own routines.
- Includes 3 classic games**, GALACHIP, PACMAN and KILLER GORILLA**!
- Equipped with a **reset button and a Pause switch** for Amstrad CPC:



You can connect it directly to an external port raiser adapter like MX4 board:



Or directly to Amstrad’s Expansion port using these adapters:



Quick Start Guide:

|HELP: Get a list of all available RSX commands with short descriptions.
(Note: If you use a usb device, you can use **file manager** for easy browsing of contents.)

AMSTRAD CPC 664/6128:

For direct file access:
- |**USB** to enable usb host module (with firmware _2d and newer, this required only once,after initial power up)
- |**CAT** to get a catalogue of root directory
- |**CD,"dir"** to change directory to "dir"
- |**CAT** to get catalaogue of "dir"

Then you just give RUN"NAME" of the BAS/BIN file, exactly like you do when using a floppy disk!

For Amsdos dsk image access:
- |**USB** to enable usb host module
- |**CAT** to get a catalogue
- |**MG,"name"** to select the image file you want to use
- |**FDC**, to enable Floppy Disk Controller emulation

From now on, any CAT,LOAD,RUN,SAVE command will access dsk image!
And by giving again "|FDC" command, FDC emulation will be disabled and CAT,LOAD,RUN,SAVE commands will access again the floppy disk drive!

For Parados dsk image access:
Follow the above first 3 steps,but then give:
- **|DOS,2** for Selecting PARADOS Emulation
- **|464** ,Amstrad will reset, and then you can access the PARADOS dsk image using CAT,LOAD,RUN,SAVE commands.

Note that RSX commands can't be used in this mode of operation, until you RESET Amstrad again.

AMSTRAD CPC 464:

For direct file access:
- |**USB** to enable usb host module
- |**CAT** to get a catalogue of root directory
- a$="dirname"
- |**CD,@a$** to change directory to "dirname"
- |**CAT** to get catalaogue of subdir

Then you just give RUN"NAME" of the BAS/BIN file, exactly like you do when using a floppy disk!

For Amsdos dsk image access:
- |**USB** to enable usb host module
- |**CAT** to get a catalogue
- a$="imagename"
- |**MG,@a$** to select the above disk image file
- **|DOS,1** for Selecting AMSDOS Emulation
- |**464**, Amstrad will Reset, to enable Floppy Disk Controller & DOS emulation,

From now on, any CAT,LOAD,RUN,SAVE command will access dsk image!

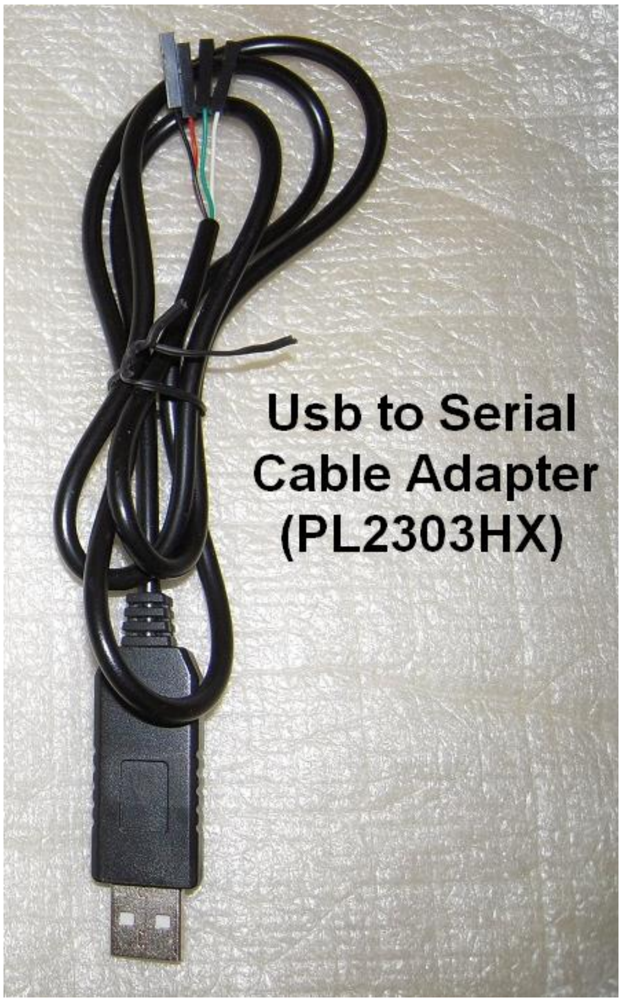
For Parados dsk image access:
Follow the above first 4-5 steps,but then give:
- **|DOS,2** for Selecting PARADOS Emulation
- **|464** Amstrad will reset, and then you can access the PARADOS dsk image using CAT,LOAD,RUN,SAVE commands.

Note that RSX commands can't be used in this mode of operation, until you RESET Amstrad again.

Serial Interface Connections

Serial interface can be used with:
(* For more details about all RSX commands, check the "**RSX COMMANDS**" section bellow)

Direct serial cable connection, using a usb2serial cable adapter.



(Connect **ONLY** Tx=Green, Rx=White, and Ground=black to serial interface pins, **red** cable **MUST NOT** be connected to the 5V!)

After you made the proper connections, just set serial port speed to match that on PC side, using the "**|SET**" Command, and then just give: "**|EN**" to enable Direct mode.

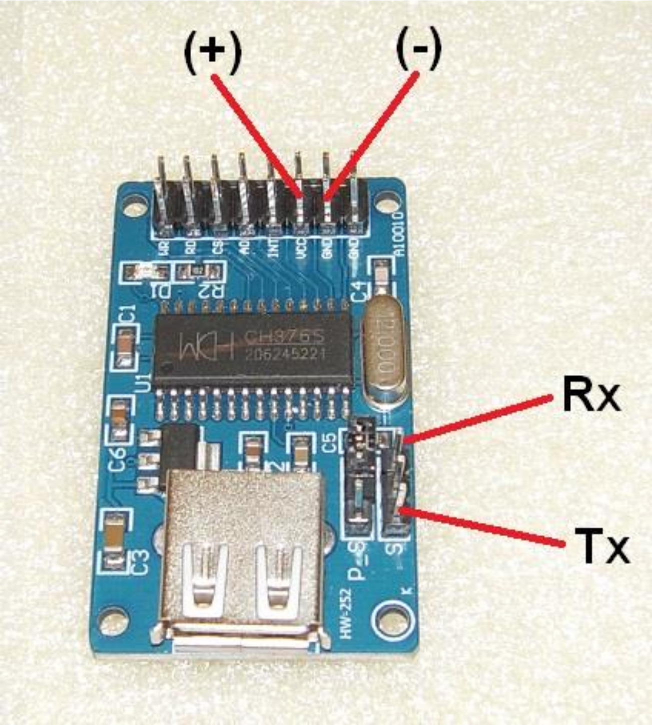
That's it!

From now on, you can access the hard disk drive of your PC,by browsing directories (**|CD**), receive catalogues (**|CAT**), delete files (**|DEL**) and use directly **load, run, save** and **cat** commands, exactly like you do with floppy disks. Note also the amazing loading speeds (that can be up to ~20kb/sec),where **you can load most of the games in a couple of seconds**!

Moreover, you can also select disk images (**|MG**) and then enable Floppy Disk controller emulation (**|FDC** on CPC 664/6128, **|464** on CPC 464),in order to have full read/write access on that disk image! In 2 words, you convert the HDD of your PC, to a HUGE super fast floppy disk, directly accessible by your Amstrad CPC! ;-)

CH376 USB Host module:

Using this module, you can access a usb storage device, like a usb flash drive! A module is now mounted on the main board but you can also connect one manually: In the photo above, you can see what pins you need to connect to interface UART connector,using 4 small dupont wires:



Usb flash drive must be **FAT or FAT32** formatted. **If you experience problems in usage** (like frequent hang-ups, delayed execution of commands, erroneous messages, or even crashes),**try to create a small partition of 256Mb and format it, using FAT file sytem**. In most cases, this will solve the problems. If not, then probably you need to change the flash drive you are using.

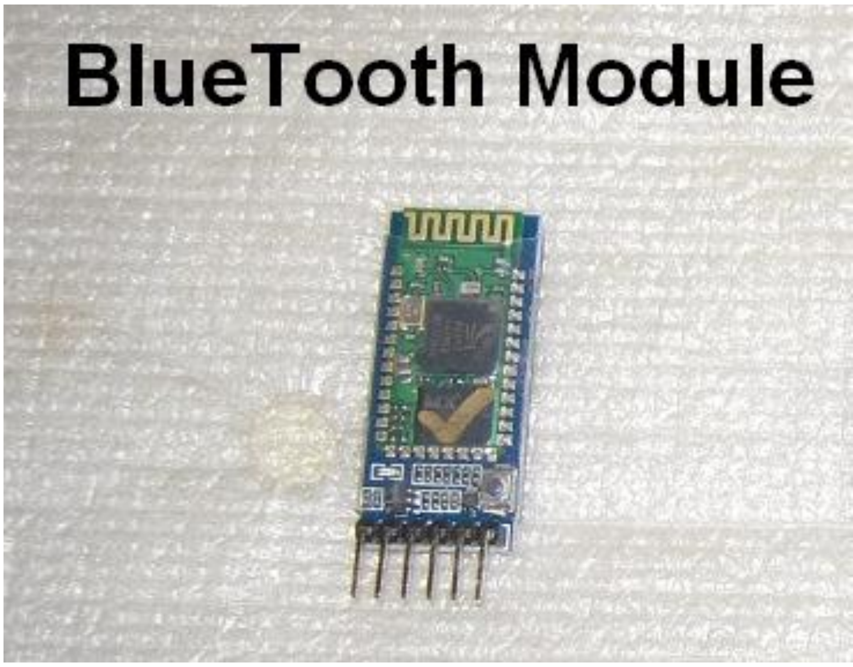
As a general rule, better NOT to use large capacity drives (like 32Gb or 64Gb) or very cheap ones.

Now, after proper connections, just turn on your Amstrad and give:**|USB** command,and you are ready to go!

Any usb flash drive connected to host module, is fully accessible by your Amstrad, through many RSX commands that allows you to:

Browse, create, delete directories **(|CD, |MD, |DELD),**
Get catalogues (|**CAT**)
Load, Run, Save programs/files (Ascii files also supported),
Delete files (|**DEL)**
Full access on DSK images
Load SNA snapshot files

Wireless connection using a Bluetooth module:



For direct wireless connection to a Laptop/Note book/Smart phone equipped with Bluetooth, or, two Bluetooth modules, one connected to CPC serial interface, and the other to a usb2serial cable adapter connected to a usb port. Check **“configure Bluetooth module”** on how exactly you can set up module for use. After that, everything is the same as described in previous “**direct serial cable** connection” .

Wireless connection using an ESP-8266 wifi module:

This is especially useful for creating a LAN or for direct connection to internet!
Check **“configure Esp8266 WiFi module”** on how exactly you can set up module for use. After that, everything is the same as described in previous “**direct serial cable** connection”

All of the above, are very easy to find on ebay and they cost almost nothing!(usb2serial can be found at ~1euro and other modules for 2-3euros…).

Finally, if you have an on old motherboard with **on board RS232 serial port**, you can’t use it directly to connect with serial interface, but you must use an **RS232 to TTL converter** between them.

Basic Usage

Interface usage, is pretty simple and straight forward. Communication with the device is accomplished using only two ports:
&FBD1: The control port
&FBD0: The data port
And the two BASIC commands INP() for receive and OUT for send.

Send & Receive bytes:

This method can be used with direct serial/ Bluetooth module and also, WiFi module, which must be pre-configured using the **|WIFI** RSX command, in order to establish a passthrough/transparent transmission mode.

To send a byte, just give the BASIC command:
OUT &FBD0,x (x: 0-255)
Or on assembler, the instructions:

```
LD A,x (x: 0-255)
LD BC,&FBD0
OUT (C),A
```

To receive a byte, you must first check if there is any byte available at the buffer, by reading the control port. Use the BASIC command: **INP(&FBD1)**. If it returns ‘255’, there is a byte available, if not, it returns ‘1’.So, in order to receive a byte from serial port, you just give the BASIC command:

IF INP(&FBD1)=255 THEN A=INP(&FBD0) (variable A contains the received byte)

And if you want to wait until a byte is available, you can use a small loop like:

```
WHILE INP(&FBD1)=1: WEND
A=INP(&FBD0)
```

And here is the assembly code for doing the same thing:

```
check_BYTE:
      LD A,&FB
      iN A,(&D1)
      DEC A
      JR Z,check_BYTE
ld      a ,&FB
in      a,(&D0)
```

Accumulator A now has the received byte.

Send & Receive bytes with a WiFi module acting as TCP server:

In order to **send data using a WiFi module** that is configured as TCP server (using the **setservr** program), you must first execute an AT command:

AT+CIPSEND=0,X

Where X, is the length of the string to be sent. Data string follows immediately after.
Below is the BASIC routine **to send a string of chars/bytes (named A$)**:

```
1000 REM SEND WiFi ROUTINE
1010 B$=STR$(LEN(A$)): C$=AT+CIPSEND=0,+RIGHT$(B$,(LEN(b$)-1))
1020 FOR k=1 TO LEN(c$)
1030 OUT &FBD0,ASC(MID$(c$,K,1))
1040 NEXT K
1050 OUT &FBD0,&D: OUT &FBD0,&A
1060 FOR k=1 TO LEN(a$)
1070 OUT &FBD0,ASC(MID$(A$,K,1))
1080 NEXT K
1090 RETURN
```

Receiving a byte/char, is done like with serial connection, BUT before getting the actual data, there is always a header in the form of:

+IPD,1,X:

Where **X** is the number of the received bytes (or length of string).
In order to **receive only the actual data**, some starting bytes should be removed:
For **1-9 bytes/chars,** first **13 bytes** should be removed or ignored
For **10-99 bytes/chars,** first **14 bytes** should be removed or ignored
For **100-999 bytes/chars,** first **15 bytes** should be removed or ignored
For **1000-2048 bytes/chars,** first **16 bytes** should be removed or ignored

Configure Interface

Default serial speed of the interface is 1065600bps.
You can give various commands to the interface, using the control port, and the BASIC command:
OUT &FBD1,x
Where **x** is:

0: For resetting the interface (without resetting Amstrad CPC)

1: Clears receive data buffer

2: Enables a special asynchronous burst mode, for fast receiving the hole receive buffer (3100 bytes) at once. When this mode is enabled, you don't use INP(&FBD1) to check if there is available byte, but instead you receive directly data using only INP(&FBD0). When the receive buffer becomes empty, next INP(&FBD0) will cause automatically refilling of the receive buffer (e.g. 3100bytes). This mode is used in the file transfer utility, in order to avoid asking if there is a byte available for every byte to receive. **USE WITH CAUTION,** because it will freeze Amstrad, until the receive buffer is full!

3: Disables the above mode

10: Set serial speed to 300bps
11: Set serial speed to 2400bps
12: Set serial speed to 9600bps
13: Set serial speed to 19200bps
14: Set serial speed to 38400bps (useful for setting Bluetooth module)
15: Set serial speed to 57600bps
16: Set serial speed to 115200bps (the usually default speed for Wifi Modules)
17: Set serial speed to 230400bps
18: Set serial speed to 460800bps
19: Set serial speed to 576000bps
20: Set serial speed to 31250bps useful for connecting MIDI devices
21: Set serial speed to 921600 (max speed using wireless Bluetooth modules)
22: Set serial speed to 1000000bps(connection speed for usb storage device)
23: Set serial speed to 1065600bps(max speed for serial cable/Wifi module)
These are meant to be used mostly in program codes, as you can set serial speed much more easily using the "**|SET**" RSX command.

30: This is the command used by |STAT Rsx command, which returns the status of interface (UART speed,ROM number, Status for Direct Mode,FDC emulation, DOS ROM emulation).

Also,in order to **change serial interface ROM numbe**r you can give:
OUT &FBD2,x
Where **x** is the desired ROM number (Default number is 5). This might be useful if you have other I/O devices connected to your Amstrad that might use the same ROM number.
For CPC464 you should use a number less of 7, and for CPC6128, a number less or equal of 15. Note also, that you should avoid numbers 0 and 7, because they are reserved by Amstrad CPC for BASIC and AMSDOS ROMs respectively. The new ROM number will be saved into microcontroller EEPROM memory (except for numbers '0' and '7'),and will be used from now on, so you don't need to give the command every time. Finally you can check the current ROM number, using |STAT RSX command.

Finally,use **OUT &FBD1,66** for return to USB device root directory after reset or **OUT &FBD1,65** for staying to last directory used.

RSX Commands

- **|HELP**: Shows all RSX commands with short description and usage.

- **|CAT**: Shows catalogue of files and sub dirs.Using argument “X” (**|CAT,”X”**) it will show a list of files, starting from 'X'. With usb device, you can use more than one letters for filtering. Finally, with argument ‘1’(|CAT,1) it will give a list of DSK images in selected dir (use this,only with PC Direct Mode).You can use both upper case and lower case letters for argument.

- **|CD,”name”**: Change dir to 'name'. Without argument, moves up a dir. You can use both upper case and lower case letters for argument.

- **|CDR**: Moves up to root directory.Use with USB Device only.

- **|USB**: Enable /Disable CH376 Usb Host Module,to access USB Storage Device. You need to give this command **only once** after initial powering Amstrad. Board will “remember” the last state of the usb device, and the dsk image(s) selected.

- **|EN**: Enables Direct Mode 1 to access files from PC or USB Device program (this is done automatically with the use of “|USB” command).This practically means that **LOAD, RUN** and **CAT** commands, will access files (or have a catalogue) from PC or USB storage device.Note that **you MUST Enable Direct Mode**, before load/run/save a game/program.

- **|EN2**: Enables Direct Mode 2,try this,if above Mode 1 fails to load a game/program (NOT to use with USB device)

- **|FDC**: Enables/Disables 765 Floppy Disk Controller (765FDC) Emulation. This command is used for accessing DSK images on Amstrad CPC 664/6128.

- **|DIS**: Disables Above Direct and FDC Modes,in order to Access Floppy Disk Drive. After that, every **LOAD, RUN, CAT** commands, will access Disk Drive again. Alternatively, you can give: **OUT &FBD1,4**.The latter is very useful, if you happen to get “unknown command” error message, when trying to use an RSX command.

- **|464**: Resets Amstrad and enables Amsdos/Parados and 765FDC emulation. **Use this command, for accesing DSK images on Amstrad CPC 464,or, Parados DSK images on all CPC models**.

- **|MD,'NAME'**: Create directory 'name' in current Directory of a Usb storage device. For Usb Device Only.

- **|DEL,'XXX'**: Delete all files starting from 'xxx',from selected directory. With PC direct mode,you can also use wild card '*' for multiple file deletion. Of course you can also give a single file name as argument, to delete this file only.

- **|DELD,'name'**: Delete the directory 'name' from Usb Storage Device.

- **|DOS,x**: Select DOS Emulation,x=1 for Amsdos or x=2 for Parados.This is used in order to determine which DOS ROM will be used with DIRECT mode, and also, after “|464” command is given.

- **|COPY,'xxx'**: Copies from USB Device to a Floppy disk,all files starting from 'xxx'. You can also use an exact file name as argument, to copy a single file only.

- **|UCOPY,"name1","folder path",("name2"):** With this command, you can copy a file into usb device, named "name1", from it's current position, into another folder. Optionally you can give "Name2" to copy file with a new name.For example, command: **|UCOPY,"GAME.BAS","/DIR1/GAMES","GAME2.BAS"** ,will copy 'GAME.BAS' file to '/DIR1/GAMES' subfolder, with name "GAME2.BAS". If you omit the last argument, then file will be copied with same name. Function can be used with any file, regardless the size. Actual copy speed is ~5-10kb/sec (depending on the speed of usb flash drive you are using),so large files like DSK images, will need some time to be copied.

- **|MG,"name"**: Mounts DSK image 'name' and place it to 1st image slot. You can access this disk image file, by using "|FDC" or "|464" 765FDC emulation. When in PC DIRECT mode, you can also use it without argument, to enable automatic selection of image,e.g. first image found in current PC directory, will be selected (and the "Auto image selection" check box, will be checked in PC windows utility).

- **|MG2,"name"**: Mounts DSK image 'name' and place it to 2nd image slot. This is required for loading multiple disk image games/programs.

- **|MG3,"name"**: Mounts DSK image 'name' and place it to 3rd image slot.

- **|MG4,"name"**: Mounts DSK image 'name' and place it to 4th image slot.

- **|SMG**: Shows a list of the image files mounted on all 4 image slots, and which slot is currently selected. You can round select image slots by pressing "dsk swap" button.

- **|SET**: A small utility for easy setting Serial port speed

- **|WIFI**: BASIC utility for easy configure ESP8266 WiFi modules.

- **|DSK,"name",x**: Use this command to copy DSK image 'name', from usb device to a floppy disk. Optionally, you can use the 2nd argument 'x' for Drive A, or '2' for Drive B. Without argument, is used for copying a selected image from PC to Floppy disk.

- **|DISK,name,(1):** Creates a dsk image file from Floppy disk. Supports DATA/SYSTEM/IBM formats and up to 42 tracks. The optional 2nd argument '1', is for auto creating new image filenames, based on the name you give, by adding a letter at the begining of the name. For example,if you give name: "BACKUP.DSK" ,with the extra argument '1', program will name images: "ABACKUP.DSK", "BBACKUP.DSK","CBACKUP.DSK" etc. So you could take many backups in a row, by only changing disks and pressing a button. Note that **if you have an older board without the RSX command**, you can still use it by running disk2image.bas from Disk2image.zip file which can be found **here.**

- **|SNA,addr**: Use this command to load SNA snapshot files. Optionally you can use argument 'addr', (to place the required final code in the procedure), to specific 'addr' address. This is useful, for snapshots files, that can't be loaded correctly, using the default address. You can use **CPC loader creator** windows utility, to automatically create a Basic loader file for snapshot files.

- **|FORMAT**: Utility for easy and quick formatting floppy disks in just 15seconds! Supports both Data and System formats

- **|2PC**: Utility for copying files,from Amstrad CPC floppy disk,to selected directory on PC or USB Device.

- **|2CPC**: Utility for copying files,from PC to Amstrad CPC disks.This is the equivalent of the above "|COPY" command, but for use with PC Direct mode.

- **|TER**: Terminal Utility.

- **|COM**: Small Terminal for easy communication with Wifi/Bluetooth Modules.

- **|WROM,'name'**: Write to Microcontroller's EEPROM,first 1022 bytes of 'name' file.

- **|WROM,adr,size**: Write to EPPROM,'size' bytes,starting from RAM address 'adr' - (Size can't be more than 1022 bytes)

- **|LROM,addr**: Loads EEPROM contents to RAM,at 'addr' address.Note also, that, you can use an **RST3,&FC00 assembly command**, in order to directly execute any code routine you have uploaded to EEPROM.(last 1kb of selected upper rom @ &fc000-&fffd is reserved for EEPROM, last 2 bytes are reserved for saving serial port speed and ROM number, thus you have 1022 instead of 1024 bytes available ☺)

- **|STAT**: Shows current status of USIfAC II Interface (UART speed,ROM number,Status for: return to Usb device root directory, Direct Mode,FDC emulation, ROM DOS emulation)

- **|MAN**: This resembles **|CAT**,but instead of getting the list of files/subfolders of a usb device to screen,it outputs the list of files/subfolders into RAM, starting from **&2b00** , and uses '1' as name separator,'2' to mark end, e.g.: 1NAME1NAME1NAME...1NAME2.
Function is used by filemanager utility, but it would also be useful for anyone want to develop it's own programs.

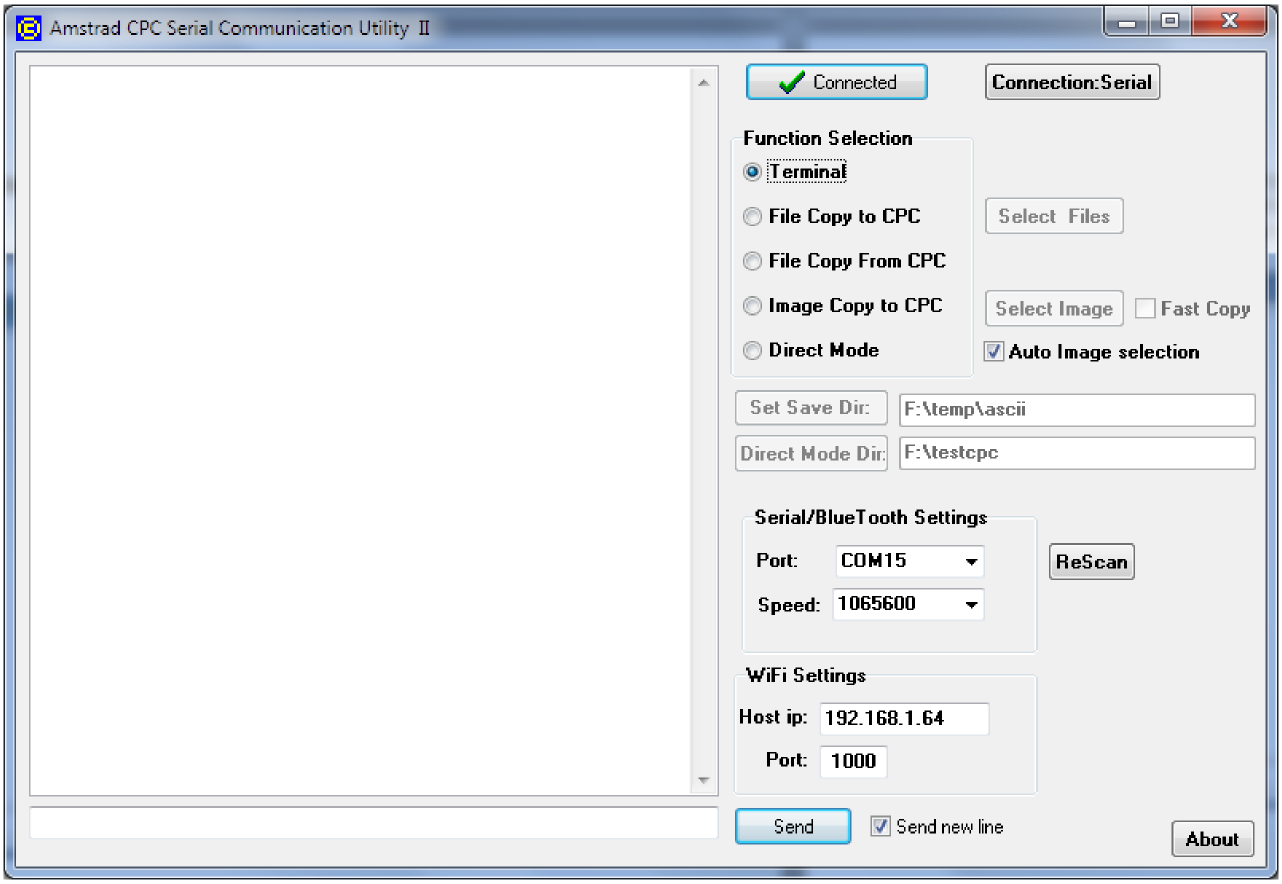
- **|GALA**: Loads GALACHIP game.

- **|PACMAN**: Loads PACMAN game.

- **|KGOR**: Loads KILLER GORILLA game.

Windows PC Communication Utility

I have developed a utility for windows, that allows communication with Amstrad CPC:



Amstrad CPC Serial Communication Utility II

Function Selection

● Terminal

○ File Copy to CPC

○ File Copy From CPC

○ Image Copy to CPC

○ Direct Mode

□ Fast Copy

☑ Auto Image selection

Set Save Dir: F:\temp\ascii

Direct Mode Dir: F:\testcpc

Serial/BlueTooth Settings

Port: COM15

Speed: 1065600

WiFi Settings

Host ip: 192.168.1.64

Port: 1000

☑ Send new line

It offers five functions:

- **Terminal:** A terminal for direct communication through serial/Bluetooth or Wifi modules.
- **File Copy to CPC**: A File Copy utility from PC directly to Amstrad CPC disk.
- **File Copy From CPC:** A file Copy utility from Amstrad CPC disk to PC.
- **Image Copy to CPC:** A dsk image copy utility from PC to Amstrad CPC disks.
- **Direct Mode:** Select this function for accessing files directly from your Amstrad,using either |EN or |EN2 RSX commands.

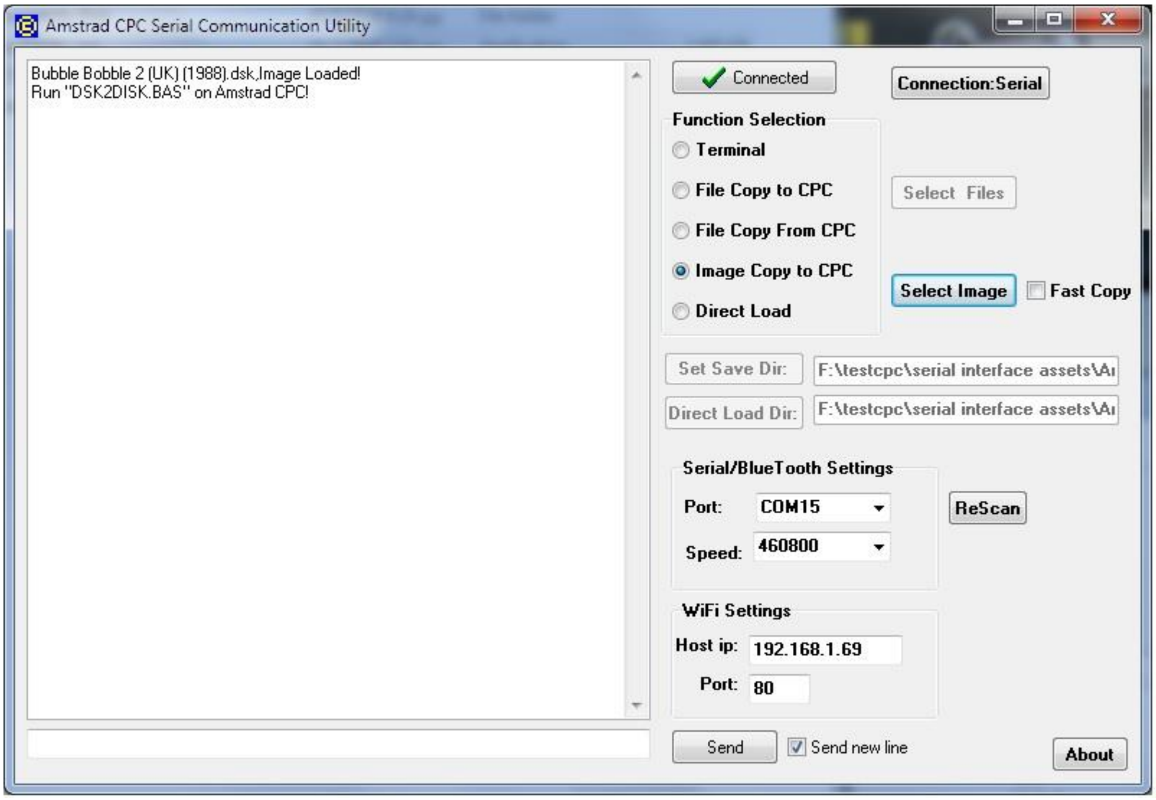
For more details on the above functions, see next sections.

Now,in order to connect with serial interface on Amstrad CPC, you must first setup your connection.This needs to be done only the first time, program will remember your settings, and set them automatically every time you run the utility.

First, using the **connection** button on the right top, select the type of your connection (Serial or WiFi), according to what you are using.

Then,from groupbox **Serial/Bluetooth Settings** you can select Com port (note: **Rescan** button, allows you to rescan for serial com ports, in case you enable/disable Com ports after running the utility), and speed for Serial/Bluetooth connection. If you use a WiFi module, connection is established from AMSTRAD CPC (see section: configure Esp 8266 WiFi module). Make sure that Serial interface on Amstrad CPC has the same speed settings and, if you are using Bluetooth module, the module is properly set (see Configure Bluetooth Module section, on how exactly to do that).

Press **Disconnected** button, it should turn to **Connected:**


Amstrad CPC Serial Communication Utility

```
Bubble Bobble 2 (UK) (1988).dsk,Image Loaded!
Run "DSK2DISK.BAS" on Amstrad CPC!
```

✓ Connected

Connection:Serial

Function Selection
- ○ Terminal
- ○ File Copy to CPC
- ○ File Copy From CPC
- ● Image Copy to CPC
- ○ Direct Load

Select Files

Select Image □ Fast Copy

Set Save Dir: F:\testcpc\serial interface assets\A

Direct Load Dir: F:\testcpc\serial interface assets\A

Serial/BlueTooth Settings
- Port: COM15
- Speed: 460800

ReScan

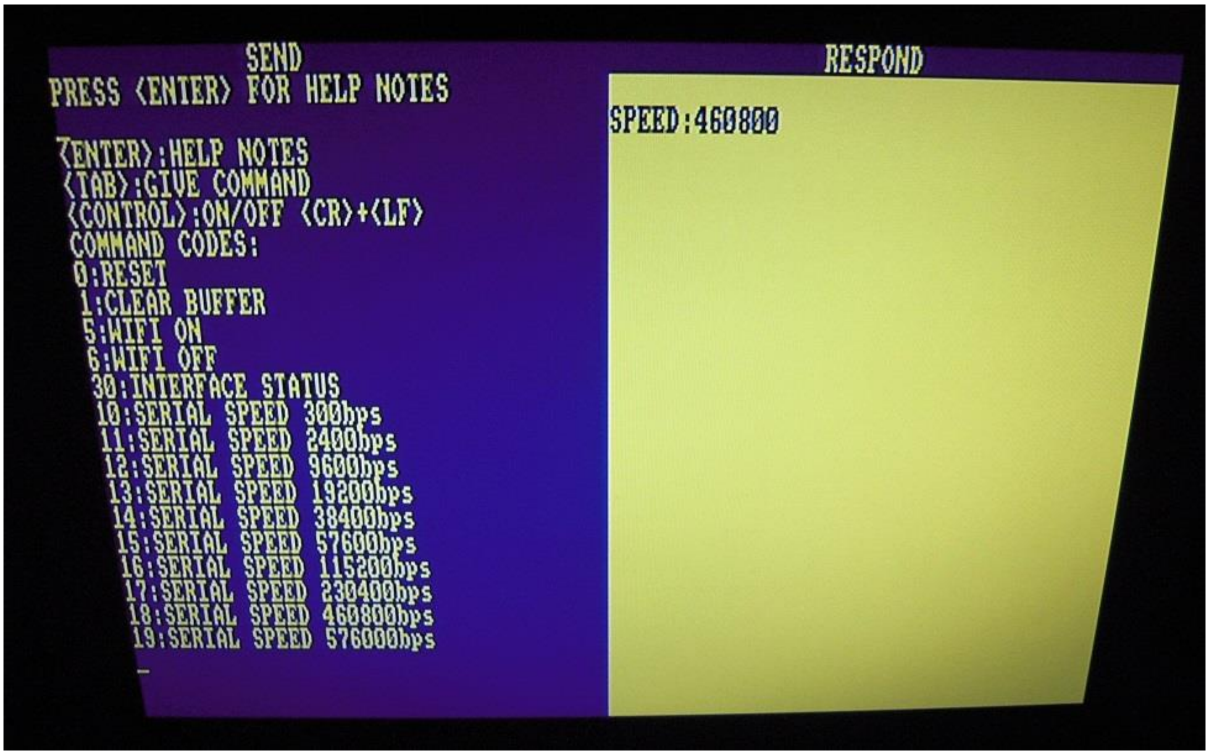
WiFi Settings
- Host ip: 192.168.1.69
- Port: 80

Send ☑ Send new line

About

Terminal Function

On Amstrad CPC, give **|TER** RSX command,and the main terminal window appears:



```
        SEND                                   RESPOND
PRESS <ENTER> FOR HELP NOTES
                                  SPEED:460800
<ENTER>:HELP NOTES
<TAB>:GIVE COMMAND
<CONTROL>:ON/OFF <CR>+<LF>
COMMAND CODES:
0:RESET
1:CLEAR BUFFER
5:WIFI ON
6:WIFI OFF
30:INTERFACE STATUS
10:SERIAL SPEED 300bps
11:SERIAL SPEED 2400bps
12:SERIAL SPEED 9600bps
13:SERIAL SPEED 19200bps
14:SERIAL SPEED 38400bps
15:SERIAL SPEED 57600bps
16:SERIAL SPEED 115200bps
17:SERIAL SPEED 230400bps
18:SERIAL SPEED 460800bps
19:SERIAL SPEED 576000bps
_
```

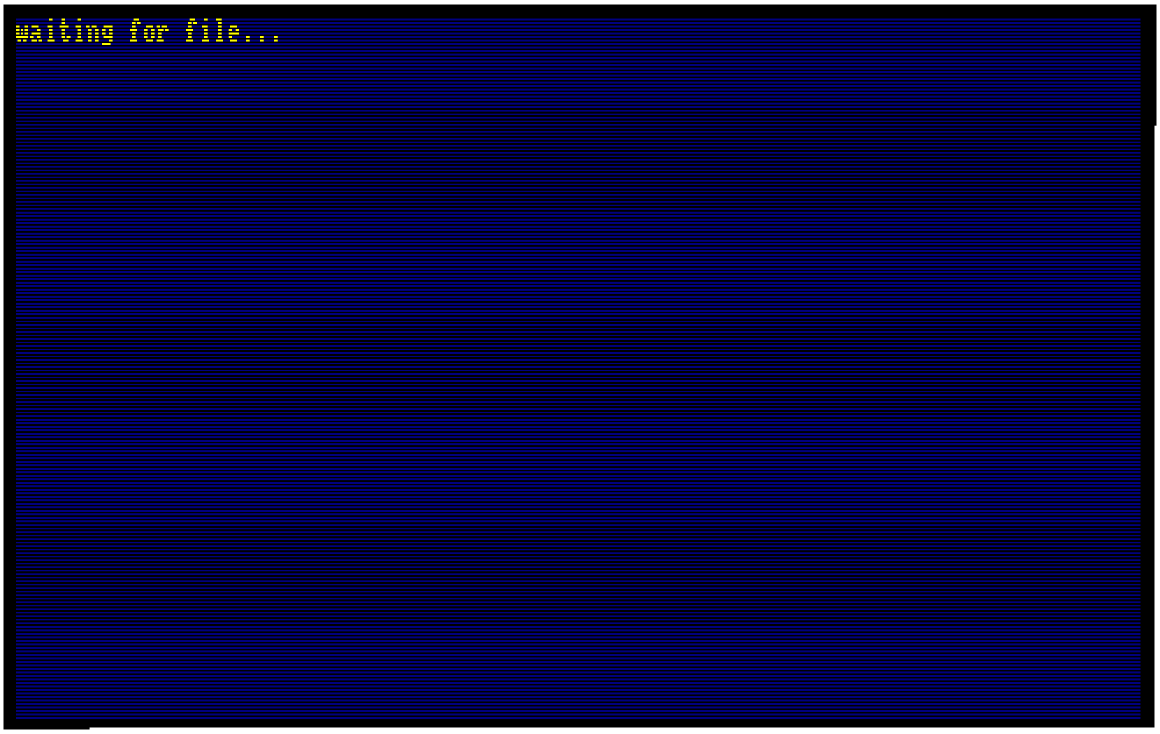
On the left side, write anything, and by pressing <Return> it will be transmitted to PC. On the right side you will receive any respond from the PC.

With terminal, you can also communicate with serial interface by sending various commands to change port speed, clear receive buffer, get status etc. By pressing <Enter> (or <COPY> on WiFi mode), you will get a list of all available commands. Commands are sent by pressing <Tab> and then the desired code.

On PC side, after setting and enabling connection, select Terminal function. You can use the edit box on the left of the <Send> button to write a message and by pressing Send button it will be transmitted to Amstrad CPC.

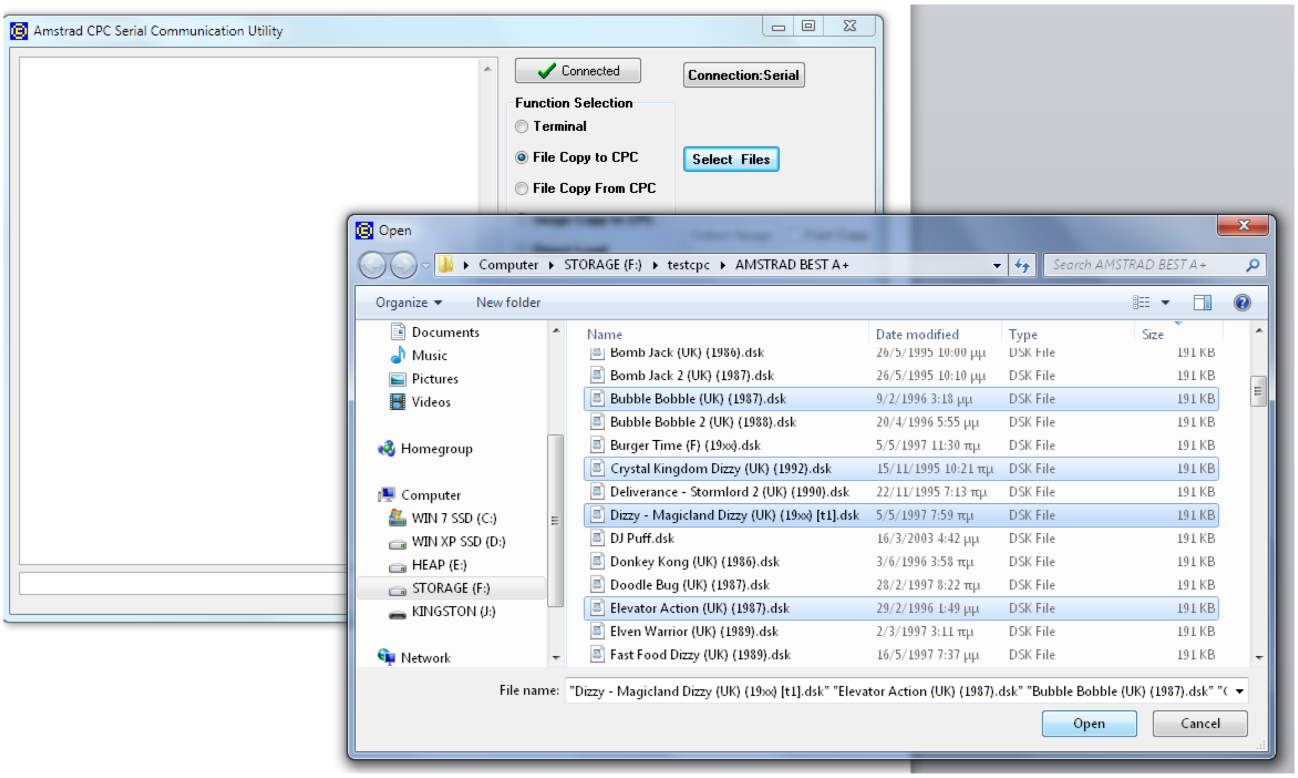
File Copy to CPC Function

On Amstrad CPC, give **|2CPC** RSX command. You need to set the serial port speed (for WiFi mode, don't forget to use **|WIFI**, to establish the connection) , and then, you should get a waiting for file… message on screen:



```
waiting for file...
```

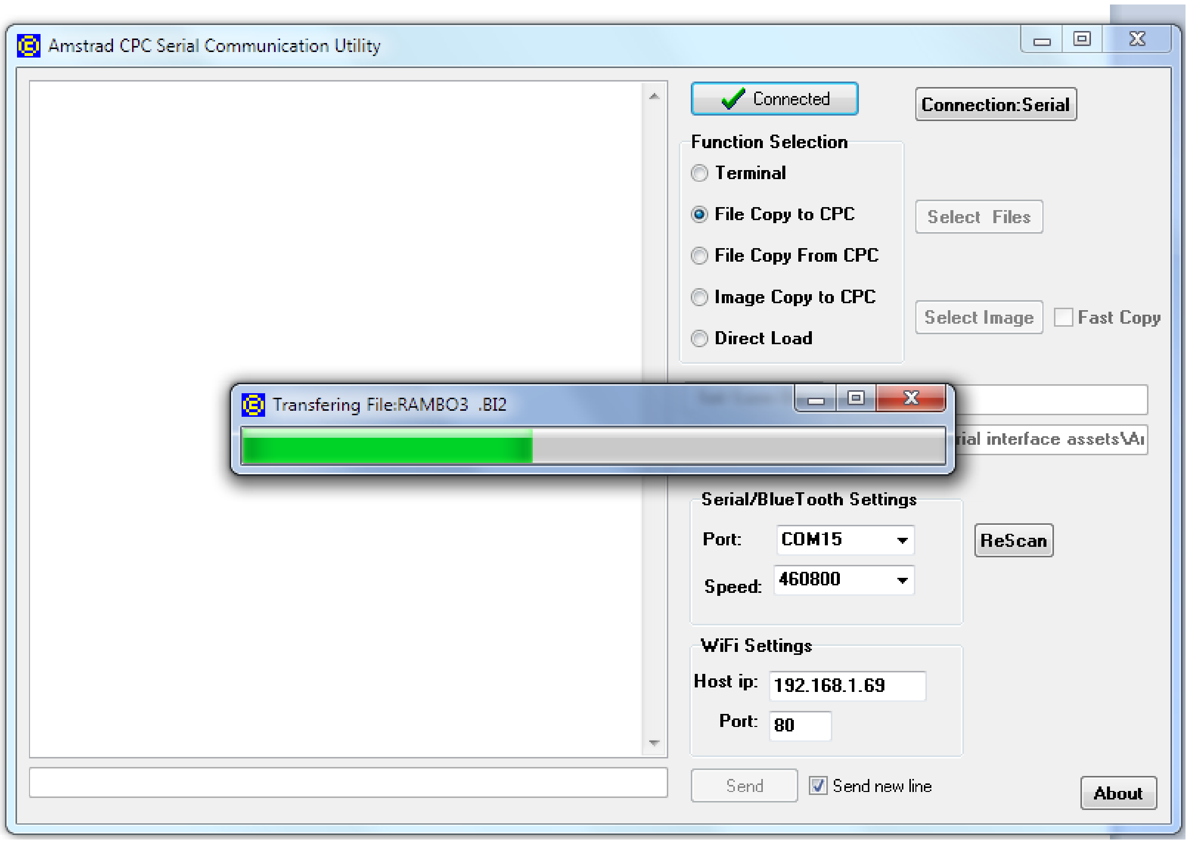
Insert a formatted disk into Disk drive.
Run windows utility on the PC.After setting and enabling connection, select **File Copy to CPC** function. Then, press Select Files button and select one or more files to transfer:



Name	Date modified	Type	Size
Bomb Jack (UK) (1986).dsk	26/5/1995 10:00 μμ	DSK File	191 KB
Bomb Jack 2 (UK) (1987).dsk	26/5/1995 10:10 μμ	DSK File	191 KB
Bubble Bobble (UK) (1987).dsk	9/2/1996 3:18 μμ	DSK File	191 KB
Bubble Bobble 2 (UK) (1988).dsk	20/4/1996 5:55 μμ	DSK File	191 KB
Burger Time (F) (19xx).dsk	5/5/1997 11:30 πμ	DSK File	191 KB
Crystal Kingdom Dizzy (UK) (1992).dsk	15/11/1995 10:21 πμ	DSK File	191 KB
Deliverance - Stormlord 2 (UK) (1990).dsk	22/11/1995 7:13 πμ	DSK File	191 KB
Dizzy - Magicland Dizzy (UK) (19xx) [t1].dsk	5/5/1997 7:59 πμ	DSK File	191 KB
DJ Puff.dsk	16/3/2003 4:42 μμ	DSK File	191 KB
Donkey Kong (UK) (1986).dsk	3/6/1996 3:58 πμ	DSK File	191 KB
Doodle Bug (UK) (1987).dsk	28/2/1997 8:22 πμ	DSK File	191 KB
Elevator Action (UK) (1987).dsk	29/2/1996 1:49 μμ	DSK File	191 KB
Elven Warrior (UK) (1989).dsk	2/3/1997 3:11 πμ	DSK File	191 KB
Fast Food Dizzy (UK) (1989).dsk	16/5/1997 7:37 μμ	DSK File	191 KB

File name: "Dizzy - Magicland Dizzy (UK) (19xx) [t1].dsk" "Elevator Action (UK) (1987).dsk" "Bubble Bobble (UK) (1987).dsk" "(

Press Open Button and file copy will begin:



Transfering File:RAMBO3 .BI2

ial interface assets\A

Serial/BlueTooth Settings

Port: COM15

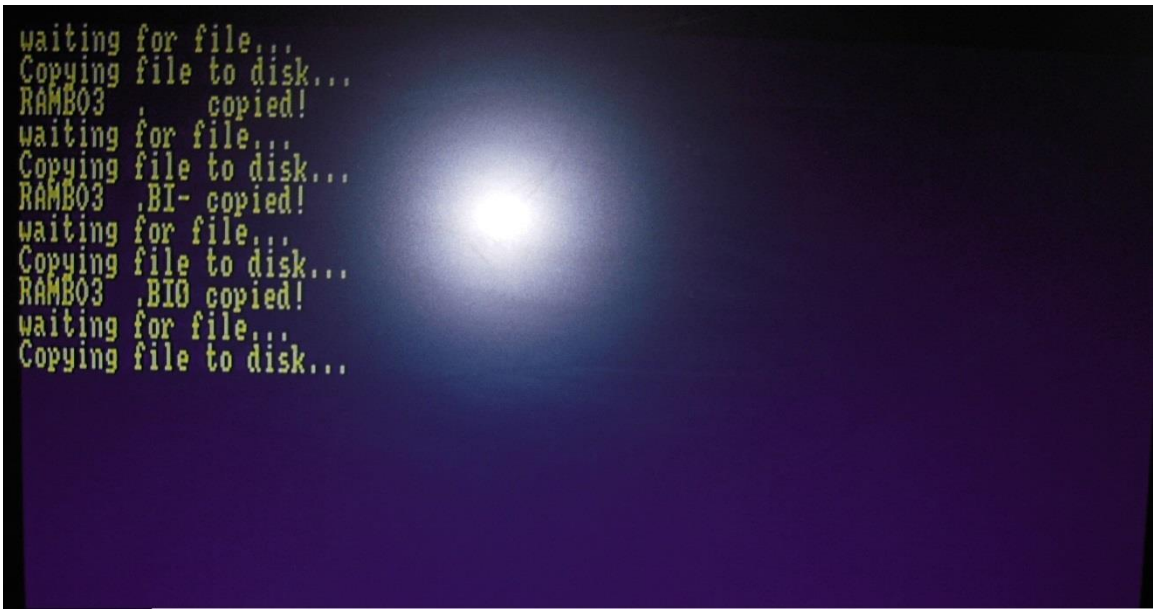
Speed: 460800

WiFi Settings

Host ip: 192.168.1.69

Port: 80

On Amstrad, you will get a confirmation for each written file:

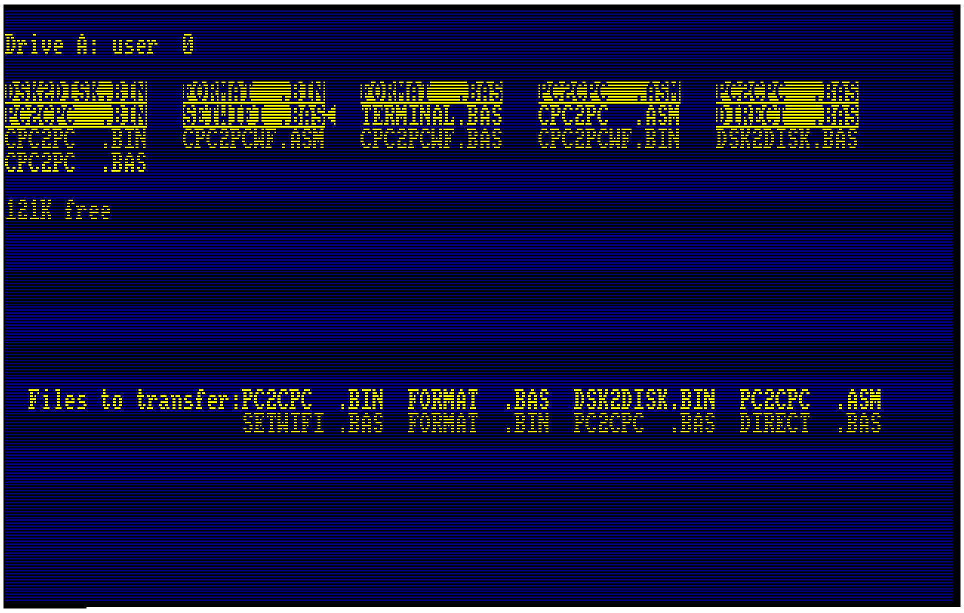


```
waiting for file...
Copying file to disk...
RAMBO3   .     copied!
waiting for file...
Copying file to disk...
RAMBO3   .BI- copied!
waiting for file...
Copying file to disk...
RAMBO3   .BI0 copied!
waiting for file...
Copying file to disk...
```

After finishing transferring the files you want, you can reset Amstrad to exit the program.

File Copy From CPC Function

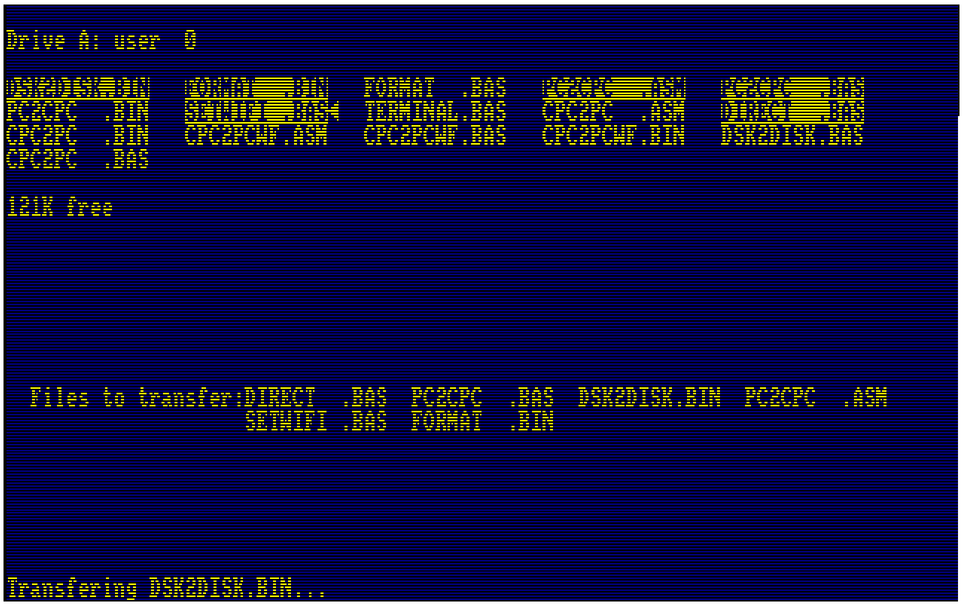
On PC, after setting and enabling connection, select **File copy From CPC** function.
Use the **Set Save Dir** button, to set the save directory for the files transferred from CPC. On Amstrad CPC, give **|2PC RSX command**. You will get a files catalogue of the inserted floppy disk:



```
Drive A: user  0

DSK2DISK.BIN   FORMAT  .BIN   FORMAT  .BAS   PC2CPC  .ASM   PC2CPC  .BAS
PC2CPC  .BIN   SETWIFI .BAS   TERMINAL.BAS   CPC2PC  .ASM   DIRECT  .BAS
CPC2PC  .BIN   CPC2PCWF.ASM   CPC2PCWF.BAS   CPC2PCWF.BIN   DSK2DISK.BAS
CPC2PC  .BAS

121K free




  Files to transfer:PC2CPC  .BIN  FORMAT  .BAS  DSK2DISK.BIN  PC2CPC  .ASM
                    SETWIFI .BAS  FORMAT  .BIN  PC2CPC  .BAS  DIRECT  .BAS
```

Use **arrows** to move between files, **<space>** to select/unselect a file, and **<Return>** to execute transfers of the selected files. By pressing **<1>**, you will receive DRIVE A file catalogue and by **<2>** , DRIVE B file catalogue.
Finally, with **<Caps Lock>** you can select/unselect all the files. This is useful if you want to transfer all files of the disk, or if you want to invert the already selected files (e.g. all selected files will be unselected, and all other, will be selected).

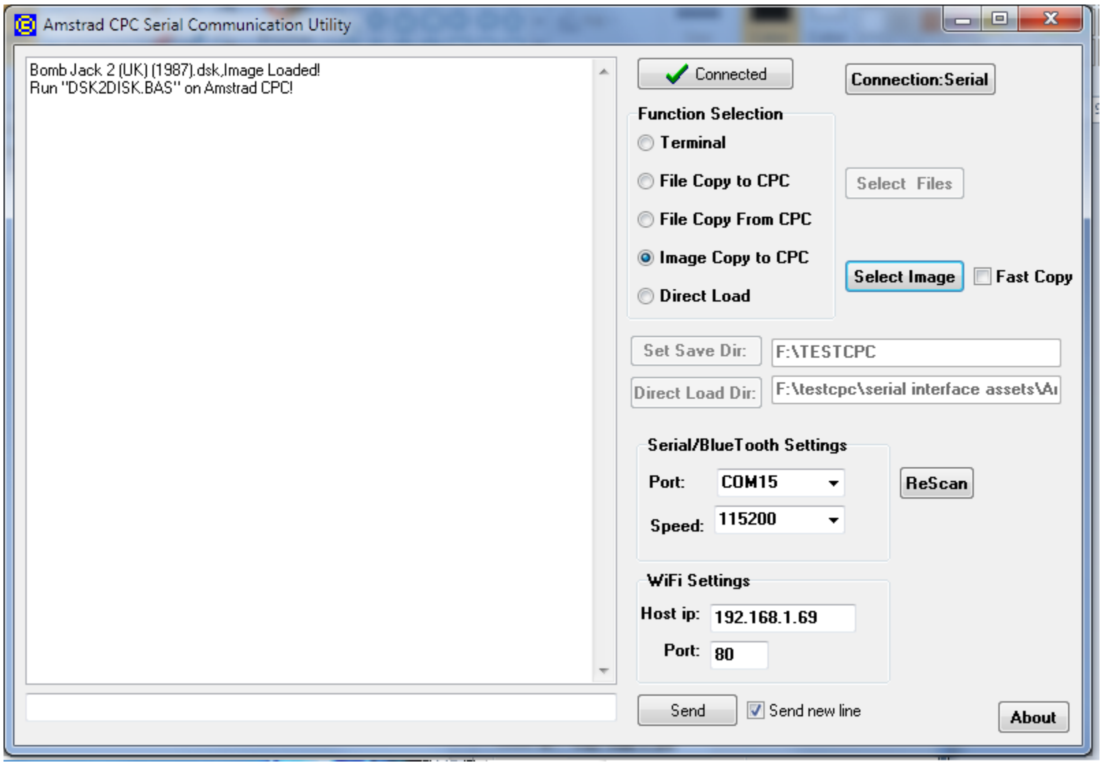
On the half bottom of the screen, you will get a list of all the selected files. Files from this list, will be removed one by one, during the transfer process:



```
Drive A: user  0

DSK2DISK.BIN   FORMAT  .BIN   FORMAT  .BAS   PC2CPC  .ASM   PC2CPC  .BAS
PC2CPC  .BIN   SETWIFI .BAS   TERMINAL.BAS   CPC2PC  .ASM   DIRECT  .BAS
CPC2PC  .BIN   CPC2PCWF.ASM   CPC2PCWF.BAS   CPC2PCWF.BIN   DSK2DISK.BAS
CPC2PC  .BAS

121K free



 Files to transfer:DIRECT  .BAS  PC2CPC  .BAS  DSK2DISK.BIN  PC2CPC  .ASM
                   SETWIFI .BAS  FORMAT  .BIN



Transfering DSK2DISK.BIN...
```

Image Copy Function

On PC utility program, select **Image copy to CPC** function. Press **Select Image** button to choose a dsk image. You will get a confirmation that image is loaded successfully:



Amstrad CPC Serial Communication Utility

```
Bomb Jack 2 (UK) (1987).dsk,Image Loaded!
Run "DSK2DISK.BAS" on Amstrad CPC!
```

✓ Connected

Connection:Serial

Function Selection

○ Terminal

○ File Copy to CPC

○ File Copy From CPC

● Image Copy to CPC

○ Direct Load

Set Save Dir: F:\TESTCPC

Direct Load Dir: F:\testcpc\serial interface assets\A

Serial/BlueTooth Settings

Port: COM15

Speed: 115200

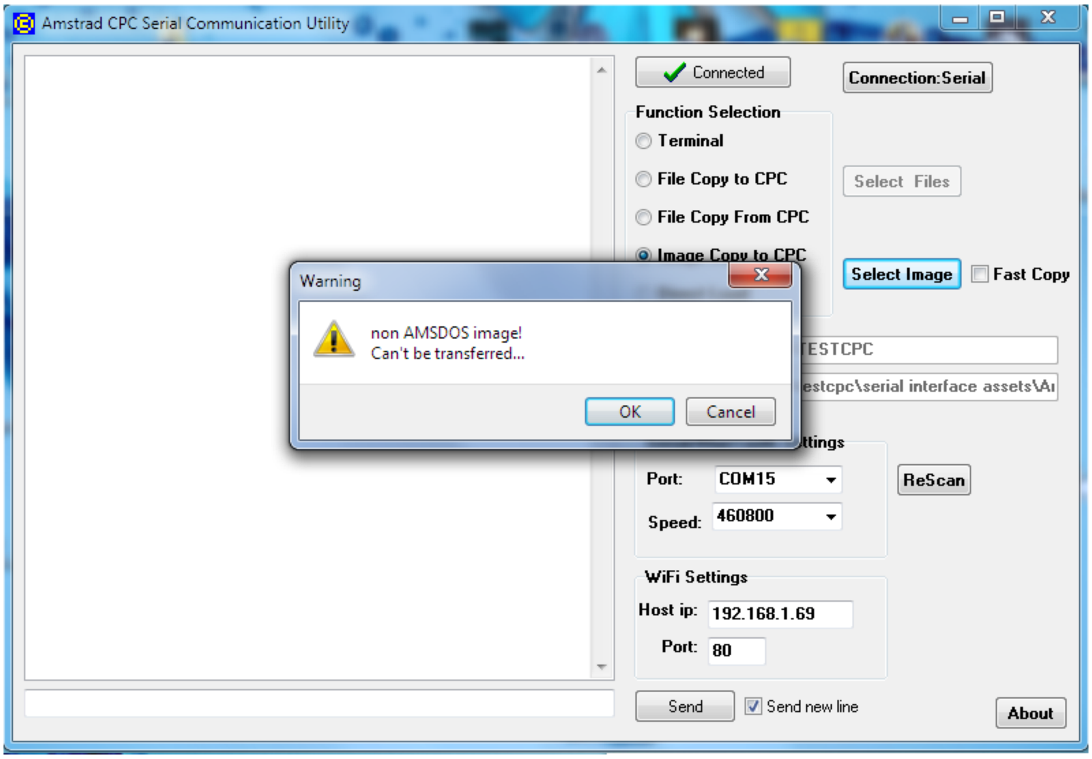
WiFi Settings

Host ip: 192.168.1.69

Port: 80

☑ Send new line

If you select a non Amsdos image (usually copy protected games) you will by notified that currently these images are not supported:

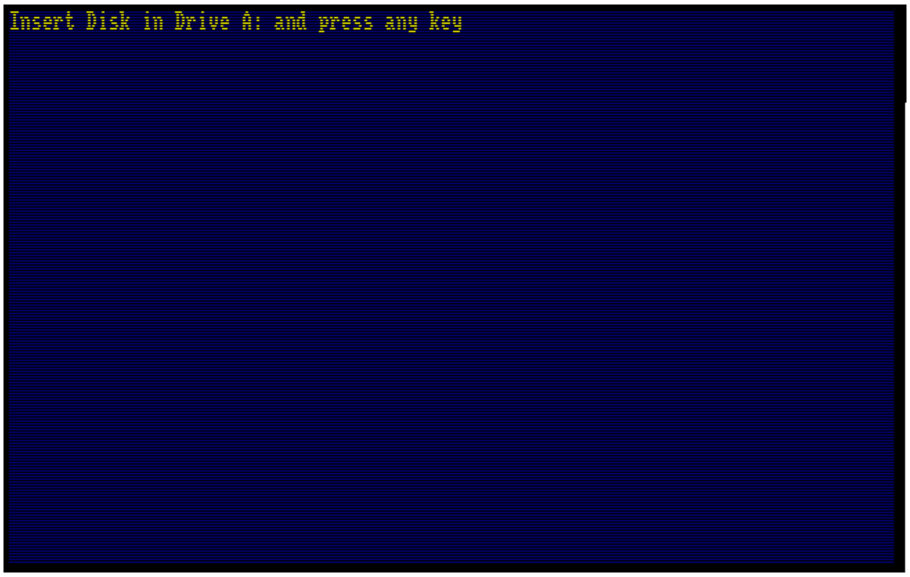


Warning

non AMSDOS image!
Can't be transferred...

Port: COM15
Speed: 460800
Host ip: 192.168.1.69
Port: 80

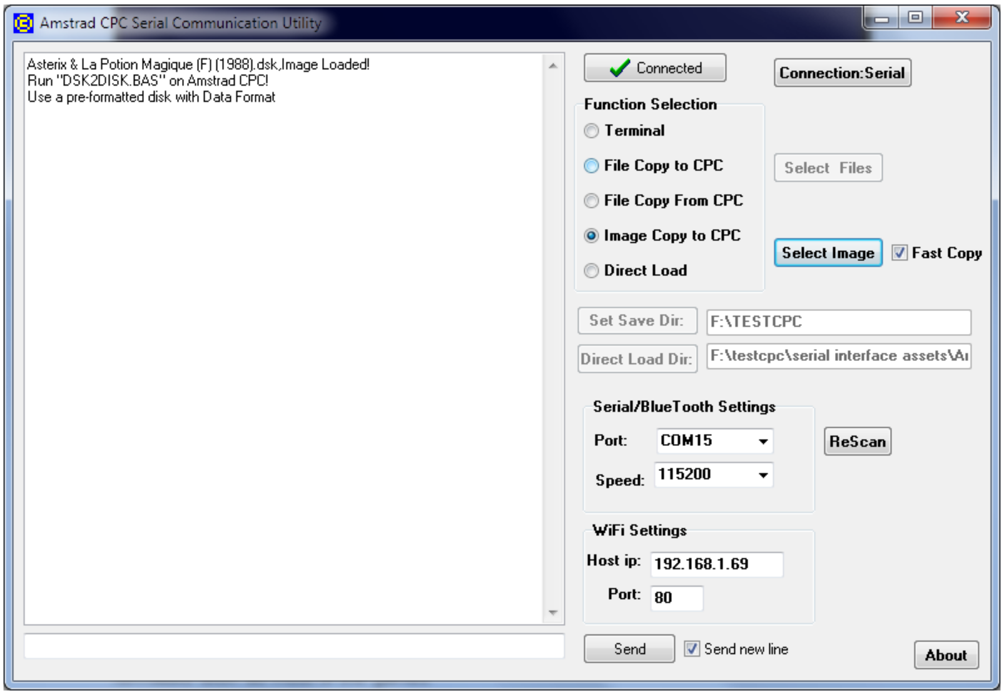
Now,give: **|DSK** RSX command on the CPC, and you will get a message to insert a disk:



```
Insert Disk in Drive A: and press any key
```

By pressing any key, the transfer of the selected image will begin. Using serial speed of 460800bps or more, it should take less than a minute (~55-56seconds) to transfer a hole 180Kb disk image into any disk (either CPC/ PC/Apple formatted or unformatted).

Now, as you might already noticed, there is also a **Fast Copy** check box, right next to Select image button. By checking this, **you can transfer an image to an already Amstrad Formatted disk in just ~40 seconds**! If you check Fast Copy, you will be notified, for the format type needed (in most cases is Data Format) on the disk:



```
Asterix & La Potion Magique (F) (1988).dsk,Image Loaded!
Run "DSK2DISK.BAS" on Amstrad CPC!
Use a pre-formatted disk with Data Format
```

○ Terminal
○ File Copy to CPC
○ File Copy From CPC
● Image Copy to CPC
○ Direct Load

☑ Fast Copy

Set Save Dir: F:\TESTCPC
Direct Load Dir: F:\testcpc\serial interface assets\A

Port: COM15
Speed: 115200

Host ip: 192.168.1.69
Port: 80

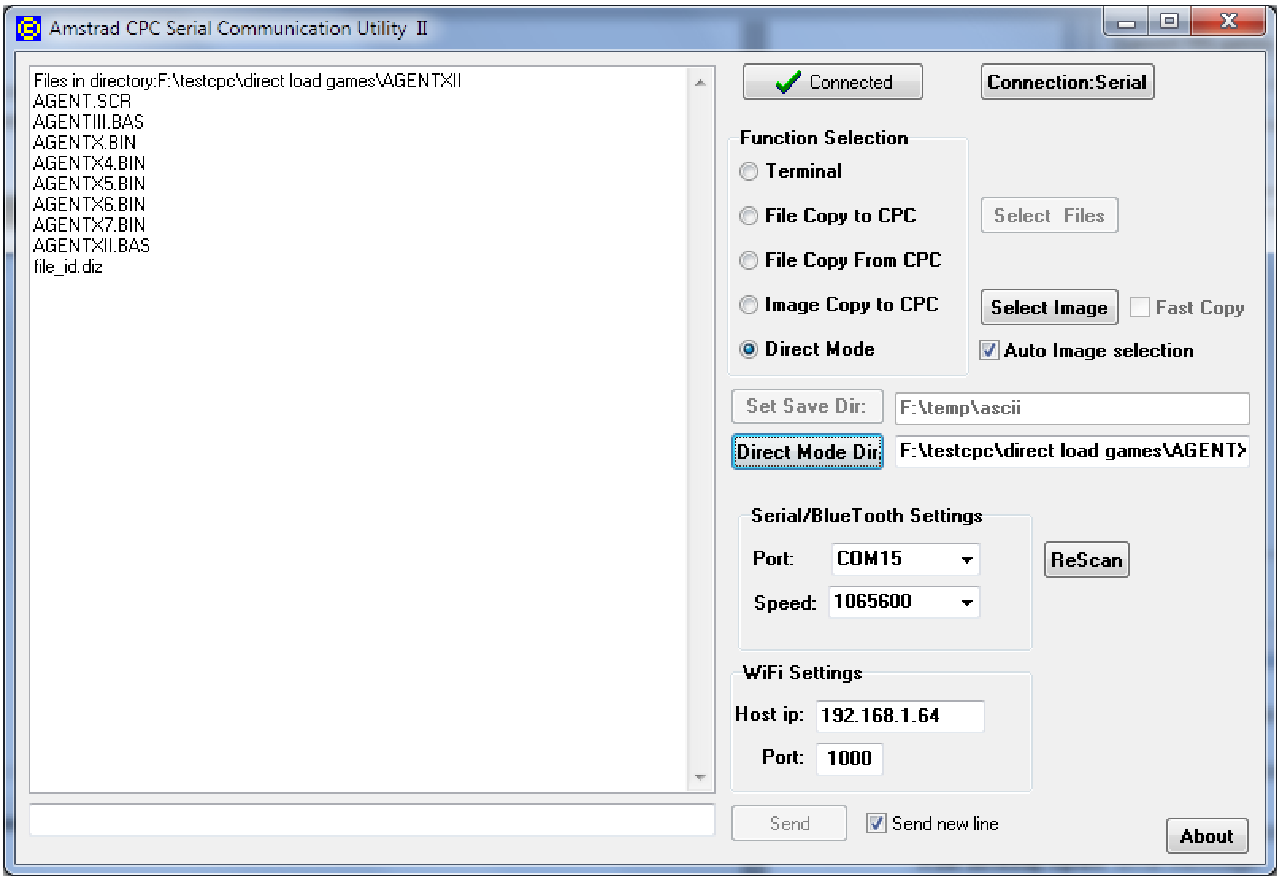
☑ Send new line

This can be proved very useful if you already transfer a game image to a disk, and you want to transfer another image on the same disk.

Direct Load Function

By selecting the Direct Load function, you practically convert the HDD of your PC to a huge storage device for your Amstrad! Through RSX commands you can **load or run a program/game (at INCREDIBLY fast speeds, of ~23-24kb/sec, more than 5 times the actual speed of a 3" disk drive!) , save files, delete files, change directories, even access DSK images (at slightly faster speed than with a real disk drive)!**

By giving a simple |EN or |EN2 to your Amstrad, any **LOAD, RUN or CAT** command you will give, it will be redirected to PC! Using button **Direct Mode Dir**, you can manually set the loading directory and have a list of all available files in it:



Amstrad CPC Serial Communication Utility II

```
Files in directory:F:\testcpc\direct load games\AGENTXII
AGENT.SCR
AGENTIII.BAS
AGENTX.BIN
AGENTX4.BIN
AGENTX5.BIN
AGENTX6.BIN
AGENTX7.BIN
AGENTXII.BAS
file_id.diz
```

Function Selection

○ Terminal

○ File Copy to CPC

○ File Copy From CPC

○ Image Copy to CPC

● Direct Mode

□ Fast Copy

☑ Auto Image selection

Set Save Dir: F:\temp\ascii

Direct Mode Dir: F:\testcpc\direct load games\AGENT>

Serial/BlueTooth Settings

Port: COM15

Speed: 1065600

WiFi Settings

Host ip: 192.168.1.64

Port: 1000

☑ Send new line

You can also use |CD,"name" command to change directory (or |CD to move up a directory), directly from you Amstrad!

About ~**90% of games can be directly executed using this super fast direct mode.** For the rest, you can always use the dsk image file of the game(although in that case, access is much slower, usually slightly faster than with a real disk drive/gotek drive).

You can find a list of many '**Classic & Worth to Play**' games (almost all in file form for fast access) here. And here is a ready made list of Basic Loaders for easy loading of all games in the list (check **Amstrad CPC loader creator** bellow).

Finally, a couple of useful notes about Direct Load function usage:

- If you try to run/load a file that it doesn't exist, or there is an error in loading, Amstrad will give you a "**File already open**" error message.

- For loading files with .BIN extension, this can be omitted (e.g. you can type: **RUNGAME**, instead of: **RUNGAME.BIN**, regardless of the file having the BIN extension or not). But you must include extension to load any .BAS files.

- If you have any problem loading a game/program, and reseting Amstrad doesn't resolve it, try to turn off/on Amstrad, and if this don't work, go to PC program and select momentarily another function (like terminal) and then set to Direct Load again (this will reinitialize the PC routine in case it has hang/crash).

Other Utilities & Tools

Here you can also find other useful tools and utilities:

File manager

This utility (**file_manager.zip**) can be used for easy browsing & loading files/dsk images/snapshots from usb device!
It eliminates completely the need to use RSX commands, so it would prove especially useful for CPC 464 with Basic 1.0 and the rather tiresome procedure of giving arguments to RSX commands: a$=”argument”:|RSX COMMAND,@a$
Extract zip file to usb flash drive root dir,and give to Basic prompt: RUN"FM (or RUN"FSM if you want to get file sizes along with file names, note that respond is a bit slower compared to the plain filemanger showing only filenames)

Select 'Y'/'y' (Check with |STAT if you board has rev_5 firmware, and then you can also choose "n"/"N")
Use keys:

- **Left-Right arrows** for changing pages.

- **Up/Down arrows** for seeking file/dir names into each page.

- **<Return>** for taking action:
  -If selected name is a directory it will move into it.
  -If it's a "DSK" image it will give you a catalogue of the disk image(CPC6128/664) or it will reset (CPC464) and then you can access image by giving "CAT".
  -If it's a SNA smapshot file, it will load it.
  -If it's a file,it will try to execute it.

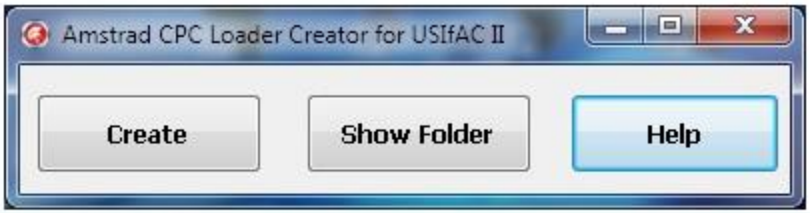
- **<SPACE>** Moves up a directory, if you are inside a sub folder. You can also use "." or ".." at the top of first page of any subfolder.

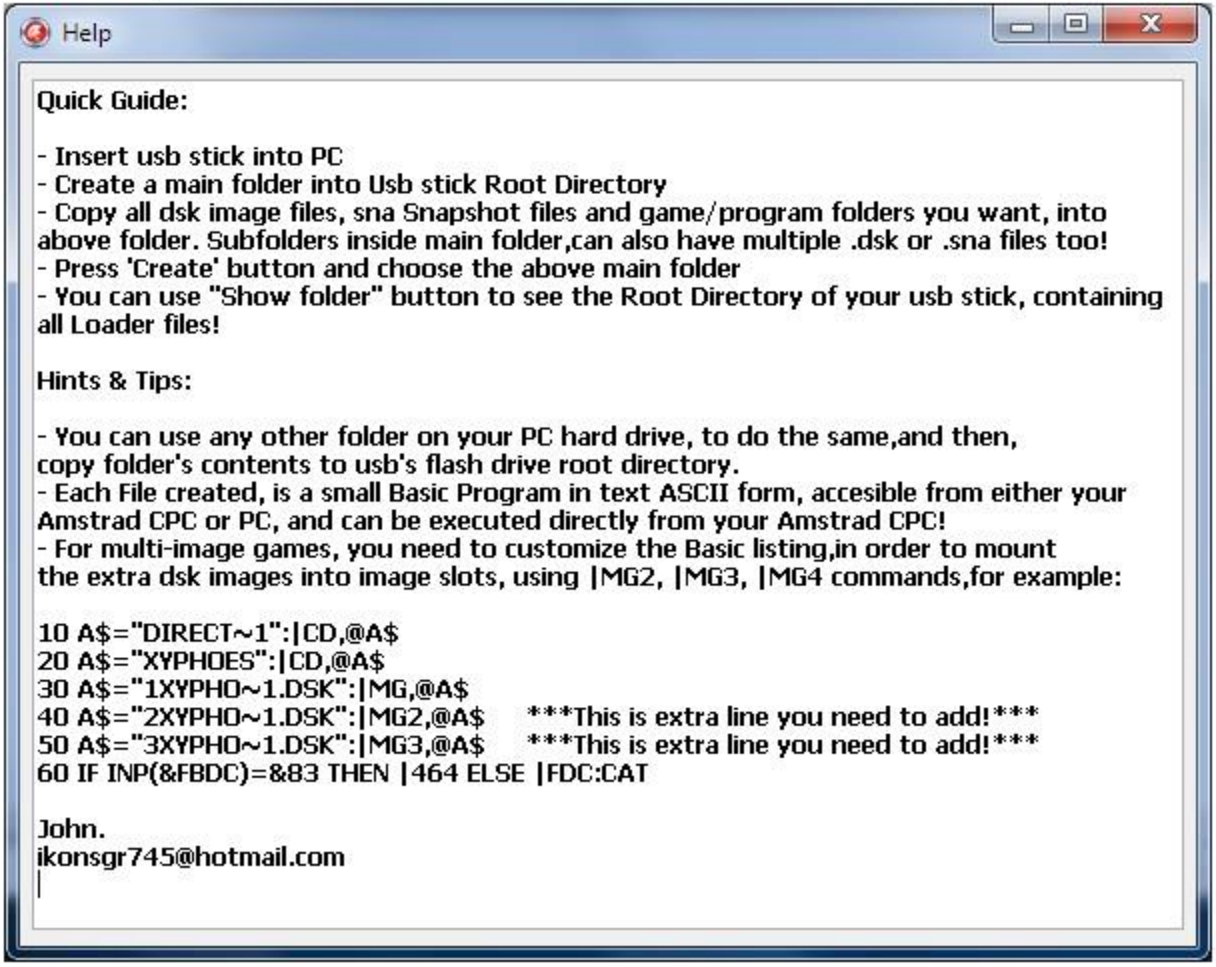
- **<1>** enables/disables treating of all names as directories. You get a note on top right corner of the screen when enabled. This is useful if some directories don't appear the <DIR> notification at the end. Alternatively you can **remove the "archive" bit property, from all files/directories, then all directories will be shown properly** (with <DIR> notification)

By continuously pressing up/down arrows you will get faster movement for quicker seeking, press momentarily for slower "row by row" seeking.
File manager **supports up to ~1000 filenames/directory and maximum 50pages** (25 names/page)
Finally**, if a game/program doesn't run directly through file manager**, just reset Amstrad, give: ‘cat’ and run game/program from "clean start" (btw, make sure that "Return to root directory" is disabled by giving an: **OUT &FBD1,65**)

Amstrad CPC loader Creator

This windows PC utility (**cpc_loader.zip**) creates small Basic loaders (.BAS files) for your games/programs, which practically eliminates the need to issue commands (you just run the .BAS file), thus, **makes loading process much easier**:





Quick Guide:

- Insert usb stick into PC
- Create a main folder into Usb stick Root Directory
- Copy all dsk image files, sna Snapshot files and game/program folders you want, into above folder. Subfolders inside main folder,can also have multiple .dsk or .sna files too!
- Press 'Create' button and choose the above main folder
- You can use "Show folder" button to see the Root Directory of your usb stick, containing all Loader files!

Hints & Tips:

- You can use any other folder on your PC hard drive, to do the same,and then, copy folder's contents to usb's flash drive root directory.
- Each File created, is a small Basic Program in text ASCII form, accesible from either your Amstrad CPC or PC, and can be executed directly from your Amstrad CPC!
- For multi-image games, you need to customize the Basic listing,in order to mount the extra dsk images into image slots, using |MG2, |MG3, |MG4 commands,for example:

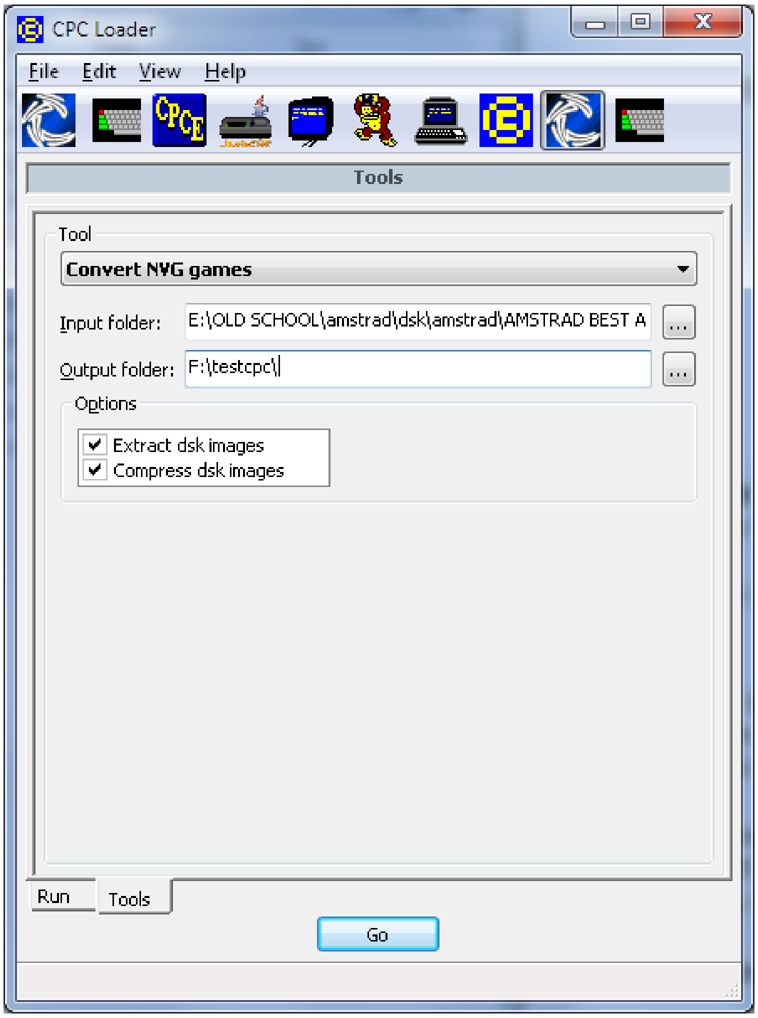
```
10 A$="DIRECT~1":|CD,@A$
20 A$="XYPHOES":|CD,@A$
30 A$="1XYPHO~1.DSK":|MG,@A$
40 A$="2XYPHO~1.DSK":|MG2,@A$     ***This is extra line you need to add!***
50 A$="3XYPHO~1.DSK":|MG3,@A$     ***This is extra line you need to add!***
60 IF INP(&FBDC)=&83 THEN |464 ELSE |FDC:CAT
```

John.
ikonsgr745@hotmail.com

It supports direct file folders, DSK images and SNA snapshot files. It will be especially useful for CPC 464, where giving RSX commands with arguments is rather tiresome (instead of giving directly commands,like with CPC 6128, you need to set first a string variable, for example, the command: |CD,"DIR", is given as: A$="DIR":|CD,@A$).

CPC Loader: Extract files from dsk images

Fast 'Direct load' mode, requires to have access, directly to the files of a game/program. Using this utility (Cpcload folder):



Tool: Convert NVG games

Input folder: E:\OLD SCHOOL\amstrad\dsk\amstrad\AMSTRAD BEST A

Output folder: F:\testcpc\

Options

☑ Extract dsk images

☑ Compress dsk images

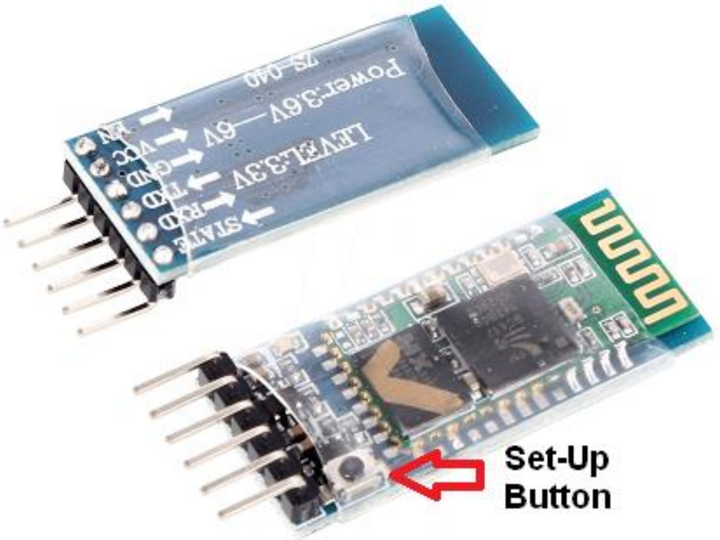
You can easily extract files from multiple dsk images and have them in separate folders, almost instantly! Then, you can also use Amstrad cpc loader creator, to make a Basic loader for each game!

Other

ESP8266_flasher.zip: Contains all required tools and files for easily flash an ESP 8266 WiFi module.
loaders.zip: Ready made list of Basic Loaders for all games in **"Classic & Worth to Play"** list.
Help.txt: All RSX commands in a single page for easy print out! ;-)
Multi_dsk_manager.zip: A Dsk manager for easy mounting images manually, to the 4 available slots.
Inner workings folder: Here you can find all assembly code used in the Usifac II project, along with board schematics, and hex file/assembly/gcb source code for Board's controller (PIC18F47Q10 MCU).
SNA.zip: A Snapshot file collection of more than 350 games, with ready made Basic loaders for easy loading. Just copy the entire SNA folder to a usb stick and choose any BAS file for direct loading of game snapshot!
setservr.bas: A small utility for easy setup ESP8266 WiFi module as TCP server.
connect_to_bbs.zip: Program+instructions to connect to a bbs, using an esp8266 WiFi module.

Configure Bluetooth Module

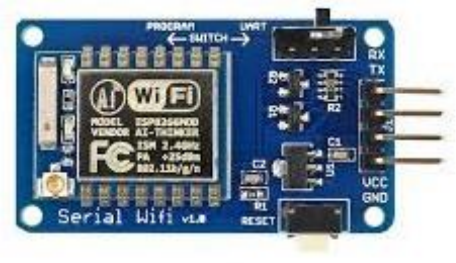
The recommended Bluetooth module is HC-05:



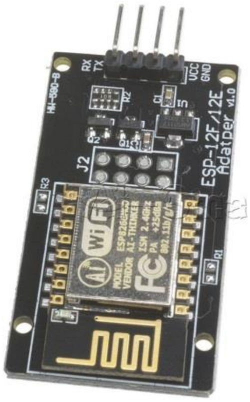
You can also use the HC-06 which is a bit cheaper, but it lucks the Set-Up button, which is very useful, if you want to change the default speed of the module (9600bps).
You can easily find these on ebay or electronics shops for a few euros.
Of course you will need a pair of these, to establish a bluetooth connection between Amstrad CPC and a PC or another Amstrad CPC. Or, you can use only one module for Amstrad CPC serial interface to connect with a tablet or a smart phone! ;-)
Connect Bluetooth module to the USB2Serial adapter cable (Red: 5V, Black: Ground, Green: Tx-goes to Rx pin, White: Rx goes to Tx pin). Then, connect cable's usb plug to a free usb port of your PC, **WHILE pressing the setup button**. The red led should flash every 2-3 seconds.Now, you should set serial speed to 38400 by giving |SET command. Then, you can easily configure Bluetooth modules using a terminal program on PC, or the |COM RSX command on Amstrad.
First give the commands:
AT -You should get respond OK
AT+UART=X,0,0
X, can be 2400,9600,19200,38400,57600,115200,230400,460800,921600. You should get response OK.
Now, disconnect the Bluetooth module and connect the other one (don't forget to press the button while powering to enter the setup mode).Give the above commands, but also add this one:
AT+ROLE=1 –You should get response OK
This is for making the module Master. In order for two Bluetooth modules to connect to each other, one must be Master and the other Slave. But Since all BT modules are preconfigured as Slave, you should change one of them to Master.
Finally, power off and on the BT module (in order to exit from setup mode) and connect the other BT module to serial interface. After a few seconds, **both modules should flash twice every 3-4 seconds**. This means that they are connected, and you are ready to go!

Configure ESP8266 WiFi Module

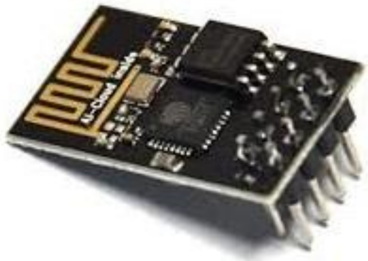
You can directly connect various versions of ESP8266 WiFi modules, by directly plug them into USIfAC's II ESP 8266 WiFi module 4pin port . The following modules are tested and work ok:



Esp-07

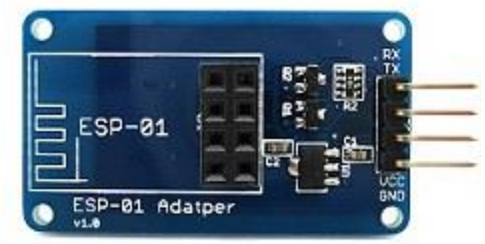


Esp-12F/E

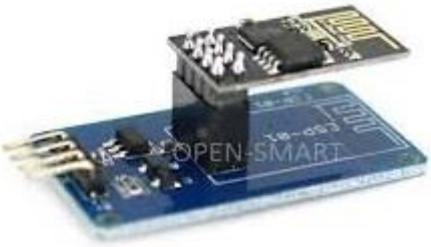


Esp-01/01S

The latter, will also need this 5v adapter (ESP-01 adapter):



Which will be combined to this:



You can easily find any of these, on ebay or many electronics shops, at very cheap prices, of only a few euros. Now, in order to use WiFi, module must be connected to an Access point and then connect to the TCP server that is activated by the PC utility program. This can be done either manually (by giving the appropriate AT commands), using the small terminal utility through |COM command, or more easily, by giving **|WIFI** command. Program will first check for the current Wifi module serial speed, and ask you if you want to change it.

Then, you just give the name and password of the access point (where WiFi module will be connected to),and then, the ip address and port of the TCP server ,taken from groupbox **WiFi Settings** in PC utility window program.
If everything goes well, you will get a connected! message, and then you can directly run and use any utility you want. If there is a problem connecting to the given Access Point or TCP server, you will be prompted for retrying or give new settings.
If for any reason you want to change TCP server's port number, you can do it from **Wifi Settings** group box, (you will have to close and reopen the PC utility for activating the new port setting) .
Note also that, when a WiFi Connection is established, the **Connection button** will be automatically enabled and connection type will be set to: **Connection: WiFi**. You can also have a serial connection and a WiFi connection both activated at the same time and select which one to use by pressing the connection type button.
In order to disable WiFi module connection you must first send a single string of: +++ (check **AT+CIPMODE** command bellow) and then give the AT command: **AT+CIPCLOSE** to disconnect from TCP server.
ESP8266 module use AT commands for control and communication.
You can give all AT commands using terminal program, or directly, using this small BASIC program (**a$** is the AT command string):

```
10 FOR k=1 TO LEN(a$)
20 OUT &FBD0,ASC(MID$(a$,K,1))
30 NEXT K
40 OUT &FBD0,13: OUT &FBD0,10
```

Note that after giving the AT command, an: **out &fbd0,13: out &fbd0,10** (CR and Line Feed) must be also sent for proper execution!

There is a **very big manual** with 100's of commands available, but bellow, i give you the most useful commands, for configuring the module manually:

AT+CIPMODE= 0 or 1 Sets Transmission Mode
0: normal transmission mode (must be used when WiFi acts as a TCP server)
1: UART-Wi-Fi passthrough mode (transparent transmission), this mode is used for communication with the PC utility program. It can only be enabled in TCP
single connection mode Notes:
• The configuration changes will NOT be saved in flash.
• During the UART-Wi-Fi passthrough transmission, **if the TCP connection breaks, ESP8266 will keep trying to reconnect until +++ is input to exit the transmission**. If it is a normal TCP transmission and the TCP connection breaks, ESP8266 will give a prompt and will not attempt to reconnect.

AT+CIPSEND Start sending data in transparent transmission mode.
Data must be sent with **a 20-ms interval between each packet**, and a **maximum of 2048 bytes per packet.**
To **disable** transparent transmission mode, a **single packet** containing **'+++'** must be received**, (**in practice, you must give: **out &fbd0,43: out &fbd0,43: out &fbd0,43)** ESP8266 returns to normal AT command mode.Wait for at least one second before sending the next AT command.
This command can only be used in transparent transmission mode which requires single connection. Note also that, **you CANT give AT commands when transparent transmission mode is activated.**

AT+CIPSEND=[link id],x send x bytes. Bytes/chars follow immediately after the command. Link id is usually 0 for single connections, but can be up to 5 in a LAN situation

AT+CIPCLOSE Closes the TCP/UDP/SSL Connection.
AT+CWLAP Will list access points in range.
AT+CWJAP=yourSSID,yourWifiPassword connects to an access point
AT+CWQAP quit from acess point
AT+UART_CUR=115200,8,1,0,0 (don't remain after reboot/power off)
AT+UART_DEF=115200,8,1,0,0 Set UART speed (remains after reboot/power off)
AT+CWMODE = 1 (1 for standard mode , 2 for AccessPoint mode & 3 for both)
AT+CIPMUX=1 (set multiple connections, this must be set to '1' if you want to use module as TCP server)
AT+CIPSERVER=1,80 (start the TCP server at port 80)
AT+CIFSR (shows WiFi module's ip/mac address)
ATE0 remove echo (recommended for having WiFi module act as TCP server)
AT+CIPSTO=X (server timeout, range between 0 and 7200, set to large number or 0 for never)
AT+CIPSTART=TCP,Tcp server IP,port no. Connects to a TCP server, useful for connecting many Amstrad CPC's together in a WiFi network!
AT+CWSAP_DEF=<ssid>,<pwd>,<chl>,<ecn> Set up WiFi module's Access point
<ssid>: string parameter, SSID of AP.
<pwd>: string parameter, length of password: 8 ~ 64bytes ASCII.
<chl>: channel ID.
<ecn>: encryption method; WEP is not supported.
‣ **0: OPEN**
‣ **2: WPA_PSK**
‣ **3: WPA2_PSK**
‣ **4: WPA_WPA2_PSK**
Example: **AT+CWSAP_DEF=ESP8266,1234567890,1,3**

For more detailed information and examples, you can refer to the AT command manual mentioned above.

Hints & Tips

- As a general rule, better use **RESET button** (instead of on/off switch) every time you want to restart Amstrad. Also this is the proper action for any problem you might encounter.

- If for some reason you don't get **"USIfAC II Enhanced"** message on boot screen, try giving: **OUT &FBD2,5** ,this will restore board's Rom number to default ROM 5, and in most cases will solve the problem.

- If you happen to get an **"unknown command"** error message, when trying to use any of the RSX commands, just give: **OUT &FBD1,4** and everything should work fine. Just remember to give: "**|EN**" again, before load/run/save a game program.

- If you are using a usb device, remember to give "**|USB**, after initial power up, you DON'T need to do it again, no matter how many times you Reset Amstrad.

- In general, you should **use UPPERCASE letters with arguments of RSX commands when using a USB device**. However, Load,Run, Save commands as **|CD** and **|CAT** RSX commands, support both upper and lowercase letters.

- For loading files with ".BIN" extension, this can be omitted (e.g. you can type:**RUN"GAME"**, instead of:**RUN"GAME.BIN"**, regardless of the file having the "BIN" extension or not). But you must include extension to load any ".BAS" files.

- Mind that many games you will find in dsk images (especially newer ones, after late 80's) are NOT designed to run on a CPC464.

- Access to DSK images on a CPC 464 (and generally whenever you use **|464** command) would be a bit slow (~20%-30% slower than a real disk drive) because Interface's Microcontroller, need to emulate both "missing" IC chips of AMSDOS/PARADOS ROM and 765 Floppy Disk Controller, **at the same time**! BUT, in direct mode, where you access directly files, you will get the same amazing loading speeds as with a CPC 664/6128!

- To use arguments with RSX commands on a CPC464, you can't pass them directly (this is BASIC's 1.0 "problem"), but you need first to assign argument to a variable. For example, if you want to change directory to "DIR1", you can't just give: **|CD,"DIR1"** but instead:**A$="DIR1" ,**and then:**|CD,@A$**

- **For showing all folders properly**, with <DIR> notification, make sure to **remove the "archive" bit property**, from all files/directories (open usb root directory, select everything ->right click-> select properties->un check 'Archive' check button).

Finally, here are a few I/O commands that might be useful if you want to develop your own programs utilizing USIfAC II:

out &fbdd1,4 : Disables direct mode (e.g. all cat/load/save/run commands will be directed to disk drive)
out &fbdd1,5 : Enables direct mode (if usb mode=off then all cat/load/save/run commands will be directed to serial port->connected pc, otherwise, usb flash will be accessed)
out &fbd1,51 :enable/disables usb mode (on->off or off->on)
out &fbd1,8 :disables usb mode
out &fbd1,30 : Get status report (like with |STAT command)
out &fbd1,31 : Get image slots report (like with |SMG command)
out &fbd1,70-73 : Select directly dsk image slot 1-4
inp(&fbd5) : Get currently selected dsk image slot
inp(&fbdd) : Get serial speed code
inp(&fbde) : Get usb mode state (1=enable, 0=disable)
inp(&fbdf) : Get FDC emulation state (1=enable, 0=disable)