

# Pioneer CAC-Vxxx CD Autochangers comprehension guide

## 1. Document revisions

Date (M/D/Y)	Author	Version	Description/Updates
04/02/2020	DJ	V1.0.0	Initial release
07/29/2020	DJ	V1.0.1	Better presentation & explanations, fixed some typo.
09/04/2020	DJ	V1.0.2	Add caution for shipping screws.
09/24/2020	DJ	V1.0.3	Add serialcheck.sh toolscript
10/01/2020	DJ	V1.0.4	Compacting

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*Note: If your device's model name begins with DRM-xxxx, it's a SCSI CD/DVD changer. This is beyond the scope of this document.*

## 2. Not usable easily

As you have guess theses CD autochangers (or can be also named “jukeboxes”) are not autonomous and user friendly. They are entirely controlled by a computer with an old school serial connection (RS-232C or RS-442A). So first, you need a cable to connect it to your computer.

## 3. Manuals

Please read the original PDF user manual according to your model, they are available in this GitHub repository. Have a look to understand how they works, like loading & removing discs.

*Note: For the CAC-V3000/3200 models: please be sure to set the left CD player address at number 1. Check user manual at chapter “PLAYER ADDRESS SETTING MODE” (page n°14/44).*

**Caution! Some models has shipping screws included to lock the carriage assy for transport. Please be sure to REMOVE them (if installed) BEFORE POWERING ON the device!**

## 4. No serial port on your computer?

Serial ports are not really used anymore and have been replaced by USB. If you don't have one you can buy an RS232-USB adapter (like FTDI FT232 or Prolific PL2303) on eBay, Amazon, AliExpress... (about 10€).



*Note: The V5000 model is RS-422A, be sure to purchase a **RS422**-USB adapter!*

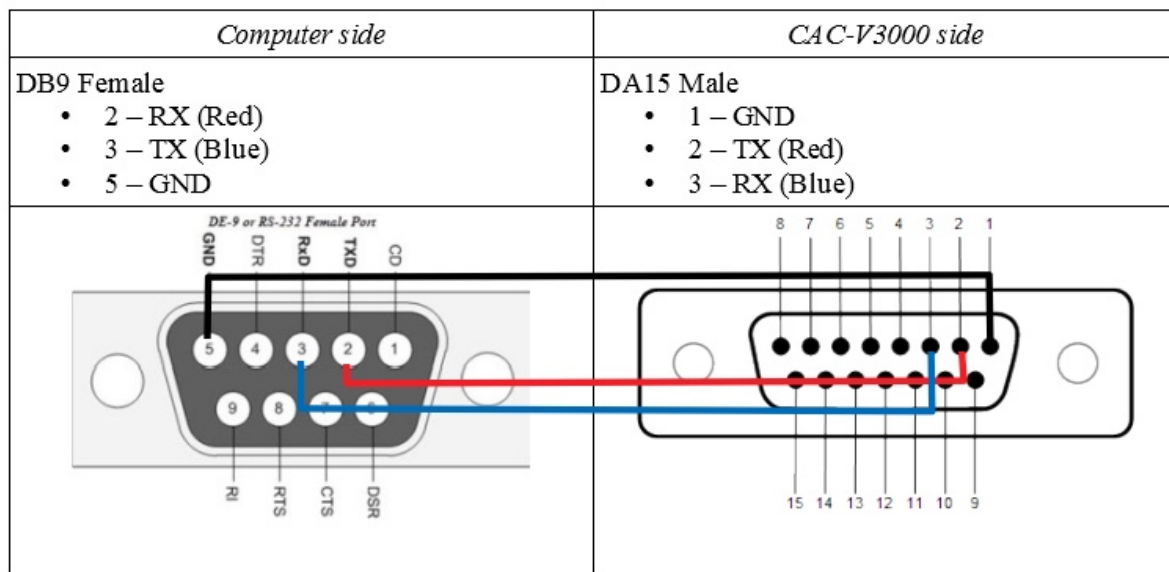
## 5. The cable

The needed cable depends on model you have.

- **For CAC-V180M and V5000 models**, use a standard D-Sub DE-9 female (computer side) to D-Sub DE-9 male (CAC side) straight type cable. This kind of generic cable can be bought on Internet like eBay, AliExpress, Amazon, etc.... Do not use a Null-Modem (crossed) type cable, it will not work.



- **For CAC-V3000/3200 models:** You have to build your own cable. Simply because these models requires a DA15 connector (not used in regular computing). Here is the schema (check user manual for RS-422A):



Parts:

- a female DE-9 connector (for computer side)
- a male DA-15 connector (for autochanger side)
- standard microphone XLR cable (3 poles for GND, RX, TX)
- soldering stuff and skills

## 6. Test your connection

Connect your serial cable and power on the autochanger.

### 6.1. With Linux

I created a tiny interactive shell script in Bash (serialcheck.sh) to easily test the jukebox good connection. Download-it and run-it in a terminal.

The script shows you the detected serial ports list. Answer questions and that's it.

```
jonathan@dellpioneer:~$ bash /opt/ccc/tools/serialcheck.sh
Welcome to CCC autochanger serial checker script v1 for Linux.

This tiny script is interactive and will ask you some questions.
Listing serial ports... 7 found.

Device | Physical port
-----|-----
ttyS0  | /devices/platform/serial8250/tty/ttyS0
ttyS1  | /devices/platform/serial8250/tty/ttyS1
ttyS2  | /devices/platform/serial8250/tty/ttyS2
ttyS3  | /devices/platform/serial8250/tty/ttyS3
ttyUSB0 | /devices/pci0000:00/0000:00:1d.0/usb2/2-1/2-1.2/2-1.2:1.0/ttyUSB0/tty/ttyUSB0
ttyUSB1 | /devices/pci0000:00/0000:00:1d.0/usb2/2-1/2-1.3/2-1.3:1.0/ttyUSB1/tty/ttyUSB1
ttyUSB2 | /devices/pci0000:00/0000:00:1d.0/usb2/2-1/2-1.4/2-1.4:1.0/ttyUSB2/tty/ttyUSB2

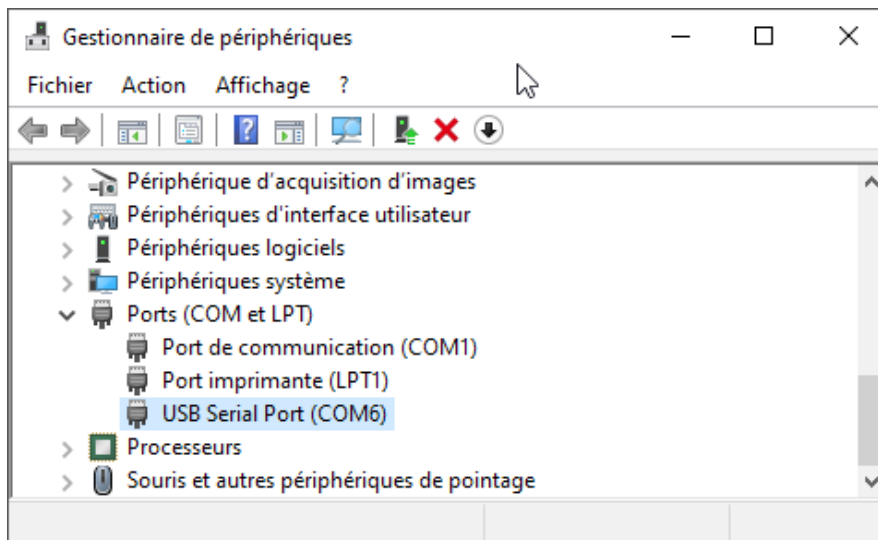
Please select a serial port:
1) ttyS0
2) ttyS1
3) ttyS2
4) ttyS3
5) ttyUSB0
6) ttyUSB1
7) ttyUSB2
#? 5
You have chosen ttyUSB0.
Please select an autochanger model:
1) CAC-V180M
2) CAC-V3000/V3200/V5000
#? 1
You have chosen CAC-V180M.
Speed set to 4800bps.
Applying stty settings... OK.
Trying to communicate with the autochanger...
Command '?X' send! Waiting for reply...
Congratulations! Your autochanger answered correctly with 'P150904'.
Do you want to send custom commands (manual mode) now? Y(es) or N(o)
Manual mode entered. Type your command and press Enter (for each one).
Warning: All chars will be sent as is! There is no verification.
Type 'exit' to terminate this program.
Command: ?Z
Command '?Z' send!
XXX
Command: ?P
Command '?P' send!
P20
Command: exit
Manual mode exited.
Goodbye.
jonathan@dellpioneer:~$
```

## 6.2. With Windows

### 6.2.a) Port detection

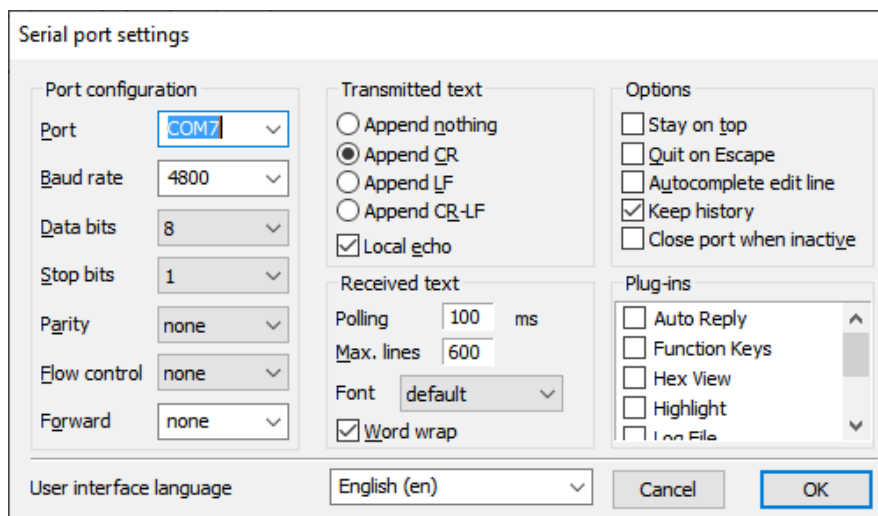
Serial ports can be listed with the “Device Manager”.

On Windows serial ports are labeled COM followed by a number.



### 6.2.b) Check usability

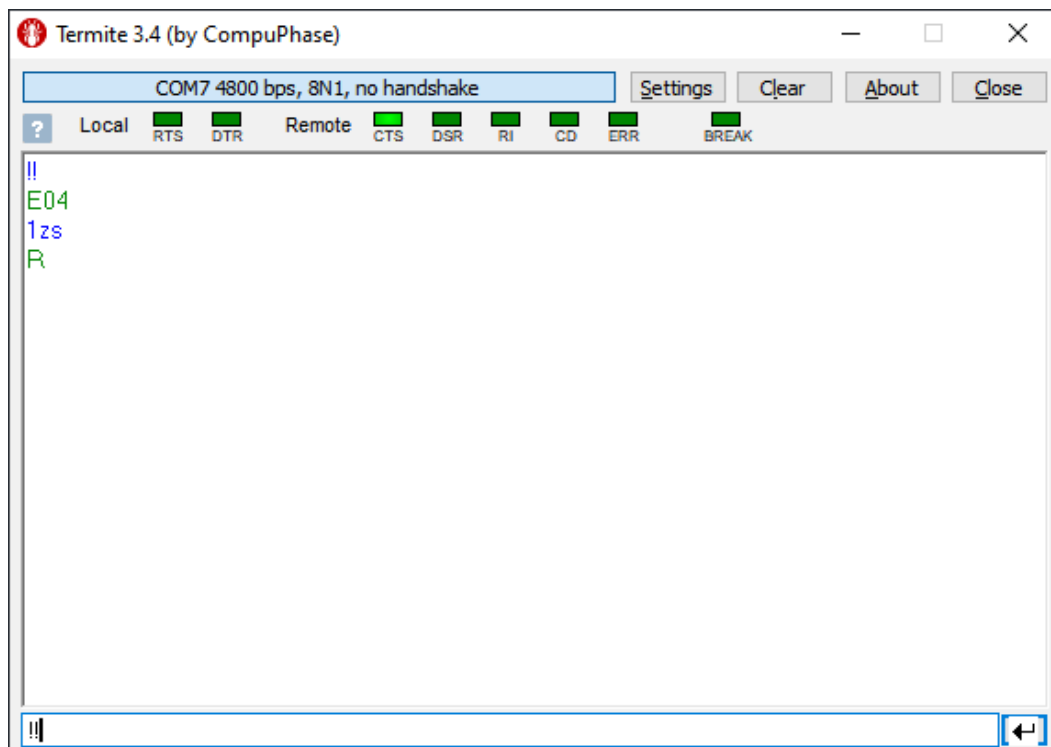
Download & install [CompuPhase Termite program](#) (very simple to use & easy for communicate with our Pioneer jukeboxes). Open Termite and go to settings.



- Select your serial port number (COM1, COM2, COM...)
- Baud rate = 4800 or 9600 (according to autochanger models & settings)
- Data bits = 8
- Stop bits = 1
- Parity = none
- Flow control = none
- Forward = none
- Please sure to be connected

### 6.2.c) *Final transmission tests*

- For CAC-V3000/V3200/V5000 models:
  - Type “!PS!!” (without the quotes) in the bottom text zone and press Enter. Confirm that the Pioneer jukebox re-initialize itself.
  - Now type “!PS!ZS” (without the quotes) in the bottom text zone and press Enter. Confirm that the Pioneer jukebox tries to load disc n°1.
- For CAC-V180M model:
  - Type “!!” (without the quotes) in the bottom text zone and press Enter. Confirm that the Pioneer returns “E04”.
  - Type “!ZS” (without the quotes) in the bottom text zone and press Enter. Confirm that the Pioneer jukebox tries to load disc n°1.



## 7. Controller/commands (programming)

As you have guessed, you have to dialogue with ASCII text commands to control your changer. Obviously it's a raw way to use it. In the past a lot of owners programmed themselves a controller software according for their usage with C, Pascal, BASIC or Visual Basic languages. Few professional and user friendly commercial software existed but no one has leaked nowadays.

Programming manuals are available in the /programming directory on the GitHub repo.

### 3.2. Command Format

#### BASIC COMMAND FORMAT:

Player Address (ADR)	Argument (ARG)	Command (CMD)	Terminator
1PS	12	SE	<c/r>

(Search for track 12 of the disc in Player 1.)

#### COMPOUND FORMAT (COMMAND LINE):

[ADR] + (ARG)CMD + (ARG)CMD + ... + (ARG)CMD + <c/r>

Command Line (up to 20 characters)

EXAMPLE: 1PSBK100000SF153050SMPL<c/r>

Command Line (up to 20 characters)

Search for the point at 10 minutes, 00 seconds, 00 blocks;

play from that point to 15 minutes, 30 seconds, 50 blocks:

	Execution Commands	Arg.	
1	PLAYER SELECT	addr	PS
2	DISC SELECT	addr	ZS
3	DISC RETURN		ZR
4	START		SA
5	SEARCH	addr	SE
6	STOP MARKER	addr	SM
7	PLAY	addr	PL
8	EJECT		RJ
9	PAUSE	addr	PA
10	SCAN FORWARD		NF
11	SCAN REVERSE		NR
12	BLOCK		BK
13	TIME		TM
14	TRACK		TR
15	INDEX		IX
16	CLEAR		CL
17	LEADOUT SYMBOL		LO
18	COMMUNICATION MODE	para	CM
19	SPEED	para	SP
20	AUTO CUE SEARCH	addr	QS
21	AUTO CUE STOP	para	QT
22	CUE LEVEL SET	para	QL
23	LIMIT TIME SET	para	LT
24	VOLUME	para	VL
25	DURATION	para	DU
26	FADE IN/OUT	para	FD
27	CHANGER RESET		!!

	Request Commands	
1	JOB STATUS REQUEST	?J
2	PLAYER ACTIVE MODE REQUEST	?P
3	DISC NUMBER REQUEST	?Z
4	MECHANISM ERROR REQUEST	?E
5	BLOCK NUMBER REQUEST	?B
6	TIME CODE REQUEST	?T
7	TRACK NUMBER REQUEST	?R
8	INDEX NUMBER REQUEST	?I
9	TOC INFORMATION REQUEST	?Q
10	CATALOG NUMBER REQUEST	?G
11	CDP MODEL NAME REQUEST	?X
12	COMMUNICATION MODE REQUEST	?M
13	PLAY TIME REQUEST	?A
14	DISC STATUS REQUEST	?K

addr: A player address, disc address, track address, etc.

para: A parameter.