

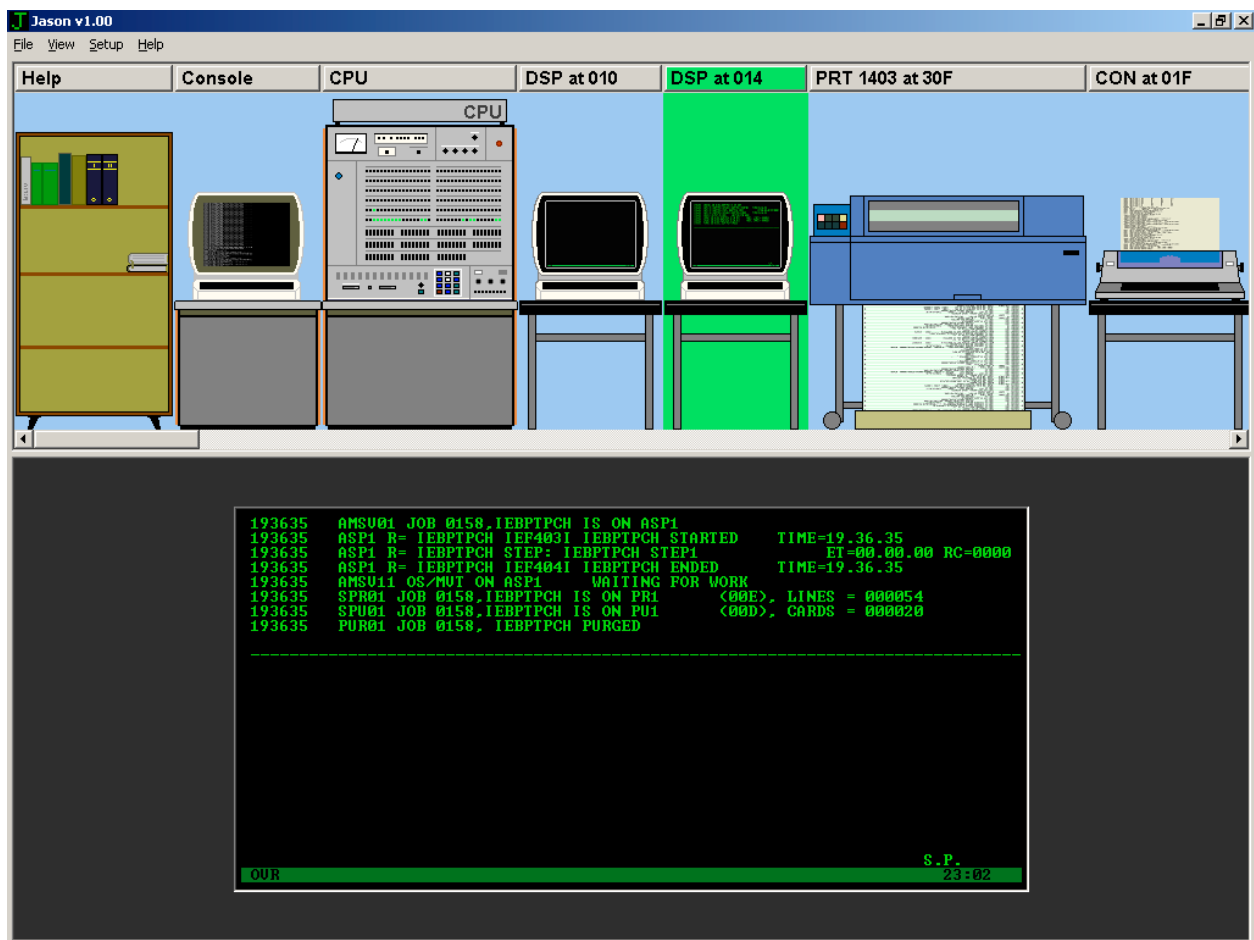
JASON v1.00

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This is Jason!

Introduction

Jason 1.00 is an integrated graphical frontend to the Hercules S/370, ESA/390 and z/Architecture Emulator. It includes 3270 emulator, viewers for listings and punched decks, and a simple keypunch editor.

Device images are animated. Displays show actual text, printers scroll paper, disks and tape drives show loaded media, and lamps on the CPU are blinking during the execution of the program.

Jason works well with MVT 21.8 and MVS 3.8. It should work with other OSes, too, although multiprocessing is not taken into account and internal 3270 emulator supports only the most basic commands.

Jason is licensed under GPL version 3. Feel free to add new features!

If you find a bug or have some wishes, please send a mail to ollydbg@t-online.de.

Why Jason?

Why not? Like Hercules, Jason was a Greek mythological hero, and together with Hercules was on the quest for the Golden Fleece. As you see, they have already collaborated in the past!

Jokes aside, when I was a student, my first programs were written in Fortran IV and compiled on IBM 370. Of course, it was mostly batch processing, but on some rare occasions I was allowed to enter the sanctuary, insert my deck into the reader, and - once - even press the IPL button!

Since then, I associate IBM mainframes with the golden times of computing that will never be back again. Can you imagine my feelings when I found Hercules! I immediately installed it, downloaded turnkey MVT 21.8 and... nothing happened! Without 3270, Hercules was unusable. I downloaded 3270 emulator, configured it, attached to Hercules - twice! - and finally got the IEA101A prompt. But even then, instead of putting the deck into the reader, I was forced to type devinit. Instead on fan-fold paper, the output was redirected to the file. Still, IVPFORTG stood on the top in so familiar big letters, and I was happy.

Command-line operation was not easy. I also tried Fish's GUI and was disappointed. This GUI allowed to edit the tiniest details of the configuration file and made devinit easier, but terminal and keypunch were absent, and there was no viewer for the printer output.

Therefore I decided to write an integrated tool that would combine all these components. The idea of Jason was born.

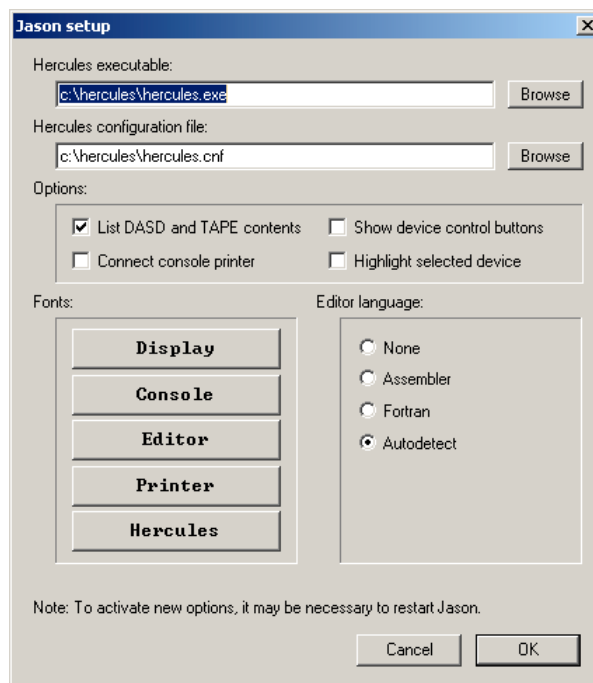
Please note: ***I did it just for fun!*** Of course, as a professional programmer I maintained some minimal coding standards, but don't expect too much. Just evoke these old good times when the computers were young!

Installation and first run

Install Hercules and your favorite OS. Edit configuration file so that it specifies correct DASD and tape volumes. That's all. You don't need to add Hercules path to the environment, Jason will do this for you dynamically.

Now copy *jason.exe* to your directory of choice. Hercules directory is a good choice. If your configuration file is called *hercules.cfg*, Jason will find it automatically. If necessary, create desktop shortcut.

Start Jason. It will attempt to locate Hercules executable and configuration file. Defaults are *<jason directory>\hercules.exe* and *<jason directory>\hercules.cnf*. If any file is missing, Jason will ask you to find them manually:



Sometimes Hercules stops or crashes on attempt to attach console printer. Probably this is my error, but I was unable to find the reason. To avoid this, leave checkbox **Connect console printer** unchecked. Other options will be explained elsewhere.

Now Hercules opens devices and reports them to Jason. Devices are displayed in the top part of the Jason window in order of their arrival. If necessary, rearrange them by pressing left mouse button on device and dragging it while pressing. First three devices (Bookshelf, Herculse console and CPU) are fixed and cannot be moved. Jason saves order of devices to the file *jason.ini*. Use right mouse button to scroll device strip.

At this moment, Hercules is running but CPU is paused and waits for your commands. Click on the CPU image, select CUU address of the booting device (frequently it's 150) and press **IPL** button. See the blinking lamps? Now, if your OS is a MVT 21.8, your system console terminal will show:

A screenshot of a system console terminal with a black background and green text. At the top, two lines of text are visible: '! IEA218I MOD=158 ASSUMED S370' and '! IEA101A SPECIFY SYSTEM PARAMETERS FOR RELEASE 21.8F MUT'. Below this, there is a large area of black space. In the bottom left corner, there is a small green square. At the bottom of the screen, there is a green horizontal bar containing the text 'OUR' on the left and '22:03' on the right.

```
! IEA218I MOD=158 ASSUMED S370
! IEA101A SPECIFY SYSTEM PARAMETERS FOR RELEASE 21.8F MUT

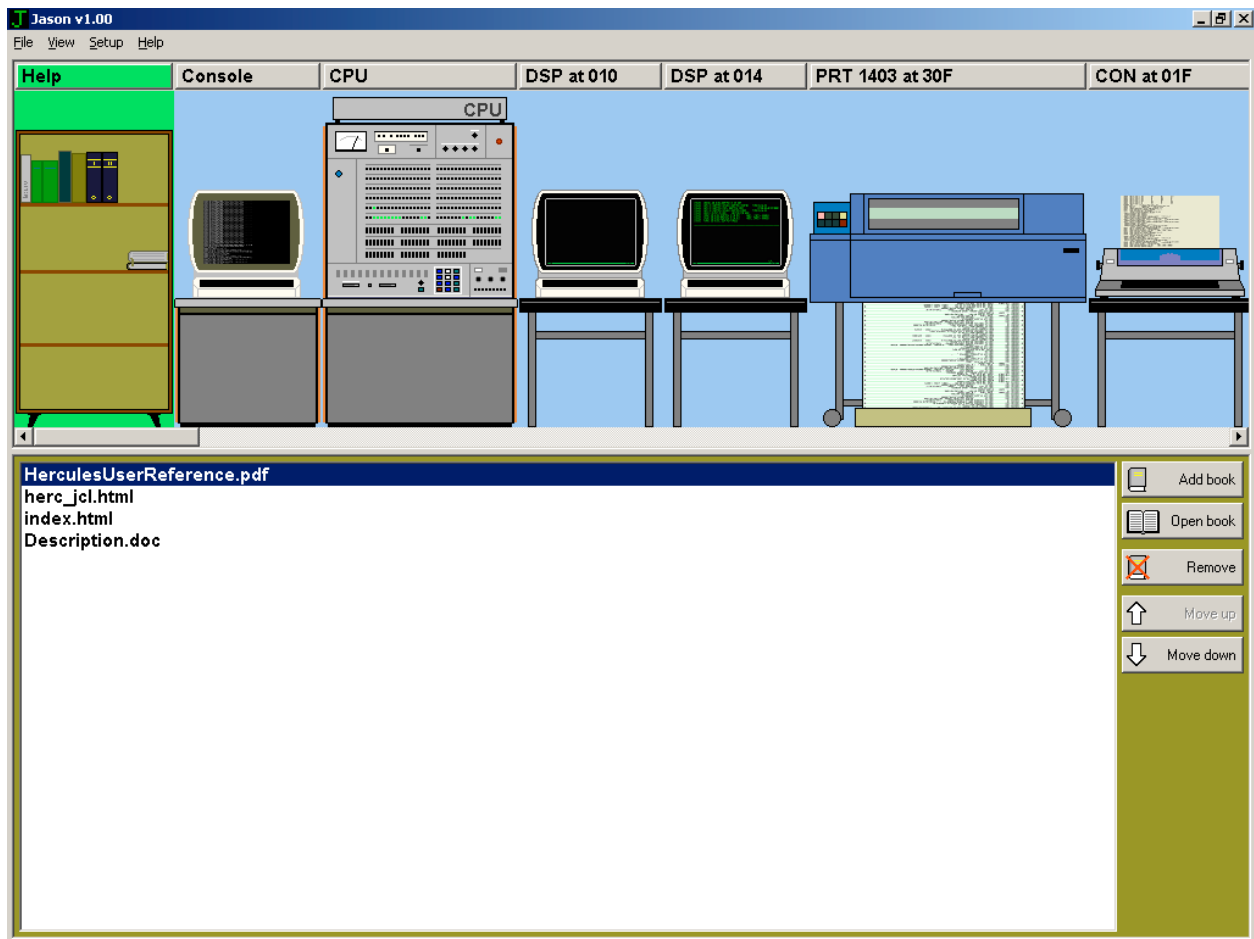
■

OUR 22:03
```

(It will show **IEA101A SPECIFY SYSTEM PARAMETERS FOR RELEASE 03.8** if you are running MVS 3.8).

Excellent! Your mainframe is starting! What to do now is best described in the documentation delivered with the OS.

Help (Bookshelf)

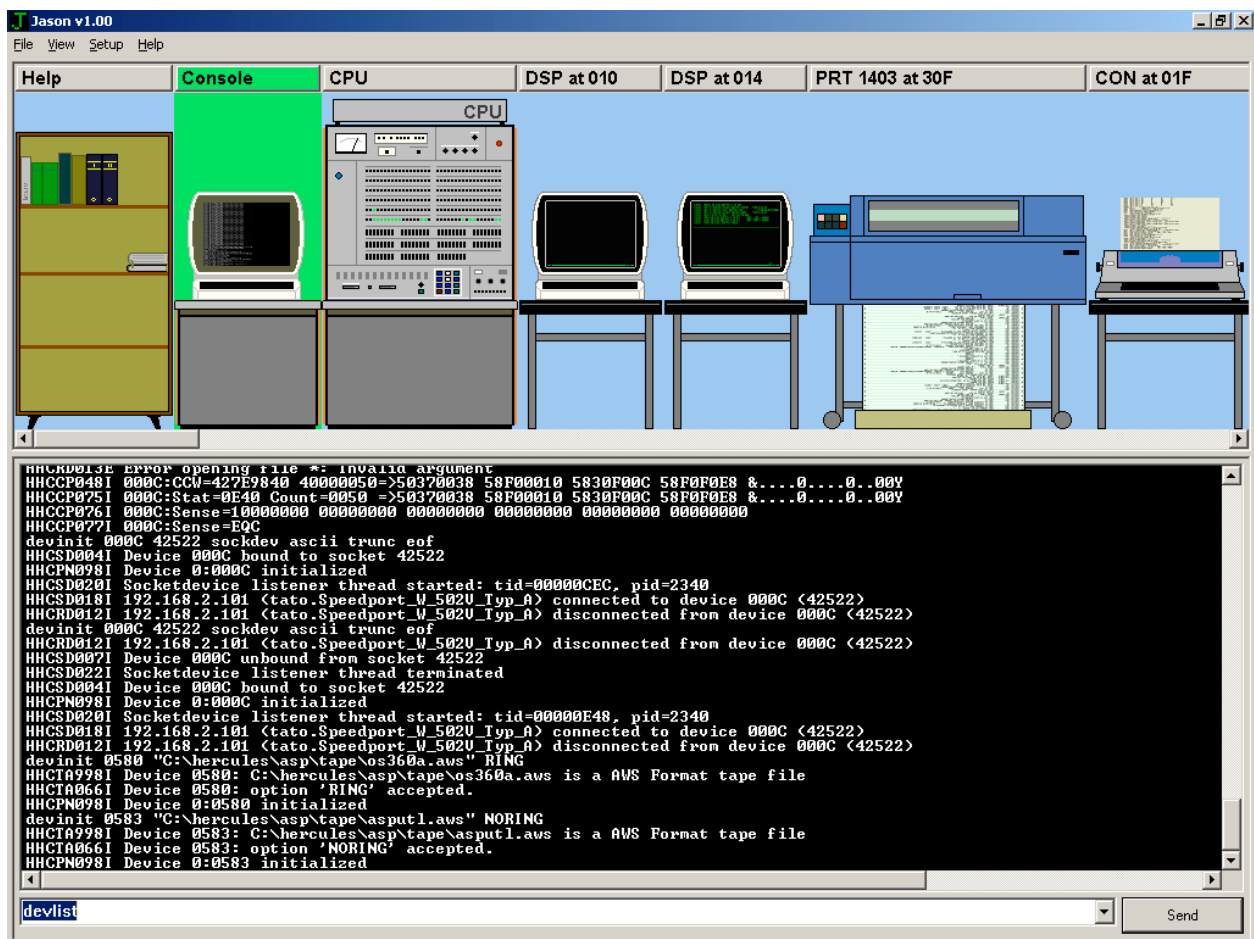


Bookshelf is a device made mostly of virtual wood. It can keep references to the frequently used documents. Simply drag and drop your files here. Doubleclick on the title to open it in the default application. Bookshelf does not accept URLs.

Meaning of the buttons:

- **Add book** - opens dialog asking you to add new file
- **Open book** - opens selected file in the default application
- **Remove** - removes selected file from the list
- **Move up** - moves selected title one line to the top
- **Move down** - moves selected title one line to the bottom

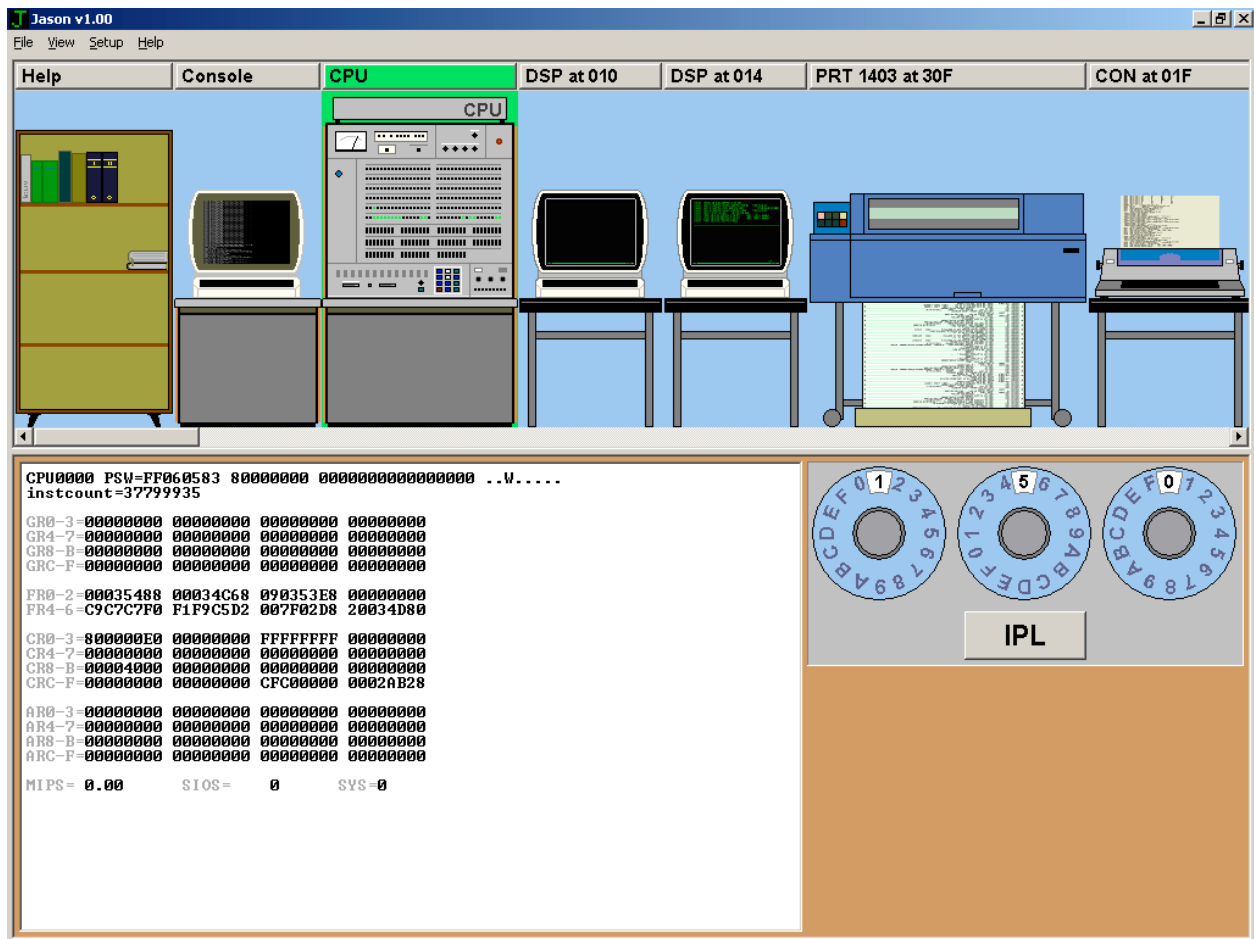
Hercules console



This is a replacement for the original Hercules console. It also displays Jason messages (in orange). To send command to Hercules, type it in the bottom line and press Enter or **Send**.

To change the font, press button **Hercules** in the Jason setup dialog and select new settings. Only fixed-pitch fonts are allowed.

CPU



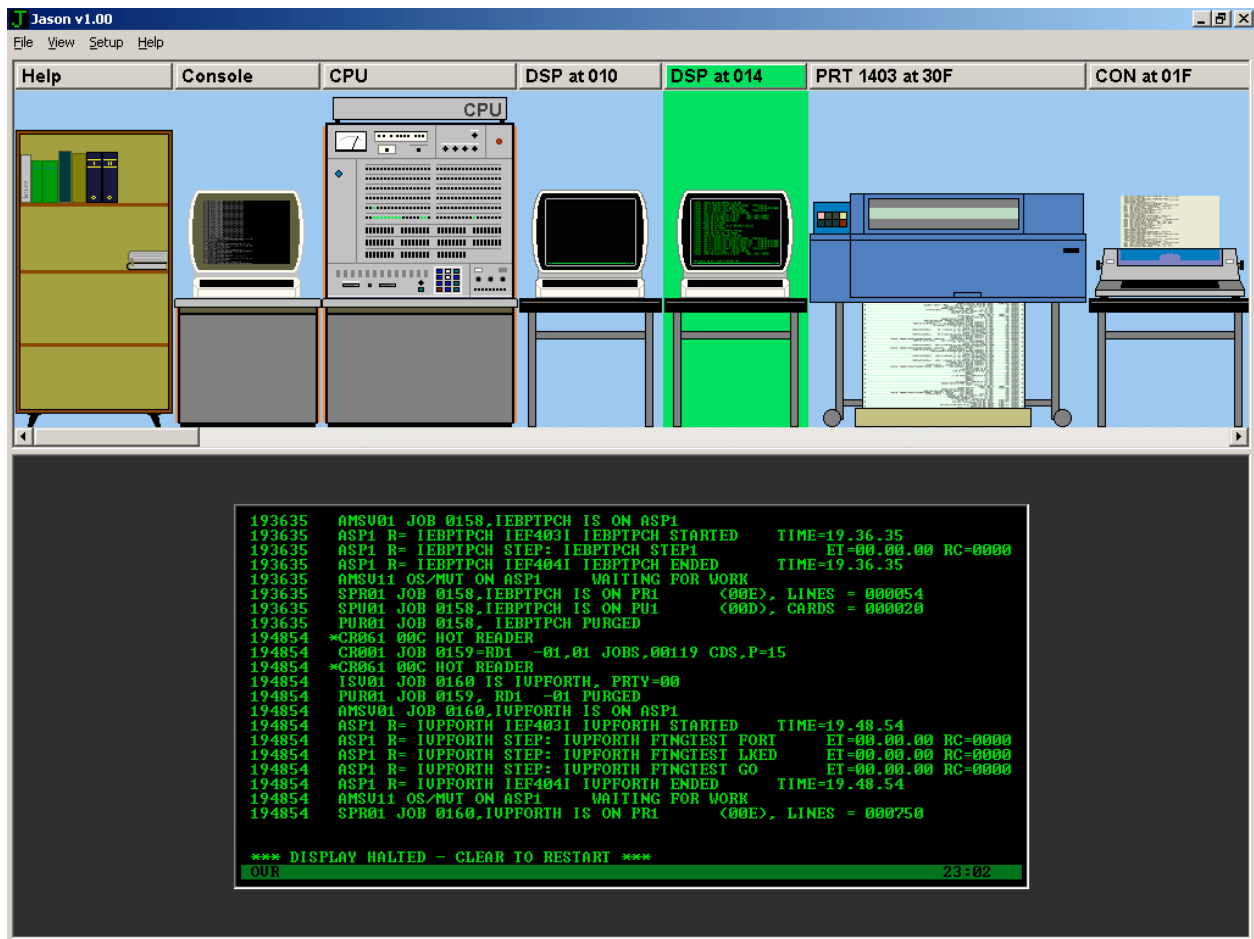
Left window on the bottom displays current state of the of CPU 0. Registers GR0-GR3 and PSW are mapped to the image of the front panel above. Multiprocessor systems are not yet supported.

To boot the system, select CUU address of the boot device on the rotary switches (mouse only!) and press **IPL** button. Default address is 150.

To change the font used to display contents of registers, press button **Hercules** in the Jason setup dialog and select new settings. Only fixed-pitch fonts are allowed.

The picture of the front panel corresponds more or less to the IBM System 360 model 65.

Display



This device emulates IBM-3278-4 terminal. Only basic features, sufficient for monochrome operation, are implemented in the first version. Note also the following deviations from the standard:

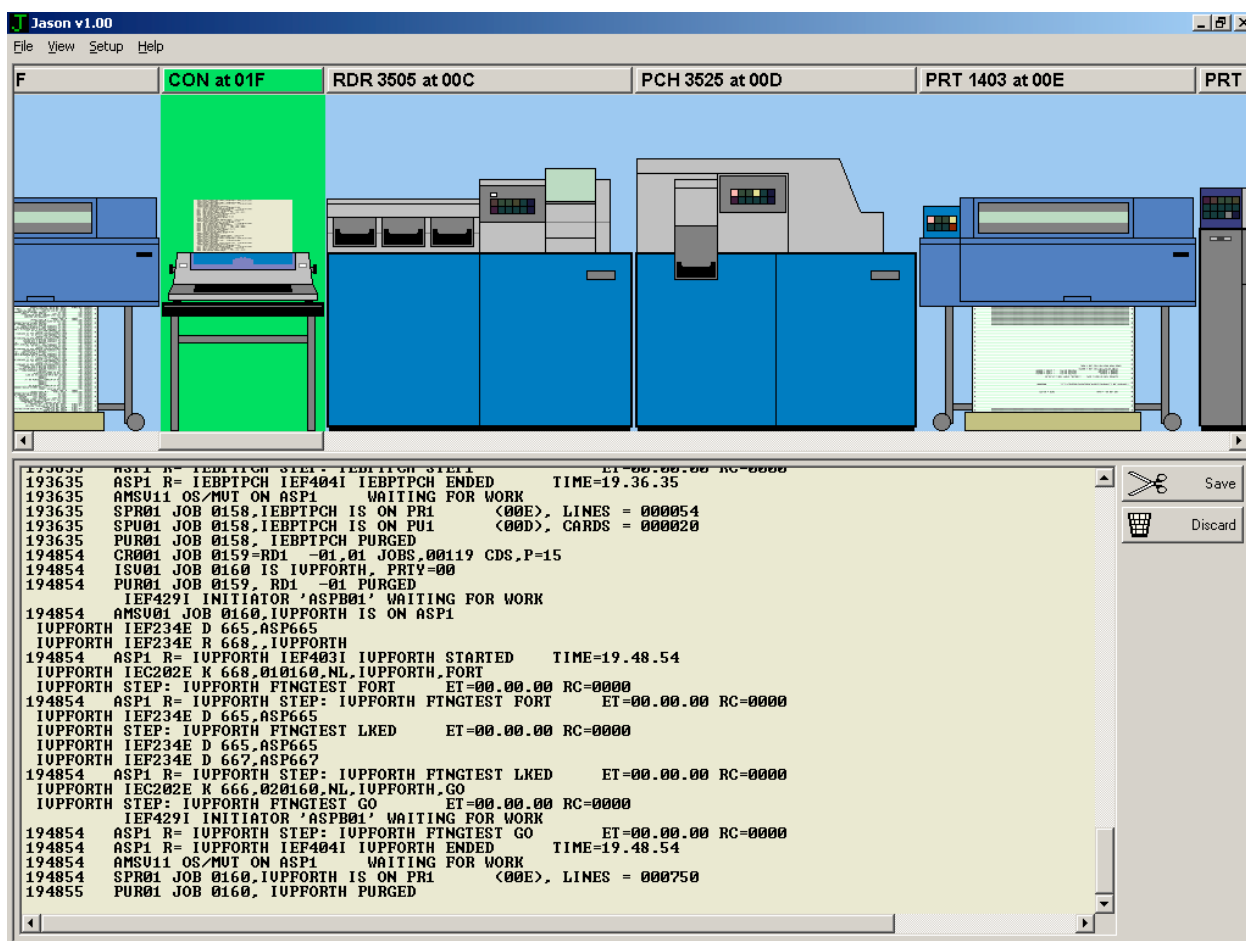
- Erase EOF is not yet here
 - If field ends with spaces, Insert is still allowed. Trailing spaces are discarded
 - If cursor is in the protected field, keyboard input is ignored instead of sending event
- Probably there are some other errors, which I was unable to find.

To change the terminal font, press button **Display** in the Jason setup dialog and select new settings. Only fixed-pitch fonts are allowed.

Emulation of special 3270 keys

PC key	3270 meaning
Insert	Toggles between Insert and Overwrite modes
Enter	Enter
Esc	Clear
F1..F12	PF01..PF12
Shift+F1..F12	PF13..PF24
Ctrl+F1	PA1
Ctrl+F2	PA2
Ctrl+F3	PA3

Console printer



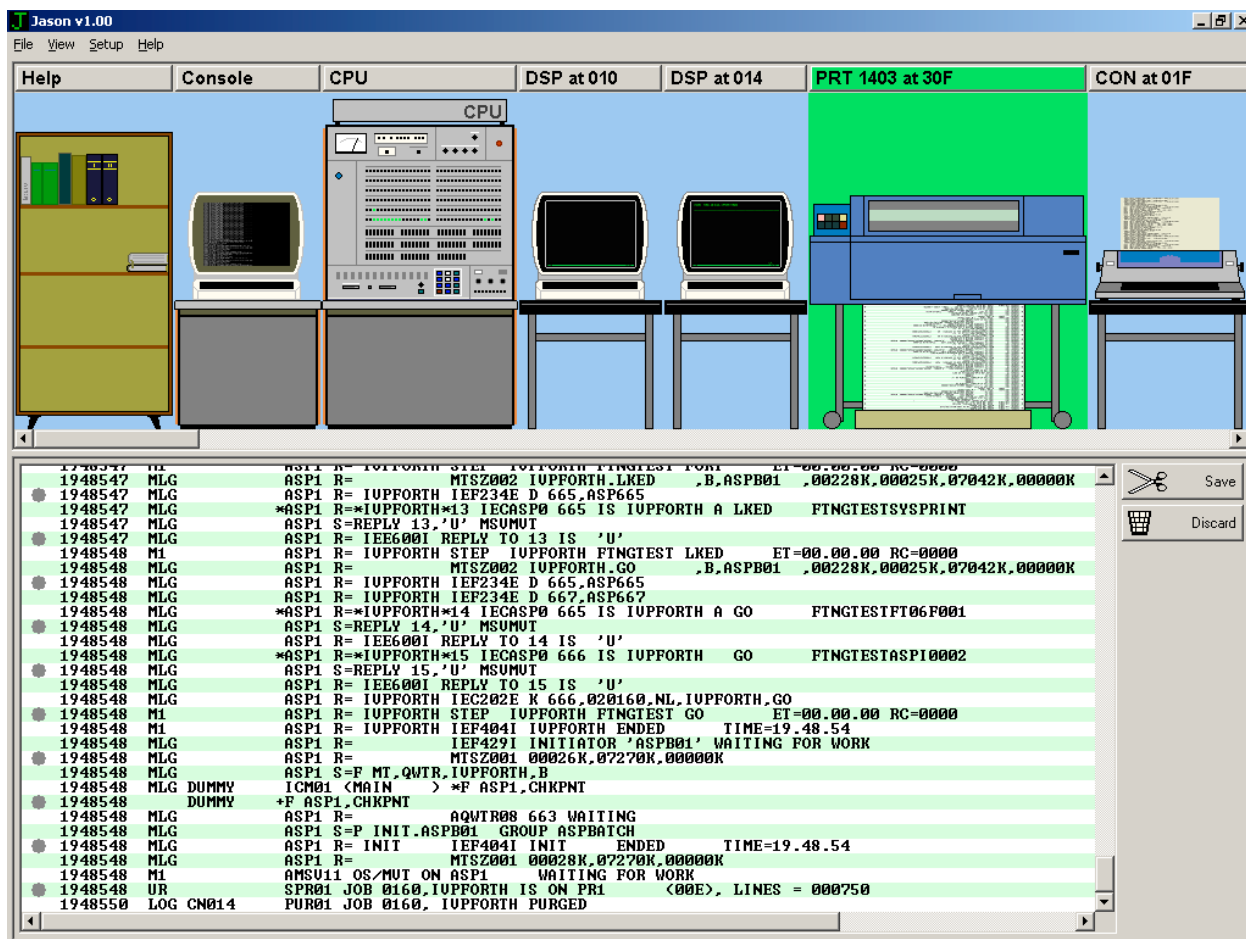
Console printer in Jason is a pure printing device, without the possibility to reply from the keyboard.

Console output is kept in memory. Button **Save** allows you to save output to the ASCII file. Button **Discard** clears contents of memory buffer.

To change the font, press button **Console** in the Jason setup dialog and select new settings. Only fixed-pitch fonts are allowed.

For unknown reasons, on some computers Hercules may stop responding or crashes if console is active. To prevent this, uncheck option **Connect console printer** in the Jason setup dialog.

Printer



Printers in Jason are made "real-time". They artificially slow down the output, so that you can see the lines flowing on the screen. Unlike in original Hercules, output is not saved to the file. Rather, it is kept in the memory (approximately 1000 pages, 132x60 symbols each).

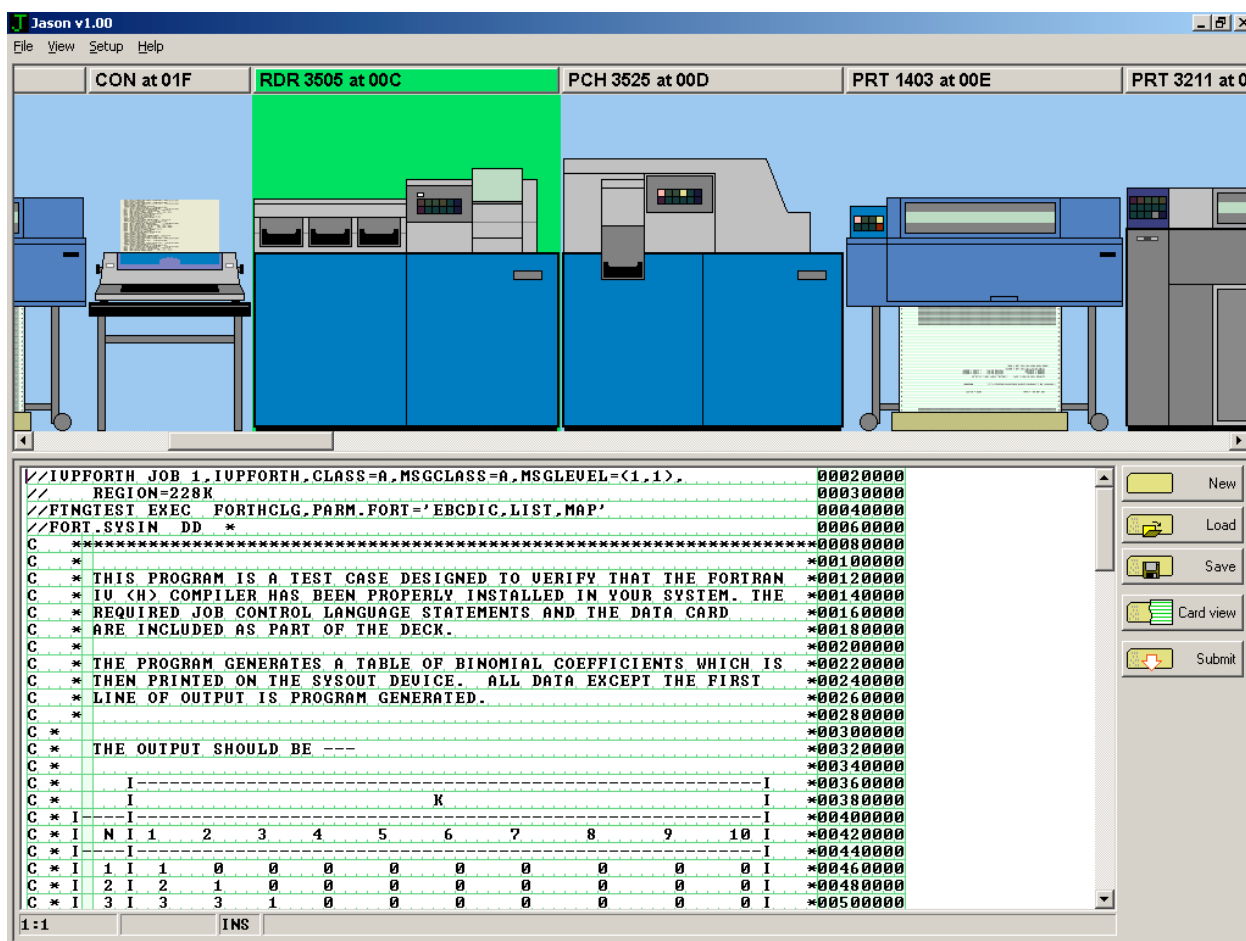
New page processing is turned off. If control program requests new page, printer displays empty line with symbol '♀' in the first position (corresponds to form feed in 437/OEM code page).

Jason has different graphical presentations for 1403 and 3211 printers. 3211 is faster, as in the real life.

To change the font, press button **Printer** in the Jason setup dialog and select new settings. Only fixed-pitch fonts are allowed.

Button **Save** allows you to save printout to the ASCII file. Button **Discard** clears contents of memory buffer.

Card reader and editor



This device combines card reader and puncher. To start a job, load ASCII file with deck image, edit it if necessary and press **Submit** button.

The built-in editor is tailored for card images. It has fixed line length of 80 columns. Columns 73-80 are preserved: you can edit them only if cursor is placed in this area. If you insert some text in the middle of the card, symbols that reach column 73 will be discarded.

Selection, copy and paste operations work either with part of the single card or with several complete cards. You can't, for example, select text from column 10 on card 1 to column 20 on card 3. If you try this, editor will select cards 1 and 2. Empty fields are interpreted as spaces.

Button **Card view** toggles between coding form and punched card views. In the punched card mode, editing is fully supported, although you can see only single card at a time.

Tabulation depends on the language. Jason supports Assembler and Fortran. In the autodetect mode, Jason traces several first cards for strings like EXEC FORTHCLG. Cards containing reserved JCL combinations (// or /*) in the first two columns have their own tabulation stops, as listed in the following table:

Language	Tab stops
None	9, 17, 25, 33, 41, 49, 57, 65, 73, 81
JCL	12, 16, 25, 33, 41, 49, 57, 65, 73, 81
Fortran	6, 7, 11, 15, 19, 23, 27, 31, 35, 39, 43, 47, 51, 55, 59, 73
Assembler	10, 16, 25, 30, 35, 40, 45, 50, 55, 60, 65, 73, 81

If you press Enter in the Insert mode, card is split in two. Label remains on the first card. Backspace in the first column merges cards, but only if there is sufficient free space on the previous card. To insert new card, move cursor to column 81 and press Enter.

Ctrl+N renumerates the cards. If deck is small (less than 9999 cards), first card gets number 00010000, second - 00020000, and so on. Maximal length of the file is limited to 1,000,000 cards.

Undo buffer keeps approx. 7500 cards.

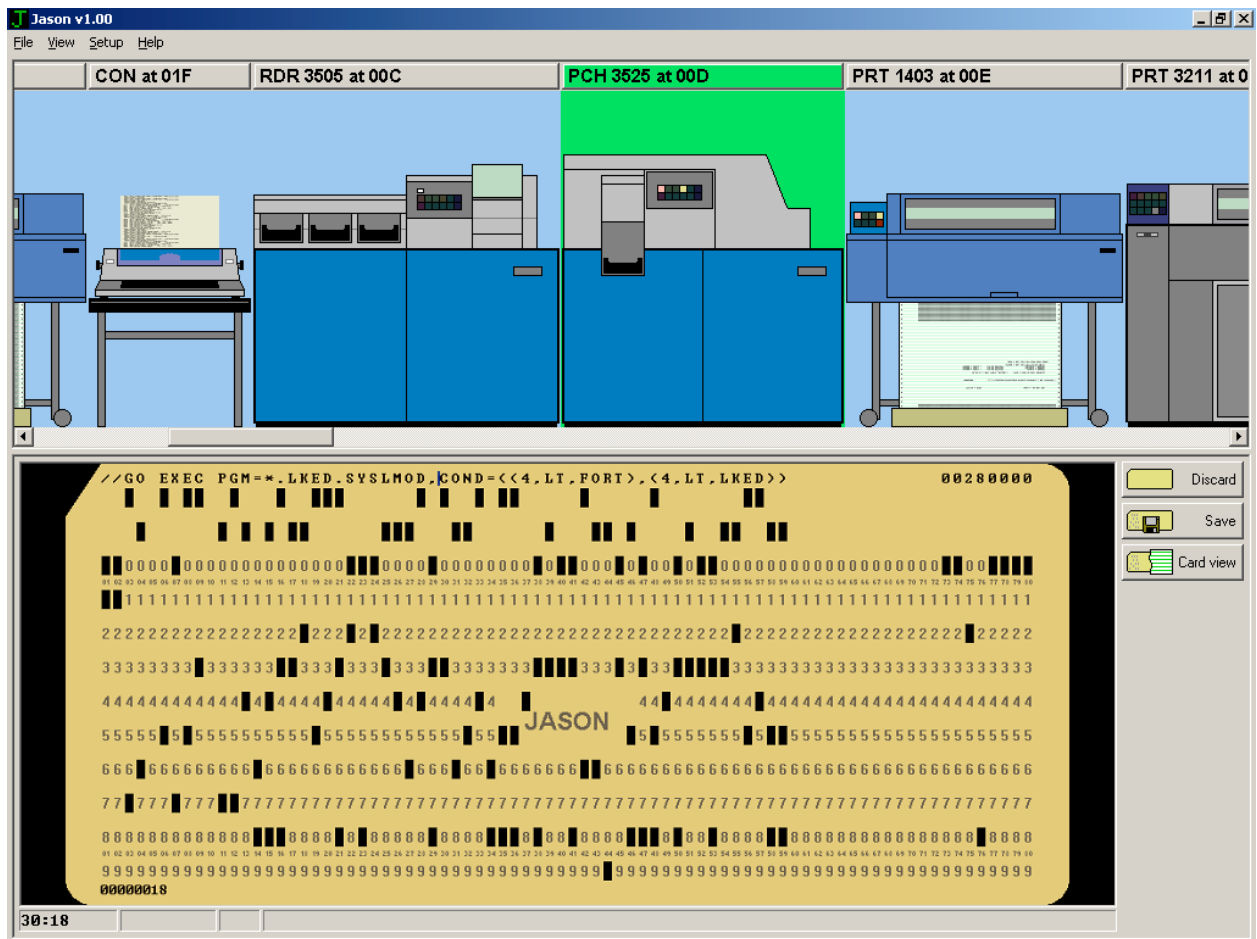
To change the font, press button **Editor** in the Jason setup dialog and select new settings. Only fixed-pitch fonts are allowed.

Here is the list of supported keyboard shortcuts. Some of them are available in two forms. Variant 1 is a classical one (Microsoft), and variant 2 is used by Borland's IDE (I am a fan of Borland, and Jason is created with BCB 5.0). Both can be used interchangeably:

Editor shortcuts

Variant 1	Variant 2	Action
Ctrl+O		Open file
Ctrl+S	F2	Save contents to file
Ctrl+F	Ctrl+Q, F	Open text search dialog
F3	Ctrl+L	Search next
F5		Toggle between form and card view
Ctrl+A		Select whole text
Ctrl+N		Renumerate cards (columns 73-80)
Arrows		Move cursor
Home		Move cursor to column 1
End		Move cursor to end of text, then to end of label
PgDn		Move cursor 1 page down
PgUp		Move cursor 1 page up
Ctrl+PgUp		Move cursor to the first line
Ctrl+PgDn		Move cursor to the line following last
Shift+(Arrows, Home, End, PgDn, PgUp)		Extend selection
BkSpc		Delete previous character or merge lines
Delete		Delete next character
Return		Split line
Ctrl+Z	Alt+BkSpc	Undo last action
Ctrl+R	Shift+Alt+BkSpc	Redo last undone action
Ctrl+X	Ctrl+Del	Cut selection to clipboard
Ctrl+C	Ctrl+Ins	Copy selection to clipboard
Ctrl+V	Shift+Ins	Paste clipboard to cursor position
	Ctrl+K, C	Copy selection to cursor position
	Ctrl+K, V	Move selection to cursor position
	Ctrl+K, Y	Delete selection
	Ctrl+K, H	Cancel selection
Ctrl+Y		Delete current line
Ins		Toggle between Insert and Overwrite modes
Tab (Insert mode)		Insert spaces till the next tab position
Tab (Overwrite mode)		Move cursor to the next tab position

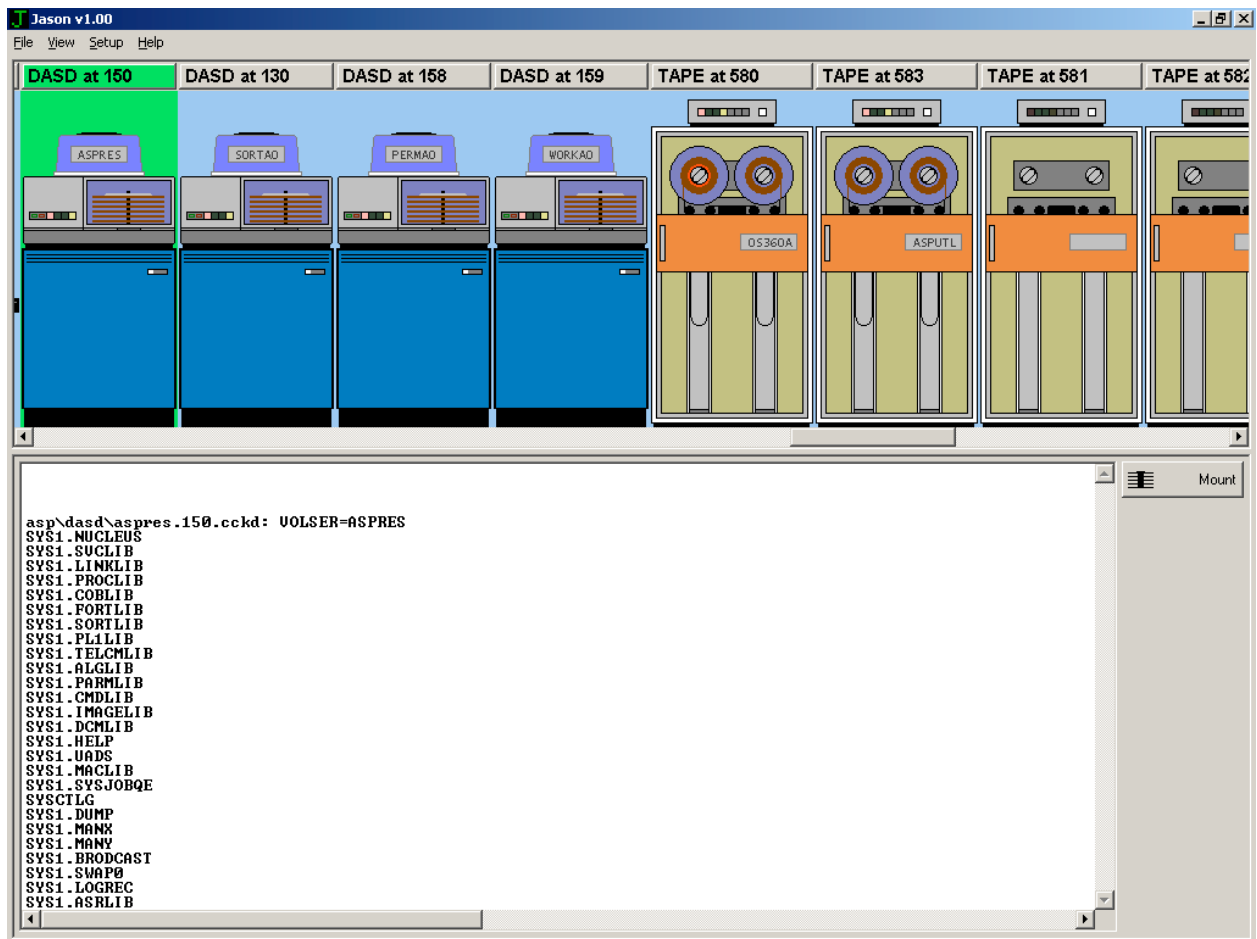
Card punch



A card punch device keeps output in the memory buffer. To discard the deck, press **Discard**. If you want to save cards to file, press **Save**. Button **Card view** toggles between the coding form and punched card views.

Card punch uses the same editor as reader, but editing is not allowed. However, you can copy parts of the deck to clipboard.

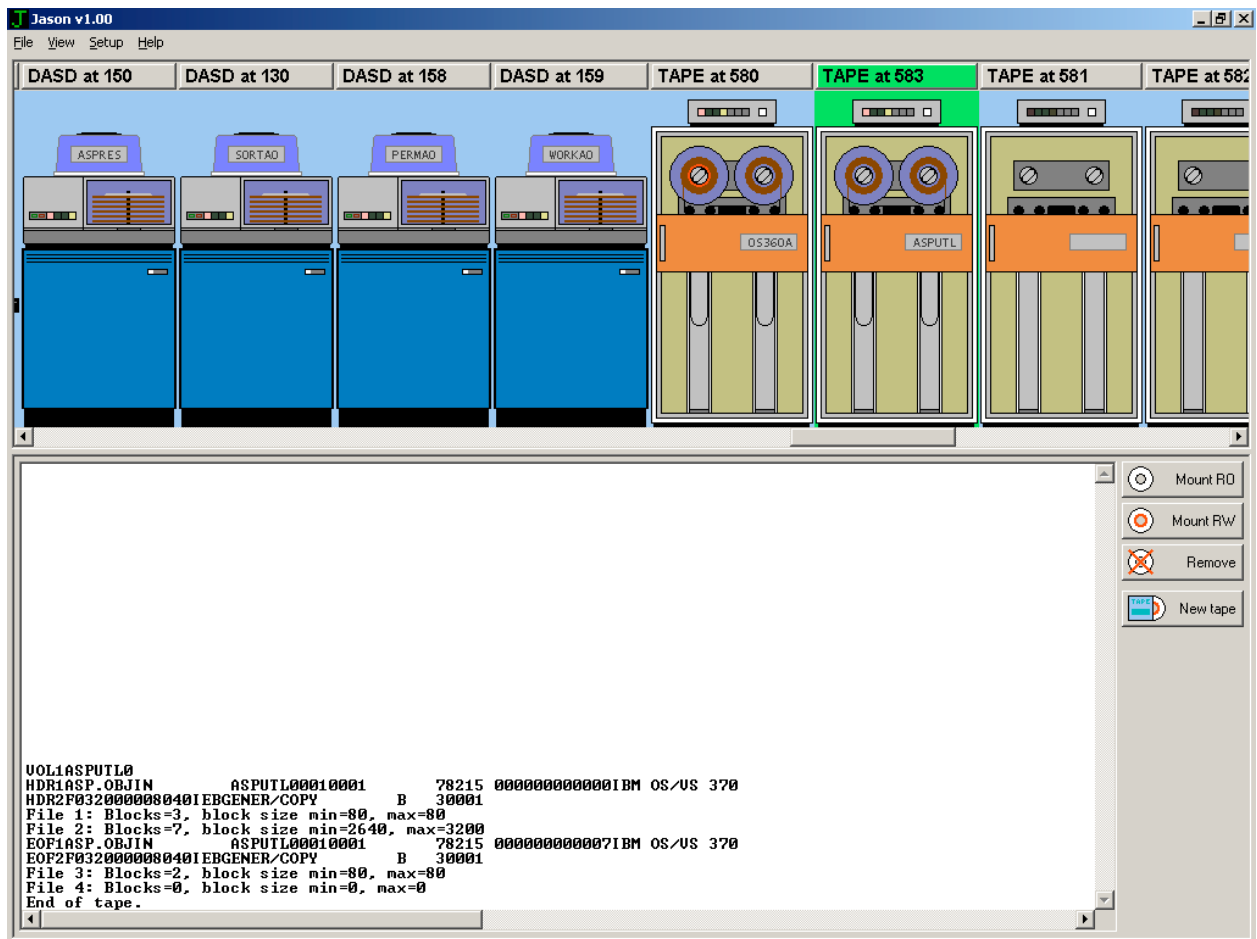
DASD device



If option **List DASD and TAPE contents** is active, each time new disk is mounted Jason calls utility *dasdls.exe* and redirects its output into the DASD window. Additionally, it displays volume label (VOLSER) on the disk cover.

Button **Mount** allows you to replace the volume. As far as I understand, Hercules does not allow to leave DASD device empty.

Tape device



When option **List DASD and TAPE contents** in Jason setup dialog is activated, each time new tape is mounted Jason calls utility *tapemap.exe* and redirects its output into the associated window. Additionally, it displays volume label (VOL1) on the door.

If left reel has red protection ring, tape is mounted in the read-write mode and write operations are enabled. If ring is absent, tape is read only.

Buttons have the following meaning:

- **Mount RO** - mounts new tape in the read only mode (with removed protection ring)
- **Mount RW** - mounts new tape in the read-write mode (with installed protection ring)
- **Remove** - unmounts tape
- **New tape** - creates new tape and mounts it in the read-write mode. Volume label is set to the first 6 characters of the file name.

Device indicators

Most devices have 4 lamps indicating their current state, as in the top row on the picture below:

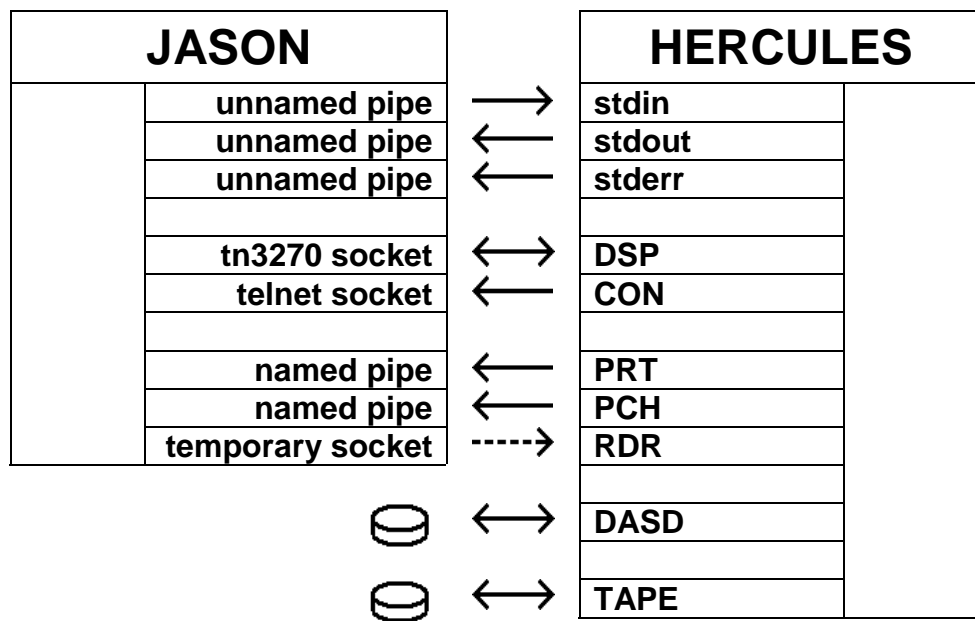


- **Red lamp** - device is online
- **First green lamp** - device is busy
- **Second green lamp** - I/O operation is pending
- **Yellow lamp** - device is open (attached to the the file)

How Jason works

This is what happens inside Jason when you start Hercules:

- Jason creates new environment block and adds Hercules directory to the PATH;
- It creates three unnamed pipes that will replace standard I/O streams (stdin, stdout and stderr);
- Jason starts Hercules as its child process in EXTERNALGUI mode, substituting default environment and standard I/O streams with those created above. In other words, Jason works as a Windows console for the Hercules;
- To display real-time CPU state, Jason sends following commands to Hercules:
`]GREGS=1`
`]CREGS=1`
`]AREGS=1`
`]FREGS=1`
- As Hercules reports installed devices of types RDR, PCH, PRT, CON or DSP, (via DEVA=xxx or DEVC=xxx), Jason replaces them with sockets or pipes. DASDs and TAPes remain mapped to the files on the disk. See the picture below for details:



Commands sent to Hercules when user pushes button in device window:

Device	Button	Command
Hercules console	Send	Command specified in the input string. Jason does not verify it for validity!
CPU	IPL	IPL <cuu>
Printer	Start	START <cuu>
	Stop	STOP <cuu>
Reader	Submit	devinit <cuu> <port> sockdev ascii trunc eof

DASD	Mount	devinit <cuu> "<filename>"
	Attn	I <cuu>
TAPE	Mount RW	devinit <cuu> "<filename>" RING
	Mount RO	devinit <cuu> "<filename>" NORING
	Remove	devinit <cuu> *
	Attn	I <cuu>

And when you stop Jason:

- It sends EXIT and waits at most 10 seconds till Hercules terminates. If Hercules is still active after this timeout, Jason kills it by calling TerminateProcess().