

## Notes about visual Mark5 (vMk5) interface v. 2

### Upgrades from previous 1 version

- Disks size: thanks to new *rtime*<sup>1</sup> command it is now possible to recover the proper bank size even if the Mark5 is busy. The old `disk_size` runstring parameter and the `disk size` field are removed.
- Control and monitor modes: to avoid interfering problem with schedule, vMk5 now starts in monitor only mode. All controls are normally disabled and the program can safely used for its principal purpose, monitor the Mark5A activity. It is possible anyway, switch to *control&monitor* mode through the button on the top left corner of the panel or specifying a third runstring parameter such as “ctrl” after the Mk5 ip number and port at the launch of vMk5.
- Play pointer: the new *position* command can return the play pointer position while it is playing. This is used to show with a yellow bar the just played bytes.
- Remaining record time: the remaining record time is show among with available bytes. This is possible thank the new *rtime* command. It is updated every refresh cycle (typ. 2 sec), even if Mk5 is not recording. The time is projection in future computed with actual settings and could not be reflect the true usage planned by schedule if this will be changed later. Together with mode setting controls, it can be used to estimate the duration of a module at different settings during local tests
- Mode controls: it is now possible see what kind of configuration Mk5 is using : mode, submode, the tracks used, the track bit rate and the total bit rate. These fields can became also control fields if the vMk5 is switched to *control&monitor* mode. When focused, the refresh of a field is suspended so user can configure the desired mode (typ. some tvg test mode). Press enter will send the inserted values to Mk5 and the refresh of that widget will start again. Be careful to set valid values because some parameter are related to other (e.g. mode and submode are setted with the same command). Switching between completely different mode can case the program to set some default valid parameters that can be following adjusted
- Bank switching mode: status of both banks are show and updated when Mk5 is not busy. The active bank is represented by a red letter and the *selected* button active. The disk usage graph, the scans list and all other disk usage information are always related to active bank. The spare bank can only show if it is ready, full or protected. Be aware that Mark5A can provide these information only when it is not busy (i.e. not playing nor recording), otherwise they are the freezed image of the last query. This mean that a bank change occurred while the other is recording is not immediately notified, until a stop will occur. If vMk5 program is in *control&monitor* mode the *selected* and *protected* widget becomes active, the first for the manual bank switching, the second to enable or disable the new module record protection feature.
- Communication: the communication of 2.5 command set is lightly changed. Some command are disappeared, news are available and some now reply without the equal sign differently as were

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<sup>1</sup> See the 2.5 command set documentation at <http://web.haystack.mit.edu/mark5/command5a.pdf>

doing before. These make actual version not backward compatible with command sets different from 2.5. The preferred mode is the formal one but the informal should also work .

- Error button: it has a double mean. If an error string is displayed in the near right field, it clears the error as if user acknowledge the last reported error. Otherwise it makes a query to Mk5 for a pending error and if one reports it in the right field.
- FS version: no more FS specific version should be used. The same application run under TCL/TK 8.0 (the default one in FS distribution), although the preferred environment is 8.3. Note that fonts and widget get a better visualization under windows than linux.

Since I was not comfortable with Gigabyte numbers displayed at byte resolution and because the loss of the “recording feel” given by a moving tapes, I decided write a graphical tool to easily control the Mark5 (MK5), and monitor its activity, among with disk usage.

### ***Purpose***

This application was developed to simplify and make more easy my Mark5 recording and data transfer tests. I also intend to use it to monitor MK5 activity during a typical MK5 VLBI experiment. Another possible use could be the control of many station’s remote Mark5 from correlator. The data streams from each station could be easily started from remote. That could be of some help in the incoming PoC (Proof of Concept) eVLBI tests.

### ***Requirements***

This application is written in TCL/TK interpreted language, so to have it running a TCL/TK interpreter must be present. The advantage in TCL/TK use is the easily development of graphical application ready to run on windows and linux.

Today there is a TCL/TK environment practically for every operating system. The visualMark5 (vMk5.tcl) program is compatible with TCL/TK v.8.3 and following.

Since the version running on a standard FS Linux 2 system is the 8.0 that has some minor incompatibilities with 8.3 there is a modified version (vMk5FS.tcl) for FS machines.

vMk5 was never tested with version previous 8.0.

### ***Structure***

vMk5.tcl is practically the client side of Mark5A. Instead of using the two pair programs Mark5A and tstMark5A developed at Haystack observatory for the control of the new VLBI disks based recording system, only the second one, Mark5A server program must be running on Mk5. The client could be replaced by vMk5.tcl (even if it can be run concurrently with tstMark5A).

The vMk5.tcl program could be run on the same MK5 computer, under a graphical session, or on another windows or linux remote machine. In second case be careful that the remote computer may gain access to MK5 computer. A ping is a good test. In case of problems check the presence of some firewall, or the tcpwrapper settings.

Keep running only one occurrence of vMk5.tcl!

## **Run the program**

The standard Mark5A server program must be running on MK5.

vMk5.tcl could be run as is, or with some runstring parameters such as the IP number of MK5, the listen port of Mark5A server program (usually 2620) and control enable keyword (“ctrl”). None of them is mandatory.

Under windows the best choice is a creation of a shortcut to the program with the MK5 IP number and port specified. On linux a simple script file with name of program and Mk5 ip number could simplify the launch<sup>2</sup>.

Once the graphical panel appears, user should press the connect button to create the TCP link with Mark5A server program. If vMk5.tcl was run without parameters, remember to fill the IP# and port fields before.

The total amount of disk space, used to compute the disk usage percentage is determined automatically at the start, now even if Mk5 is recording, playing or transferring data.

If MK5 is not busy (no data storage, play or transfer) the program will scan the entire disk space showing a text list of all recorded scan in the scan list window. Another graphical representation of recorded scan is showed in disk usage bar.

The status of Mk5 is regularly queried (typ every 2 sec), and the corresponded button and flags are lit on (status, rec,play,off, bank, etc.). In the default mode the vMk5 works as a monitor tool and any control is enabled so no damage should be done.

If Mk5 is busy, the bank is scanned for the usage, but not for the list of scan. At the first stop, user can press the “**force an update**” button to get an updated list of recorder scans. Be careful to use it because it requires an amount of time, especially if there are many scans just recorded.

The control&monitor mode can be enabled pressing the **switch to control&monitor mode** . A warning window will alert user to not interfere with running schedule. Many widget will switch to their control mode. They are **mode**, **submode**, **tracks data rate**, **rec,play,stop** and **selected** and **protected** controls of each bank

The panel is divided in two frame, one for disk operation and one for data transfer operations. On the first is possible to start or stop a recording or playing session. In recording mode the disk usage bar will be updated among with percentage. Above this bar there are three numbers representing the recorded, available and total Gbyte on the disks, amog with residual recording time in hh:mm:ss format.

A scan could be selected by clicking on it in the disk usage bar. The correspondent scan directory info in scan list window will be highlighted. Vice-versa, if you select a scan in the scan list window with a DOUBLE click of the mouse, the correspondent graphical representation if disk usage bar will be highlighted. To unselect click on the unused space of disk usage bar.

To start a new record simply press the rec button when MK5 is in **ready** mode. Be careful to have formatter properly stetted otherwise the record will be started but percentage number will be never increments from its value. A useful procedure to set MK4 formatter with both headstacks enabled is bypass, included in the mark4 Dan Smithe test procedures.

A play session can be started pressing play button after the scan selection.

All this mode will be terminated with the stop button. In case of early end (disk full while in recording, or scan finished in play) the relative button became yellow.

The critical **reset**= command for safety reasons is not managed by this program.

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<sup>2</sup> The widget and fonts are optimized for Windows version of TCL/TK 8.3. Although it will work under linux, the font are not the best they can be. Further works it required to find a configuration good for windows and linux.

### **Data transfer**

The data of a selected scan could be transferred from disk to local or remote machine. Also the data coming from the input of Mk5 can be forwarded directly by network to remote computer running a server program such as the Haystack Net2file server.

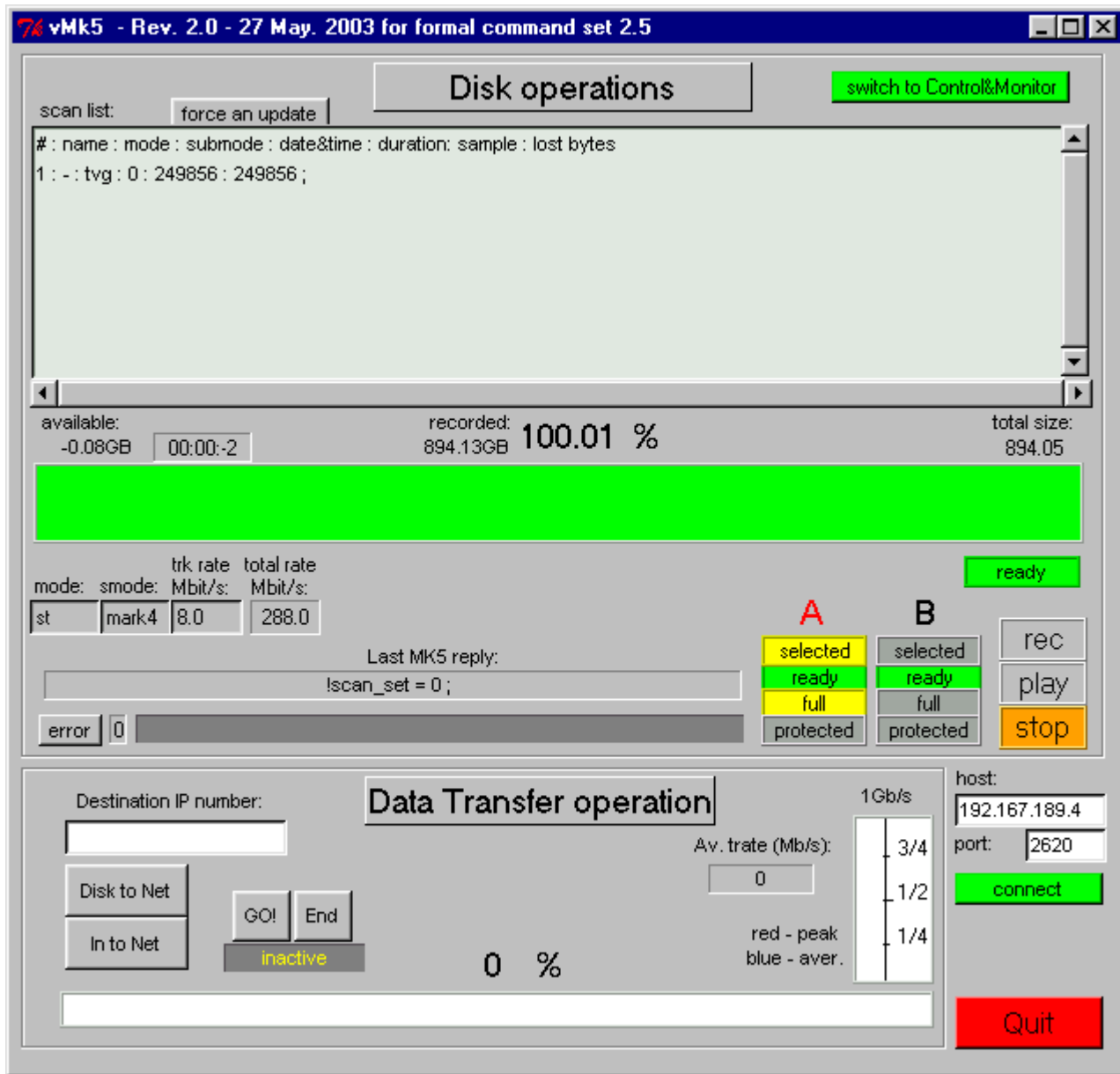
This is possible when MK5 is in idle mode.

Once the destination IP number field is filled, select the scan by clicking on it in the scan list window or disk usage graph bar, then press "**disk to net**" button. If a server program running at remote machine is available the link status label became Connected, otherwise an alarm windows will be shown. Except for the scan selection the same steps are valid for the input to network data transfer mode, selected with the in to net button. The data transfer is started for both the modes by pressing the **GO** button. The link status became active and the horizontal bar start to show the percentage of transfer. Another green vertical bar will show the instantaneous throughput in Mbit/s. The near field and the blue line show the average transfer rate, while the red line keeps track of maximum. The transfer will end automatically at the end of the scan in disk to net. The **end** button will terminate any transfer (disk to net or in to net). Please notice that each end close the remote server, so before start another transfer session remember to restart the server at remote location.

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Giuseppe Maccaferri

**Panel view:**



**Fig. 1:** the panel of vMk5 program in monitor mode.

