

Mark 5A Field System Commands - DLS - 24 September 2003

Alphabetical Listing (Equivalent Mark5A Command shown in parenthesis.)
 Enter 'help=<command>' or '?=<command>' in an oprin window to display
 available information on each of these commands.

```
bank_check
disc_check      (data_check?)
disc_end        (record=off)
disc_pos        (position?)
disc_serial     (disk_serial?)
disc_start=on   (record=on)
mk5
mk5close
mk5relink
```

Station procedure:

```
change_pack
```

Default change_pack procedure:

```
xdisp=on
"the disk module that is not selected may now be replaced.
"the mark5 will not respond to commands from the fs
" for almost 20 seconds after the key is turned to "locked".
"turn the key to "locked" only when the FS will be
" idle for more than 20 seconds.
wakeup
xdisp=off
```

SNAP Commands:

```
bank_check - Mark 5A recording bank check
```

```
Syntax:      bank_check
```

```
Response:    bank_check/VSN
```

Monitor-only parameters:

```
VSN      Volume serial number of bank to be recorded
```

Comments:

This command will check the VSN. If it has changed or hasn't been
 logged since the current log file was last opened, it will be logged.

If the active drive type is "mk5a_bs", this command will check the
 remaining record time on the current bank and if the next scan will
 not fit, it will switch banks before checking the VSN.

```
disc_check - check Mark V recorded data
```

```
Syntax:      disc_check
```

```
Response:    disc_check/format,tracks,time,pos,period,??,
```

Settable parameters:

```
command      any legal command for Mark IV decoder. The  

terminating "$" character is appended before
```

sending the command.

Monitor-only parameters:

format Data format: mark4, vlba, test, or ?
 tracks Track mode: 8, 16, 32, 64
 time Data time tag read from first encountered header
 pos Byte position of header
 period Track frame period (seconds)
 ?? unknown

Comments:

If format is ?, the remaining fields are not valid.

This command sets the read pointer 1 mega-byte before the current write pointer location and attempts to use the low-level Mark 5 data_check command. The displayed parameters are the output of is command. A future version will allow the position of the read pointer to be set explicitly, but this can be done with a mk5 SNAP command. To check at position "pos", use:

```
mk5=play off pos,data_check?
```

disc_end - end Mark V recording

Syntax: disc_end

Response: none

Comments:

Stops recording.

If the active drive type in use is "mk5a", this command will check the VSN after stopping the recording. If it has changed or hasn't been logged since the current log file was last opened, it will be logged.

disc_pos - Mark V byte position pointers

Syntax: disc_pos

Response: disc_pos/write_pointer, read_pointer

Monitor-only parameters:

write_pointer Current write pointer byte position
 read_pointer Current read pointer byte position

Comments:

This command reports the current position of the write and read pointers.

This command sets the read pointer 1 mega-byte before the current write pointer location and attempts to use the low-level Mark 5 data_check command. The displayed parameters are the output of is command. A future version will allow the position of the read pointer to be set explicitly, but this can be done with a mk5 SNAP command. To check at position "pos", use:

mk5=play off pos,data_check?

disc_serial - Mark V byte position pointers

Syntax: disc_serial

Response: disc_pos/serial1,serial2,...,serial16,

Monitor-only parameters:

serialX` Serial number of disc X, null if no disk is installed in that slot

Comments:

This command reports the serial numbers of the installed disks.

disc_start - Start Mark V recording

Syntax: disc_start=on,scan_name
disc_start

Response: disc_start/on/off

Settable Parameters:

on Turn recording on, only on is allowed
scan_name String of up to 16 characters, default is current scan name defined by the scan_name SNAP command

Monitor-only parameters:

on/off` on (recording) or off (nor recording)

Comments:

This command may be given only with either one parameter on to start recording or with no parameter to monitor whether recording is on or off. To stop recording use the disc_end SNAP command.

Normally scan_name is taken by default as the scan name defined by the most recent scan_name=... command. The scan_name parameter allows the value used for this recording to over-riddden. It does not change the actual scan name. The scan is sent to the Mark 5 to identify the scan being recorded.

mk5 - Low-level Mark V interface

Syntax: mk5=command,...

Response: mk5/response,...

Settable parameters:

command low-level Mark 5 command or query

Monitor-only parameters:

response response from the Mark 5.

Comments:

Multiple commands can be sent with one mk5 command by separating them with commas. The responses for each command are separated by commas.

Please refer to the Mark 5A command set document (<http://web.haystack.mit.edu/mark5/command5a.pdf>) for details on available commands and their responses.

mk5close - Close the Mark V connection

Syntax: mk5close

Response: none

Comments:

This command can be used to close the connection to a Mark V5 recorder. It is recommended that this be done prior to shutting down the Mark V control program for a disc swap. The connection can be re-opened with the mk5relink command.

mk5relink - re-establish the Mark V connection

Syntax: mk5relink

Response: none

Comments:

This command can be used to open a new connection to the Mark 5 recorder. If the connection is already open, it will be closed and new one established. Opening a new connection is needed after after the Mark V's control program has been restarted or its power has been cycled. This may happen for example for a disc swap.

If a schedule is running, but halted, this command will release the halt if a connection is successfully re-established.

i i

Fill Pattern
2.5 Disk Bank Management



5. Operating the Mark 5A System

5 1

1. Introduction

The Mark 5A disk-based VLBI data system is designed as a direct replacement for a Mark 4 or VLBA tape transport, both for recording and playback. The Mark 5A has the following characteristics:

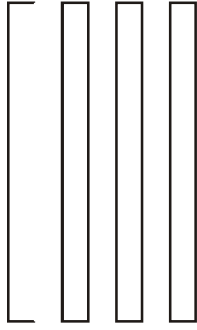
In parity-stripped modes ('m

In all parity-tripped modes ('mark4' and 'vlba' modes), however, the Output Section must synchronize to the data and restore parity. This is a multi-step process, as f

Clear: Re-normalizes Output Section and forces a

Warni

}]
}]



local network, time-zone and ntp configuration is available at <http://web.haystack.mit.edu/mark5/linux.pdf>.

4.2

5. Run '*tstMark5A*'
tstMark5A is small standalone program¹² with a simp

com

5. No attempt should be ma

Panel view:

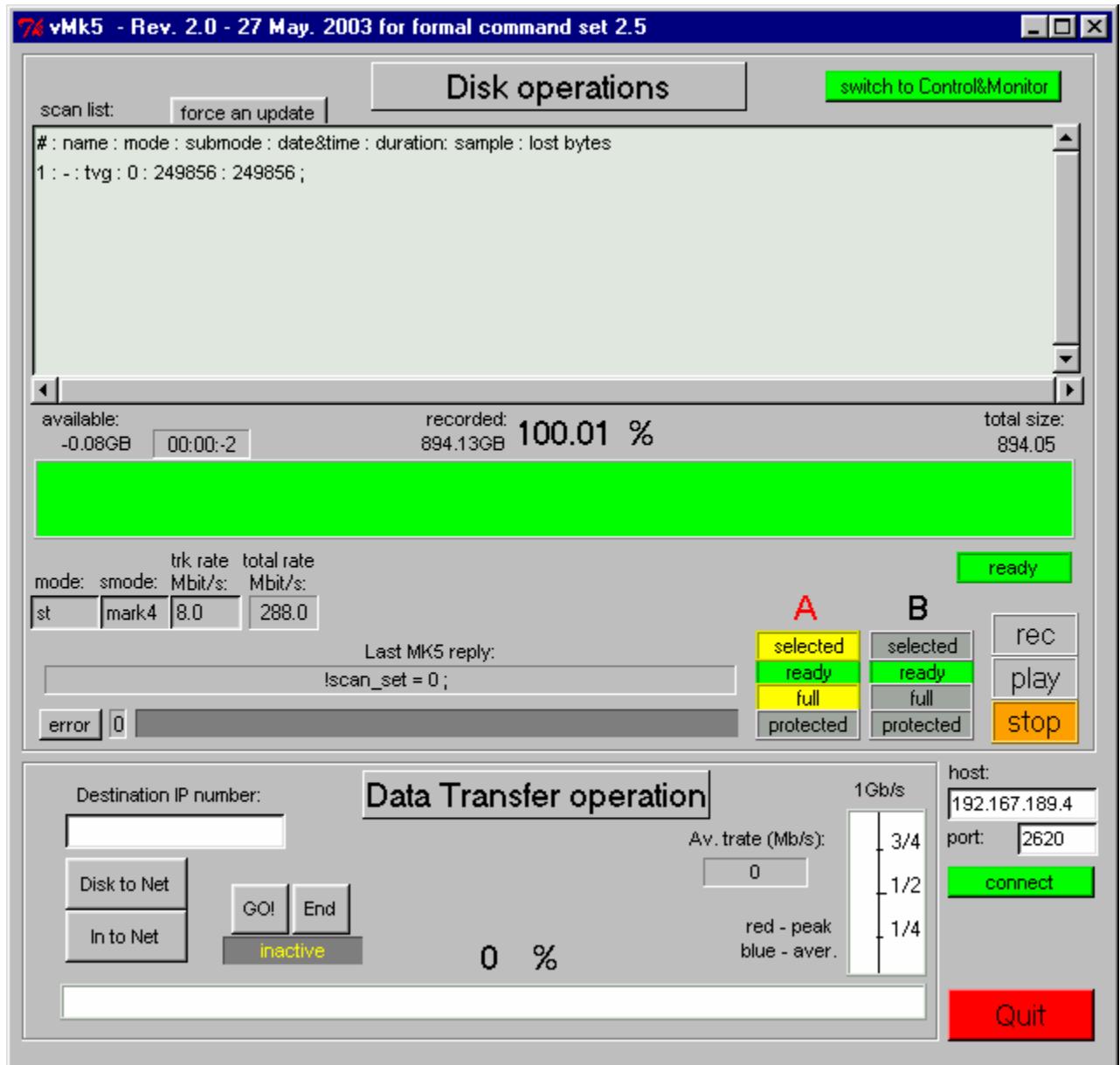


Fig. 1: the panel of vMk5 program in monitor mode.

Notes about visual Mark5 (vMk5) interface v. 2.1

Upgrades from previous 1 version

- Disks size: thanks to the new *rtime*¹ command it is now possible to recover the 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 with the schedule, vMk5 now starts in monitor only mode. All controls are normally disabled and the program can be used safely for its principal purpose, monitoring Mark5A activity. It is possible anyway, to switch to *control&monitor* mode through the button on the top right corner of the panel or by specifying a third runstring parameter such as “ctrl” after the Mk5 ip number and port at the launch of vMk5. It is also possible specify a fourth parameter, the refresh time in msec (default 2000).
- Play pointer: the new *position* command now returns the play pointer position while it is playing. This is used to show the bytes already played with a yellow bar.
- Remaining record time: the remaining record time is shown along with available bytes. This is possible thanks to the new *rtime* command. It is updated every refresh cycle (typ. 2 sec), even if Mk5 is not recording. The remaining time is computed with the free disk space and actual Mk5 settings and could not reflect the true time usage planned by the schedule if the settings will be changed later. Together with the 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 the Mk5 is using (mode, submode, tracks used, track bit rate and the total bit rate). These fields can become also control fields if the vMk5 is switched to *control&monitor* mode to be used during local tests. When one of these fields is focused, the refresh is suspended so the user can configure the desired mode (e.g. some tvg test mode). After pressing <Enter> the value inserted will be sent to Mk5, and the refresh of that widget will start again. Be careful to set valid values because some parameters are related to others (e.g. mode and submode are set with the same command). Switching between completely different modes can cause the program to set some default valid parameters. They can be further adjusted
- Bank switching mode: status of both banks is available 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 the 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. neither playing nor recording), otherwise they are the frozen image of the last query. This means that a bank change that occurred while the other is recording is not immediately notified, until a stop occurs. If the vMk5 program is in *control&monitor* mode the *selected* and *protected* widgets becomes active, the first for the manual bank switching, the second to enable or disable the new module record protection feature.

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

- **Communication:** the communication of the 2.5 command set is slightly changed. Some commands have disappeared, new ones are available, and some others now reply without the equal sign different from what they were doing before. These make this version not backward compatible with command sets different from 2.5. The Mark5A program preferred mode is the formal, but vMk5A is compatible also with the informal mode, for compatibility with the FS.
- **Error button:** it has a double meaning. If an error string is displayed in the near right field, it clears the error as if user acknowledged the last reported error. Otherwise it makes a query to the Mk5 for a pending error and reports its explanation in the right field.
- **FS version:** no more specific version for FS should be used. The same application can run under TCL/TK 8.0 (the default one in FS distribution) or later versions, although the preferred environment is 8.3.

Note that fonts and widget get a better visualization under windows than linux.

Purpose

This application was developed to simplify and make easier 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 a correlator. The data streams from each station could be easily started from a remote terminal. That could be of some help in the incoming PoC (Proof of Concept) e-VLBI 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 easy development of a graphical application ready to run on windows and linux or some other platform. Today there is a TCL/TK environment for almost every operating system. The visualMark5 (vMk5.tcl) program require TCL/TK v.8.3 or a later version. It could also be run on a standard FS Linux 2 system that uses v. 8.0, although the graphics is not so good as under Windows.

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 disk-based recording system, vMk5 can be used together with Mark5A server program (running on the Mk5 unit) to get a graphical interface to Mark5 (tstMark5A can also be run concurrently).

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 the second case be careful that the remote computer may gain access to the 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. This is because it request the status to Mark5 quite often (default every 2 seconds). A slower refresh time could be chosen as the fourth run-string parameter. In that case many occurrences of vMk5 don't represent a problem.

Run the program

The standard Mark5A server program must be running on MK5, as normally happens.

vMk5.tcl could be run as is, or with some runstring parameters such as the IP number of the Mk5, the listen port of Mark5A server program (usually 2620), control enable keyword (“ctrl”) and refresh time (default 2000 msec). None of them is mandatory.

Under windows the best choice is the creation of a shortcut to the program with the Mk5 IP number and port specified (ie: E:\FS\mark5\vmk5.tcl 192.167.189.4 2620 no 6000). On linux a simple script file with the name of the program, Mk5 IP number, with some other parameters should simplify the launch².

Once the graphical panel appears, the 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 the 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 scans in the scan list window (this will take some time if many scans were recorded). Another graphical representation of recorded scans is shown in the disk usage bar.

The status of the Mk5 is regularly queried (typically every 2 sec), and the corresponding buttons 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 disabled 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, the user can press the “***force an update***” button to get an updated list of recorded scans. Be careful to use it when there is at least a minute before the next recording start. Scans list requires an amount of time, especially if there are many scans already recorded.

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

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

A scan could be selected by clicking on it in the disk usage bar. The corresponding scan directory info in the 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 corresponding graphical representation of the disk usage bar will be highlighted. To unselect, click on the unused space of the disk usage bar.

To start a new recording, simply press the rec button when MK5 is in ***ready*** mode. Be careful to have formatter properly set, otherwise the recording will be started but the percentage number will never be increments from its value. A useful procedure to set the Mk4 formatter with both headstacks enabled is the bypass procedure included in the mark4 Dan Smythe test procedures.

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

² 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 as they might be.

Record or play 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 will become yellow. The critical *reset*= command is not managed by this program for safety reasons.

Data transfer

The data of a selected scan can be transferred from the disk to a local or remote machine. Also the data coming from the input of Mk5 can be forwarded directly by the network to a remote computer running a server program such as the Haystack Net2file server. This is possible when the Mk5 is in the 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 is running at the remote machine, the link status label becomes Connected; otherwise an alarm window 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 of these modes by pressing the **GO** button. The link status becomes active and the horizontal bar will start to show the percentage of transfer. Another green vertical bar will show the instantaneous throughput in Mbit/s. The nearby field and the blue line show the average transfer rate, while the red line keeps track of the peak. The transfer will end automatically at the end of the scan in *disk to net* mode. The *end* button will terminate any transfer (*disk to net* or *in to net*). Please notice that every stop closes the remote server, so before starting another transfer session remember to restart the server at the remote location.

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Giuseppe Maccaferri
CNR IRA Italy. g.maccaferri@ira.cnr.it

Edited 19 September 2003 by Dan Smythe, MIT Haystack Observatory