MERCURY 1.5 PROTOCOL

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April 1993

This document describes the protocol used to send information between the Mercury participant system and the Mercury front end. This protocol applies only to Mercury 1.5 and will change for Mercury 2.0.

All information is exchanged in network byte order, so be sure to use the ntohl and htonl functions when reading and writing your data.

All messages are in the following form:

```
|    4 bytes      |    4 bytes    |  variable
 message size        message type    data
 (not including
  this size field)
```

There are four types of messages: commands, values, deletes and returns. Commands, values and deletes are sent from the front end to the participant system, and returns are sent the other way.

```
/* number of bytes in the network input buffer */
#define NET_BUFFER_SIZE 1024

/* room to say how long current message is */
#define MSG_HEADER_SIZE 4

/* tags for messages going from mercury to front end */
#define MERCURY_ALIVE         1
#define MERCURY_DATA          2
#define MERCURY_PROC_CONFIG   3

/* tags for messages going from front end to mercury */
#define SIXD_VALUE            0
#define ORIGIN_VALUE          1
#define COLOR_VALUE           2
#define VISIBLE_VALUE         3
#define PICTURE_VALUE         4
#define TEXTURE_VALUE         5
#define TEX_MAP_VALUE         6
#define TEX_SCALE_VALUE       7
#define SOUND_VALUE           8
```

```
#define LOUDNESS_VALUE        9
#define AUDIBLE_VALUE         10
#define SCALE_VALUE           11
#define WIREFRAME_VALUE       12
#define DOPPLER_VALUE         13
#define SOURCE_VALUE          14
#define ROLLOFF_VALUE         15
#define SIXD_DELTA_VALUE      16

#define VELOCITY_COMMAND      0
#define DELTA_COMMAND         1
#define ORIGIN_COMMAND        2
#define VOID_COLOR_COMMAND    3
#define STATISTICS_COMMAND    4
#define RESET_COMMAND         5
#define SHUTDOWN_COMMAND      6
#define BORESIGHT_COMMAND     7
#define NO_VELOCITY_COMMAND   8
#define DELETE_OBJECT         9
#define DELTA_CONSTRAINT_COMMAND    10
#define NO_DELTA_CONSTRAINT_COMMAND 11
#define AMBIENCE_COMMAND      12
#define PACE_COMMAND          13
#define FOG_COMMAND           14
#define DETACH_COMMAND        15
#define AURAL_CONTROL_COMMAND 16
#define CALIBRATE_COMMAND     17
#define BIND_SENSOR_COMMAND   18
#define BIND_HEAD_COMMAND     19
#define SPECIFY_PACKET_COMMAND      20
#define ADD_PROCESSOR_COMMAND 21

#define COMMAND_MESSAGE       0x8000
#define DELETE_MESSAGE        0x4000
#define TABLE_MASK            0x0fff

#define SENSOR_CONFIG_TYPE    1
#define IMAGER_CONFIG_TYPE    2
#define SR_CONFIG_TYPE        3
#define SPROC_CONFIG_TYPE     4
```

GLOSSARY

Attribute label	Data Format
<< all-purpose >>	
"6D"	#(#(xpos ypos zpos) #(rot #(xdir ydir zdir)))
"position"	#(xpos ypos zpos)
"orientation"	#(rot #(xdir ydir zdir))
"scale"	#(x y z)
<< graphics >>	
"picture-desc"	filename or dog description
"color"	#(r g b) all numbers [0.0-1.0]
"visible"	T/NIL
"wireframe"	T/NIL
"texture-desc"	filename or texture description
"tex-map"	#(mapping s-param t-param)
"tex-scale"	#(s-scale t-scale)
"opacity"	level [0.0-1.0]
<< sound >>	
"sound-desc"	filename or sound description
"audible"	T/NIL
"loudness"	level [0.0-)
<< musical composition >>	
"midi-desc"	filename or voice (channel) description
"midi-note"	#(pitch velocity sustain)
<< physics >>	
"velocity"	#(x y z)
"mass"	level
"force"	#(x y z)