## Messaging Protocol

The Open Sound Control protocol uses a concept of messages and arguments.
The following table details the full messaging protocol employed between clients and the MAX/Msp sound server:

| **send message** | **arguments** | **return message** | **arguments** | **comments** |
|---|---|---|---|---|
| server | "ping" | client | "pong" | send ping <string> to initialize client to server communication |
| server | "path" <string> | | | a colon separated search path for sound related files |
| server | "gain" <float> | | | set the overall server gain |
| server | "reset" | | | clear the voice list and prepare to initialize communication |
| server | "kill" | | | instruct the server program to terminate |
| server | "listener" | client | "handle" <int> | create a listener and return a positive handle number (optional) |
| listener | <int> "position" <float> <float> <float> | | | set listener position relative to origin in OpenGL coordinates |
| listener | <int> "kill" | | | kill the listener with the given handle number |
| server | "sample" <string> [<int>] | client | "handle" <int> | create a sample file object and return handle [listener handle] |
| object | <int> "loop" <int> | | | set the looping status of the sample |
| object | <int> "play" | | | play the buffer from the current position |
| object | <int> "pause" | | | stop the buffer at the current position |
| object | <int> "stop" | | | stop and reset the buffer position |
| object | <int> "amplitude" | | | set the sound amplitude [0:1] |
| object | <int> "attenuation" <int> | | | set distance attenuation model* |
| object | <int> "referencedistance" <float> | | | distance at which sound has full amplitude (default 0.0) |
| object | <int> "falloffdistance" <float> | | | distance at which sound has zero amplitude |
| object | <int> "fallofffactor" <float> | | | divisor for factored attenuation models |
| object | <int> "mingain" <float> | | | minimum calculated amplitude (default 0.0) |
| object | <int> "maxgain" <float> | | | maximum calculated amplitude (default 1.0) |
| object | <int> "position" <float> <float> <float> | | | set sound position relative to listener in OpenGL coordinates |
| object | <int> "distance" <float> | | | set sound distance relative to listerner (optional)† |
| object | <int> "kill" | | | kill the sound object with the given handle number |
| | | client | "stop" <int> | inform the client the sample has ended (not looped) |
| server | "tone" [<int>] | client | "handle" <int> | create a tone object and return handle [listener handle] |
| object | "frequency" | | | set tone frequency |
| | | | | (also receives all messages between "play" and "kill" above) |
| server | "whitenoise" [<int>] | client | "handle" <int> | create a white noise object and return handle [listener handle] |
| | | | | (also receives all messages between "play" and "kill" above) |
| server | "recordfile" <string> [<int>] | client | "handle" <int> | create record-to-file object and return handle [listener handle]‡ |
| object | <int> "record" | | | begin recording line-in input to buffer |
| | | | | (also receives all messages between "pause" and "kill" above) |
| server | "amplitude" [<int>] | client | "handle" <int> | create an amplitude object to monitor line-in [listener handle]‡ |
| object | <int> getamplitude" | object | <int> "amplitude" <float> | request the current amplitude of the line-in |
| | | | | (also receives all messages between "play" and "kill" above) |
| server | "ratsource" [<int>] | client | "handle" <int> | create RAT source object and return handle [listener handle]± |
| object | <int> "source" <string> | | | set the source SSRC identifier |
| object | <int> "enable" <int> | | | set the 3D spatialization status of the source (o:off,1:on) |
| | | | | (also receives all messages between "play" and "kill" above) |

notes:
*attenuation models are 0:none,1:linear falloff, 2:inverse square law, 3:linear falloff by factor, 4:inverse square law by factor, 5:inverse square law clamped beyond falloff distance
†distances in the range [-1:0] reflect attenuated directionalization at full amplitude
‡recording amplitude is spatialy modulated by the attenuation model and relative distance to the listener
±this functionality is only supported by Bergen Server and not by the MAX/Msp server (see Space RAT)