

# t-u-b-e

gallery for radiophonic art installations and audio performances in Munich/Germany

presents the

free cross platform multichannel internet music solution

## tubePlug (Mac/Win)



### Welcome!

tubePlug runs as a VST/AudioUnit plug on MACOSX 10.3.9 or higher (universal Intel/PowerPC) and as a VST plug on Win9x, WinME, WinXP. You can use your favorite audio host (e.g. Cubase, Logic, Plogue Bidule, MAX/MSP, PD, etc.). It can connect several tubePlug users via the internet and allows high quality multichannel audio exchange between them. The tubePlug can be transformed in a receiver, sender or server.

tubePlug is freeware only for non commercial projects. Please take a look at the tubePlug license.

## **Tutorial starts here!**

This tutorial tries to help you using that simple however extremely variable system. Try it today and make your first network jam! It is free, it is cool, it is easy! Please download latest version of the software from [www.t-u-b-e.de](http://www.t-u-b-e.de). By the way: If you are interested in radiophonic and sound art have a look at our very artistic performance schedule.

## **Installation MAC**

Please be sure that you are using MACOSX 10.3.9 or higher. If not, please use free MACOSX update from Apple. Download tubeplug.dmg image file from [www.t-u-b-e.de](http://www.t-u-b-e.de). Doubleclick the file. Start the tubeplug installer. The installer will lead you through the installing process. Start your favorite audio unit host and load tubeplug into one audio unit or VST slot.

## **Installation PC**

Download tubeplug.zip file from [www.t-u-b-e.de](http://www.t-u-b-e.de). Unzip it. You'll find the VST plug tubeplug.dll. Just copy the file into your preferred VST plugins directory manually (mostly something like "c:\programs\steinberg\vstplugins" when working with Cubase VST). Please refer to the documentation of your VST host for details about the VST interface. Start your favorite VST host and load tubeplug into one VST slot.

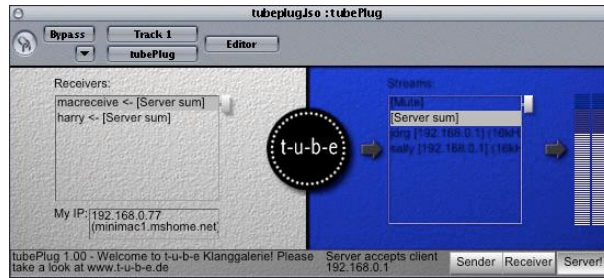
## **MAX/MSP or PD**

To use tubePlug under MAX/MSP or PD you have to install the VST~ object. Please refer to <http://www.parasitaere-kapazitaeten.net/ext>.

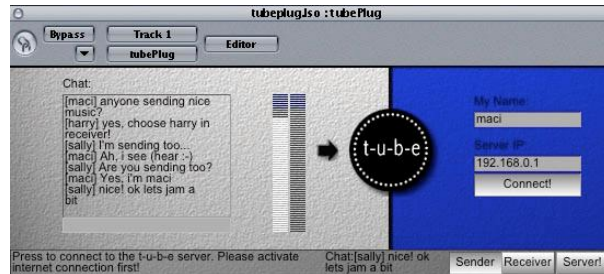
## **The tubePlug idea**

The tubeplug idea is simple but many music artists think about it as brilliant: The tubeplug has three faces: it can be a *receiver*, *sender* or *server*. To start a music network session one server should be provided by one member of the session. In t-u-b-e hosted „real” performances the server is provided by the venue.

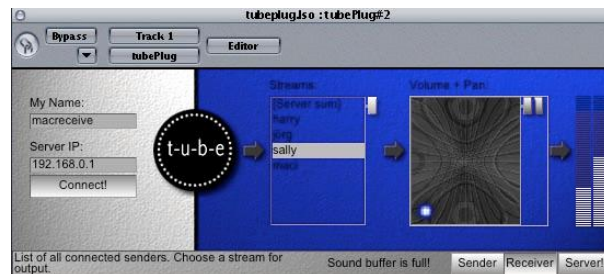
After the server is running, senders and receivers can log in the server. Senders can send stereo high quality audio streams and receivers can choose between the provided streams and receive them. Additionally the server provides an audio sum that can be chosen by the receiver too. This sum is the audio mix (pure same level addition) of all senders.



This is a running tubePlug server.  
Switch between the modes receiver, sender or server with the three buttons on the lower right side.



This is a running tubePlug sender.  
You can chat with other connected tubePlug users using the left boxes.



This is a running tubePlug receiver.  
Choose an available audio stream to route to other senders or use the "[Server sum]".

That's all! But imagine the possible and complex network setups you can explore with that idea! A simple network approach would be if each member just stream one signal to the server and receives the sum. Complex networks can be done on the fly by choosing other routings and use several senders and receivers for each member. Imagine the tubePlug as a virtual wire or virtual patchbay. Everything is allowed, everything should be explored. Let's start!

### Your first local test setup

Even tubePlug is designed for internet network sessions you can use it on your local computer. Just start your host and load two instances of tubeplug. Switch one to sender and one to server. tubePlug is an effect. That means that it expects audio processing on its input and outputs. Please be sure that you provide it by enabling the audio processing (e.g. press start in your host) and don't bypass the effect.



This is your first step to combine a local sender with a local server. The tubePlug effect is loaded into one logic audio channel, first the sender (because it need audio input) and then the server (because it can output the received streams).

Please connect to the local server by pressing connect (using “localhost” or “127.0.0.0” as Server IP) in the sender. After successfully connection (see messages in the message bar) just provide the sender with audio data (by starting the sequencer or choosing an live audio input for that track). You will see the sender appearing in the server stream list. If you choose a stream the server will output the received audio stream and you should hear it. Please keep in mind that also in this simple case the network structure of your computer is already used.

Take a look inside the plug directory. If you run a server the tubePlug will generate a file called tubepluglog.txt. In this file all server actions are logged.

### **Add a sender and receiver on an other computer**

Now you are ready for first network experiments. You can use one or more computers that might be interconnected through LAN or WLAN. You can also use a PC/MAC mixture setup because the audio stream format is platform independent.



This is a setup where a sender (first plug) and a receiver (second plug) are connected to an server that is hosted by another computer in a local network. Because other senders are also connected to that server the receiver can choose between several streams or choose the “[Server sum]”.

Your receiver enables you to process the received stream with that physical modeling Volume/Pan Field. Just pull up the little faders and “throw” the ball. Stereo/volume/panning effects will be heard. During first steps the ball should be stand still in the upper middle area of that field to be sure not to mute the received audio.

### About [server sum] & Add to sum Button

The server provides the system with an internal mixdown of all connected sender streams. If you choose in the receiver [server sum] in the list you will hear a equal level downmix of all streams. But there is one exception: If the sender disable the “Add to sum” button, this stream is not included in the servers downmix. That enables you to add own downmixes for the group (e.g. microphones that capture the local sound).

### Loosing connection - no problem

Network systems tends to fail! So don't expect a stable connection over the session. But don't panic: tubePlug provides you with a simple technique that allows you to forget this problem. On loosing the connection the senders and receivers retries automatic login after detecting that network problem. Moreover: The receiver knows about the last connection and on reconnection he looks for the right stream to connect in again. During the network failure itself the receiver switches to [Mute].

## Using the chat system

Each sender can send also chat text. Just type in what you have to say and all connected tubePlug users will see your comment. The chat is only fully available in sender mode but it can also be seen in the receivers message bar.

## About the networks capabilities & firewall & routers

Because of extremely high quality compression each stereo audio stream (sending or receiving) needs only a network bandwidth of 32kBit/s. That means it should be possible to receive and send one stereo stream with a single 64k ISDN line. But to prevent yourself for audio droppings (in that case "buffering..." message will appear in the message bar) you may combine two ISDN lines together to have 128kBit/s. DSL is even better. In that case you can use several sender and receiver channels together.

Please be sure that you have opened **TCP/IP port "7172"** in your firewall for outgoing connections and if you running a tubePlug server that should be accessed from external hosts please open that port also for incoming TCP/IP connections.

If you are using a (DSL) Router make sure that you enable port forwarding (e.g. by using the routers web interface) of this port to the computer that runs the tubePlug Server. In that case you have to publish the IP address of the router and not the IP address of the computer to your tubePlug peers.

Unless you have connect button down the tubePlug will try to connect the server periodical (around once a second) even if the line is broken. After successful reconnection the old setup is restored: receivers will reconnect to the audio stream that was choosen before.

## Join a real t-u-b-e network concert

If you have experimented with several tubePlug setups and provide your local WLAN or LAN with your music you are ready to join an announced real t-u-b-e concert or performance. Before such a concert starts one of the t-u-b-e curators (e.g. Ulrich or Jörg) will ask you to join. Don't try to join if you're not invited! The concert is announced in the t-u-b-e press publishing and is a "real" performance situation with audience, local musicians etc. If you like to join such an artistic schedule and if you have a sound artistic background, please contact us ([www.t-u-b-e.de](http://www.t-u-b-e.de)). But anyway: you are also free to use tubePlug in your "real" concert situations or venues by setup comparable configurations like the following:

In a real t-u-b-e performance tubePlug server will run on a local host of the venue. That means that we have to provide you with the IP of that server. Because IPs can change depending on the network provider t-u-b-e will provide you with a DynDNS Name (see [dyndns.org](http://dyndns.org) if you are interested how that works). You can type that name into the "Server IP" field inside your receiver or sender. To make things much more easier for the network musicians please choose an unique name for each of your streams by using the "My Name" input box on each running sender and receiver. All settings will be stored together with your host savings.



The "real" t-u-b-e venue in munich germany.  
See our program announcements on [www.t-u-b-e.de](http://www.t-u-b-e.de). (foto by Christoph Höfig)

In a real t-u-b-e setup each sender will be routed through our multichannel audio system to a separated loudspeaker pair. That means that your audio stream is spatialized by the local artist or sound engineer. And that leads to the main question of the tubePlug idea:

**Does each local output of a tubePlug network concert sounds the same?**

**The answer is: NO!**

The idea is that each member of that network concert is responsible for his own arrangement and sound. Besides tubePlug has a latency about 1 second for each stream. So if three musicians join such a network concert there will be three different sounds and concerts on each location. It's not a problem - it's the idea! (In case: free your mind from the idea of a total synchronized world ;-)

## **Have fun!**

That should be enough to say at this moment. tubePlug comes with a small help system that presents a help line for each interface element at the interfaces bottom.

Now it depends on you to explore the capabilities and the idea behind that system. If you look at it as useful or use the tubePlug in your concerts, please drop us a line. If you spot any bug or error, please feel free to let us know. You will help us a lot!

All the best

Dr. Jörg Stelkens

developer of tubePlug and curator of the t-u-b-e venue

**tubePlug is a project of the  
t-u-b-e gallery for radiophonic art installations and audio performances  
City of Munich - Cultural Office  
In collaboration with büro </stelkens> munich**

**tubePlug by büro </stelkens> and City of Munich - Cultural Office  
VST PlugIn, Cubase Technology by Steinberg Media Technologies GmbH  
AudioUnit, MACOS, Logic by Apple Computer, Inc.  
Windows by Microsoft Corporation**

**tubePlug is designed and developed by Dr. Jörg Stelkens 2006**

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