



Mobile Broadcasting For Community Radio Stations

*Created and published by
www.ontoitmedia.com under the Auspice
of Edge Radio 99.3fm, Hobart and the
support of the Community Broadcasting
Foundation's Online Development Grants*

ontoitmedia

 **edge radio 99.3^{FM}**
www.edgeradio.org.au sms:0427 334 336


Community Broadcasting Foundation Ltd

© Copyright 2009 ONTO IT MEDIA PTY. LTD.
ACN 133 498 067

TABLE OF CONTENTS

Section A: Overview

- 4 A1: What is mobile broadcasting?
- 5 A2: What you need to become a mobile broadcaster.
- 6 A3: How it works.

Section B: Setting Up For The First Time

- 7 B1: Checking computer's minimum requirements.
- 7 B2: Configuring computer firewalls.
- 9 B3: Internet connections and speeds.
- 10 B4: Computer sound cards.
- 11 B5: Install Virtual Private Network (VPN) software on computers.
- 13 B6: Install Broadwave audio streaming software on the OB computer.
- B7: Configure Broadwave for live streaming and recording.

Section C: Starting A Live Broadcast Session

- 19 C1: Connect the studio computer to the studio mixing panel.
- C2: Test the sound through Windows Media Player.
- C3: Connect computers through 'Log Me In' VPN.
- 20 C4: Connect your OB mixing panel to the OB computer.
- C5: Test Broadwave's sound input.
- 22 C6: Test Broadwave's recording function.
- 23 C7: Test Broadwave's streaming function.
- 25 C8: Stream audio to your studio computer.
- 26 C9: Upgrade stream settings to improve audio quality.

Section D: Quick Start Procedure For A Live Broadcast

- 29 D1: Setup tasks for the studio operator.
- D2: Setup tasks for the ob operator
- D3: Connect the studio computer to audio stream

Section E: OB Equipment and Setup

- 30 E1: Basic outside broadcast mix.
- 32 E2: Roving car broadcasting.

Appendix

- 34 Appendix 1: Checking computer minimum system requirements.
- 37 Appendix 2: Modems, internet connections and product road tests.
- 39 Appendix 3: Sound cards.
- 40 Appendix 4: Road tests of other audio streamers.

SECTION A: OVERVIEW

A1: WHAT IS MOBILE BROADCASTING?

Radio stations have performed 'Outside (away from the studio) Broadcasts' for decades using various telecommunications and antenna technology. Many of these resources are expensive, require a high level of technical expertise, and access to special telecommunications services.

New mobile broadcasting systems take a different approach. They harness Australia's wireless internet and 3G mobile telecommunications networks to transmit an Outside Broadcast (OB) to your station through the internet. This guide shows you how to create a broadcast connection with commonly used mobile phone and internet plans.

If you don't think you have the equipment for this think again! Many mobile phones have the capacity to act as modems these days, and a staff member or volunteer may be carrying one of these devices in their pocket! Alternatively you can buy 'pre-paid' wireless modems that run on 3G mobile phone networks for as little as \$120. You then buy the data on a casual basis, getting enough data for 3 hours of broadcasting for as little as \$30. You can use this manual to set up equipment and special software to turn the phone or modem into an outside broadcast transmitter!

Wherever possible the manual has been written in plain language – not technical jargon. Sometimes jargon is unavoidable, but the guides contain step-by-step instructions with lots of images, and appendixes that provide more detail. So you don't need to know what many of the terms mean, simply follow the steps and it can work for you anyway. The manual has been road tested by station volunteers (not technicians or computer-savvy people) from multiple community radio stations to make the manual as easy to follow as possible.

It will take a little bit of time to setup your equipment the first time around, but once you've configured everything it will get much easier. You can then jump straight to Section C to setup new broadcast sessions or use the 'Quick Start' guide (Section D) once you're really confident.

Before we start - a word about nasty 'Drop Outs'

There is ALWAYS a risk of technical issues disrupting a broadcast. Drop-outs (interruption in the audio broadcast) are always a risk with OBs – whether using traditional equipment, or new technology. There are many factors that can cause drop outs, but the main one is the quality of the telecommunications connection between your OB site and studio. You can reduce the likelihood of drop-outs by using an internet connection recommended in this manual but you still need to test them in your actual area. The key to a good live-stream broadcast is to plan ahead and assess the potential risk of drop-outs, and plan what you will do if they occur during your broadcast. Stringent tests at your OB site is a 'must' prior to committing to this method as your method of broadcasting. Ideally test your connections under similar conditions to the day of your event (same time of day, similar day etc).

The Broadwave software works hard to reduce drop-outs by creating a delay between the sound transmitted and the sound received. Broadwave calculates this 'buffer' automatically to get the most stable live stream between your computers based on current conditions. Delay times can be anywhere from three seconds to one minute. Broadwave's automatic buffer creates a more reliable, stable connection than some of the other streaming software we tested. So the live stream may not be as 'live' as a telephone call, but it is of a much higher sound quality.

A2: WHAT YOU NEED TO BECOME A MOBILE BROADCASTER

Remote-studio equipment: This is the equipment you use on the OB site for your announcers to talk into and usually play music from. It can be as simple or ambitious as your outside broadcast needs. It usually includes microphones, music players and speakers that are all connected to a mixing panel (herein called the 'OB panel'). The manual will refer to the OB panel as the point where all the sounds that you want to broadcast are collected and mixed.

Section E provides examples of useful OB equipment configurations, but is by no means comprehensive. We assume as a radio maker you know (or know others) who can help you put together microphones, music players and a OB panel to suit your needs.

2x Personal Computers (PCs): Most software used in this manual is available for PC only, not Macintosh (MAC) computers. Macs are not supported in this manual. Computers act as the transmitter (OB computer) and receiver (studio computer) for the broadcast. It's ideal if your OB computer is a laptop because they're easier to transport and setup on OB sites.

- Minimum requirements = Windows 98/2000/XP/2003/Vista/ or 2008.
- Processor speed = 1.7 Hz and 1GB (gigabyte) of RAM.

Section B1 outlines minimum requirements for PCs and appendix 1 shows how to work these out.

2x Internet connections: One internet connection is used at your studio on your studio computer: This is ideally a broadband or ADSL internet connection installed into your land line phone system, or running on a dedicated internet line. If you have a Wireless Area Network (WAN) modem do not connect to it wirelessly. Instead plug your studio computer straight into it with an Ethernet cable otherwise you increase the risk of the internet connection 'dropping out'. Ethernet cables are usually provided with a wireless modems for this purpose.

The other connection is used on your OB computer: You can use a broadband connection that's already installed at the OB site or go totally wireless and bring in your own 3G modem.

Section B3 explains the minimum requirements and appendix 2 explains different types of modems, internet connections and results of our road tests on some products. This will help you assess which type of modem(s) suit your needs. We recommend you ask station personnel if they already have these products, as it can save you the cost of purchasing a new service for your broadcasts.

2x Computer sound cards: Pretty much all computers have a sound card (sockets for plugging in headphones, microphones and/or a 'line level' input). The internal sound card on computers can be used for testing but they may not deliver good sound quality. Ideally you should buy two external sound cards (one for each computer) but as a minimum you must get at least one for the OB computer.

Section B4 explains how sound cards are used and appendix 3 has example products and prices.

Virtual Private Network (VPN) Software: The manual uses a free program called 'Log Me In' by Hamachi. It establishes a 'Virtual Private Network' connection on the internet between the OB computer and studio computer. This helps the OB audio travel between the two computers.

Section B5 explains how to download and setup the 'Log Me In' VPN software.

Windows Media Player (WMP) on both computers: This software comes free with PCs installed with the windows operating system. Your studio computer (receiver) will use WMP to stream the audio sent by the OB computer. The sound is then sent to your studio mixing panel via the computer sound card.

Streaming software for the OB Computer: This is the computer program used to send the audio from your OB computer (transmitter) to your studio computer (receiver). We road tested six different types of streaming software and chose to focus on 'Broadwave Streaming Software' by a company called NCH. We have no commercial affiliation with this software. It was selected because it rated high on the following criteria:

- Usability: Broadwave was the easiest to setup and simplest to use during OB events.
- Stability: The biggest risk with performing a live OB is the risk of drop-outs. Broadwave stayed connected under many different conditions, internet speeds, and locations including rural Tasmania, the Queensland coast, Melbourne and Sydney.
- Price: Broadwave can be run for free, but if you're happy with it you really should buy it to acknowledge the hard work of the software developers. It costs around \$115.

Sections B6 & B7 explain how to download and setup Broadwave. Appendix 4 lists the other audio streamers and provides road test results.

1x Stereo Audio Cable to connect your studio computer to your studio broadcast panel: You will feed the sound from studio computer's sound card to a channel on your on-air studio broadcast panel. You can then control the levels of the stream on your broadcast panel like any other audio device (eg Microphone, CD players etc). The type of cable you use depends on the output on the sound card and the channel input on your broadcast panel. You will need to find the right cable to suit your needs.

A3: HOW IT WORKS

For testing purposes this can all be performed in the studio or your station's office. Once you've successfully achieved this you can put your OB computer on a separate internet connection and/or test it from your OB site.

1. OB equipment is set up and audio is fed into the OB mixing panel,
2. The OB panel is connected to the OB computer via the sound card,
3. Both computers are connected to the internet and run 'Log Me In' VPN software so they are connected to each other across the internet. Broadwave is run on the OB computer to stream OB panel audio through the internet,
4. The studio computer receives the audio off the internet through Windows Media Player (WMP),
5. The sound output on the studio computer is connected to an input on the studio mixing panel to broadcast audio on air like any other channel on your studio panel.



1. OB mixing panel ... to...2. OB Computer...to...3.Internet as a continuous stream... to...4. Studio Computer...to...5... Studio mixer

SECTION B: SETTING UP YOUR EQUIPMENT FOR THE FIRST TIME

B1. CHECKING COMPUTER'S MINIMUM REQUIREMENTS

Both computers need:

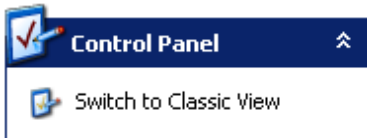
- Operating System = Windows **98/2000/XP/2003/Vista/ or 2008.**
- Processor Speed = 1.7 Hz.
- System Ram = 1gigabyte (GB).
- Windows Media Player = version 8 or above.

Appendix 1 shows how to check these settings in a step-by-step guide with illustrations.

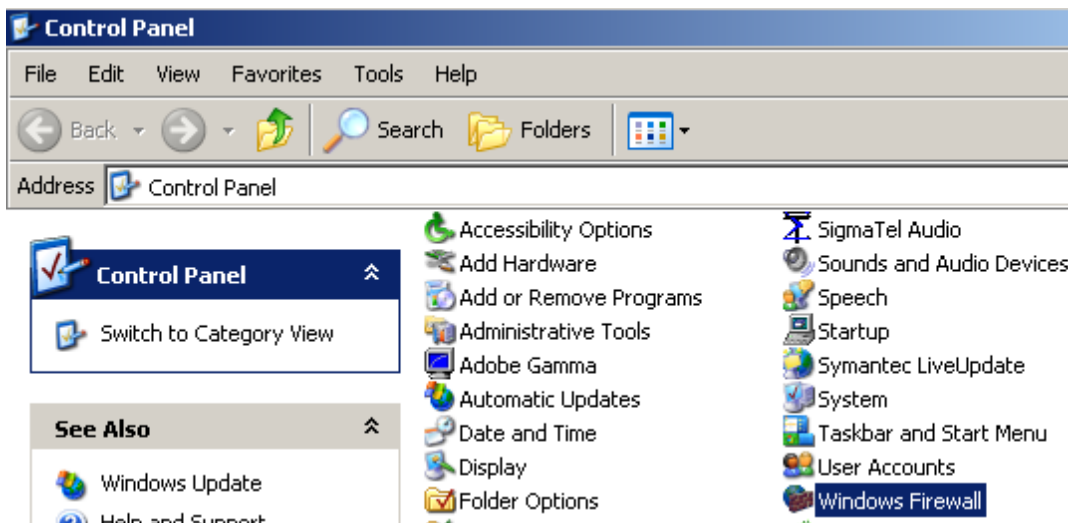
B2. CONFIGURE THE OB COMPUTER'S SECURITY FIREWALL TO TRANSMIT YOUR AUDIO

A firewall is used to protect your computer from sending and/or receiving dangerous information over the internet. You need to open up 'Port 88' on your OB computer's firewall so that Broadwave can transmit audio to the studio computer over the internet. This should not harm your computer (and may already be opened by other programs without you realising it anyway).

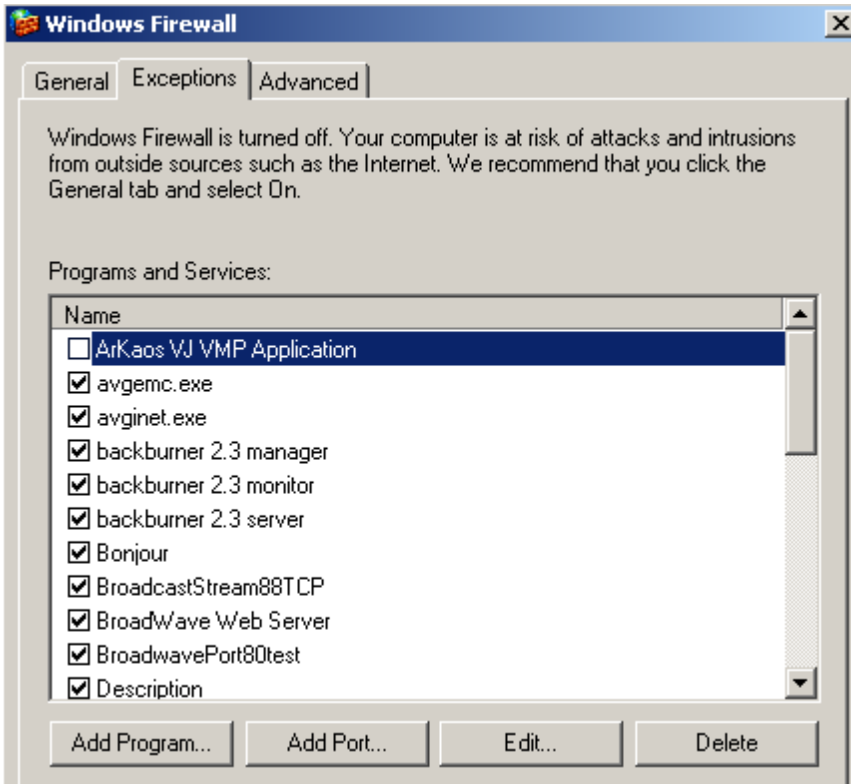
On your computer's desktop click the 'Start' button. Click on control panel. If control panel is in 'Category View' click on the 'Switch to Classic View' on top left hand side.



On the classic view click on 'Windows Firewall'



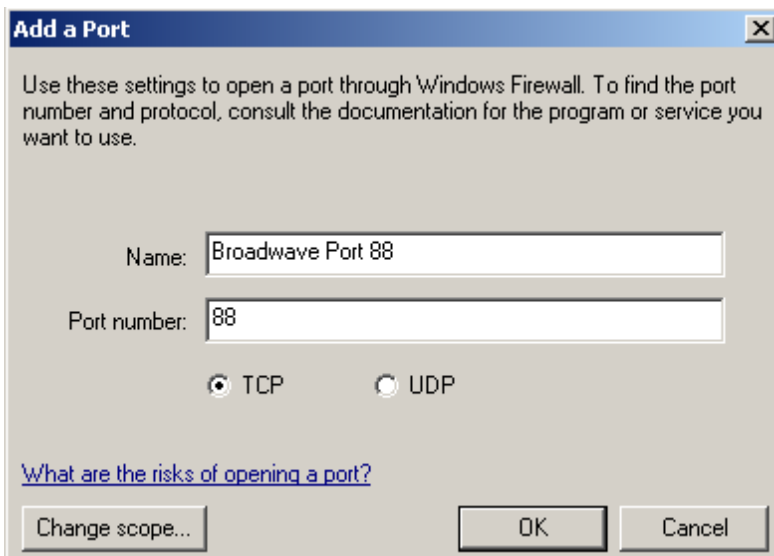
Click the 'Exceptions' tab on the 'Windows Firewall' box



Click the 'Add Port' button.

In the 'Name' box type 'Broadwave Port 88'. In the 'Number' box type '88'.

Check that the 'TCP' button is selected (not 'UDP').



Click 'OK' and the 'Add a Port' box will close.

Your port should now be listed in the 'Exceptions' box. Make sure it has a tick next to it. Click 'OK' on this Windows Firewall Box and it will close.

B3. CHECK INTERNET CONNECTIONS AND SPEEDS

You need a Broadband (or ADSL) internet connection for both the OB and studio computers. We recommend you take advantage of the 3G wireless and mobile networks that are now established in many parts of Australia. Use this type of connection on your OB computer so you don't have to rely on other people's internet connections at the OB site.

Broadcasting audio over the internet uses up data. Most internet accounts offer a certain amount of data each month for your internet connection. If you go over your data usage you may be charged more, or your internet connection may be slowed down (making it very difficult to stream good quality audio).

As a rule of thumb you will need a minimum of 60 mega bytes (mb) of data per continuous hour of stereo broadcasting for each computer's internet connection. This is if you are streaming at a sound quality setting (bit rate) of 128kb/ps (this is explained later).

This means that if you are streaming a 2 hour broadcast you will need at least 120mb of data for your OB computer's internet account AND 120mb of data for your studio computer's internet account. We recommend you have at least 30 minutes spare for 'testing time' (= an extra 30mb per account).

By today's standards this is not much data but check your account settings for how much data you have allocated to your account. Data is usually calculated as a monthly allocation.

Internet setup for the studio computer:

This is ideally a broadband internet connection installed into your phone system, or running on a dedicated internet line. If you have a Wireless Area Network (WAN) modem don't use the wireless setting. Instead plug your studio computer straight into the modem with an Ethernet cable (a standard internet and networking cable – it's often bright blue with a clear square end). This will make a more reliable connection than a wireless one, reducing the risk of audio drop-outs.

This 'receiving' computer needs an internet connection with a 'download speed' of at least 256kbps (Kilo bits per second).

To identify the speed of your connection look at the figure displayed on your internet contract. It will have a similar format to the examples below:

Download speed / upload speed:

256 / 128 kbps, or
1500 / 256 kbps, or
1.5mbps / 256 kbps

The first figure is your download speed; the second figure is your upload speed.

If the first figure is mega bits per second (mbps) you're in luck because 'mega' is a lot faster than 'kilo'. If you have trouble identifying your internet speed simply contact your service provider and ask them what the minimum download/upload speed is of your connection.

Internet setup for the OB computer:

For testing purposes use you can use your station's internal internet connection for your OB computer. Once you've successfully streamed from the OB to station computer, try your OB computer on (A) a third party's internet connection at the OB site or (B) anywhere you like (including the station) using a wireless or 3G modem.

(A) Using a third party broadband connection at your OB site: If the OB site has a nearby office with internet it is worth checking to see if you can run an Ethernet cable from their modem to your OB computer. However, doing this makes you dependent on the third party's connection. If you do this it is wise to get them to stop other computers using this internet connection. Other connections can affect the OB computer's access to bandwidth (speed and data access), and could interrupt your connection.

(B) Using your own wireless/mobile modems for your OB Computer: This is where the real broadcast magic happens, as you can take your broadcast anywhere you get a stable 3G telephone connection.

This 'transmitting' computer needs an internet connection with an 'upload speed' of at least 256kbps.

This is the second figure displayed on your internet speed information.

Eg 1500 / **256 kbps**

It is vital that the upload speed is this high so your computer can transmit your audio 'up' to the internet, for your OB computer to take it 'down' from the internet. Larger upload speeds create a more reliable stream, and allow you to increase the quality of the audio you're transmitting.

See Appendix 2 for a breakdown of Mobile & Wireless internet modems, and findings from our Road Tests.

B4. COMPUTER SOUND CARDS

Most PCs come with a simple inbuilt 'internal' sound card that allows you to feed audio into your computer and listen back. Internal sound cards are fine for testing purposes if you'd prefer to test the manual before buying extra equipment. However if you want to broadcast good quality audio we strongly recommend you get at least one 'external' sound card. See appendix 3 for some external sound cards to suit your budget. Follow the manual that comes with your sound card to set it up for your computer.

Sound card for your OB computer (transmitter):

As a minimum most computers have an internal 'line' and/or 'mic' socket, and a 'headphone' socket. Use a 'line in' (preferred) or 'mic in' socket to feed audio into the computer from your OB mixing panel. Use the sound card's headphone socket to monitor the audio. Be warned that if you're using an internal sound card the quality may not be very good.

If you can only afford one sound card, use it on your OB computer.

Sound cards for your studio computer (receiver):

This computer receives and plays back audio so it needs a good quality 'headphone' or 'line out' socket. Use either of these to plug into your studio mixing console. You won't need to use the microphone or line inputs on this sound card.

B5. INSTALL 'LOG ME IN' VIRTUAL PRIVATE NETWORK SOFTWARE ON BOTH MACHINES

This free program helps establish a clear connection between your OB computer and studio computer (called a 'Virtual Network') so you can transfer audio. It will safely open security blocks (including firewalls) that may prevent your audio stream from getting between the two computers. It is easier to install this at the beginning as it reduces potential problems later.

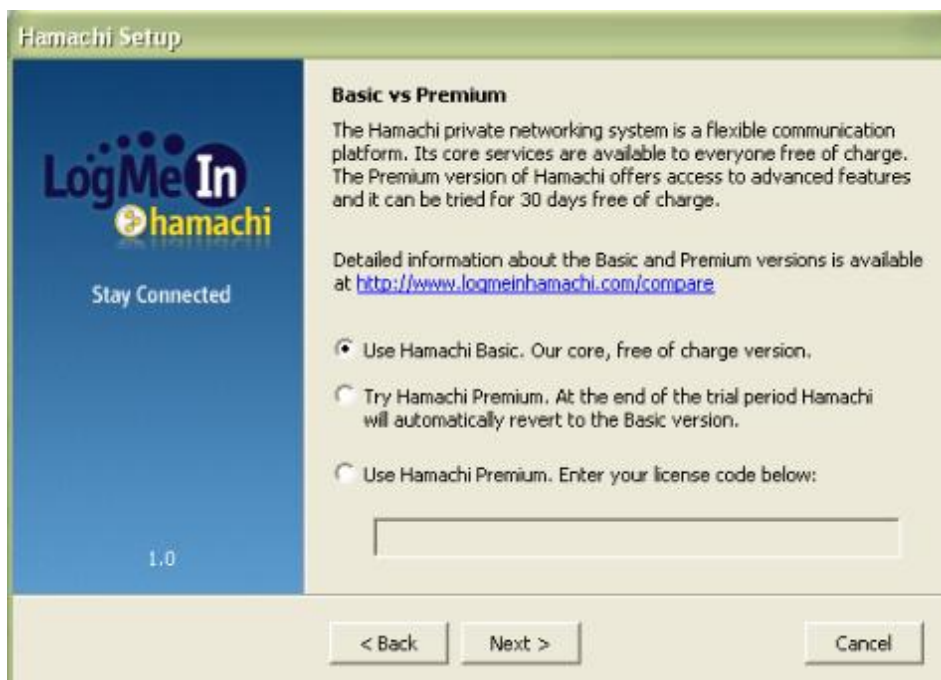
For this step your OB computer doesn't need to be at the OB site. We recommend you put your OB computer in the studio and connect it to the internet so you can control both computers at the same time.

Install on your studio computer first. Go to www.LogMeIn.com and Download Hamachi 'Log Me In' Software.

'Log Me In' has great automatic configuration steps when you install the program. Select the following options during the configuration process:

"Security" page – do not tick the box to 'disable vulnerable Windows services over Hamachi': If you tick this option you will block some of the features required for mobile broadcasting. You can trust that doing this will not harm your system because you will only be accessing your own computers through the program.

"Basic vs Premium" page – select 'Use Hamachi Basic...."



When prompted click 'Install'. The program will take a few minutes to install. When 'Next' button appears click it. Click 'Finish' to launch the program.

Follow the configuration prompts - give your computer a name etc.

Do not choose the option to 'block vulnerable Microsoft Windows services'.

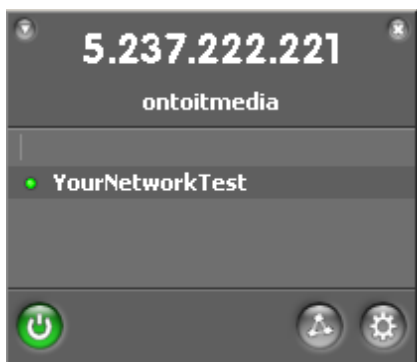
If asked to 'allow access to Windows services' choose 'Yes'.

When you get to the option to 'create a new network' choose 'Yes'. Here is where you create a Virtual network that your OB and studio computers can use to transfer broadcast audio.

Type in a network name and password and write this down – you'll need these later. Click 'Create'.



'Log Me In' will open and your computer name and network will be listed.



Now install 'Log Me In' to your OB computer:

Go to www.LogMeIn.com and download Hamachi 'Log Me In' software.

Follow all the previous configurations up until you're given the option to 'Create a Network' or 'Join Existing Network'. This time choose 'Join Existing Network'.

Type in the network name and password that you created on 'Log me in' on the studio computer. Click the 'Join' button.

When the computers are connected you will see the IP address (a series of numbers) and name of the studio computer appear on the OB computer's Log Me In screen. A green light indicates the connection is working. The example below shows a network named 'MyPrivateNetwork' and a

connection to a studio computer called 'POWERPLANT'.



Keep 'Log Me In' running on both computers for the following steps.

B6. DOWNLOAD AND INSTALL BROADWAVE AUDIO STREAMING SOFTWARE TO THE OB COMPUTER

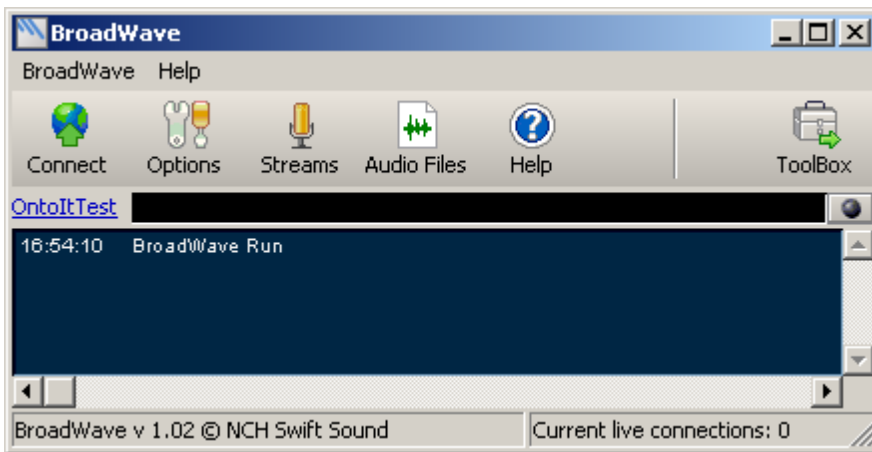
You only need to run Broadwave on your OB computer. Go to <http://www.nch.com.au>. Choose 'Broadwave' from the product list and download it.

When the file is downloaded double click on it to install.

You will be asked to accept terms and conditions – choose 'Yes'.

A 'Select Related Programs' box will open. This lists other NCH products that you can download. Uncheck all of the products on the list and then press "Finish".

The Broadwave program should instantly appear.



B7. CONFIGURE BROADWAVE FOR LIVE STREAMING AND RECORDING

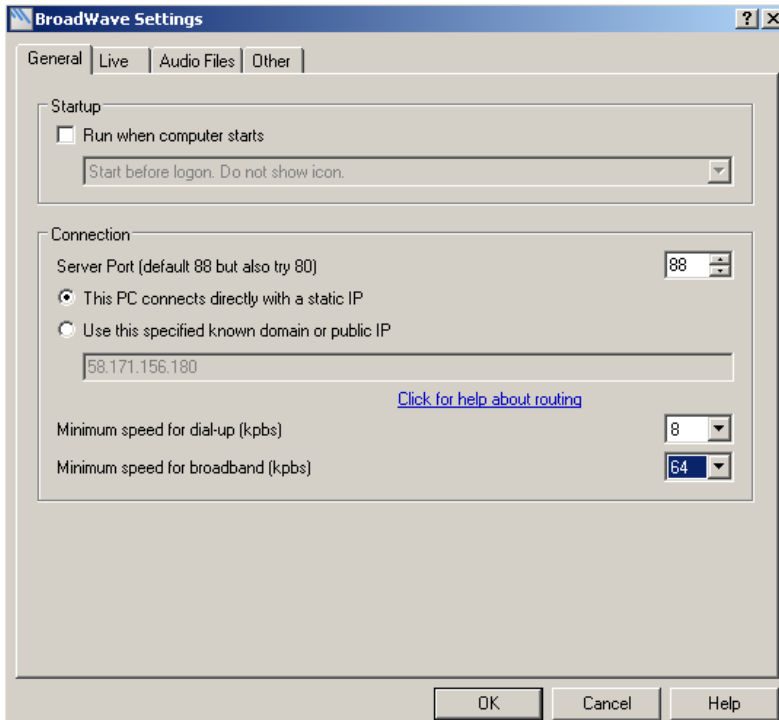
Click the 'Options' button.

The 'General Tab' will appear. Uncheck the box stating 'Run When Computer Starts' so the program only starts on the computer when you want it to.

Under 'Connections' it shows the 'Server Port'. Make sure this is entered as '88' (default setting)

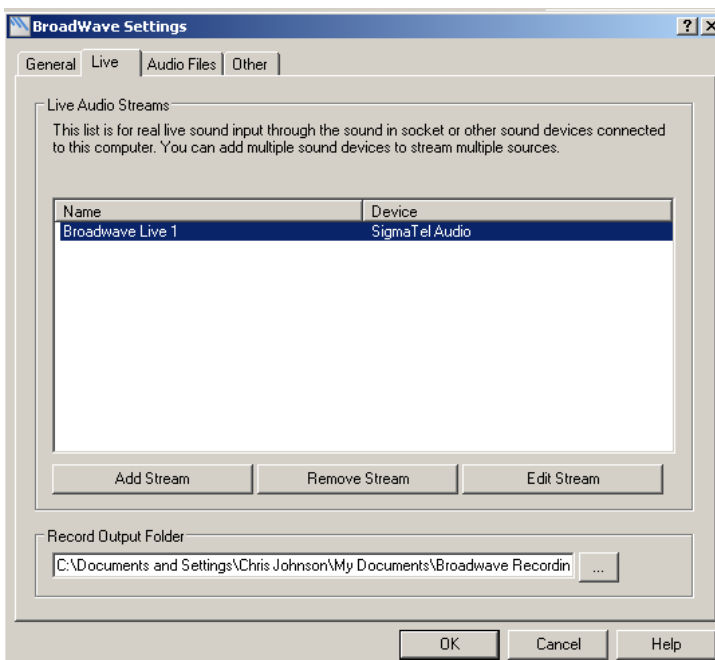
Leave 'Minimum speed for dial-up' as 8: you won't need this function.

Change 'Minimum speed for broadband [kpbs]' to 64: This defines the audio quality of your stream. Higher figures increase the sound quality, but require faster and more stable internet connections. During initial testing put the speed at '64'.



Click the 'Live' tab

It will display a live audio stream called 'Broadwave live 1'.

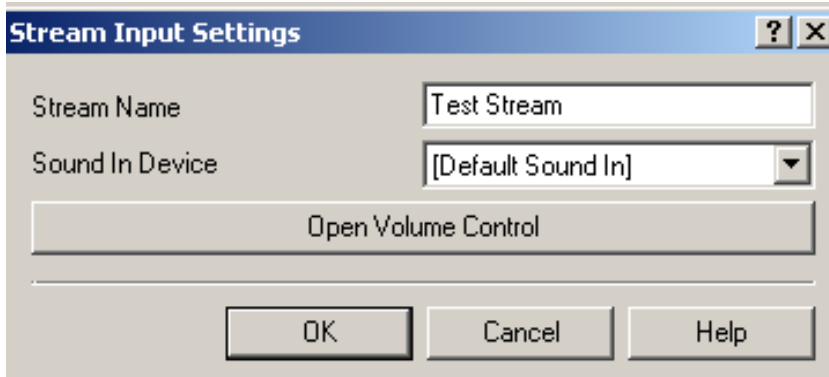


Click on this and then click 'Edit Stream'.

The 'Stream Input Settings' box opens. Here is where you select the sound card that will be sending the sound into the computer.

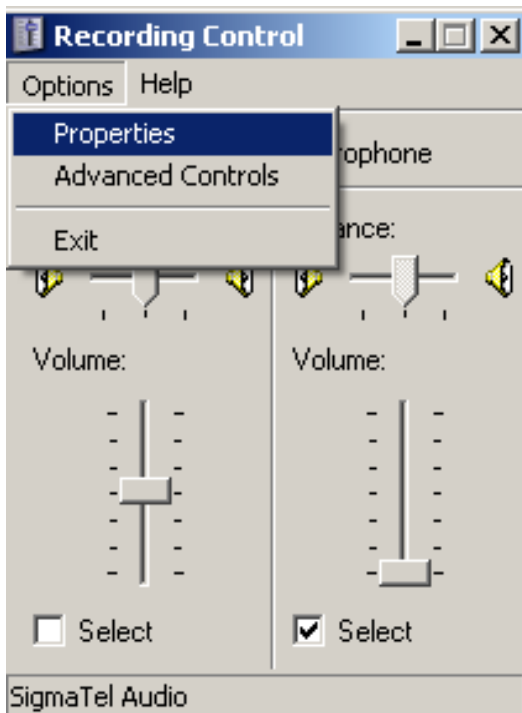
You can change the 'Stream Name' to whatever suits you (this guide uses 'Test Stream')

If you are using your internal sound card it will probably automatically appear in the 'Sound In Device' setting. If you are using an external sound card it should appear on the dropdown menu. Refer to your external sound card's manual for its settings.



Click on the 'Open Volume Control' button. If you're using your default or internal sound card this will open the Windows 'Recording Control' box. If using an external sound card the mixer interface for the sound card may open. The following steps display an internal windows sound card mixer.

On the menu bar click 'Options / Properties'.

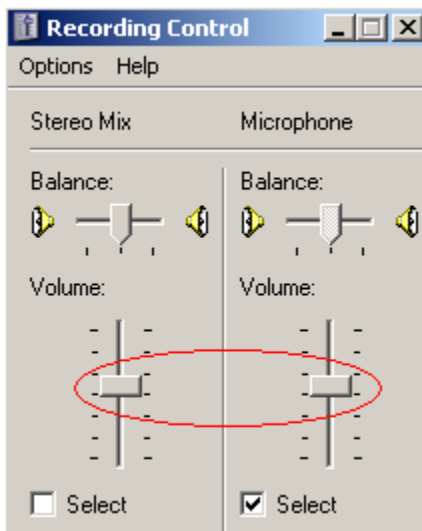


Make sure the 'Adjust Volume For' button is set to 'Recording'. Make sure the 'Stereo Mix', 'Microphone' (and if listed the 'Line') boxes are ticked. Click 'OK' button



Make sure the 'Microphone' and 'Stereo mix' volumes are turned up to at least half way (this may need adjusting later).

Tick the 'Select' box for the input that you are using to send audio into ('mic' is ticked below).



Minimise the 'Recording Control' box because you may need it later (click “_” not “X” button on top right of box).

On the 'Stream Input Settings' box click 'OK'.

This returns you to the 'Live' tab of the 'Broadwave Settings Box'.

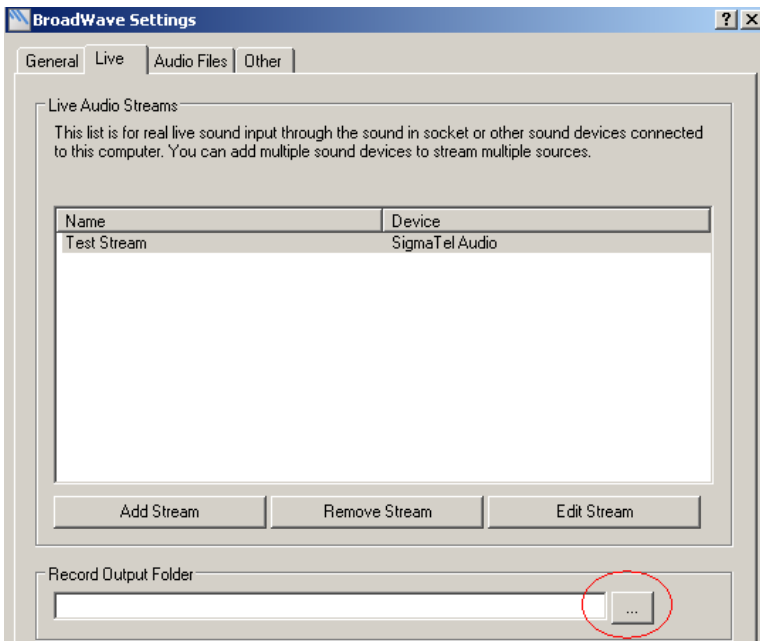
Broadwave can also record the audio that it streams:

We will use this for testing purposes and you can also use this to record high quality back-ups of your broadcast. Recordings are automatically made at CD quality (16bit 44.1 kHz stereo wav file). This takes up a lot of memory on your computer (10 megabytes per minute). This is set independently of the 'broadcast quality' setting the you use on Broadwave to determine the sound

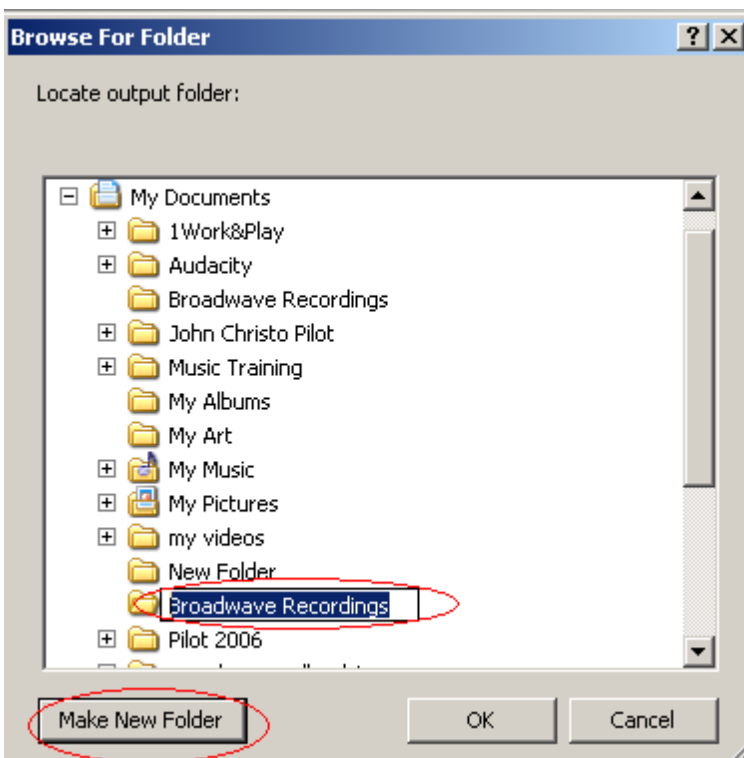
of your stream, and unlike the stream the recording quality setting can not be changed.

Specify where to store recorded audio files on your computer:

On the 'Live' tab click the grey browse button to the right of the 'Record Output Folder' section.

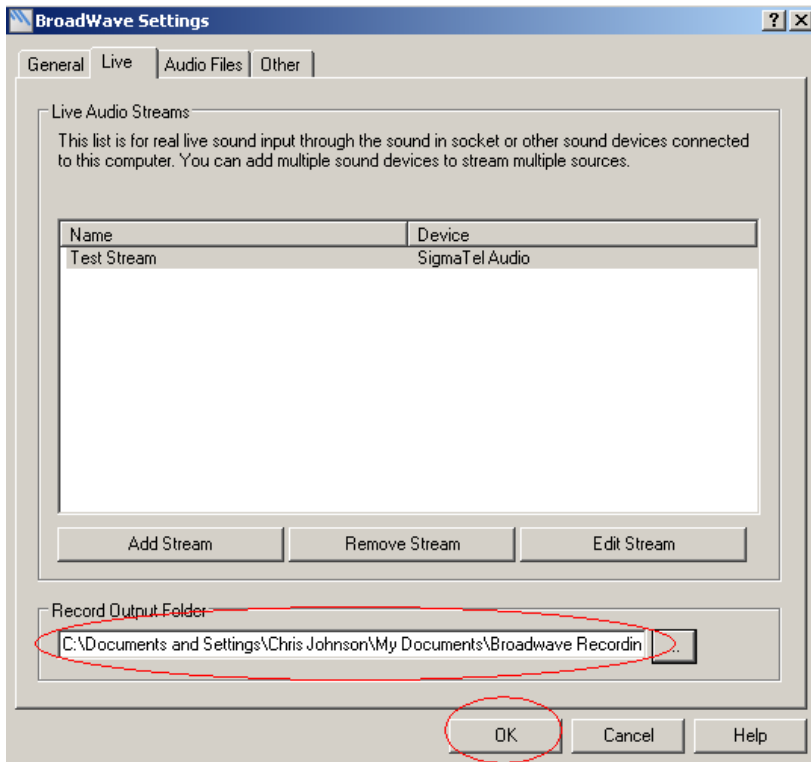


A 'Browse for Folder' window will appear. You can save these files directly to an existing folder, or create and name a new folder that will store your recordings. Recommended approach is to click on 'My Documents' in this list then click the 'Make New Folder' button. Name the folder 'Broadwave Recordings' then click 'OK'.



The pathway to the folder you've created will appear under the 'Record Output Folder' section of

the 'Live' tab.



On the 'Live' tab click 'OK'. This returns you to the main Broadwave interface.

SECTION C: STARTING A LIVE BROADCAST SESSION

Now that the initial setup of software is complete we can connect things and run a test broadcast. We'll setup the on-air studio first. Provided you keep your settings from Section B you should be able to follow this procedure to quickly setup a new broadcast session.

C1. CONNECT THE STUDIO COMPUTER TO THE STUDIO MIXING PANEL

Run an audio cable from the computer's sound card line out (preferred) or headphone socket to a channel on your mixing panel. The type of cable you use depend on what type of connections your sound card and mixing panel have.

C2. TEST THE SOUND THROUGH WINDOWS MEDIA PLAYER (WMP)

If you have an audio file on your computer on WMP go file/open and select the file. If you don't have an audio file on the computer play a CD on the computer.

On the studio mixing pan Turn 'Cue' on the channel that is receiving the computer's audio (the same way that you would 'Cue' a CD player or turntable on your panel).

Fade up the channel. If sound is distorted turn down the volume on WMP until it sounds cleaner.

When you're happy that audio is getting from your studio computer to the panel stop WMP – but keep it open.

Now we know that if we can get the stream into the studio computer, it will play out through the studio panel.

C3. CONNECT COMPUTERS THROUGH LOG ME IN VPN

Ensure both the studio and OB computers are connected to the internet.

Launch the Hamachi 'Log me In' program on the studio computer. Press the power button (bottom left). It will go green.

Launch the Hamachi 'Log me In' program on the OB computer. Press the power button (bottom left). It will go green.



If the name of the studio computer appears on the 'Log Me In' on the OB computer then you know you're connected. This will happen automatically whenever your turn on the program in both computers.

Now we know that our computers have a clear connection to transmit/receive the stream.

C4. CONNECT YOUR OB MIXING PANEL TO THE OB COMPUTER

Perform the following tasks on your OB computer so you are confident that it can transmit your broadcast to the studio computer. For testing purposes it's easier to just run music into your OB mixing panel.

Plug a CD or MP3 player into the OB mixing panel.

Make sure the sound is coming through clearly on the panel – adjust the fader and listen through headphone out on the OB panel. When happy turn down the master volume on the desk.

Now we know the sound is getting into the OB mixing panel

Plug your OB panel into the 'line in' (preferred) or 'mic in' on your OB computer.

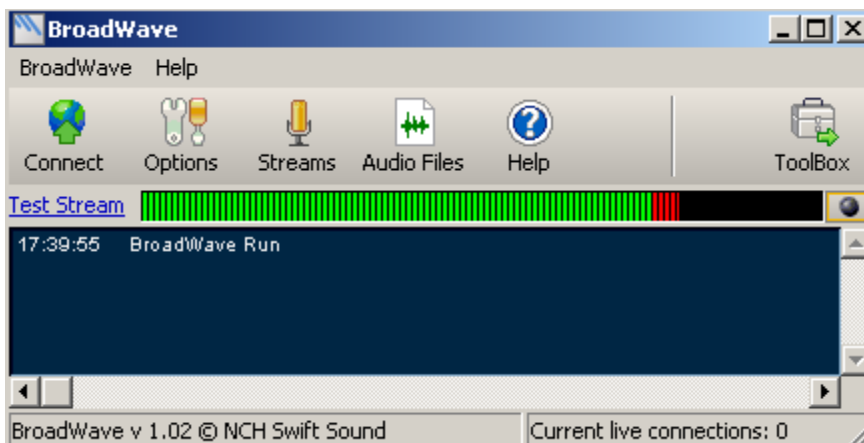
Plug some headphones into your OB computer's sound card.

Ensure the input channel you've used on your sound card is turned on: In the below example we've selected the 'Line In' as the input source because we've plugged the OB panel into this channel on the OB computer's sound card. Your sound card settings may look different.

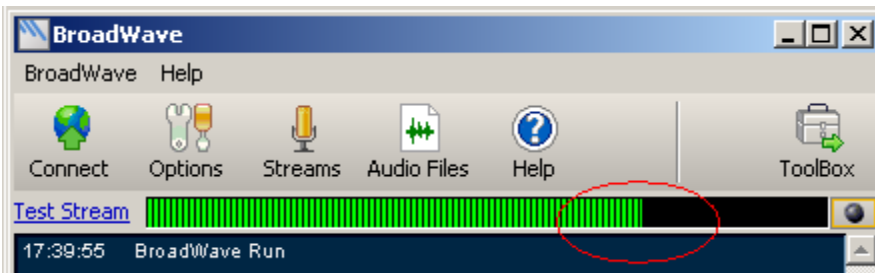
C5. TEST BROADWAVE'S SOUND INPUT

Fade up the master fader on your OB panel so music is feeding into your OB computer.

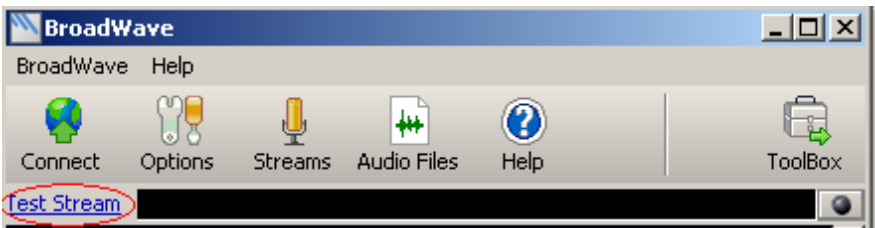
Note: Depending on your sound card settings you might not hear the audio through headphones plugged into your sound card. This does not necessarily mean that the computer is not receiving the sound. If you see some green bars appearing on Broadwave's audio meter it means the sound is being received.



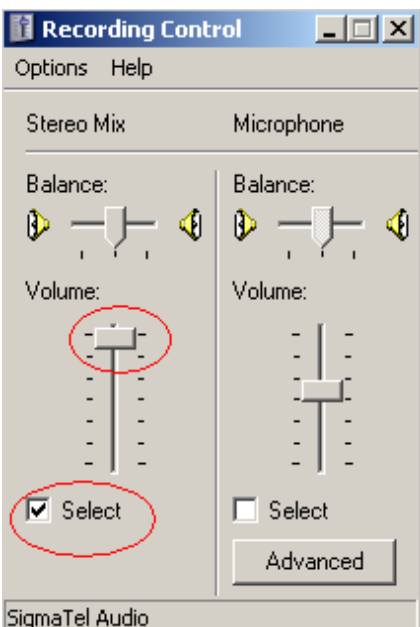
Adjust the volume control on the mixing panel so that the audio signal is just below where the red bars appear.



If you don't see any green bars turn up the volume on the mixing panel. Access the sound card's volume by clicking the name of your stream on Broadwave. Click the 'Open Volume Control' button.



On the sound card's volume control turn up the master input volume (this will look different on different sound cards).

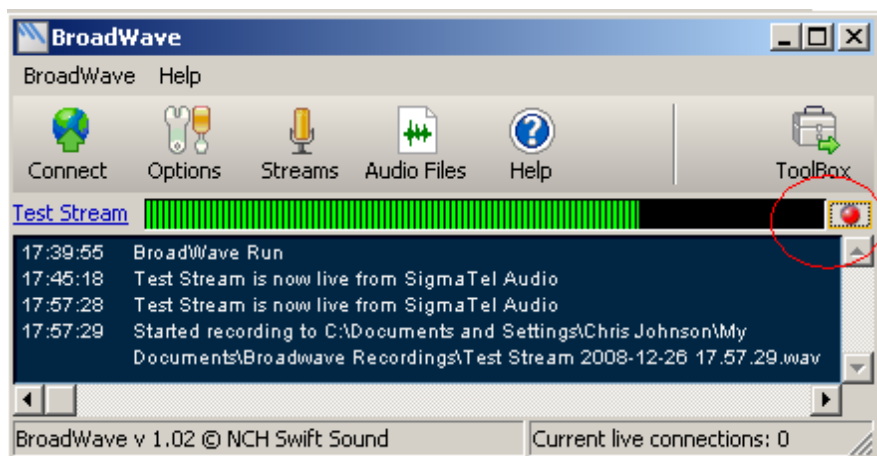


If you're seeing green bars we know that the sound is getting from the OB mixing panel into Broadwave.

If you're still not seeing any green bars proceed to the next step to see if it repairs the problem.

C6. TEST BROADWAVE'S RECORDING FUNCTION

Click the record button to the right of the sound monitor. The button will turn red and it will start recording an audio file to the folder specified in earlier configuration steps.



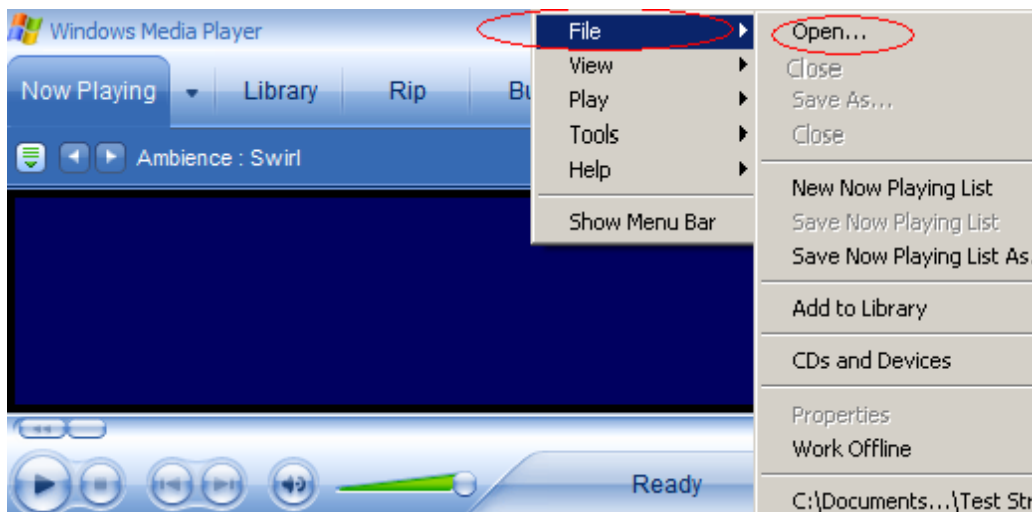
Record about 10 seconds of sound then click the record button again to stop recording (the button will go from red to grey).

Click the record button a third time to record another 5 seconds or so. Click the button a fourth time to stop this recording. We have recorded this second file to 'release' the first recording from the Broadwave program. This means we can play back the first file to check the quality.

Fade down your mixing panel so no sound is entering the OB computer. The green bars should disappear from Broadwave.

Open Windows Media Player (WMP): Click 'Start Button' and go to 'All Programs/Accessories/Entertainment/ Windows Media Player'.

On WMP go file/open: Note that if 'File' does not appear as a menu option on your WMP put your cursor over the top blue title bar and press your right mouse button. A pop up box with 'File' should appear. Choose 'Open URL' in this box.



Go to the folder that you selected to store your recording – if you followed the guide it should be

'My Documents/Broadwave Recordings'. The recordings will be named as: your stream name / date / start time.

Double click on the first recording listed. It will open and play in WMP.

Have a listen back and make sure the sound isn't distorted.

Note: Your broadcast won't sound as good as this – because you configured Broadwave to use a lower quality setting for test streaming.

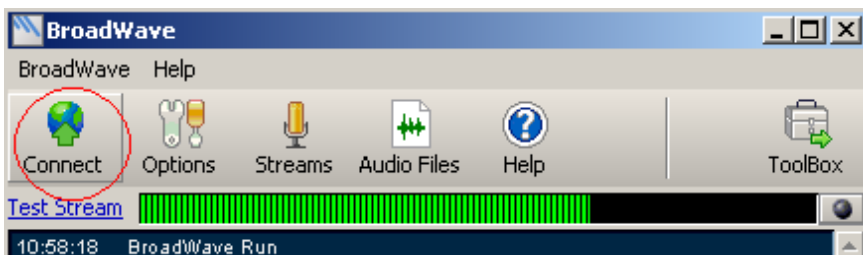
Note: The second audio file (the 5 second one) may appear in the folder but it may not play for you. This is because sometimes Broadwave does not give you access to a recording until it is activated to record the next file. Don't worry though, as soon as you click record on Broadwave to create the next audio file, it will release the previously recorded file for playback.

Now we know that we can record a backup file of the broadcast.

C7. TEST BROADWAVE'S STREAMING FUNCTION:

Fade up the volume on your OB panel so fresh audio is sent into Broadwave. You need to see the green bars on the Broadwave meter again.

On Broadwave click the 'Connect' button



This launches an internet page containing a list of internet addresses. All the addresses start with "<http://>".

Right click on the first 'Broadband stream' address listed and choose 'copy shortcut'

Test Stream

Broadband Stream

<http://5.237.222.221:88/broadwave.aspx?src=1&kbps=64>

Dialup Stream

<http://5.237.222.221:88/broadwave.aspx?src=1&kbps=8>

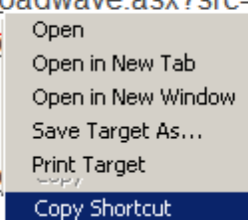
Broadwave Playlist

Broadband Stream

<http://5.237.222.221:88/broadwave.aspx?src=1&kbps=64>

Dialup Stream

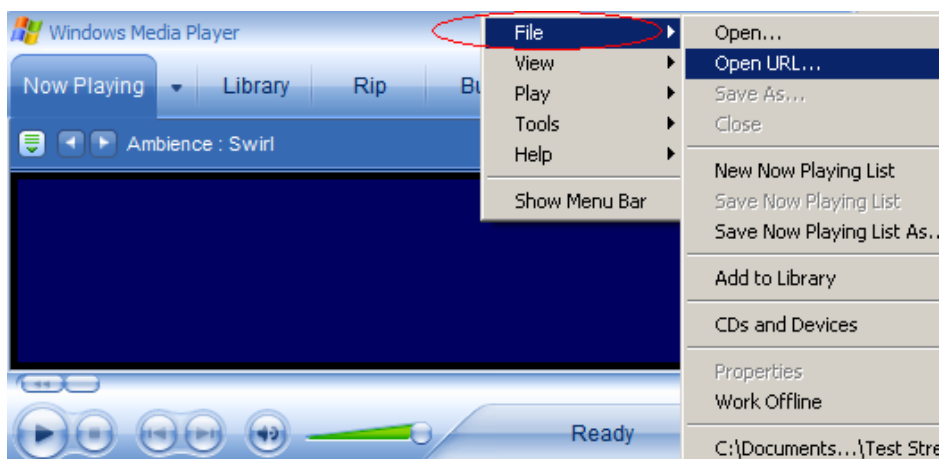
<http://5.237.222.221:88/broadwave.aspx?src=1&kbps=8>



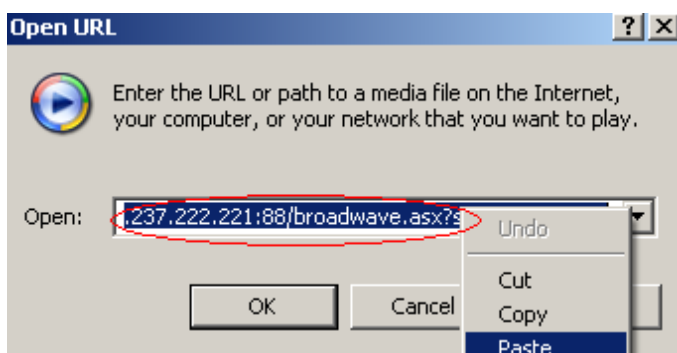
On the OB computer Open WMP:

On the WMP menu click 'File/Open URL'

Note: If 'File' does not appear as a menu option on your WMP right mouse click on the top blue title bar. A pop up box with 'File' should appear. Choose 'Open URL' in this box.



In the 'Open URL' Box right mouse click in the 'Open:' panel and choose 'Paste'.



The URL you copied from the Broadwave internet page should appear in the 'Open' box. Click 'OK'.

The following text should appear on the bottom of WMP: 'Connecting...' then 'Buffering', then 'Playing'. When it's successfully playing you should receive at least one of these indicators:

- The sound should start playing through your computer,
- The word 'Playing' should appear on the bottom of WMP,
- If WMP has a visual skin running you should see some animation/movement.

Press stop on WMP when you're satisfied that the audio is streaming.

Note: the audio quality will not be very good because you selected a low broadband speed (64) earlier. We will upgrade this in later steps.

Note: Because we are 'transmitting' and 'receiving' the stream on the same computer the sound may start to 'loop' or feedback on the OB computer. Basically the music will start repeating over itself. That's OK for testing purposes and it won't occur when streaming to your studio computer. Once WMP is connected and 'Playing' the stream I recommend you fade down the OB panel. Sound will be 'captured' in the OB computer and may continue to loop itself until you stop WMP.

Now we know that Broadwave is working.

C8. STREAM AUDIO TO YOUR STUDIO COMPUTER:

Finally we're at the fun part!

On the OB computer follow previous steps to get Broadwave streaming, specifically:

- Play test music from OB panel into OB computer
- Check that green meter bars are bouncing on Broadwave on the OB computer
- On Broadwave click 'Connect'.
- This launches the internet page containing a list of internet addresses. The address you will want to use is the first one listed and it's called 'Broadband Stream'. It looks similar to this:

Test Stream

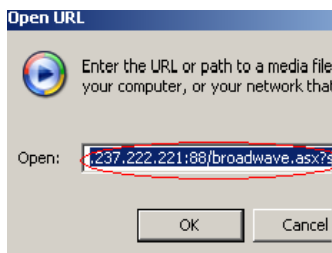
Broadband Stream

<http://5.237.222.221:88/broadwave.asx?src=1&kbps=64>

But this time Open WMP on the Studio Computer

- On WMP click File/Open URL.

In the 'Open URL' box type the Broadband internet address that was displayed on the OB computers internet page two steps back:

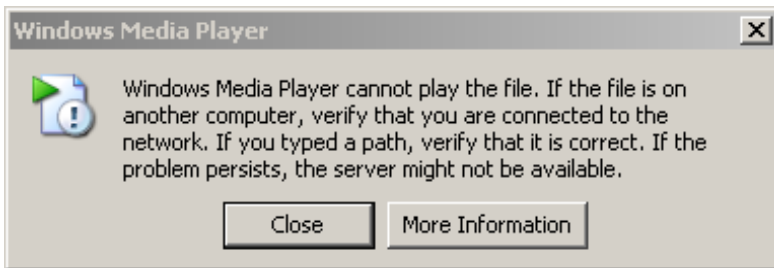


On the Open URL box click 'OK'.

The following text should appear on the bottom of WMP: 'Connecting...' then 'Buffering', then 'Playing'. When it's successfully playing you should receive at least one of these indicators:

- The sound should start playing through your computer,
- The word 'Playing' should appear on the bottom of WMP,
- If WMP has a visual skin running you should see some animation/movement.

If the following error message appears you need to check that your studio computer is still connected to the internet and that 'Log Me In' is running and connected between the two computers.



- Turn the studio panel fader connected to the studio computer on to 'Cue' and fade up.

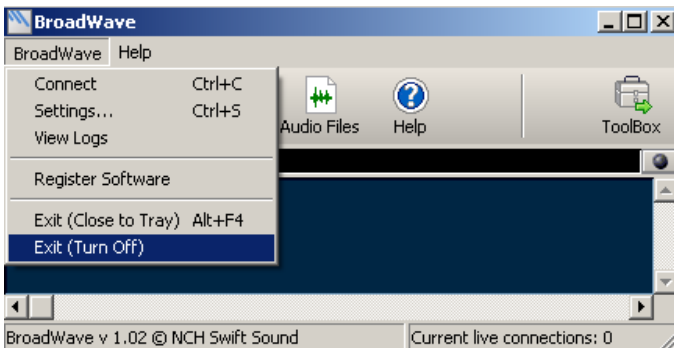
If you can hear the audio congratulations – you've got yourself an OB kit!

To stop the stream playing on the studio computer press 'Stop' on WMP:

This stops 'pulling' audio through the streaming software so you won't be using up internet data.

IMPORTANT!

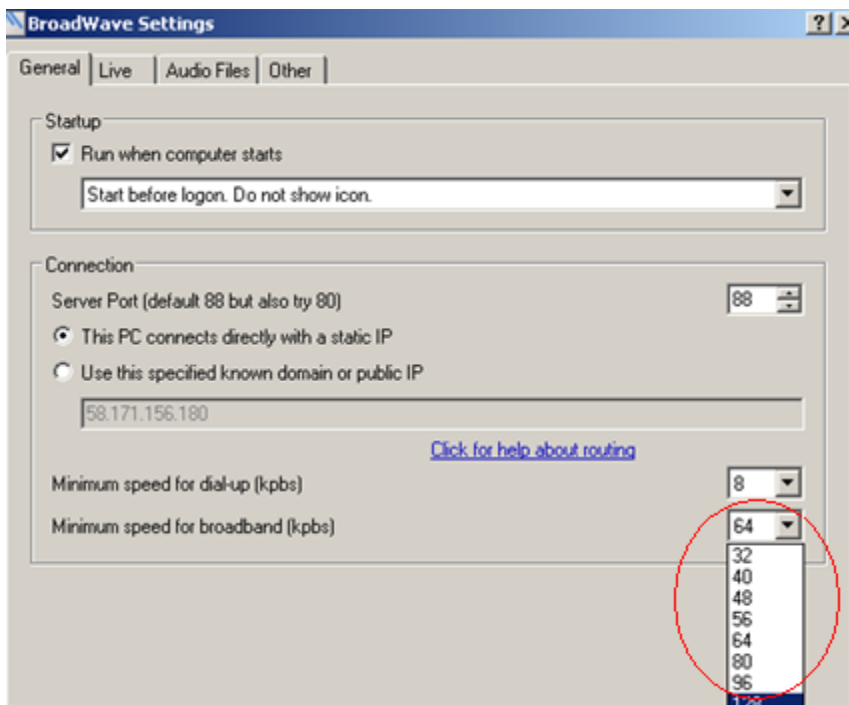
To stop Broadwave from transmitting a stream: Click 'Broadwave' on the menu list and choose File/Exit (Turn Off). Note that the "X" on the top right of Broadwave only closes the program to the system tray – it doesn't stop the stream or completely shut the program down.



C9. UPGRADE STREAM SETTINGS TO IMPROVE AUDIO QUALITY:

As you can hear the 64kbps speed setting does not transmit very good quality audio. Try different connection speeds to see which one is the most stable for you. But be warned - if you go too high your streaming connection might drop out.

On Broadwave click the 'Options' button. The 'General Tab' will appear.



Change the 'Minimum speed for broadband [kpbs]' figure to suit your needs and Click 'OK'.

Refer to the table below to experiment with speeds that suit you.

Speed [kpbs]	Sounds...	Good for...	Data used on the OB computer internet connection per hour	Min upload speed on OB computer [kpbs]	Min download speed on studio computer [kpbs]
Less than 64	Very poor	Dial up connections and talk content requiring very low quality.	Less than 30 mb	96	96
64	Slightly distorted	Initial testing only. Select this for your very first test stream. Upgrade to higher levels once you've proven it streams OK.	30mb	96	96
96	Clear but not as good as FM quality	Voice broadcasting. Will not reproduce music very well.	45mb	192	128
128	Close to FM quality	Acceptable music and quality voice without stressing your internet connection.	60mb	256	256
192	Close to CD quality	Quality music broadcast that gives clear bass and treble. Ideal setting for live music broadcasts.	90mb	256	256
256	As good as a CD	Great sounding broadcast.	120mb	511	511

Back on the Broadwave interface click 'Connect': This will launch a new webpage displaying the new URL that you need to type into WMP on your studio computer.

When using higher speeds it's a good idea to keep the stream running for at least 15 minutes to make sure it does not drop out.

If the stream worked at a lower speed, but fails to connect with a higher speed this is a good indication that you've exceeded the maximum speed your internet connection can handle to broadcast. A sure sign that the connection is failing is if:

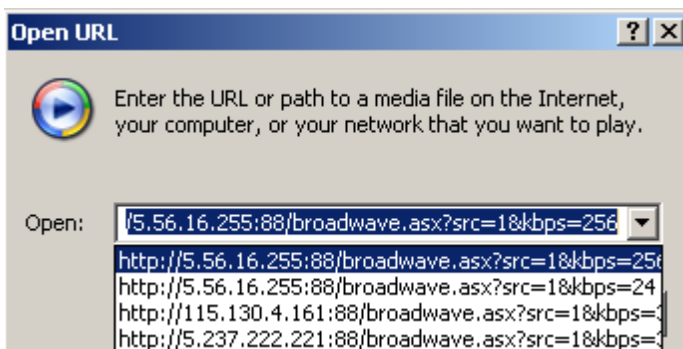
- The phrase 'Buffering' appears on WMP for a long time and is not changing to 'Playing'
- The sound cuts in and out, and you see WMP revert from 'Playing' to 'Buffering'
- The music seems to 'jump around' from place to place on the studio computer, but sounds fine on OB computer.

If these issues occur choose a slower speed and go through the connection process again until you find a consistent stream that works for you.

Advanced Tip: Usually (but not always) the URL address is identical to the one you've previously entered into WMP on the studio computer with the exception of the last few digits.

These digits represent the Broadband speed that you have selected (ie a 128kbps speed URL will always finish with the digits '128').

You can edit the previously used address On WMP on the studio computer by clicking 'File/Open URL'. Use the drop down menu to select the previous URL. See if it is identical to the new URL with the exception of the last few digits. If so click on this URL and then type over the last few digits with the new speed. Click 'OK' to see if the connection is established.



SECTION D: QUICK START PROCEDURE FOR A LIVE BROADCAST

Now your equipment and software is configured you can follow these steps to quickly start a new live broadcast session and activate your stream. Follow steps in this order.

D1 SETUP TASKS FOR THE STUDIO OPERATOR

1. Plug studio computer into studio broadcast panel.
2. Open Windows Media Player (WMP) and play a test audio file on it so check that sound is traveling to studio panel. Stop file when satisfied.
3. Launch Hamachi 'Log Me In' and press 'power' button.

Phone OB operator and tell them studio is ready to receive signal.

D2 SETUP TASKS FOR THE OB OPERATOR

4. Setup the OB panel: Refer to Section E for different configurations of onsite equipment for OBs.
5. Attach equipment that you want to send to the studio (microphones, music players etc). Ensure all this equipment runs through the OB panel.
6. Plug OB panel into OB computer soundcard.
7. Feed audio into OB panel.
8. On the OB Computer open Hamachi 'Log Me In'. Ensure that you can see the studio computer on the list and that it is connected.
9. Open Broadwave. Check that panel audio is feeding into it (green bars should bounce on Broadwave).
10. Press 'connect' on Broadwave.

The Internet page will appear with the Broadband web address. Phone studio operator and read out Broadband web address.

D3 CONNECT THE STUDIO COMPUTER TO AUDIO STREAM

11. Studio Operator goes to WMP. Click file/open URL. Type in web address quoted by OB operator. Press OK.
12. WMP will connect to stream.
13. Adjust volume on studio panel and WMP so the stream sounds clear on-air.

Pat yourselves on the back...you've got yourself a mobile broadcast stream!

SECTION E: OB EQUIPMENT

Your OB setup is limited only by your imagination! Below are two possible configurations to get your ideas flowing.

E1: BASIC OUTSIDE BROADCAST MIX

GOOD FOR: Traditional outside broadcasting – do talk breaks, play music and interview guests.

RECOMMENDED PERSONNEL:

- 1x Broadcast Producer: Liaises with all OB personnel, the public and guests.
- 1x OB Engineer: Controls mixing desk and music.
- 1x Broadcast Engineer: Monitors OB computer, liaises with OB engineer to ensure mix is OK.
- 2x Presenters: Conduct talks content on site.
- 1x Studio Operator: Ensures studio computer stream is playing into studio console. Handles cross fades between studio and broadcast.

EQUIPMENT:

Mixing desk: as many channels as you need. Ideally the desk has 2 x master outputs, so you can mix the sounds for broadcast separately from the sound for your PA speakers (like example below).

PA system: Ideally 2 x speakers so the public can hear what you're doing at the OB site.

2x audio players: You want to be able to cross fade between music tracks, and maybe have sponsor announcement/ids loaded into one of the players. Example below uses 2x CD players.

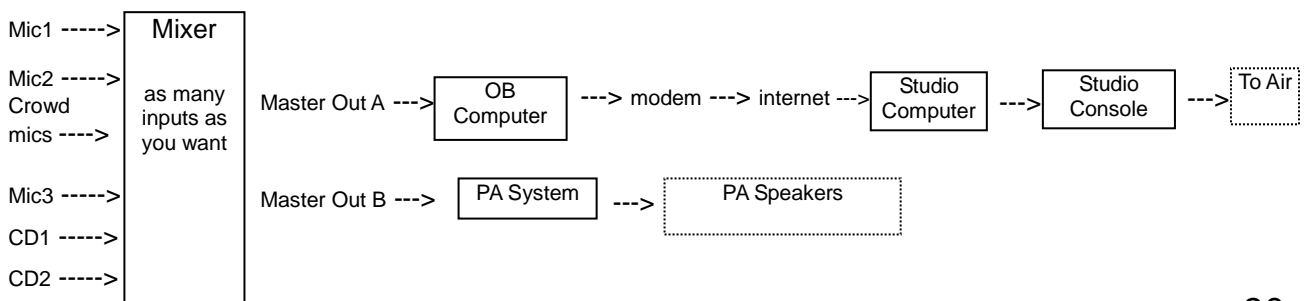
Microphones for talk: As many as you need. Ideally get 1x battery powered microphone to 'rove' in the audience.

Microphones for crowd ambiance (optional): We recommend you get 2x microphones on long leads and hang them above the audience. Fade these up on the desk during talk break intros and outros so radio listeners hear the audience clap and cheer!

2x headphones: 1 for OB engineer to monitor mixing desk, 1 for broadcast engineer to monitor feed streaming into the OB computers soundcard.

2x portable radios with headphones: Tuned to your station to monitor the quality of the final sound hitting the airwaves. 1 for broadcast producer, 1 for broadcast engineer.

EQUIPMENT SETUP:



TIPS FOR BASIC OUTSIDE BROADCASTING

- Prepare a good program run sheet before you broadcast, including where to play music and pre-recorded pieces.
- Organise your music in advance. Perhaps burn it to one CD. Have a backup CD ready to go in case there are problems. Choose music that is long enough to prepare your team/guests for the next talk break segment.
- Never mix the crowd mics into 'Master Out B' (sound going to the PA at the OB site). The crowd noise may feedback through the PA speakers.
- Keep roving microphones away from the PA speakers, they may feedback as well!
- Paint some large 'Applause' cards and get your team to hold them up for talk break intros and outros. Warm the crowd up before hand and get them excited about the fact that they are part of the show! Fade up your crowd mics for Master Out A so the crowd noise is in the broadcast, but do not put them through Master Out A (or it may feedback).

E2: ROVING CAR BROADCASTING

It is possible to run a broadcast off your car's power supply so your broadcast can go anywhere regardless of access to mains power. This configuration even uses your car stereo as the PA speaker system, so the onsite audience can hear what you're broadcasting. Setup the equipment in the boot of your car, and you'll look really cool and DIY!

GOOD FOR:

- Getting attention! It's not about a high quality sound broadcast – it's about being portable and accessible.
- One hour maximum of broadcasting (unless you've got a super-duper car battery).
- Short but regular crosses between the studio and OB locations: for updates on events/activities and on site interviews.
- Public vox pops and 'street DJ showcases': invite the public to bring along their portable music players and plug them into the system for live on-site music requests. This is a great way to engage the public as they can be guest DJs on your radio station!

RECOMMENDED PERSONNEL:

1x Broadcast Producer: Liaises with all OB personnel, the public and guests.

1x OB Engineer: Controls mixing desk and music.

1x Broadcast Engineer: Monitors OB computer, liaises with OB engineer to ensure mix is OK.

2x Presenters: Conduct talks content on site.

1x Studio Operator: Ensures studio computer stream is playing into studio console. Handles cross fades between studio and broadcast.

EQUIPMENT:

A car with a good quality battery: You shouldn't run the vehicle whilst broadcasting (it'll be too noisy).

DC to AC power converter to draw power from your car's cigarette lighter: These create a standard power point that you can plug appliances into. You'll find these at most car battery/accessory shops. The main device we'll need to plug in is the OB computer. Approx Price: \$100.

Note: DC-AC power converters have a limit to the amount of power they can supply. The maximum is usually 120 watts. This will be indicated on the unit. Ensure you don't exceed this by checking how much wattage your powered devices (eg computer, CD players etc) draw. The 'maximum wattage drawn' should be written somewhere on your powered devices.

A laptop to use as the OB computer: If you only have a desktop check how many 'watts' it draws to run the computer and monitor and make sure it doesn't exceed the power converter's wattage rating.

3G mobile phone or wireless broadband modem: For your OB computer's internet connection. See the appendix for product options.

Small battery powered mixing desk: Recommended for price and ease of use is the 'Soundking

2 x 4Ch Battery Powered Mixer' (product code SKAF0402). Search it on the internet. Approx Price is \$60.

2-4 Microphones and leads: They need ¼ inch jack plugs to go into the Soundking mixing desk.

Music player(s): Ideally portable and battery powered CD players or MP3 players. They'll need leads that come out of the headphone socket and have a ¼ inch jack plug on the end that goes into the mixing desk.

1x headphones: For OB engineer to monitor the feed streaming into the OB computers soundcard from the OB mixing desk.

2x portable radios with headphones: 1 for broadcast producer, 1 for broadcast engineer. Tune these to your station to monitor the 'off-air' feed.

IF YOU WANT TO USE THE CAR STEREO SPEAKERS AS PA SPEAKERS YOU NEED...

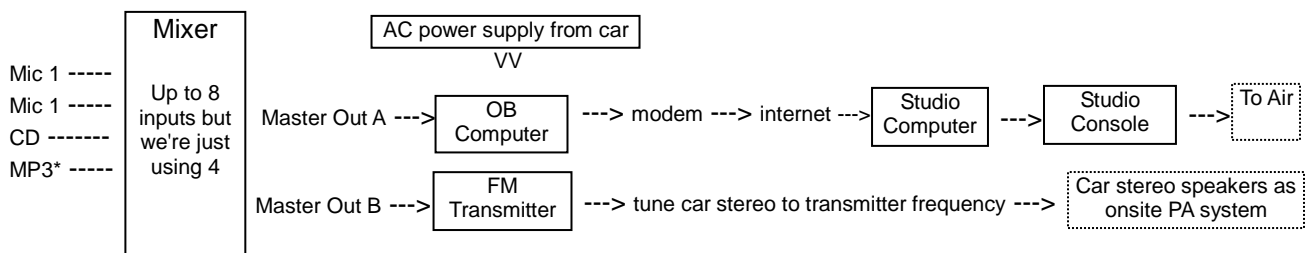
FM car radio with good car speakers: It's also useful if you have basic 'treble' and 'bass' equaliser control on the stereo so you can get a clean, clear sound. We recommend you open your car doors so the sound gets out to the audience.

Portable 'FM transmitter' to send sound to your car radio: These nifty battery powered devices are usually used to send the sound from portable music players to your radio, but we will use it to send the entire mixing desk sound to radio. Most allow you to choose the FM frequency that you transmit on. You then tune your car stereo into that frequency to hear the mixing desk audio through your car stereo. Buy a battery powered FM transmitter that has a jack plug on it so you can plug the output of your mixing desk into it. We recommend you hang the FM transmitter over your car antenna so it gives a clean feed and adjust your mixing desk volume so it does not distort (overload) the sound into your stereo.

You can buy these at electronics shops (Dick Smith, Tandy, Jaycar) and we've even found some in Woolworths. Search 'Fm transmitter' on www.myshopping.com.au to compare products & prices. Prices start from \$30.

EQUIPMENT SETUP:

You can broadcast in stereo, but the below setup is in mono. This is to take advantage of the Soundking's 2x master output configuration. Running in mono lets us do a separate mix for what goes to air (master output A), and what is put through the car stereo as the on-site PA (master output B).



*MP3 player is optional and can be any portable music device. You can have a lead plugged into this channel and use it for a 'street DJ showcase' as suggested in the 'good for' section.

APPENDIX 1: CHECKING COMPUTER MINIMUM SYSTEM REQUIREMENTS

The first thing we need to do is check that the two computers are powerful enough to become mobile broadcasters. Follow the steps below to check your computer's details.

1.1 CHECK YOUR PROCESSOR SPEED

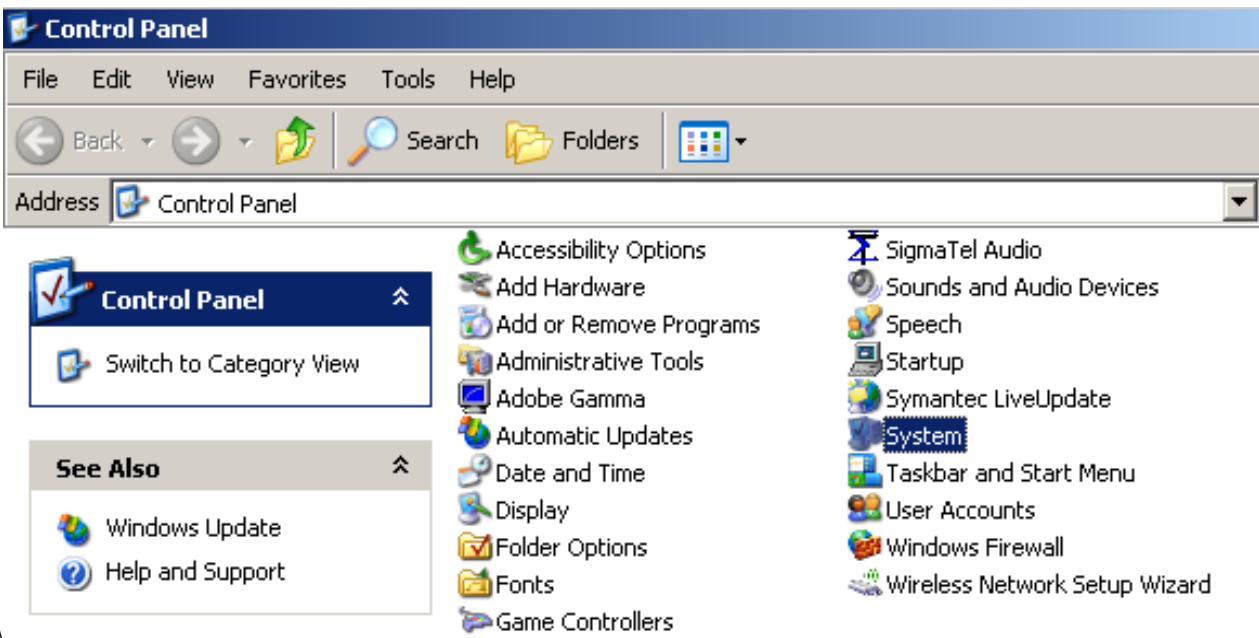
On the computer desktop click the 'Start' button.



In this list click on 'Control Panel'. The Control Panel view gives the option of viewing it in 'Category View' or 'Classic View'. If you see the 'Switch to Classic View' statement (below) on top left of the Control Panel click it. This switches the view to match steps in the manual.



The items in Control Panel will now be listed in alphabetical order. Click on the 'System' icon.

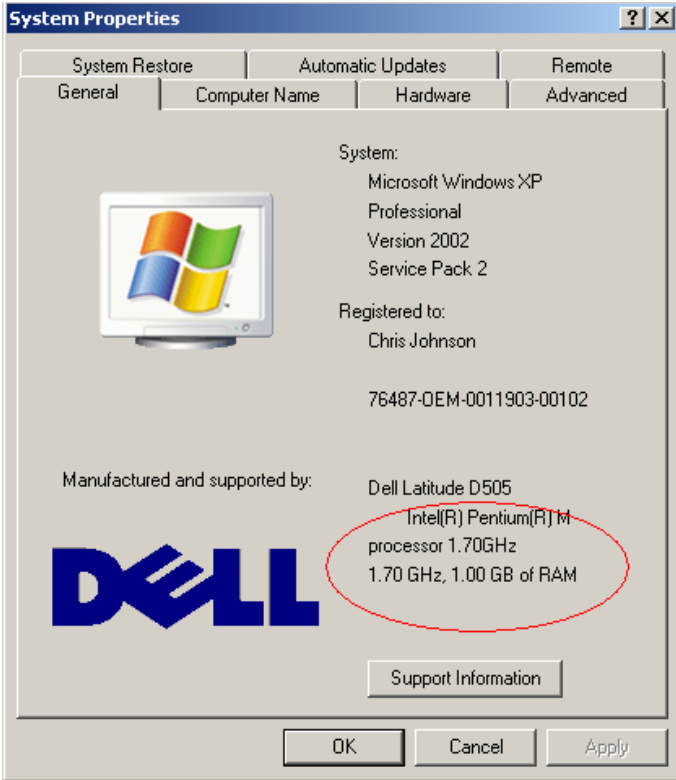


This opens a grey window displaying 'System Properties'. Click on the 'Properties' tab. A grey box appears listing your computer's details.

Both your computers need a minimum of the following – detailed on the 'General' tab of the 'System Properties' window:

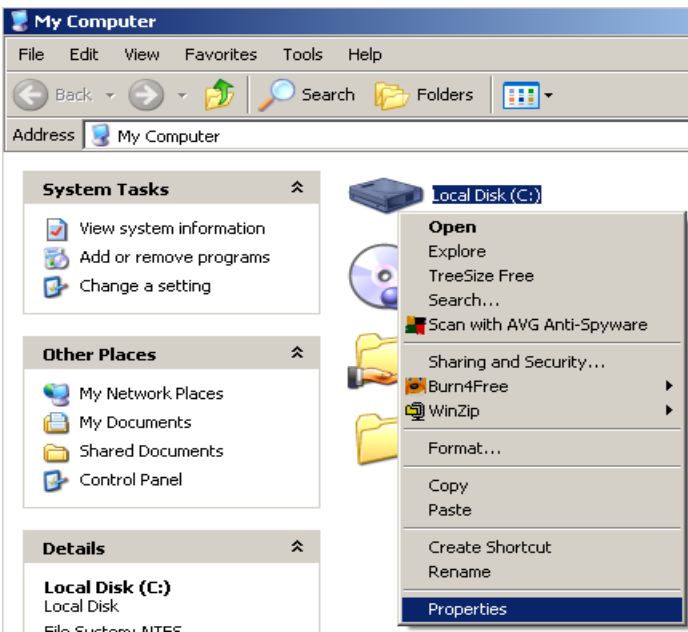
- System = Microsoft Windows 98/2000/XP/2003/Vista/ or 2008.
- Processor speed = a minimum of 1.7hz and 1GB (gigabyte) of RAM.

If you have lower figures there may still be hope so give the manual a go and see if your computers can still do the job.

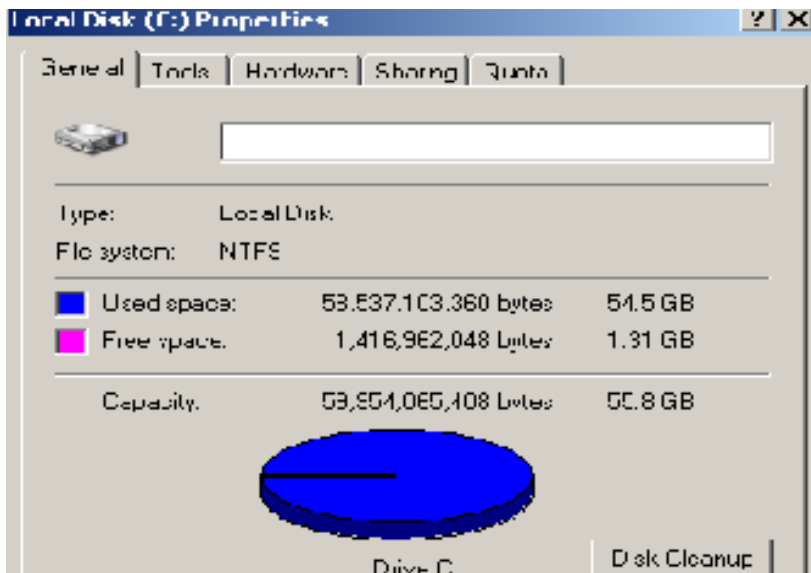


1.2 CHECK YOUR COMPUTER'S MEMORY SPACE

On the computer desktop click the 'Start' button. Click the 'My Computer' Icon. Click once on your computer's hard drive icon (Most likely called 'Local Disk C'). Now right click on that drive icon. The menu list appears. Click 'Properties'.



A box will appear displaying 'Available Space'. You need at least 500MB (Mega Bytes) of available hard drive space. If you have less that 500MB the system may still work but may not be as stable. We recommend you delete files that you no longer need to get more free memory. The below example shows 1.31GB (Giga Bytes) of free space. This is about 1300MB.



1.3 CHECK THAT BOTH COMPUTERS HAVE WINDOWS MEDIA PLAYER (WMP)

The guide explains how to use WMP for testing and replaying audio, and receiving broadcast streams. You can use a different audio player (Real Player, Winamp, iTunes) if you prefer but they are not supported in the manual.

To check for WMP on your computer go to Start Button, All programs, Accessories/Entertainment (Windows Media Player should be in this folder)



If your computer doesn't have WMP go to www.microsoft.com and download the program for free.

APPENDIX 2: ROAD TESTS OF MODEMS AND INTERNET CONNECTIONS

There are dozens of wireless broadband and 3G mobile data packages in Australia. The good news is prices are consistently dropping, and data allowances are rising – giving you more data for less money! The most important thing is to make sure the provider has good coverage in your area. We recommend you compare products on an independent site like <http://www.cnet.com.au>. Type 'broadband round up' into the search box and select 'modems and cards'. All the product websites should have a 'test for coverage in your area' option so you can see if the product will work in your backyard.

2.1 Wireless Area Network (WAN) Modems: Are modems that plug into a telecommunications line and have a transmitter that allows computers to access the internet wirelessly (without connecting cables from the computer to the modem) . Authorised computers can connect to this when they are within the transmitter's reception area (like tuning into a radio).

We have referred to WANs throughout the manual because they are quite common and you may find one at your OB location. However we recommend you do not connect to these wirelessly. Most wireless area network modems have the option of plugging an Ethernet cable from it to a computer. It's better to use this option for your OB computer to get a more reliable connection.

You do not want other computers connecting to the WAN when you're using it because they will take up data and may slow down your internet speed. This can cause drop-outs in your audio stream. We have not road tested WANs because there are too many variable conditions (such as those described above) to advise on them.



2.2 Pre-paid 3G Wireless Modems: These modems use a mobile telecommunications network to connect your computer to the internet. The modems usually plug into a USB socket on your computer, and can be used anywhere that the service provider has a signal. Pre-paid ones are good because you 'pay as you go' rather than committing to a 12 or 24 month contract. They are very common these days so check with station personnel to see if they have one of these that you can borrow.



2.3 Road Test Results - Wireless Modems:

Product Name (all tested with the 192kpbs setting on the 'sound quality' section of Broadwave)	Results & Ratings out of 10 (tested in areas the product has coverage)
<i>Telstra</i> Next G Wireless Broadband USB Mobile Card	Stable. The best national coverage. 10/10
<i>Optus</i> Pre-Paid Wireless Broadband	Stable - 8/10
<i>Virgin</i> Pre-Paid Broadband	Stable - 7/10
<i>3 Mobile's</i> Broadband USB 3.6Mbps/384kpbs	Found it to be quite unstable. It's also really only good for capital city use. 5/10

2.4 3G Mobile Phone as a Modem: There are many mobile phones on the market that can connect to the internet. Only use phones that are using the 3G network. These can usually be connected to a computer to supply it with an internet connection. Many of the highest selling and most basic 3G mobile phones sold by Telstra have this feature. Ask your mobile company if your phone can be connected to a computer to act like a modem, or see the 'Mobile Phone as Modem' appendix for examples of some. Plug the phone into a USB port on your computer with the cable supplied with the phone – do not use a 'wireless blue tooth' connection.



Road Test Results – Mobile Phone as a Modem:

We only tested phones on the Telstra 3G network, but the aim was to test their performance as a modem, not the quality of the internet connection. There are plenty of more expensive phones on the market that can be used as modems, but we featured these because they are basic (and cheap) phones that are commonly used in Australia. Surprisingly, we found the cheaper, simpler phones provided a better connection (probably because they didn't have so much 'stuff' on them). We recommend these two:

Product Name (all tested with 190kpbs 'Live Broadcast' stream)	Results (tested in areas the product has coverage)
Samsung A411	Stable. Has been used by one radio station for the past 24 months without any major hiccups.
Telstra T6	Stable. Has the blue tick for 'excellent coverage in rural Australia'. This means it is specially designed to maintain better reception in regional areas than fancy 'city' phones.

APPENDIX 3: SOUND CARDS

These external sound cards use USB inputs on your computer, because it makes them portable and easy to use on different computers. If you want to spend more you can look into fire wire sound cards. If you want to spend a little bit less you could replace your internal sound card with a higher quality internal sound card.

Product (click name to go to web page)	Number of inputs / outputs	Pre-amps	Head phone sockets	Approx price (AUS\$)	Image
ART USB PhonoPlus Preamps2	2/2	2	0	\$170	
mu 0202	2/2	1	1	\$185	
Emu Tracker Pre USB 2.0	2/2	2 XLR Incl 1/8" Mic input	1	\$280	
Tascam US122L	2/2	2	1	\$280	
Alesis MultiMix 8 USB Mixer With USB 2.0 Audio	8-4 with Mixer	4	1	\$450	
Digidesign M-Box 2	2-2	2 XLR Incl 1/8" Mic Input	1	\$700	

APPENDIX 4: OTHER AUDIO STREAMERS

We road tested a number of audio streaming programs before settling on 'Broadwave'. Here are the results from the others we tested:

Product Name	Description	Rating
NHC VRS Recording System http://www.nch.com.au/vrs/index.html	This provides a good alternative to streaming 'live' because it records and then sends files to the studio for replay.	Second place on our road tests but it was too complicated to perform streams longer than 5 minutes.
Ustream http://www.ustream.tv/	This is a free online service that allows you to stream sound and vision in real time. The sound quality is mono, and not nearly as good as Broadwave, but it is a quick and easy way to get a broadcast happening. Ustream is mainly used by people who want to create a 'internet tv station', but the product is really useful for mobile broadcasting, and it tested as easier to setup than other dedicated 'internet radio' services available.	Low sound quality but no IT experience needed to set it up
Ubroadcast www.ubroadcast.com/	Free online service where you can create your own online radio station. Sound quality was fair but we experienced many drop-outs. We even had trouble streaming their 'featured' stations.	No IT experience needed but not recommended.
Audio TX Communicator www.audiotx.com	Very expensive (over \$1000) but good quality streaming solution. Easy to setup. Main advantage is it allows you to set a 'delay time' for the broadcast so there is a buffer to reduce chances of drop-outs. One station has replaced Audio TX with Broadwave because Broadwave road tested quite well against it.	If you've got the cash it may be worth a look. Basic IT skills required.
Real Producer Basic http://www.realnworks.com/products/producer/basic.html	Free audio (and video) encoder. Very reliable and used by many stations to stream their radio stations 24/7. It is however a little tricky to setup if you're not IT savvy.	Great if you've got strong IT skills.
VLC Media Player www.videolan.org/vlc	Free video and audio player that also contains a webstreaming interface. Requires a little bit of IT knowledge to setup.	Great. Medium IT skills required.