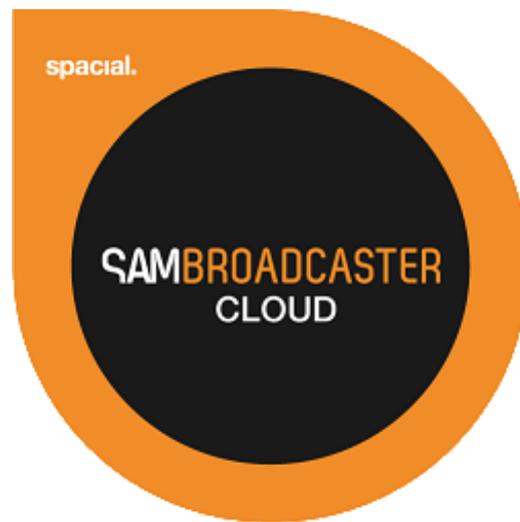


**spacial.**



# SAM Broadcaster Cloud Live Streaming User Guide

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## Live Streaming

Broadcasters and Internet Radio Station Managers can now use the power of SAM Cloud (SAM Cloud), the cloud-based radio automation solution from Spacial, to switch between broadcasting from the SAM Cloud and different live sources.

Although the live source is usually provided by SAM Broadcaster Pro, SAM Broadcaster Studio or the specifically designed SAM Broadcaster Live-DJ edition, any Icecast2 compatible source can be used including both software and hardware encoders.

As a part of the Live Streaming infrastructure you will find a new version of SAM Broadcaster, SAM Broadcaster Live-DJ. This version includes all of the great, professional features broadcasters have come to love but it provides the Station Manager with the security and peace of mind of having total control over their investment.

The access control is managed by the Station Manager who can assign a variety of different access permissions for each DJ and who can be reassured that with Live-DJ, Station Managers will no longer worry that the license key they purchased and assigned to a specific DJ is also being used to broadcast by the DJ to other stations. The control and security afforded by Live-DJ means this worry is a thing of the past.

## How it works

The first image shows SAM Cloud being the source feed to the broadcaster. This means all listeners connected to the streaming servers will hear what is currently playing with SAM Cloud.

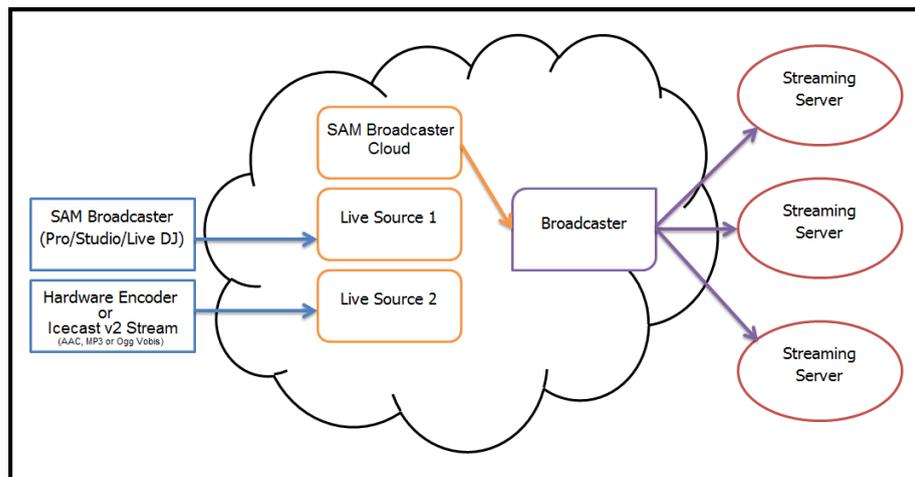


Figure 1 – How it Works SAM Cloud Streaming

The next image shows how things look once the broadcaster switches to using a Live source which in this diagram is being fed from SAM Broadcaster. If the Station Manager switched the source to the Live Source 2 then the stream would be generated by the Hardware Encoder.

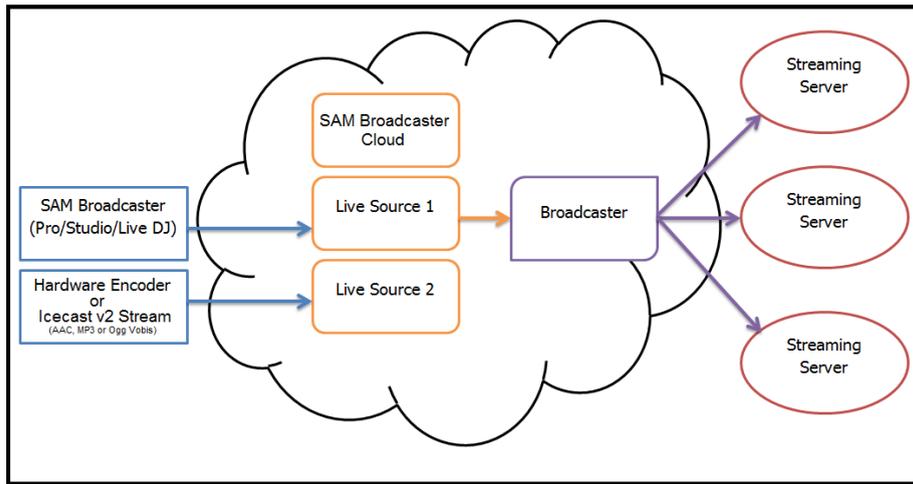


Figure 2 – How it Works SAM Broadcaster Software Streaming

The following image shows the stream being taken from the second live source which in this example, is taken from any hardware encoder or Icecast v2 compatible source.

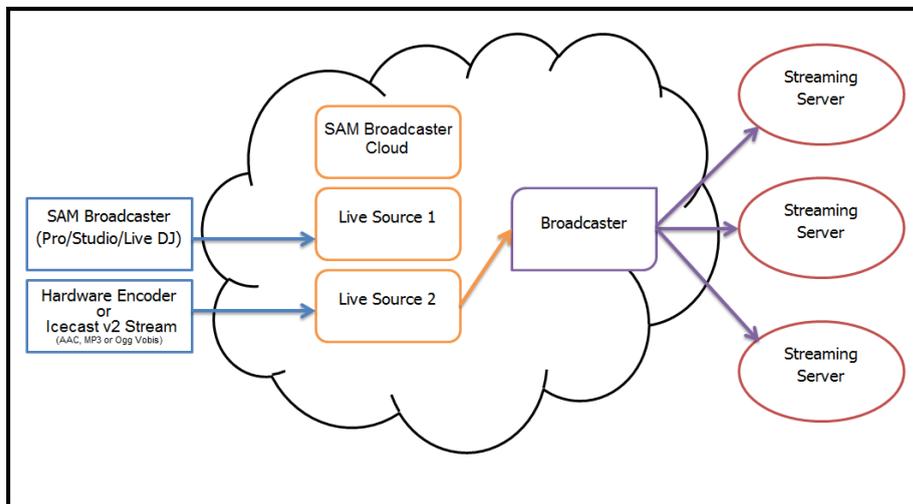


Figure 3 – How it Works Hardware or Icecast v2 Encoder

Switching between sources is as easy as clicking a button in the SAM Broadcaster, Broadcast Control window.

## Broadcast Control (BC)

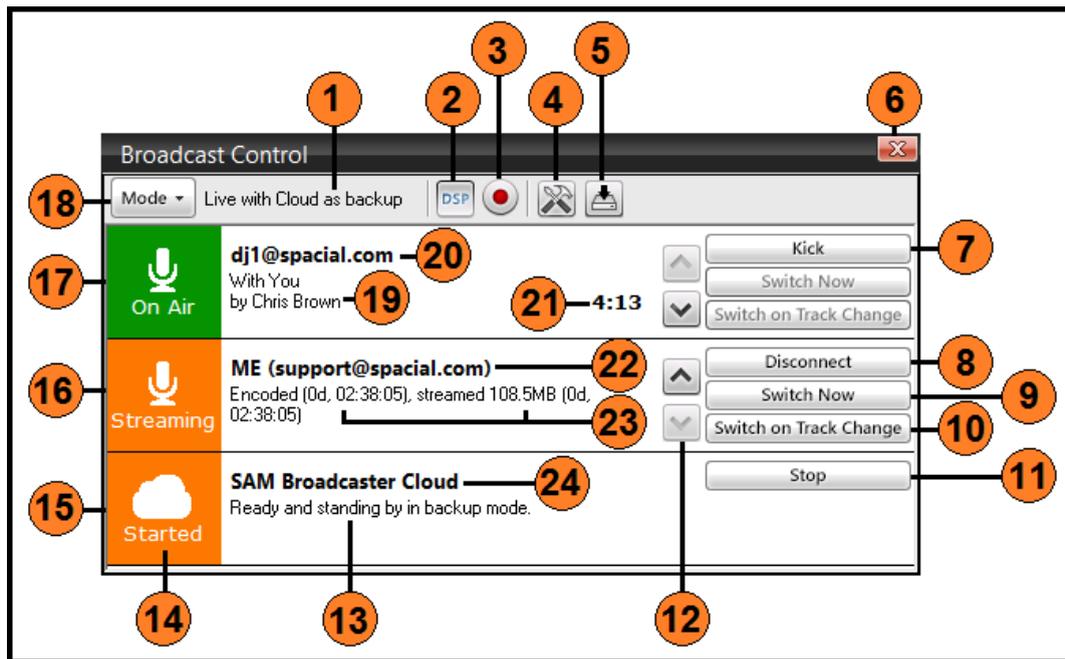


Figure 4 – Broadcast Control

Serial	Description
1	Current Broadcast Mode
2	Stream from the Digital Sound Processing (DSP) pipeline within SAM Broadcaster
3	Stream sound from the computer sound card
4	Options
5	Archive Stream
6	Close the Broadcast Control window
7	Kick the current On-Air Source
8	Disconnect
9	Switch source now
10	Switch source on the next track change
11	Stop SAM Cloud
12	Move sources up and down in the priority
13	SAM Cloud Status
14	Source status
15	Broadcast Slot 3 (SAM Cloud)
16	Broadcast Slot 2 (shown as Streaming but not On-Air)
17	Broadcast Slot 1 (shown as On-Air)
18	Change Broadcast Mode
19	Track currently playing at Broadcast Source 1
20	The source for Broadcast Slot 1
21	Current playing track length
22	The source for Broadcast Slot 2
23	Encoded and streamed data totals
24	Visual indication of the source

Depending upon your needs, you can move either live sources or SAM Cloud up or down in the Broadcast Control (BC).

As we have seen, there are three available streaming sources (slots) within the BC but one of these is always assigned to SAM Cloud. By default, the two uppermost slots are available for your DJs or other live sources to connect to. We would recommend leaving SAM Cloud at the bottom of this list as there is a hierarchy in effect. If a DJ connects to the first slot, then when they disconnect, SAM Cloud cycles through the next available source which becomes the broadcast source. If the second slot is empty then the bottom source will start streaming. Leaving SAM Cloud in the bottom position will help ensure your listeners never experience dead-air if correctly configured.

## Trigger File

You can also trigger the switch by playing a trigger file. Thus you can do your live show and as soon as you are done simply play this trigger file to switch to the next source. The system will then smoothly at the end of your live show roll over to the next available source which might usually be SAM Cloud, but this can also be the next DJ broadcasting their live show after yours.

Creating a trigger file is simple, just make sure the trigger file contains this text as either the artist or title as shown in the image below: `cmd://switch`

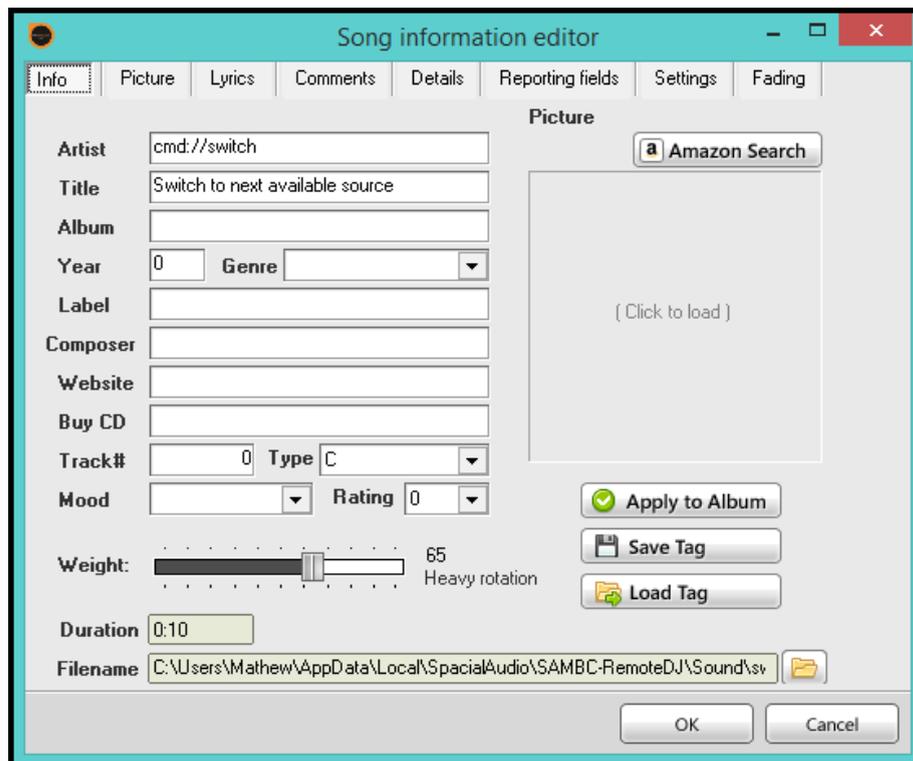


Figure 5 – Switch Command Information Editor

An example switch file is included within the built-in 'Other' Playlist Category within SAM Broadcaster and you can also download this file if necessary, from:

<http://download.spacial.com/download/cmd-switch.flac>

We would recommend importing this track into a Playlist specifically created for this file which would never be included in a standard playlist except when being used to switch the source or you could change the song type in the Song Information Editor to a category which would not normally be selected like "C – Unknown Content" as shown in the image.

*Note: This trigger file can also be used in SAM Cloud to switch to a live source.*

## Usage Examples

The following provides a number of example uses of this technology and better explains the process:

SAM Cloud can be used as the primary stream for the station, but remote DJs could present a live show with the versions of SAM Broadcaster previously mentioned. SAM Cloud will provide the audio for the broadcast until a DJ connects and takes over the broadcast. As soon as the DJ disconnects the system will either switch to the next connected DJ or back to the primary SAM Cloud stream.

The live stream can be the stations' primary stream, but if the live source becomes unavailable for any reason the system can fall back to SAM Cloud. This can ensure you have 24/7 broadcasting with a SAM Cloud backup solution in case of network issues or any other type of trouble with your live broadcast source.

If you wish to stream in multiple formats and bitrate but your upload bandwidth is perhaps not good enough to upload multiple source streams. SAM Cloud Live streaming will allow you to send a single high quality source stream that will automatically be converted to multiple formats and bitrates and streamed out to the streaming servers through SAM Cloud streaming relays which are compatible with any SHOUTcast, Icecast v2 and LIVE365 streaming services.

## Introducing SAM Broadcaster Live-DJ

Previously, Spacial provided SAM Broadcaster DJ Seats which allowed Station Managers to provide temporary SAM Broadcaster licenses to remote DJs. If the remote DJ left the station, at worst, they would only be able to use the provided DJ Seat license until the license was renewed which happened every 6 months however Station Managers asked for even greater control and increased flexibility.

As a result of the feedback we developed SAM Broadcaster Live-DJ. No longer can a remote DJ use one stations' license to stream elsewhere. When the Station Manager assigns the Live Streaming permission, the DJ is automatically provided with their own, licensed SAM Broadcaster Live-DJ which is available from their personal user zone.

This license and software can only stream to the stations under the Station Manager's control however a DJ can still stream with multiple stations if the respective Station Managers each assign the DJ these permissions. We would recommend, where possible, the DJ uses a single email address for all stations which will allow them to switch between stations without changing user names.

Station Managers can revoke their license at any time and immediately assign a new license to another DJ if necessary.

SAM Broadcaster Live-DJ includes the same great features DJs have become accustomed to and has the same familiar user interface as SAM Broadcaster Pro but is restricted to only streaming to the station's SAM Cloud service.

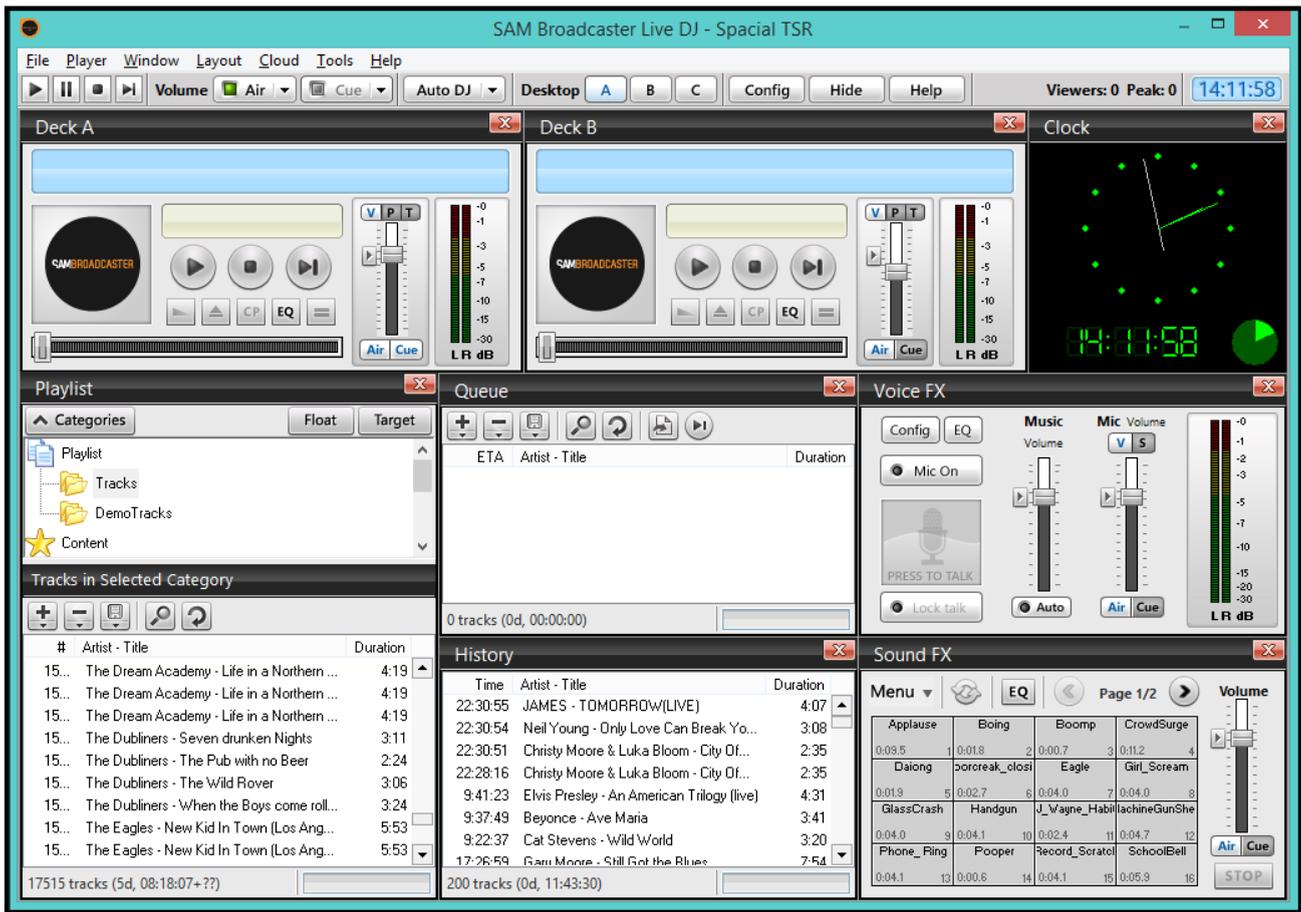


Figure 6 – SAM Broadcaster Live-DJ

The major difference can be found on Desktop B where you will notice that by default, there is no Encoder Window and when you examine the Window menu at the top of the screen, you will also note that this is not an available option.

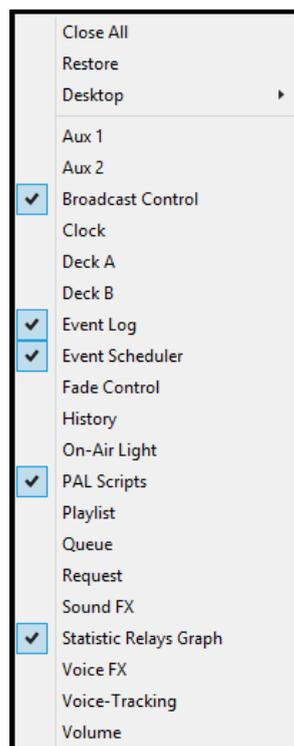


Figure 7 – Available Windows

This is because SAM Broadcaster Live-DJ is automatically configured to stream to the SAM Cloud station associated with the account and the statistics relay will automatically display the information for the current station under the specified account. This configuration is managed by the Station Manager from within the Web User Interface (WUI).

When a DJ logs into SAM Broadcaster Live-DJ, the software is automatically activated with their personal license key. This key is also available to the DJ from the User Zone as it is possible that under certain conditions, the DJ might have to manually enter their license key.

To configure the options within SAM Broadcaster Live-DJ click the Config button and you will be presented with this window.

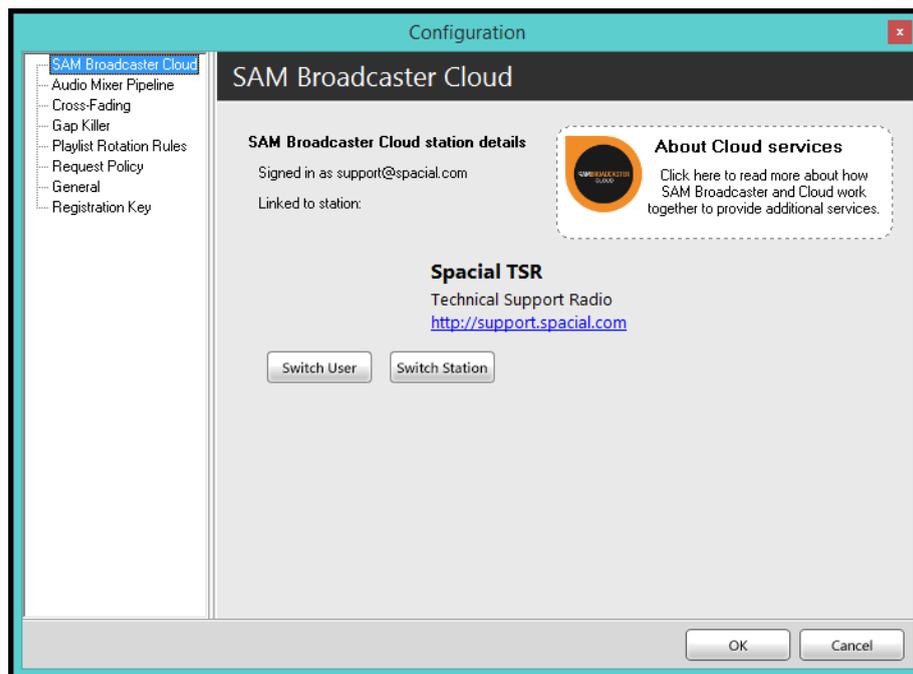


Figure 8 – SAM Broadcaster Live-DJ Configuration

If you are familiar with either SAM Broadcaster Pro or SAM Broadcaster Studio then you will notice a smaller number of options in the left-hand pane.

When SAM Broadcaster Live-DJ starts for the first time, you will be prompted to enter a username and password for the station. This information is contained within the email you will receive when the DJ is assigned the Live Streaming permission. You have the option to switch to another user which in reality allows you to use the same software to stream to another station which might have assigned you the Live Streaming permission.

### **Switch User**

The Switch User button allows the DJ to change the login credentials. This would be useful if a DJ streams to multiple stations under different user names and ensures SAM Broadcaster Live-DJ is automatically and correctly configured to stream to the stations for which the DJ has permission and wishes to stream.

The DJ can stream to multiple stations if they are granted the correct permissions by the various Station Managers but they can only stream to one station at any one time.

## Switch Station

Clicking on the Switch Station button allows you to change to another station under the same username however, only one active session is permitted for each username and if two people attempt to use the same login credentials at the same time, you will receive this notification.



Figure 9 – Signout Existing Session Warning Message

Any DJ can be assigned Live Streaming permissions by any number of stations and if these stations assign the permission to the same DJ email address, the Switch Station button will list all of the available stations to which the DJ could stream.

The stations available depend upon the access and configuration provided by the Station Manager or Station Managers if the DJ hosts shows on multiple stations.

Clicking Cancel will return you to the previous Config screen whilst clicking Continue will log out any existing sessions for this username and return you to the Config window.

In normal operation, clicking the Switch Station button will bring up this window listing the available stations the logged in credentials has been assigned the Live Streaming permission.

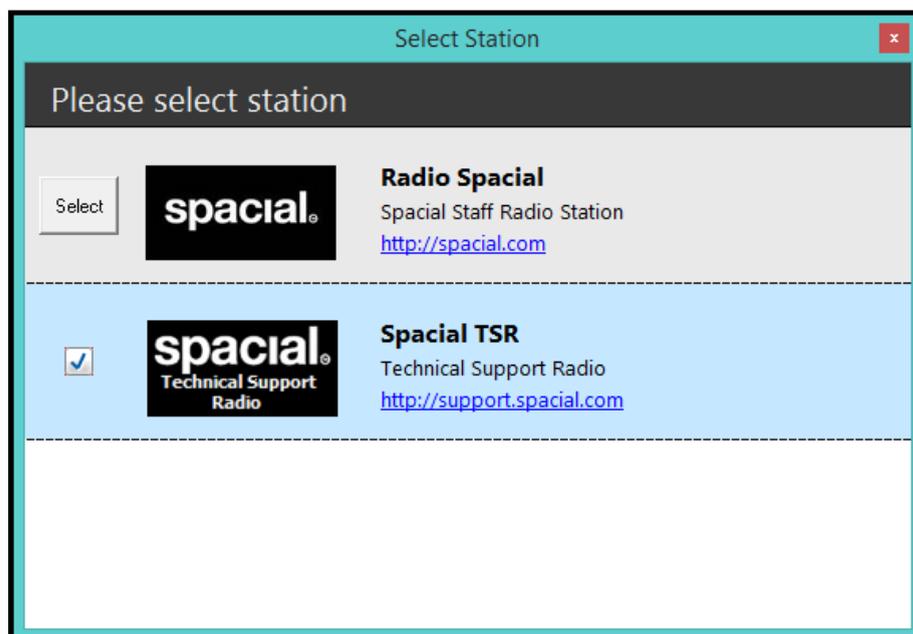


Figure 10 – Select Station

## Broadcast Control

As you can see, the Broadcast Control window can be displayed on either of the Desktops or hidden as required but with this functionality you have the ability to control the source of the stream.

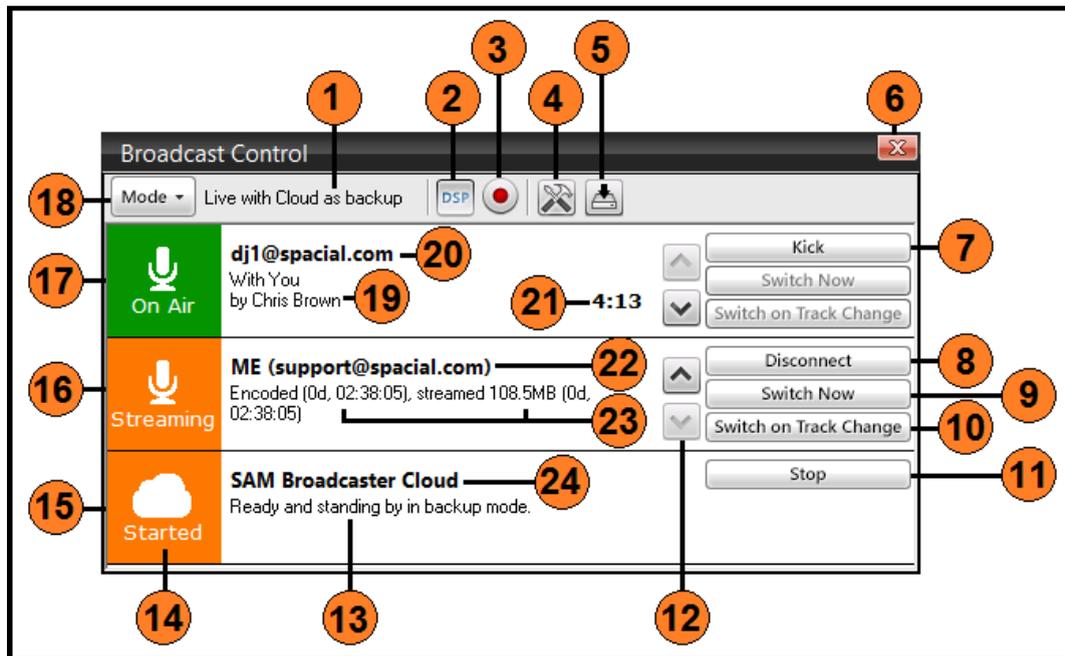


Figure 11 – Broadcast Control

Serial	Description
1	Current Broadcast Mode
2	Stream from the Digital Sound Processing (DSP) pipeline within SAM Broadcaster
3	Stream sound from the computer sound card
4	Options
5	Archive Stream
6	Close the Broadcast Control window
7	Kick the current On-Air Source
8	Disconnect
9	Switch source now
10	Switch source on the next track change
11	Stop SAM Cloud
12	Move sources up and down in the priority
13	SAM Cloud Status
14	Source status
15	Broadcast Slot 3 (SAM Cloud)
16	Broadcast Slot 2 (shown as Streaming but not On-Air)
17	Broadcast Slot 1 (shown as On-Air)
18	Change Broadcast Mode
19	Track currently playing at Broadcast Source 1
20	The source for Broadcast Slot 1
21	Current playing track length
22	The source for Broadcast Slot 2
23	Encoded and streamed data totals
24	Visual indication of the source

There are three Broadcast Modes available within the Broadcast Control:

- Cloud Only (No live Streaming)
- Cloud with Live Streaming
- Live streaming, with Cloud as backup only

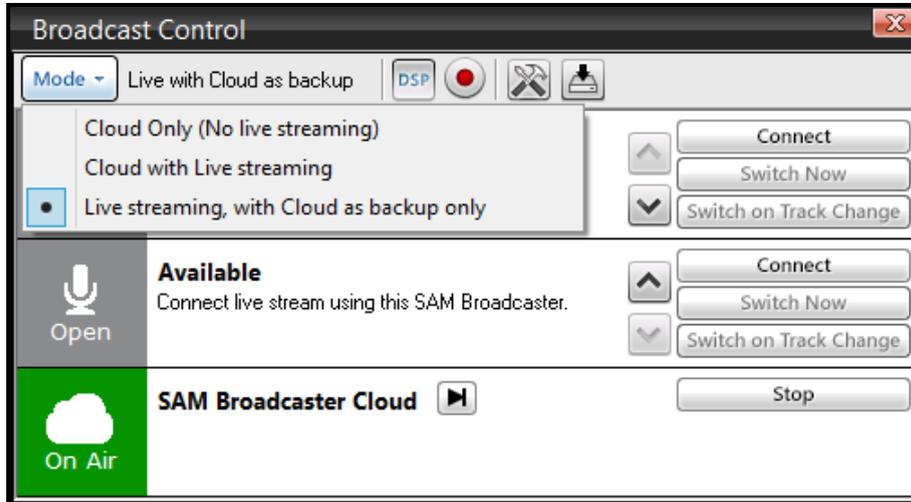


Figure 12 – SAM Broadcaster Broadcast Control

## Encoder and Streamer Configuration

You will find a number of configuration options available to you if you select the options button (crossed tools) this will bring up the window shown in the next image.

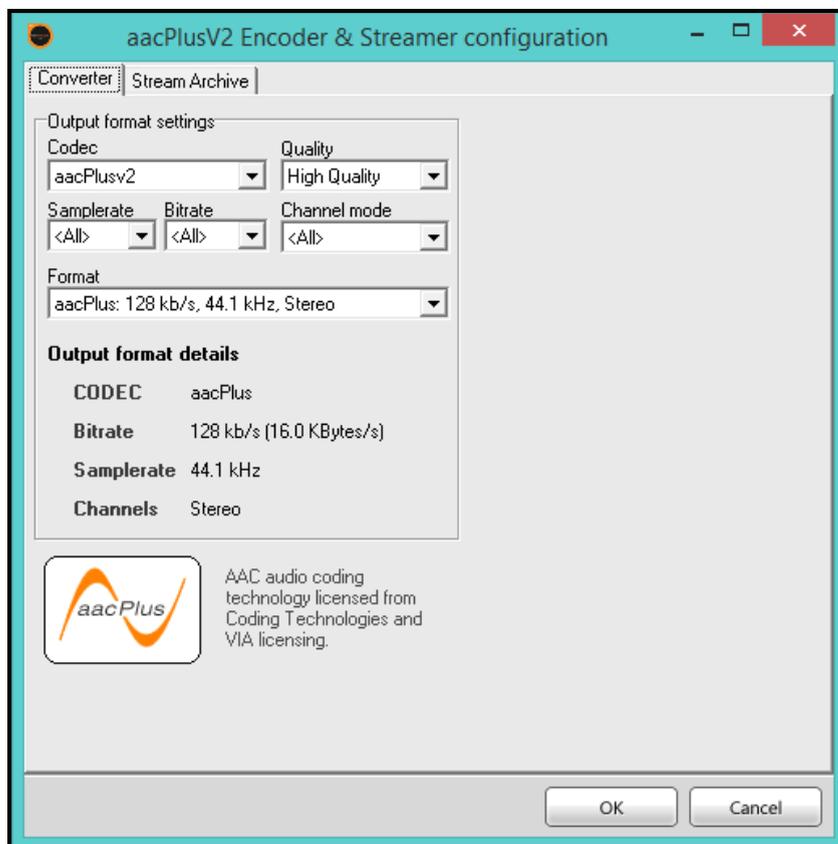


Figure 13 – Encoder Configuration Options

SAM Broadcaster Live-DJ uses AAC to stream to the SAM Cloud and whilst you have the associated configuration options for this AAC stream available, we would recommend keeping the default settings for optimum results.

The stream is recorded in AAC format and can be played by SAM Cloud either from the queue or through program scheduling. This could also be used to record a standby show for a DJ which would be scheduled to play when the DJ is performing live as with the SAM Cloud broadcast mode set to broadcast Live streaming, with SAM Cloud as backup only, if the DJ experiences any hardware or Internet connection problems, SAM Cloud would start streaming the backup program.

You will also note there is a Stream Archive tab which enables DJs to record their live shows or to pre-record their shows for future broadcasting from SAM Cloud.

### Stream Archive

The Stream Archive option is available from the options within the Broadcast Control Center and provides the following options:

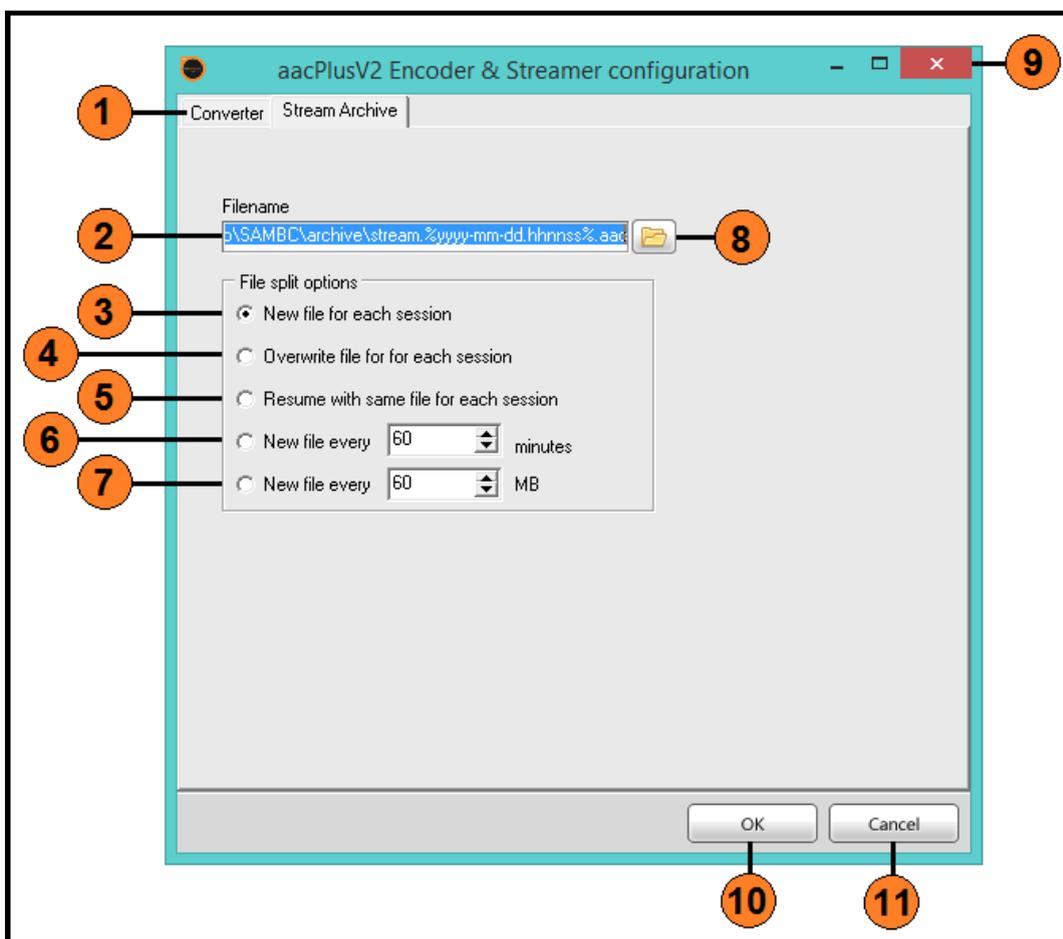


Figure 14 – Stream Archive Options

Serial	Description
1	Encoder and streamer configuration options Tab
2	File path location to where the files are saved
3	Option to create a new file for each session
4	Option to overwrite the existing file for each session
5	Option to resume the existing file for each session
6	Select and configure this to create a new file every XX minutes

7	Select and configure this to create a new file every XX MB
8	Navigate to and Select a new file path
9	Close the window
10	Save the changes
11	Cancel any changes made and close the window

***SAM Broadcaster Cloud Only***

Selecting this option will generate this pop-up to confirm whether you are sure you wish to complete this selection:



Figure 15 – Cloud Only Warning Message

Selecting 'Yes' will sign you out of SAM Cloud and you will have to re-enter your password to sign back in. Selecting No will close this window.

***SAM Broadcaster Cloud with Live Streaming***

SAM Cloud with Live Streaming is the default and the recommended mode.

You can see that SAM Cloud is the current source for the stream and the two options available are either Stop the SAM Cloud station or Connect to either of the Open (available) sources.

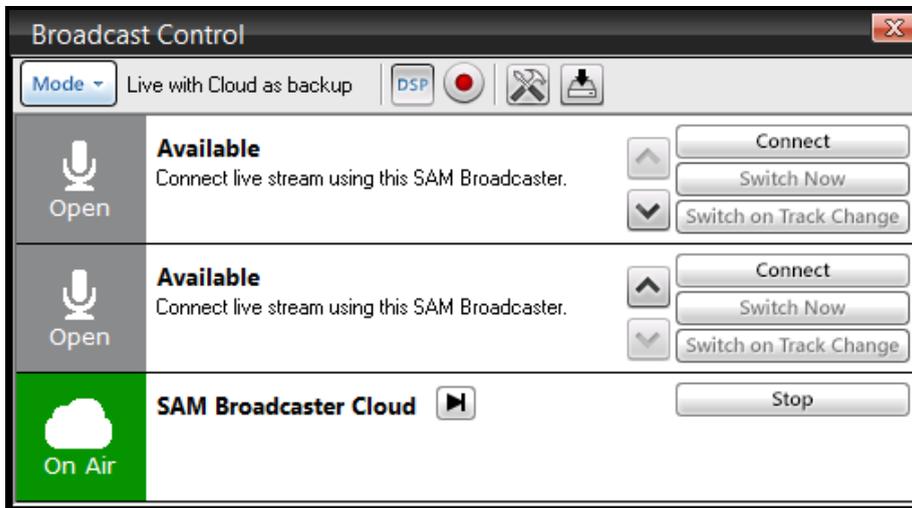


Figure 16 – SAM Broadcaster Broadcast Control, Cloud streaming with Live Available

Clicking Stop brings about the following situation which shows the SAM Cloud state as Stopped and the two other sources as Open or Available, both of which can be used as sources depending upon the options configured with the current user credentials.

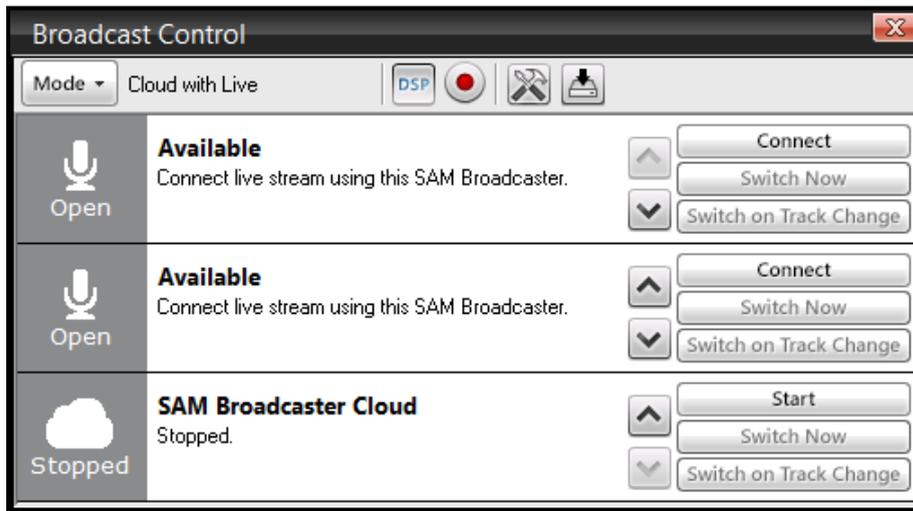


Figure 17 – SAM Broadcaster Broadcast Control, All Stopped

Selecting the Start option for SAM Cloud cycles through the start-up process and provides the option to either switch to SAM Cloud immediately or when the next track changes.



Figure 18 – SAM Broadcaster Broadcast Control, Cloud Started but not Broadcasting

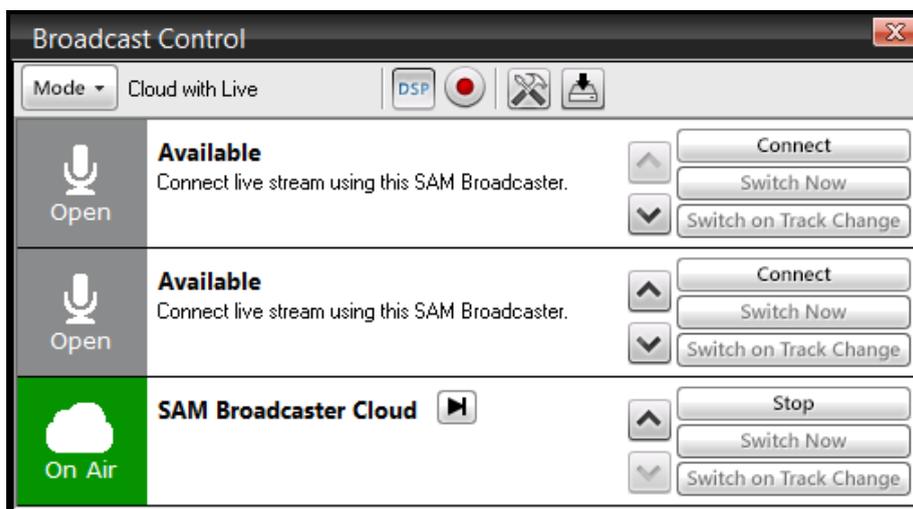


Figure 19 – SAM Broadcaster Broadcast Control, Cloud streaming with Live Available

By selecting Connect with one of the Open sources, the Broadcast Control cycles through the connection process with SAM Broadcaster in a Streaming state with the source buffering until a stable connection has been created. The Connect button changes to a Disconnect button and the other buttons are greyed out until the connection is stable.



Figure 20 – SAM Broadcaster Broadcast Control, Buffering



Figure 21 – SAM Broadcaster Broadcast Control, Streaming but not Broadcasting

Once the connection is stable, SAM Broadcaster begins to encode, the status changes to Encoding with the connected user name shown along with the length of time connected and the total amount of data traffic streamed. We now have three options, we can disconnect from the Broadcast Control, we can switch the source now or we can switch the source at the end of the currently playing track.

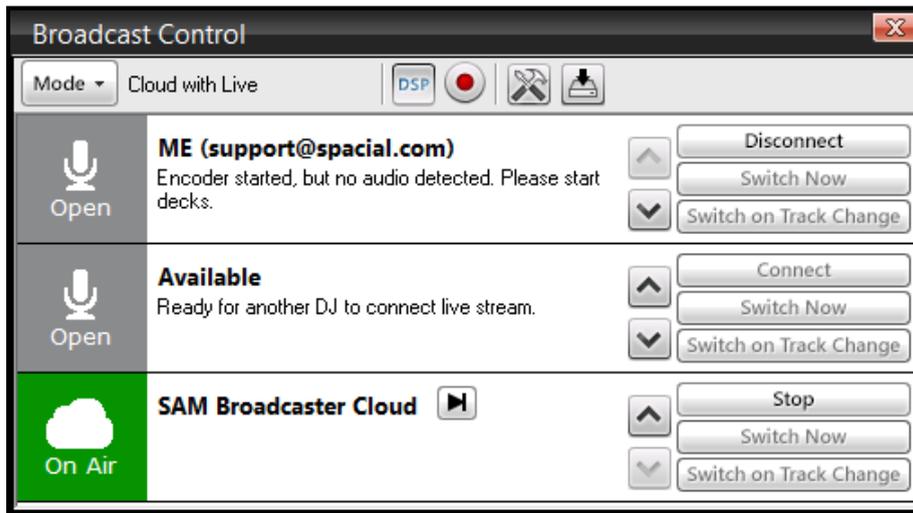


Figure 22 – SAM Broadcaster Broadcast Control, No Audio Detected

If you connect but you are not currently streaming audio then the following message is displayed with a recommendation to start the decks, "Encoder started, but no audio detected. Please start decks". Starting the decks will start the streaming process and enable your listeners to hear your station output.

If you are already playing audio files then you would see the following image and this would indicate your audio is being encoded but you are not yet broadcasting.



Figure 23 – SAM Broadcaster Broadcast Control, Decks Started

You can see that SAM Cloud is still the On Air source of the stream your listeners can hear.

When you are streaming, two additional buttons marked "Switch Now" and "Switch on Track Change" become available. Selecting "Switch Now" will switch the streaming source from SAM Cloud to your new stream whilst selecting "Switch on Track Change" will wait for the current track to finish and then switch the source on the start of the next track. Once the source has been switched, the source switches to the selected.



Figure 24 – SAM Broadcaster Broadcast Control, Streaming Live

When the source has been successfully switched, the original source, in this case SAM Cloud remains in a streaming state but can be stopped if necessary.

### Switch Now

By selecting "Switch Now" for the SAM Cloud streaming source, this will again become the streaming source whilst the previous source continues to stream.



Figure 25 – SAM Broadcaster Broadcast Control, Switching to the Cloud Stream

### Switch on Track Change

If the option to "Switch on Track Change" is selected, the message 'Will transition to next source once buffer has finished streaming' is displayed and an option to cancel the switch becomes available.



Figure 26 – SAM Broadcaster Broadcast Control, Switch on Track Change

SAM Broadcaster Live-DJ can usually recover from any errors within the Broadcast Control which might be caused by stopping the audio and in these cases you might notice the following Error code is displayed with the status of Disconnected. If SAM Broadcaster Live-DJ does not automatically recover within a few seconds, this could indicate a more serious issue which should be investigated.



Figure 27 – SAM Broadcaster Broadcast Control, Disconnected Error Message



Figure 28 – SAM Broadcaster Broadcast Control, Automatic Error Recovery

## Live Streaming with SAM Broadcaster Cloud as Backup Only

Selecting this mode allows for Live Broadcasting but with SAM Cloud as a failover should the current DJ experience a connection or hardware issue. This helps to keep your listeners tuned in when your DJ has a problem which might usually result in lost listeners.

You should be aware that unless the SAM Cloud library contains tracks and has been configured correctly, SAM Cloud cannot be used as a failover. You should ensure there are sufficient tracks in the Cloud library to cater to the separation rules within the active Playblock.

It might be appropriate to create a number of Playblocks which would include station idents and tracks suitable for the mood of the current program. It could result in lost listeners if your live DJ was hosting a Death Metal hour but your failover was playing classical music. You can use the powerful and intuitive SAM Cloud scheduling features to create any number of Playblocks which can be scheduled as a duplicate of your planned live programming schedule to cater for any absent DJs or any problems your DJs might encounter. You could also consider having your DJs record standby programming which would play in the event they were unable to broadcast or if they experienced any hardware failure.

The connection process is identical to SAM Cloud with Live but you should remember that if you experience any hardware failure or have a problem with your Internet connection then SAM Cloud will take over the stream automatically. If the problem is resolved then SAM Cloud will automatically return control to you when you reconnect and your SAM Broadcaster will automatically switch to On-Air.

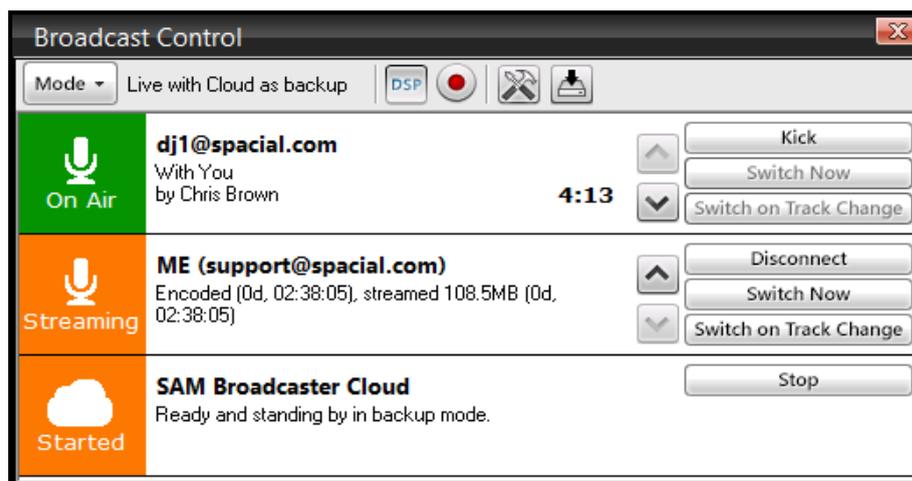


Figure 29 – Live with Cloud as Backup

## Working with Multiple DJs

SAM Broadcaster Live-DJ is designed to integrate with SAM Cloud and each DJ is provided with a SAM Broadcaster Live-DJ license with which they can broadcast their live shows by connecting to SAM Cloud. As we have seen, connecting the first DJ is a simple procedure and we will now discuss the process of transitioning from the streaming DJ to a second DJ.

This image shows the Broadcast Control (BC) with SAM Cloud running but not streaming as the stream is coming from a broadcasting DJ however, we now have the option to 'Kick' the broadcasting DJ which is useful if a DJ becomes renegade or starts acting in a fashion not suited to the style of broadcasting the Station's listeners expect.

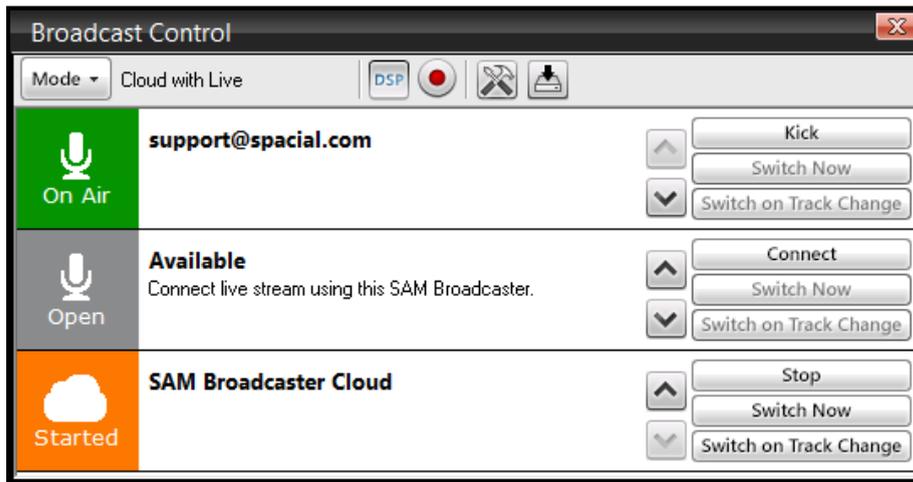


Figure 30 – Kick DJ button

The incoming DJ would connect to the available slot which in this case is position 2 by clicking the available Connect button which will cycle through the connection stages until a stable connection has been established.

There are two warning messages which could be displayed if you are not currently playing a track or do not have an open microphone. The first is 'Encoder not started' which indicates SAM Broadcaster is not On Air. To remedy this simply click the Air button and start playing a track in Deck A or Deck B.

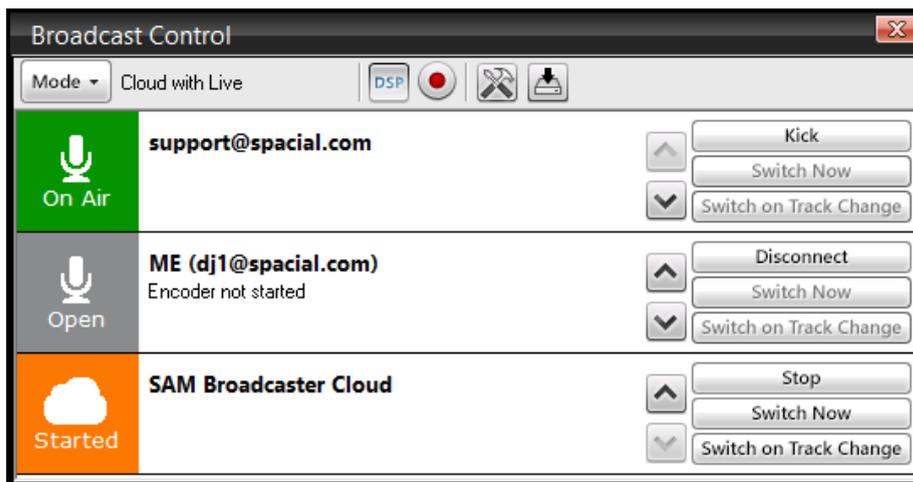


Figure 31 – Encoder not started warning message

The second warning message is 'Encoder started, but no audio detected. Please start decks' which indicates SAM Broadcaster is On Air but no track is currently playing. To rectify this simply start playing a track in either Deck A or Deck B.

Alternatively, you can use an open microphone when connecting however we would recommend playing a track to simplify the connection process.

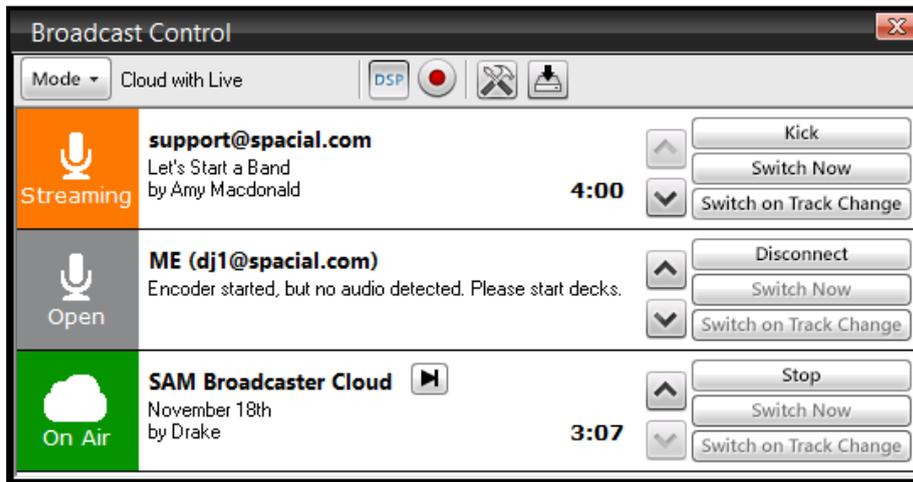


Figure 32 – No audio detected warning message

If SAM Broadcaster has been encoding for any length of time without playing any tracks, you could encounter the 'Disconnected (10053)' error message which can be remedied either by disconnecting and reconnecting or by playing a track in Deck A or Deck B.

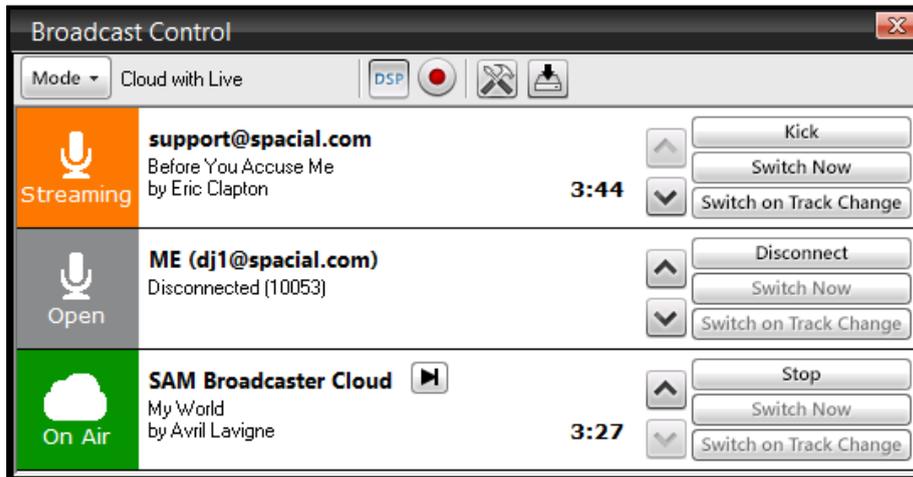


Figure 33 – Disconnected (10053) Error Message

When audio is detected, all options become available and the DJ can become the On Air source by selecting either "Switch Now" or "Switch on Track Change".

The currently streaming DJ would see the incoming DJ appear in the Broadcast Control as shown.

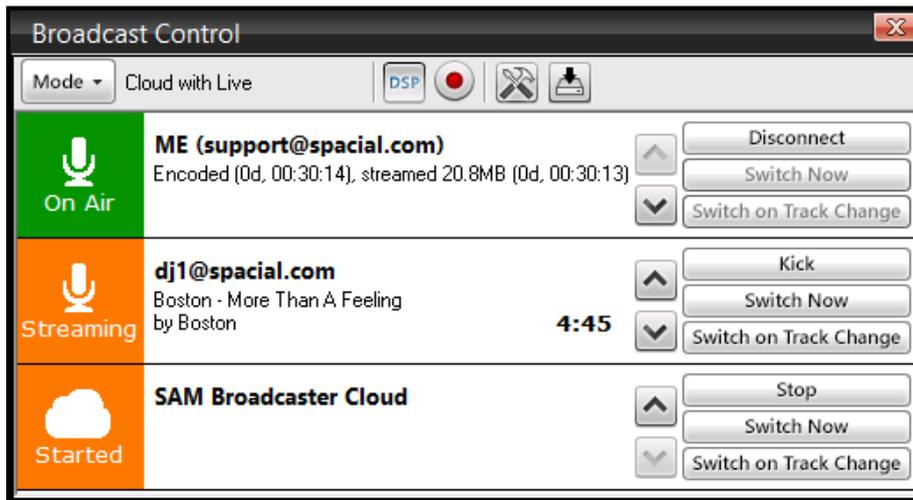


Figure 34 – Incoming DJ Connecting

Incoming DJs also have the options to “Switch Now” or “Switch on Track Change” and if the track change option is selected, SAM Cloud will identify the end of the track being played by the current DJ and then switch streaming to the incoming DJ.

This will provide a smooth transition between two DJs.

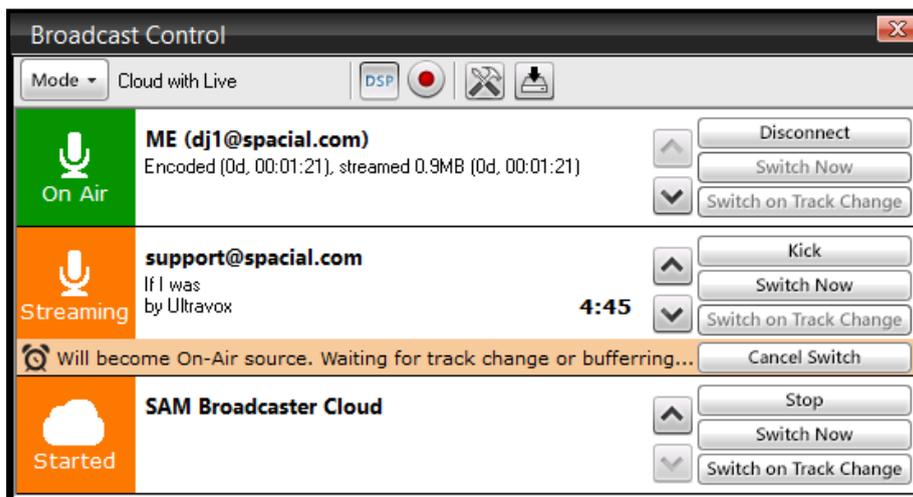


Figure 35 – Incoming DJ, Switch on Track Change

### **Disconnecting or Kicking a Streaming DJ**

The Station Manager or any DJ with the appropriate permissions can kick any currently connected DJ. When a DJ is kicked, the next available stream which is encoding will start streaming to reduce dead air however, if there is no second stream available, your listeners will experience dead air until a new source starts streaming. For this reason we recommend using the Live Streaming with Cloud as backup.

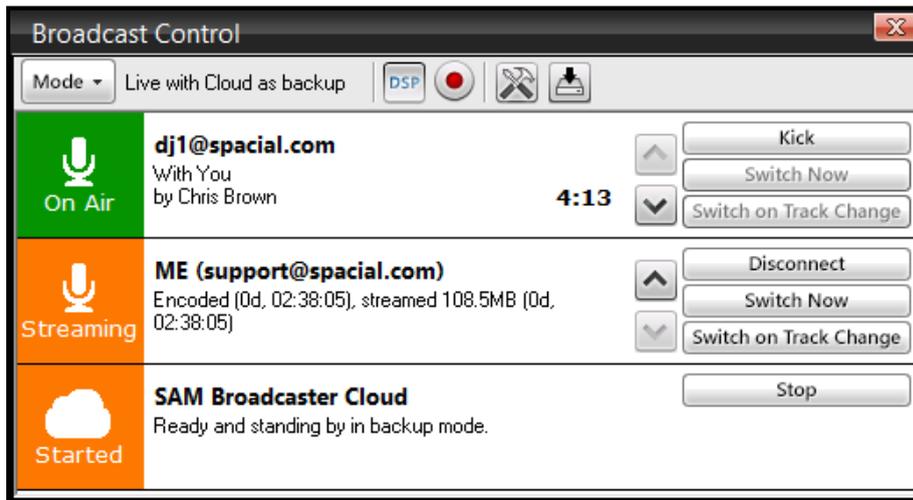


Figure 36 – Broadcast Control Prior to Kicking a Streaming DJ

It should be remembered that by kicking the current DJ, you have only interrupted their stream long enough to remove them from the live broadcast, you have not stopped them playing audio nor have they been prevented from further streaming and SAM Cloud will by design, automatically attempt to reconnect. If the DJ was kicked for unacceptable behaviour then you might wish to revoke their Live Streaming permission from the DJ Management section within the Web UI.

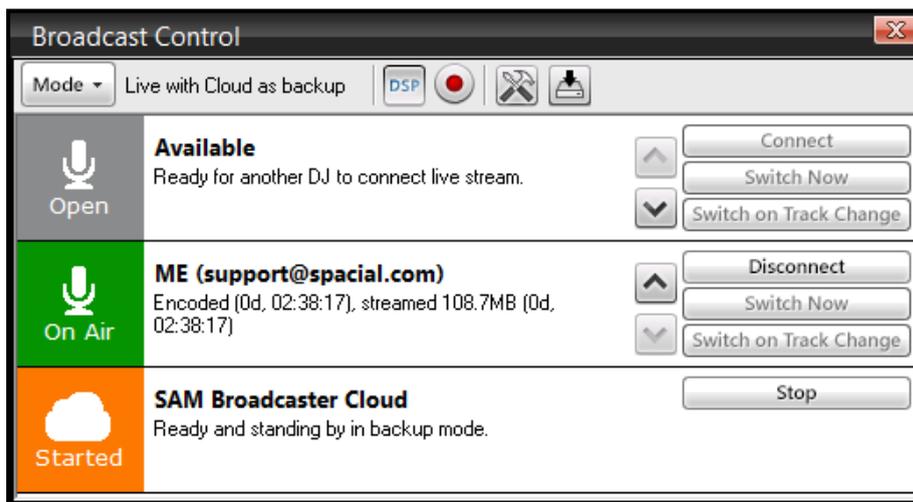


Figure 37 – Broadcast Control Just After Kicking a Streaming DJ

You will note that the On Air source switched to the DJ in the middle slot as the order of the sources determines the streaming source. If the kicked DJ had been streaming in the middle slot then SAM Cloud would have taken over the streaming which would also be the case if no other live DJ was streaming when the DJ was kicked if the broadcast mode is set to 'Live with Cloud as backup'.

As you can see, the kicked DJ returns shortly after being kicked but the DJ or Station Manager who kicked the DJ is now broadcasting as indicated by the On-Air status. There is however, nothing to stop the kicked DJ from kicking the On-Air DJ if they wish and DJ management remains the responsibility of the Station Manager.

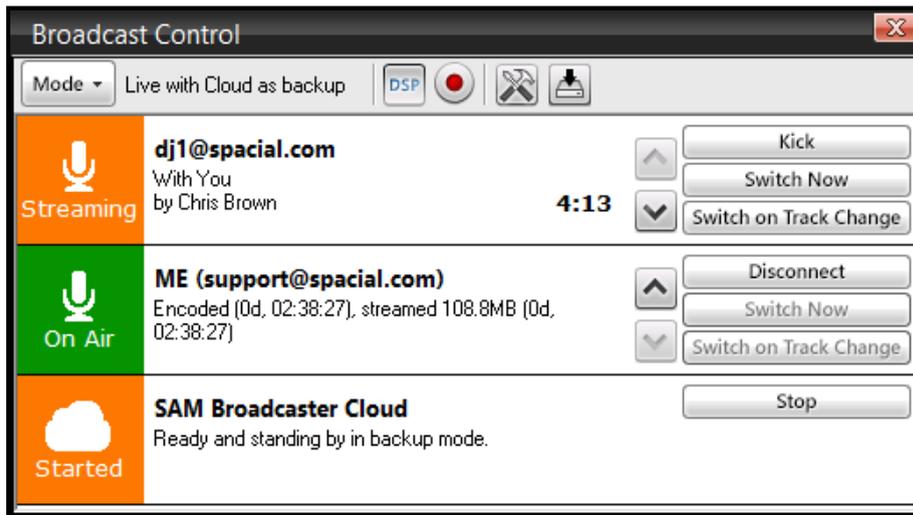


Figure 38 – Broadcast Control, Kicked DJ Automatically Reconnecting

## Stream Buffer

We have mentioned a buffer which is designed to handle brief network issues the live DJ or listener might experience and whilst by default, the recommended buffer duration is 25 seconds; this can be adjusted if necessary. A shorter buffer would reduce the amount of time it takes a DJ to connect however this would also reduce the systems' ability to cope with longer or multiple network interruptions.

The Stream Buffer can be adjusted under the Options button shown on the Live Control tab.

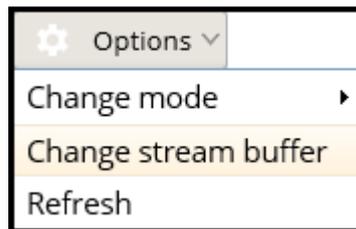


Figure 39 – Change Stream Buffer

To adjust the Stream Buffer click the Options button, Change Stream Buffer and you can adjust the stream buffer by selecting the required Buffer duration from the dropdown list. Adjusting the Buffer duration will restart your station.

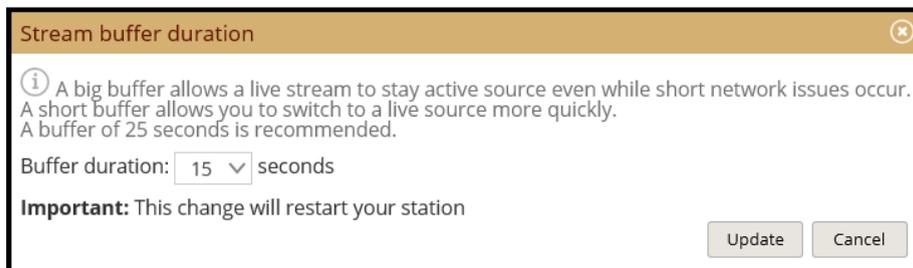


Figure 40 – Adjusting the Stream Buffer

## How to Manually Connect an Encoder

You do not need to use SAM Broadcaster (PRO/STUDIO/Live-DJ) to provide a source stream. Any Icecast v2 compatible encoder should work as long as it is streaming in AAC, MP3 or Ogg Vorbis.

## Manually Connecting an Encoder

The required connection information can be found in the Broadcast Control by clicking the question mark to the right of the Icecast2 Compatible

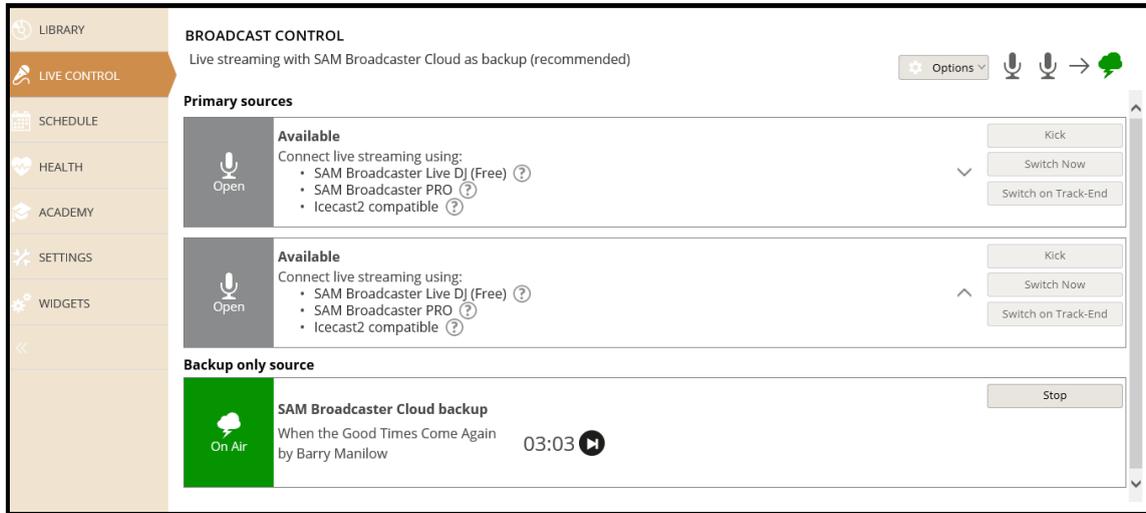


Figure 41 – Manually Connecting an Icecast v2 Encoder

This will present the required information for both available connection slots.

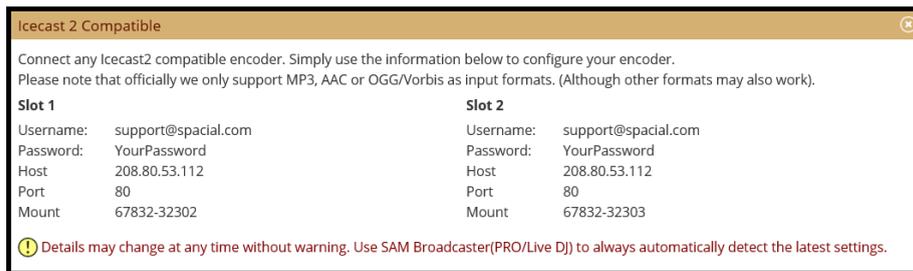


Figure 42 – Connection Slot Credentials

This information can be used to configure either a hardware or software, Icecast v2 compatible encoder.

## Advanced Usage

Also note the LiveSourceId in Step2. You can use that in the following two API calls:

You can use this link after adding your Station ID and the Live Source ID to make this source the new active source:

<http://samclient.spacialaudio.com/samvibeapi/station/<SID>/livesource/<LiveSourceId>/switch?waitForMetadataEvent=true>

Likewise, you can use this link to disconnect the Live Source referenced and connected on this slot:

<http://samclient.spacialaudio.com/samvibeapi/station/<SID>/livesource/<LiveSourceId>/kick>

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