Rock Solid STLs over IP are a Reality
Tieline G3 IP codecs are engineered to deliver rock solid and reliable audio over IP and wireless 3GIP networks and they are also capable of connecting over POTS/PSTN, ISDN, X.21 and satellite networks. Therefore, with a Tieline G3 codec it is possible to take advantage of both new and old telecommunications transports as Telcos transition into new IP-based technologies.

To change to an IP STL from an analogue program line (or POTS/ISDN link), all you need is a pair of Tieline IP codecs. Connect them to a reliable business DSL connection at both the studio and transmitter site and you are ready to broadcast dependable, high fidelity audio 24/7.

Common Misconceptions
There are some common misconceptions when it comes to broadcasting over IP, so let’s set the record straight.

Myth number 1: IP is not reliable enough to broadcast over.

Not true. Growth in IP broadcasting is now exploding and it will soon dominate the broadcast scene. Thousands of customers around the world and throughout Australia are now using Tieline IP codecs for reliable live broadcasts every single day. There are three key factors driving much of this growth:

1. Throughout the USA, Australia, and Europe in particular, circuit-switched ISDN networks are either being scaling down or phased out and there has been a huge expansion of terrestrial and wireless broadband infrastructure.
2. The cost advantages of packet-switched IP networks over circuit-switched networks have become too great to ignore.
3. Significant advances in technology have increased the reliability and flexibility of IP networks and reduced the delay of broadcasts over packet-switched IP broadcasts.

Myth Number 2: Broadcasting over IP is Expensive.

To use IP for your STL you need to order a business DSL data plan for both the studio and transmitter site. The cost of these plans has decreased substantially and they are now cheaper than other forms of leased line networks.

Business SHDSL plans send guaranteed symmetrical data (i.e. 512 kbps downlink and 512 kbps uplink) as opposed to ADSL connections, which send asymmetrical data (i.e. 512 kbps downlink and 256 kbps uplink). Symmetrical data is preferred in most IP broadcast situations because you are more likely to achieve higher uplink speeds than with ADSL connections. Higher bandwidths increase the stability and quality of your connections.
Unlike DSL (ADSL), SHDSL cannot be transported on top of a POTS/PSTN line so line sharing is not possible. For STLs we recommend using a dedicated connection so that your STL will never be compromised by other people downloading over the same Internet connection.

**Myth Number 3: I need to be an expert in IT to set up my IP codec at the studio and transmitter.**

Just like you would order a leased line from your Telco and get them to install it, your Telco and IT administrator will set up your fixed line IP broadband connection, preferably with a static public IP address. They can program Network Address Translation (NAT) between the public Internet, private Local Area Networks (LANs), Port Forwarding and any other routing required. Tieline has over 20 full time engineers and support personnel available to ensure you are up and running with a minimum of fuss.

**Myth Number 4: Broadcasting over IP is complicated.**

Nothing could be further from the truth! The latest advances in Tieline codec software have demystified IP and made it much simpler to broadcast over broadband networks. Some of the key things to be aware of in relation to IP include:

**Automated Dialing:** If you can make a phone call you can make an IP call – it’s as simple as that. All Tieline codecs can be programmed for one button dialing over IP and 3G/3.5G, providing the confidence of knowing that you can send a codec to a remote site without technical personnel and easily connect and broadcast.

**Automatic Connection Management:** Once you have connected, Tieline’s QoS Performance Engine software completely automates the management of IP connections by continuously diagnosing the ‘health’ of the network you are connected to. This software:

1. Can withstand significant packet loss over IP and 3GIP connections and still deliver continuous high quality audio.
2. Includes Tieline’s user-configurable automated jitter buffer solution, which dynamically analyzes the health and history of a connection, automatically adjusting settings to minimize delay and maximize reliability.
3. Incorporates Forward Error Correction (FEC) to replace any lost packets, ensuring broadcast clarity and stability over IP networks.
**Automatic Failover:** In the unlikely event of disconnection, Tieline IP codecs provide peace of mind by employing a fully automated failover connection to a backup transport. For example, IP can be used as the primary circuit for sending audio and you can use POTS/PSTN, ISDN or even a 3G/3.5G connection, as the backup link if the primary network connection fails. All this will happen automatically.

**Myth Number 5: If I buy Tieline codecs I won’t be able to connect to other brands of codecs.**

Tieline codecs are the only ones to support compatibility with other brands of codecs over five different network types – IP, 3G/3.5G, POTS, ISDN, and X.21.

Over IP Tieline is compatible with all major brands of codecs that have implemented EBU specifications for interoperability over IP using SIP. As a member of the Audio-via-IP Experts Group, Tieline is compatible with fellow members Orban CRL, Mayah Communications and AETA, as well as Prodys, Telos, AEQ, AVT, and Digigram.

Tieline codecs are compatible with all major brands of codecs using the popular G.722 and MPEG algorithms and they are also compatible over POTS with Comrex Matrix, Access, Vector and Blue codecs.

In fact, with a Tieline rack-mount codec installed you can connect to any brand of codec over ISDN and IP, all Comrex codecs over POTS, and receive wireless 3G broadband and GSM connections from other Tieline codecs – now that’s compatible!

**Which Algorithms should I use over IP?**

Tieline IP codecs provide various algorithm options for IP STLs. The algorithm you choose will depend upon the bandwidth of your Internet connection and the type of codec you are connecting to.

**Connecting Tieline Codecs**

To achieve the highest quality over a typical STL you have the choice of connecting over Tieline’s MusicPLUS algorithm or the industry standard MPEG 1 Layer 2 algorithm. To achieve full bandwidth 20kHz stereo audio, MusicPLUS requires 128kbps and MPEG 1 Layer 2 requires 256kbps.

If your bandwidth is more limited for some reason, Tieline Music provides 15kHz stereo at 64kbps.

**Connecting to a non-Tieline Codec**

If you are connecting a Tieline codec to a different codec brand you have the choice of full bandwidth 20kHz stereo audio using MPEG 1 Layer 2 at 256kbps,
or for voice only transmissions such as AM talk or racing, you can use G.722 at bit-rates as low as 64kbps.