

Mixing in Stereo

✝ Church Audio ✝

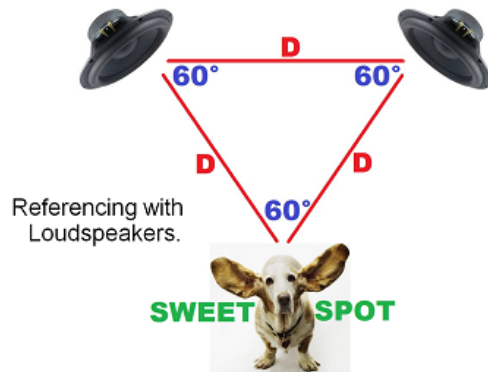
Mixing many tracks into Stereo (two)



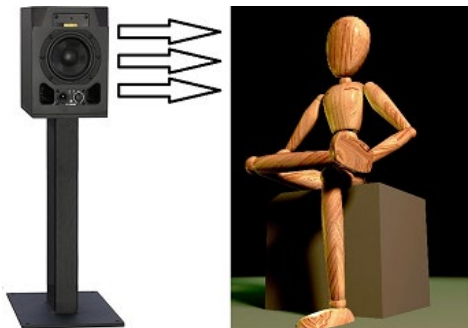
When you mix in a “**Live**” venue you normally mix in **mono**. Mono means you keep all the PAN dials in the centre so that the content in the Left and the Right channels is the same. This is necessary because most people in a church are closer to one set of Loudspeakers than the other. Because the Left and Right loudspeakers contain the same sound we can aim them where they can best serve a particular section of the crowd.

When we are mixing for a “**Recording**” (the church CD) then we start turning the PAN dials so that the material in the Left channel differs from that in the Right. The human ear detects the differences in the two Speakers and experiences a sense of depth and space, which we call **Stereo**.

Stereo Imaging.



The optimum setup for **referencing** (listening to) (monitoring) stereo is to angle the Loudspeakers inwards at 60 degrees. The Listener should be back at whatever distance (D) the speakers are apart (this is the Sweet Spot). Mathematicians would call this an Isosceles (Equilateral) Triangle.



When mixing, the loudspeakers need to be aiming at your face so that you are hearing all loudspeaker cones directly. This is to ensure that you hear the high frequency content properly (high frequencies are very directional).

Listen to your mix loudish to reveal anything that might start to stand out. Listen to your mix quietly. Then go really quiet and check what disappears first. The sounds that disappear first are lowest in the mix. Obviously, what remains till last is high in the mix (are these the things you want to be quietest and loudest in the mix?).

Ideally you will have two pairs of Loudspeakers... one large pair with big woofers further back (far field) and a set of smaller Loudspeakers about a metre away (near field). The truest representation of the **sound** is on the far fields, and the truest representation of the **levels** is on the near fields.



There are two kinds of Headphones. **Open** Headphones are designed to allow some outside noise to come in. This gives a more natural sound. In general, these are more comfortable with lighter pressure on the ear area. **Closed** Headphones are designed to isolate your ears from outside noise. This isolation may help in critical listening. Closed headphones generally provide a heavier bass sound. Be careful that these aren't false basses (basses that are not audible on loudspeakers, meaning the Headphones are inventing them).

Referencing with Headphones offers the maximum stereo effect, however the sound quality isn't comparable to quality Loudspeakers and your equalising should always be made on Loudspeakers. The ideal is to flick back and forth between Loudspeakers and Headphones listening for things that stand out. A good mix is one that sounds good on Loudspeakers and in Headphones, remember... you don't know where your mix is going to end up.



Ear fatigue comes after hours of concentrated listening.

There will be moments when you realise you can't tell if the mix is good or bad. Stop. Leave the room for a while. Never mix immediately after a long Recording session because your ears and brain will be tired, and you will not be capable of the long and deep concentration required to mix well.

It is mixed correctly when you can hear



**all-the-words,
all-the-music,
all-of-the-time.**



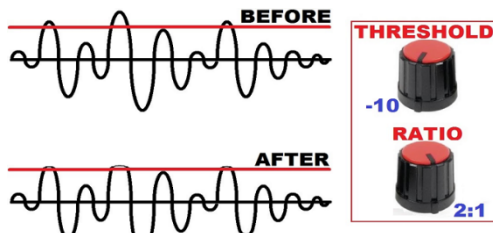
**Tracks should be cleaned
before Mixing starts:**

- No unwanted sounds.
- Any fragmented tracks preferably consolidated (merged) or else locked.

If you are mixing from a Multitrack, consider cleaning all the tracks of noise and unwanted waves. If it's not there it can't sneak into the mix by accident.

When you are mixing, you are doing a lot of things at once. It's easy to bump a small wave-file (clip) out of time, so lock the sound clips in place, or merge them (safer).

You may consider **Premixing** (Comping) multiple tracks into sets of two tracks, for example to create L-R tracks of vocal backing singers, strings, horns etc. Premixing smaller numbers of tracks gives a higher quality result, as it allows you to focus solely on those few tracks. You will have all the Effect Units at your disposal for just that handful of tracks, and the Reverb and Delay Units will give better cleaner results as there are no other sounds going through them. It is good to record the result on to 2 new tracks (to preserve the L-R you have created) and that frees all the Effect Units for other things, as well as less faders to focus on when you are doing the main mixdown. You can also use **Sub-groups** as a way of bringing groups of tracks under control.



Apply Dynamic Processing early! This calms any irregular volumes, and the track will sit better in the mix. Slight compression will change the sound. Slight compression lightly compacts the frequencies contained in the sound, immediately sounding more balanced, and inevitably needing less equalising (it sounds better already).



Set up your Left/Right Panorama

We create our sound **panorama** using the Channel **Pans**.

By panning some voices and instruments more to one side than the other...

- the mix will feel like it has space and depth.
- we can separate any sounds that will mask each other because they have similar frequencies.

The lead Singer and any Solo instruments are normally panned near the centre.

Bass Frequency instruments (eg. electric bass, bass drum) are kept fairly central as well because bass frequencies have higher electrical volumes. This will cause one channel to be electrically much higher and start to cause difficulty with your overall levels.

All other voices and instruments wrap around the centre image, in varying degrees off to the left or right.

Set out your panning strategy before you go near the equalisers, and before trying to set the levels. Panning affects both of these quite dramatically.

Equalisation

A good balanced sound (balanced frequencies inside the sound) will always be audible in a mix, and easy to level. A bad sound is hard to sit well in a mix (it will never sound quite right, and continually be too loud or too quiet).

You need to filter your sounds on Loudspeaker cabinets with decent sized loudspeaker cones. If you do all your filtering in headphones or tiny Loudspeakers, even if they have "Studio Monitor" written on them (but they're actually just small cones) then anyone who plays your mix later on a large Sound System will not like what they hear.

You need to equalise your sounds on big speakers (cones), then check that it sounds ok in the headphones.

After all your tracks sound ok, it will be easier to get the volumes levelled when you switch to the smaller monitors or headphones.

A mix is considered right when it sounds good on large loudspeaker cabinets, and in headphones.

You need to solo a sound while you filter it, but you must always check it in the presence of the other sounds it will have around it. Sounds filter each other as they mix together (multiple sine-waves mixed together will randomly add and subtract from each other's frequencies). Because of this a sound might seem a bit strange on it's own (soloed) but when added into the mix it sounds correct.

ADT (Automatic Double Tracking)

You may choose to 'double' some instruments on to 2nd tracks, to create a stereo image of an instrument or a singer.

This can be done physically by taking the Direct Out from one channel and passing it to the Line In of another channel. You equalise each of the two tracks differently to create sound difference.

Another method is to send the single track through an Effects Unit that has a stereo output, and return on to two separate channels (L-R).

Effect Units (*used lightly*) will always improve depth and sense of space.

a) Insert on single track, subgroup or master.

b) Use *shared Aux* effect sends for binding groups of tracks.

Also remember you can use Outboard Effect Units in the Mix.

WAYS OF ADDING DEPTH TO A STEREO MIX



Creating Depth using Sound (*when your brain hears similar but not identical sounds left and right, the differences between the two create a sense of depth*).

1. Pan instruments and voices that have the same basic frequency content in different directions.
2. Split a sound so that there are two of them. Filter one bright, and one warm. Pan them in opposite directions.

Creating Depth using Time (*when your brain hears something arrive at each ear at different times, it perceives a sense of direction and depth*).

1. Pan a sound to one side. Send the sound through a Reverb or Echo Unit and pan the effected version to the opposite side.
2. Send the sound through a Stereo Delay and create two different length echoes.
 - a. Pan the original left. Pan the quicker of the two echoes to centre, and the slower echo right... or...
 - b. Pan the original right. Pan the quicker of the two echoes to centre, and the slower echo left... or...
 - c. Pan the original to centre. Pan the quicker of the two echoes left, and the slower echo right.

Creating Depth using Plugins

There are many Software Plugins available to give your sound depth.

Auto-Pans can be set up to continuously move a sound back and forth between the Left and Right.

Pseudo-Stereo or *Binaural* effects let you send in a single (mono) sound, and it creates a pleasantly different Left and Right.

Stereo Reverb effects add a very full sense of space and depth by moving the reverb back and forth between the Left and Right.

APPENDIX: *SOME THINGS THAT MAY HELP YOU MULTI-TRACK MIXING*

MIXING THE VOICE

Soloist

If a song is sung then the vocals, by default, are the most important part of the song and are what the success of the song will hang on. Slightly boost 5K... this is known as the "magic frequency" (sweet spot) for the voice.

Apply sufficient compression to keep the singer's quietest and loudest volumes within a listenable level. Use your best reverb on the voice (discretely). At times a good echo can give the voice a more appropriate ambient, with or without reverb. An ambience using an Echo keeps the voice much cleaner. Reverb can sometimes smother some of the detail in the voice. To get clarity with a Reverb you really need to use pre-delay to push the reverb out from under the attack of the voice. A clean reverb with a shortish tail, and a fairly high aux send is the best start.

Once you have a good ambience around a voice none of the other instruments can invade its space and mask it, even if they have the same range of frequencies. Consider a De-esser Plug-in if the 'S' is excessive, and a 'P' remover Plug-in (or just bass cut below 80Hz) for excessive popping. Don't remove all the esss from a voice as this is the intelligibility, and a lack of high frequencies will make the voice sound like it has a veil over it and no one will understand the words.

Choir / Background Singers

A little trick to help blend harmony vocals, and make them thicker, is to add a 'little' Chorus effect, along with some Reverb. Compression is good here because they aren't supposed to be very dynamic (they need to be a constant-levelled background wall of sound).

MIXING THE PIANO

A piano delivers a mass of frequencies. We don't always need them all.

If there is a bass guitar playing, then consider filtering (lowering) the basses slightly on the piano so the pianists left hand (which is accustomed to playing the bass part) doesn't dirty what the bass guitarist is doing. If there is a guitarist it can sometimes be helpful to lower slightly the mid frequencies on the piano (that correspond to the zone of the guitar that you want to come through) as the piano will smother the guitar sound. The part of the piano that you want to come through is in the higher frequency area (the "ivory" sound).

MIXING THE GUITAR

To get a big guitar sound you really should consider two tracks of the same performance (panned Left / Right). The ideal is that the guitar track is played twice with even better results if you change guitar or amplifier or microphone the second time you record. If you find the guitar sound is too thin when mixing, you can set up a cable, coming out of the guitar channel *Direst Out*, and send the guitar track back into a guitar amplifier and record it on a new track (actually you can use this trick to fatten any sound, including a voice, if you wish). Third option is to double it electronically (ADT) as mentioned above.

MIXING THE ELECTRIC BASS

Pan it to a central position, a Bass will play havoc with your electrical levels if it's not in the centre. Compression is best (lightly, and correctly) because it balances out the frequency components and makes the professional sound you are accustomed to hearing. Try containing 100 Hz by lowering it 6 dB with the EQ, then increase 200 Hz by about 6dB. This is called 'apparent loudness' and is a way of getting a full bass sound without having any boomy component in the sound. Balance the Bass with the Kick Drum. When you hit the right spot, you'll know it; the bass and kick should complement one another almost as though they were one instrument. A chorus or flange (just a little!!) can often sound nice on a Bass.

MIXING THE DRUMKIT & PERCUSSION

Generic

As always... do your Panning first as this dramatically affects all subsequent sounds and levels.

For rock music you may choose to balance the individual drum mics first and then add the overhead mics to improve the space and clarity of the cymbals.

For a very live acoustic drum sound (incl. jazz) you may find it easier to start with the overhead mics and add individual mics where you need a little extra focus. If individual drum sounds are great when soloed but poor when the other drums are added this could indicate phasing problems.

Because the drum microphones are some distance apart from each other, some will be out-of-phase with the others. Add each drum channel one at a time and flip the phase switch back and forth on each. Listen for the phase position with the fullest sound.

Kick

Pan it to a central position, a Kick Drum will play havoc with your electrical levels if it's not in the centre. A light compressor is always good.

A short delay (20mS) can help fatten a Kick drum if it is weak or hollow sounding. A noise gate will make it tighter, more percussive.

Bass cut from 80Hz, the subsonic material below this point is not part of a good kick drum sound, and it modulates and messes up the electrical levels.

Snare

A bright reverb of short duration (2 Sec) is often all it needs; use a little pre-delay and turn up the aux send quite a lot.

With the EQ you can create a narrow boost around 1.5K, and wide boost around 5K.

Hi-Hat

Typically, you need to cut some of the basses to lower the snare sound that inevitable spills in to the Hi-hat microphone. A short echo sent to a second track will give you a great stereo L-R. The Hi-hat can sound nice with a little chorus, and even a light flange.

If the sound sizzles too much, and you can't soften it satisfactorily with EQ, then try applying a De-esser plug-in to obtain a soft fresh cymbal sound.

Toms

Consider the panning of the Toms. Notice which toms are used in various parts of the song, so you can plan how to pan them. Note: It isn't always a good feeling having a single tom strike hard left or hard right in a mix; often panning of toms works better panned out to 80% instead of 100% L or R.

Cymbals

If you used two L & R Overhead microphones, then listen to them one at a time to be sure they are panned the way you want. Then be sure the other drums follow the positioning heard by the overheads. Bass cut the cymbals so that the drums are lowered, and the brass cymbal sound comes through better.

Percussion

Don't try and improve or 'effect' percussion sounds, just try and make them as 'natural' sounding as possible. A short fresh reverb can add a nice ambience.

CREDITS

This material is offered freely to the Christian Churches; downloadable at Pietango.com

Text: *Original, by the Author, a Christian Recording Engineer.*

Images: *Designed by the Author. Some photographs were sourced from the Internet, then re-worked.*

Ever since the creation of the world, God's invisible attributes and divine nature have been evident. They are clearly understood through his workmanship, and all the wonderful things that he has made. Therefore, those who fail to believe and trust in him are without excuse, or defence. **Romans 1:20**

All of us have sinned and fallen short of God's glory, but God treats us much better than we deserve.

Because of Christ Jesus, he freely accepts us and sets us free from our sins. God sent Christ to be our sacrifice. Christ offered his life's blood, so that by faith in him we could come to God. **Romans 3:23**

If you declare with your mouth, "Jesus is lord," and believe in your heart that God raised him from the dead, you will be saved. For it is with your heart that you believe and are justified, and it is with your mouth that you profess your faith and are saved. **Romans 10:9**

For the Scripture (*Isaiah 28:16*) says, "Whoever believes in Him will not be disappointed." **Romans 10:11**

These things have been written so that you may believe that Jesus is the Christ, the son of God; and that by believing, and relying on him, you may have new life in his name. **John 20:31**